1699 References Apimedical Science


17. [ANON] (2003) I'm here to tell you the bear facts about honey. National honey board

   Abstract: Topical application of most CMs used in commonly available wound-care products is usually safe Honey, calendula and aloe have evidence that they may facilitate heating in both acute and chronic wounds Chamomile, lavender oil, tea-tree oil, pawpaw and vitamin E have insufficient evidence for recommending to patients with wounds

Abstract: The Baccharis genus is an important source of natural medicinal products. The information collected here is an attempt to cover the most recent developments in the ethnopharmacology, pharmacology and phytochemistry of this genus. This review describes its traditional and folkloric uses, phyto-constituents and pharmacological and toxicological reports of the prominent species of the genus Baccharis. Flavonoids and other phenolic compounds, diterpenoids and volatile constituents have been reported as the major phyto-constituents of the Baccharis species. Pharmacological studies are mainly based on the anti-inflammatory, antioxidant, antimicrobial and antifungal properties. The potential for development of leads from Baccharis genus continues to grow. The information summarized here is intended to serve as a reference tool to practitioners in the fields of ethnopharmacology and chemistry of natural products.

Abstract: The antioxidant activity of eight Egyptian propolis samples from different localities was evaluated by the antioxidative potential and capacity of the DPPH-ESR signal, superoxide anion generated in the xanthine-xanthine oxidase (XOD) system and low density lipoprotein (LDL) peroxidation assay. As, F, Is and D samples showed the highest antioxidative capacity and potential, respectively. The El, IsR, Is, D and So samples exhibited highly significant antioxidant activity in the XOD system and in LDL peroxidation assays. The antiviral activity of propolis samples was investigated. They showed variations in their activity; sample D induced the highest antiviral activity against Newcastle disease virus and infectious bursal disease virus. 42 Polyphenolic compounds were identified by HPLC; 13 aromatic acids, esters and alcohols were present, 29 flavonoids were identified, 6 of them being new to propolis.

Abstract: 1 Caffeic acid phenethyl ester (CAPE), an active component of propolis from honeybee hives (honeybee resin), has anti-inflammatory, anti-carcinogenic and anti-bacterial properties. This study was designed to investigate the anti-inflammatory effects of CAPE on Helicobacter pylori-induced NF-kappa B and AP-1 in the gastric epithelial cell line AGS. 2 Electrophoretic mobility shift assay was used to measure NF-kappa B- and AP-1-DNA binding activity. Western blotting was used to detect kappa B-alpha and COX-2 expression in AGS cells cocultured with H. pylori. The antiproliferative effect of CAPE was measured by MTT assay. 3 Our results showed that caffeic phenethyl ester inhibits H. pylori-induced NF-kappa B and AP-1 DNA binding activity in a dose (0.1 - 25 mu g/ml(-1) 0.35-88 mu M) and time- (15-240 min) dependent manner in AGS cells.
Maximum inhibition by CAPE was observed at concentrations of 25 μg ml\(^{-1}\) (similar to 88 μM) CAPE prevented H. pylori- and cytokine-induced degradation of I kappa B-a protein. 4 Pretreatment of AGS cells with CAPE also blocked cytokine- and mitogen-induced NF-κB and AP-1 expression. Furthermore, CAPE suppressed H. pylori-induced cell proliferation and production of the cytokines TNF-alpha and IL-8. In addition, CAPE blocked H. pylori-induced COX-2 expression. 5 The inhibition of such transcription by CAPE could result in suppression of many genes during H. pylori-induced inflammation, and also provide new insights into the anti-cancer and anti-inflammatory properties of CAPE


Abstract: Treatment of male albino rats with 5% honey for 20 days had no significant effect on total body weight or on the relative weight of other organs like the testis, seminal vesicles, spleen, kidneys, liver, heart, or brain. The only significant change was a 17% increase in the relative weight of the epididymis (\(P <= .01\)). The relative weight of all the other organs was similar to those in control animals treated for the same period with drinking water. Treatment of rats for the same period with the same concentration of 5% sucrose produced no significant changes in absolute or relative weight of tested organs compared to control animals. The same treatment with Palestinian honey increased significantly the epididymal sperm count by 37% (\(P <= .05\)). The activity of testicular marker enzymes for spermatogenesis such as sorbitol dehydrogenase (SDH) was increased by 31% (\(P <= .05\)), and lactate dehydrogenase (LDH) was reduced by 48% (\(P <= .05\)), which indicates that treatment with honey induces spermatogenesis. Similar treatment with sucrose had no significant effect on any of the key enzymes or epididymal sperm count. In conclusion, our results show that ingestion of honey induces spermatogenesis in rats by increasing epididymal sperm count, increasing selectively the relative weight of the epididymis, and increasing SDH activity and reducing LDH activity.


Abstract: On June 3, 2004, a 25 yr old male came to my clinic with a history of red painful eye of 7 months duration. There was no history of trauma to the eye nor history of past similar affection. Examination showed that the left eye lids were markedly swollen and he had marked photophobia. Upon opening the left eye there was a deep corneal ulcer with ciliary injection and marked conjunctival edema. He did not show a favorable response to various forms of conventional treatment. He consulted more than one ophthalmologist who prescribed various forms of drugs including antibiotics, antiviral drugs, and corticosteroids but without favorable response. Nearly one month before his presentation I advised for him topical honey as a treatment for his condition but he was hesitated to start such kind of treatment and he wanted to give for his eye the last trial of traditional treatment. Again the last trial failed to make any noticeable improvement and he became afraid of loss of such eye because of the possibility of endophthalmitis. This ulcer was presumed to be due to more than one type of infection and/ or infection resistant to the traditional treatment. On June 3, 2004 he was ready to start treatment by honey and I explained to him that honey has anti-microbial, anti-inflammatory, and wound healing effects. Also I explained to him the initial temporary misleading benign reactions of topical honey in the eye. Honey (raw, filtered, not diluted and not gamma radiated) was topically applied to the conjunctival sac of the diseased eye in a dose of 1.0 ml twice daily and the patient was advised not to wash the eye after honey application and to keep the eye
covered throughout the day. The effects of topical application of honey to the diseased eye were generally in the form of temporary increase of symptoms and signs followed by improvement. The most annoying was the occurrence of moderate to severe pain a few seconds after application. This pain persisted for about 1-2 minutes followed by improvement. Also there was increase of the conjunctival injection and discharge which were also transient. After about 15 days the ulcer healed leaving a relatively big corneal opacity and there were still ciliary injection and conjunctival edema which were less severe than before. Nearly after about 3.5 months the ciliary injection and conjunctival edema disappeared but the opacity was still present. At that time the patient was much satisfied by the results and he stopped honey application. Iwere also satisfied by such result as the ulcer completely healed and there was no risk of endophthalmitis and loss of that eye. Dr. Stefan Stangaciu, the president of the German apitherapy society advised me to convince the patient to continue topical honey as this will eliminate or at least will reduce the size of the opacity. The patient was convinced to apply honey regularly and since November 2006 till the time of writing this report the opacity is getting smaller.


Abstract: The effect of bee honey (BH) taken from Apis melifica on human peripheral blood lymphocytes and neutrophils was studied using lymphocyte blastogenic 3-[4,5-dimethylthiazole-2-yl]-2, 5-diphenyl tetrazolium bromide (MTT) and quantitative nitroblue tetrazolium (NBT) assays, respectively. Bee honey showed a mitogenic effect on both B- and T-lymphocytes. Stimulated by lipopolysaccharide (LPS) at 0.1% BH, B-cells showed maximum stimulator?, index (0.838 +/- 0.14 relative to 0.521 +/- 0.09). Stimulated by concanavalin A (Con A) or phytohemagglutinin (PHA) in the presence of 0.2% BH, T-cells showed maximum stimulatory index of 0.820 +/- 0.12 and 0.712 +/- 0.09 compared to controls of 0.531 +/- 0.07 and 0.648 +/- 0.08, respectively In addition, in the absence of classical mitogens, BH also stimulated B- and T-cells with stimulatory indices of 0.247 +/- 0.03 and 0.34 +/- 0.04, respectively. In the absence of LPS, maximum NET uptake (fmol of formazan per phagocyte) by neutrophils was achieved at 0.2% BH (1.53 +/- 0.23 compared to 1.29 +/- 0.08) but no significant (p > 0.05) effect of BH was found in the presence of LPS.


Abstract: Whole fruit and fresh-cut pieces from 4 types of melon were stored for up to 10 d at 0 and 5 degreesC. After the wound stress period, no differences in the respiration rates were found between intact and the fresh-cut melon. Softness, weight loss,
translucency, wound stress, and respiration rate were lower and sensorial quality higher during storage at 0 degreesC than at 5 degreesC. Cut cylinders showed a low degree of softness, high translucency, and a poor processing efficiency. Slices showed a higher softness but lower translucency. Trapezoidal sections showed a behavior intermediate between cylinders and slices. For the fresh-cut melon, the best results were obtained with Amarillo trapezoidal sections and a storage temperature of 0 degreesC.

39. AHMAD, R (1989) Justicia adhatoda, une plante mellifere medicinale important..... The XXXIth Apimondia Congress, Rio de Janeiro, Brasilien,

Abstract: Formulations contain 1% beeswax

Abstract: Propolis is a resinous substance collected by honeybees from various plant sources. The composition of propolis depends on time, vegetation, and the area of collection. This study examined the antioxidant activity of propolis from various areas of China: Heilongjiang, Neimongol, Hebei, Shandong, Shanxi, Gansu, Henan, Hubei, Sichuan, Hunan, Yunnan and Hainan. Ethanol extracts of propolis (EEP) were prepared and evaluated for their antioxidant activities by beta-carotene bleaching, 1,1-diphenyl-2-picylhydrazyl (DPPH) free radical-scavenging, and 2,2'-azinobis(3-ethylbenzothiazoline-6-sulfonic acid) radical cation decolorization assays. Furthermore, the major constituents in EEP were identified by high-performance liquid chromatography (HPLC) analysis with a photodiode array (PDA) and mass spectrometric (MS) detection, and each component was quantitatively analyzed. All propolis samples except that from Yunnan had relatively strong antioxidant activity accompanied by high total polyphenol contents. Propolis with strong antioxidant activity contained large amounts of antioxidative compounds, such as caffeic acid, ferulic acid and caffeic acid phenethyl ester. On the other hand, propolis from Yunnan and Hainan had compounds not present in propolis from other areas. (c) 2006 Elsevier Ltd. All rights reserved


43. AL-SOMAI, N; COLEY, K E; MOLAN, P C; HANCOCK, B M (1992) Sensitivity of *Helicobacter pylori* to the antibacterial activity of Manuka honey. *Submitted for publication*


Abstract: The objective was to study the effect of natural pure honey on the antibody production against thymus-dependent antigen [sheep red blood cells (SRBCs)] and thymus-independent antigen (Escherichia coli) in mice. Forty-two mice (mean weight 28.33 +/- 3.44 g) were divided into two groups: group A (21 mice) fed regular diet and group B (21 mice) fed regular diet plus 0.8 g/kg of body weight/day of honey administered in four equally divided doses. Each animal was injected intraperitoneally with 0.1 mL of 5% SRBCs and 0.1 mL of killed E. coli. The same dose of both antigens was given after
17 days. At days 7 and 16 after primary immunization and Lit day 4 after secondary immunization, blood samples were collected from seven mice at each time interval front group A and group B to estimate antibody titer using the hemoaggulination test. At day 7 after primary immunization, the mean antibody titer against SRBCs was 9.14 +/- 3.02 in group A and 13.7 +/- 3.9 in group B (P <.05), while the mean antibody titer against E. coli was 14.8 +/- 8.5 in group A and 14.8 +/- 9.35 in group B. At day 16, the mean antibody titer against SRBCs was 13.71 +/- 3.9 in group A and 20 +/- 9.8 in group B, while the mean antibody titer against E. coli was 14.69 +/- 935 in group A and 26.67 +/- 8.26 in group B (P <.05). Four days after secondary immunization, the mean antibody titer against SRBCs was 13.33 +/- 4.62 in group A and 16 +/- 8.7 in group B, while the mean antibody titer against E. coli was 42.67 +/- 18.4 in group A and 69.33 +/- 31.4 in group B. It might be concluded that oral honey stimulates antibody production during primary and secondary immune responses against thymus-dependent and thymus-independent antigens.

Abstract: OBJECTIVES: To evaluate effects of natural and artificial honey solutions on urinary nitrite content, prostaglandin excretion and urinary variables in healthy individuals.
METHODS: The study comprised 12 individuals, nine males and three females; age range 25-45 years. Urinary total nitrite, prostaglandin E2 (PGE2), prostaglandin F2 alpha (PGF2 alpha) and thromboxane B2 (TXB2) were assessed in spot morning sample and 1, 2, and 3 hours after ingestion of 80 g of natural honey dissolved in 250 ml water. Honey solution was given at night; urine volume, urinary osmolality and electrolytes, and serum osmolality and electrolytes, were assayed 10 hours after drinking honey. Same procedure was repeated after drinking artificial honey (30 g glucose plus 38 g fructose) and compared with control (drinking 250 ml of water). RESULTS: The mean (SD) of total urinary nitrite excretion was 103 +/- 43.5 micromol/l which was increased by 40%, 55% and 74% at 1, 2, and 3 hours after drinking honey solution respectively. The mean urinary PGE2 was 1.323 +/- 0.8 ng/ml that was decreased by 31% 3 hours after honey ingestion. The mean urinary PGF2 alpha was 1.554 +/- 1.2 ng/ml and that of TXB2 was 0.35 +/- 0.4 ng/ml. Forty-four percent reductions in urinary PGF2 alpha and 67% reduction in TXB2 were obtained 3 hours after drinking honey. Honey increased insignificantly free water clearance, filtered sodium and creatinine clearance. It decreased insignificantly urinary osmolality, urinary calcium, urinary sodium, and fasting blood sugar (FBS). Little changes were obtained in urine volume and urinary urea, glucose and creatinine concentration. Artificial honey decreased urinary nitrite and increased urinary prostaglandins concentration. It increased insignificantly free water clearance, filtered sodium, urinary urea, urinary creatinine and creatinine clearance. It decreased insignificantly urinary osmolality, urinary calcium, urinary sodium, and fractional excretion of sodium (FENa). Artificial honey increased FBS by 14% and urinary glucose by 76.5%, and decreased serum sodium and plasma osmolality. CONCLUSION: Honey solution decreased urinary prostaglandins concentration and increased total urinary nitrite content whilst artificial honey decreased urinary nitrite and increased urinary prostaglandins.

Abstract: Honey has antibacterial activity, promotes healing, and enhances immunity. Its acidity, osmotic effects of its high content of sugar, and hydrogen peroxide are assumed to be responsible for its effects. In this study, various honeys were investigated for the presence of nitrite/nitrate, the stable nitric oxide (NO) metabolites, and the effects of intravenous infusion of honey on urinary and plasma NO end products were studied in healthy sheep. Seven kinds of honey, different in their origin (three from Yemen, two from the United Arab Emirates, one from Germany, and one from India), color, and duration of storage, were investigated for the presence of NO metabolites. The assessment of NO metabolites was performed before and after exposure of the honey samples to heating.
(80°C for 1 hour) or ultraviolet light (for 24 hours). Seven healthy male sheep were used for the study. Fresh unprocessed yellow honey (2 g/kg of body weight) was infused over a period of 45 minutes to each fasting sheep. Plasma and urinary NO metabolites were measured before and after the infusion. All the honey samples examined had various concentrations of NO metabolites; the highest concentration was in the fresh dark honey collected from Yemen, and the lowest in 1-year-stored dark honey collected from India. Darker or fresh honeys contained more NO metabolites than light or stored honey. After heating, NO metabolites decreased in all the kinds of honey. After ultraviolet exposure, NO metabolites were decreased in four kinds of honey, increased in one kind, and unchanged in two kinds. The darker stored honey had more resistance to heating and ultraviolet exposure. Intravenous infusion of honey elevated urinary NO metabolites from 8.4 ± 7.4 µmol/L to 14.9 ± 10 µmol/L during the first 60–90 min after infusion and to 35.2 ± 34 µmol/L during the next 150–180 min. Plasma NO metabolites were increased during 1, 2, and 3 hours after infusion by 3%, 3.6%, and 17%, respectively. No side effects were reported with the use of intravenous honey. It might be concluded that honey contains various concentrations of NO metabolites. Its intravenous infusion increased plasma and urinary NO metabolites. It is assumed that NO might be responsible, in part, for the biological and therapeutic effects of honey.

49. AL-WAILI, N S (2003) Intrapulmonary administration of natural honey solution, hyperosmolar dextrose or hypoosmolar distill water to normal individuals and to patients with type-2 diabetes mellitus or hypertension: Their effects on blood glucose level, plasma insulin and C-peptide, blood pressure and peaked expiratory flow rate. European journal of medical research 8 (7): 295-303.

Abstract: Safety and effect intrapulmonary administration (by inhalation) of 60 % honey solution, 10% dextrose or distill water on blood sugar, plasma insulin and C-peptide, blood pressure, heart rate, and peaked expiratory flow rate (PEFR) in normal or diabetic subjects were studied. Twenty-four healthy subjects, 16 patients with type 11 diabetes mellitus and six patients with hypertension were entered for study. They were underwent complete physical examination and laboratory investigations. Twelve healthy subjects were subjected for distill water inhalation for 10 min, and after one week they received inhalation of honey solution (60% wt/v) for 10 min. Another 12 healthy subjects received inhalation of 10% dextrose for 10 min. Blood glucose level, plasma insulin and C-peptide, blood pressure, heart rate and PEFR were estimated before inhalation and during 2-3 hrs after inhalation, at 30 min intervals. Random blood glucose level was estimated in eight patients with poorly controlled diabetes mellitus, and repeated 30 min after honey inhalation. One week later, fasting blood glucose level was estimated in each patient and blood glucose level was re-estimated during three hrs after honey inhalation, at 30 min intervals. Glucose tolerance test was performed in another eight patients with type-2 diabetes mellitus, and after one week the procedure was repeated with inhalation of honey, which was started immediately after ingestion of glucose. Six hypertensive patients received honey inhalation for 10 min; supine blood pressure and heart rate were measured before and after inhalation. Results showed that in normal subjects distill water caused mild elevation of blood glucose level, mild lowering of plasma insulin, and significant reduction of plasma C-peptide. 10% dextrose inhalation caused mild reduction of plasma insulin and C-peptide and unremarkable changes in blood glucose level. No significant changes were obtained in blood pressure, heart rate or PEFR after distill water or 10% dextrose inhalation. Honey inhalation caused lowering of blood glucose level and elevation of plasma insulin and C-peptide, mild reduction of blood pressure and up to 11 and 16 percent increase in PEFR. Honey inhalation ni 1 significantly reduced random blood glucose level from 199 +/- 40.9 mg/dl to 156 +/- 52.3 mg/dl after 30 min (p = 0.0303). Fasting blood glucose level was reduced after honey inhalation during three hr post-inhalation, which was significant at hr three (p < 0.05). Intensity of hyperglycemia was significantly lowered in glucose tolerance test when pa tients received honey inhalation. Systolic and diastolic blood pressure was reduced by honey inhalation in hypetensive patients; significant changes were obtained at 60 and 120 min after inhalation. No adverse effects were observed with inhalation of distill water, 10% dextrose
and 60% honey solution except for nasal watery discharge experienced by all subjects and mild cough that was experienced by seven subjects after honey inhalation. The results demonstrated that honey inhalation was safe and effective in reducing blood glucose level, in normal and diabetic subjects, it could improve glucose tolerance test, elevate plasma insulin and C-peptide and PEER, and reduce elevated blood pressure in hypertensive patients.

50. AL-WAILI, N S (2004) Investigating the antimicrobial activity of natural honey and its effects on the pathogenic bacterial infections of surgical wounds and conjunctiva


Abstract: Antimicrobial activities of 10-100% (wt/vol) concentrations of new honey, stored honey, heated honey, ultraviolet-exposed honey, and heated stored honey were tested against common human pathogens, including Escherichia coli, Entrobacter cloacae, Pseudomonas aeruginosa, Shigella dysenteriae, Klebsiella sp., Haemophilus influenzae, Proteus sp., Staphylococcus aureus, Streptococcus hemolyticus group B, and Candida albicans. Antimicrobial activity of honey was tested in acidic, neutral, or alkaline media. These were compared with similar concentrations of glucose in nutrient broth. Surgical wounds were made on the dorsum of mice and infected with S. aureus or Klebsiella sp. The wounds were treated with local application of honey four times a day or appropriate antibiotics and compared with control values. Bacterial conjunctivitis due to E. coli, Proteus sp., S. aureus, Klebsiella sp., and P. aeruginosa was induced in rats. Conjunctival application of honey four times a day or appropriate antibiotics was used for treatment and compared with control values. Growth of all the isolates was completely inhibited by 30-100% honey concentrations. The most sensitive microbes were E. coli, P. aeruginosa, and H. influenzae. Glucose showed less antimicrobial activity than honey, and many microbes showed positive culture even in 100% glucose. Heating to 80°C for 1 hour decreased antimicrobial activity of both new and stored honey. Storage of honey for 5 years decreased its antimicrobial activity, while ultraviolet light exposure increased its activity against some of the microorganisms. Antimicrobial activity of honey was stronger in acidic media than in neutral or alkaline media. Single doses of honey used to prepare the 60% concentration in nutrient broth were bacteriocidal for P. aeruginosa and bacteriostatic for S. aureus and Klebsiella sp. during certain periods. Local application of raw honey on infected wounds reduced redness, swelling, time for complete resolution of lesion, and time for eradication of bacterial infection due to S. aureus or Klebsiella sp. Its potency was comparable to that of local antibiotics. Honey application into infective conjunctivitis reduced redness, swelling, pus discharge, and time for eradication of bacterial infections due to all the isolates tested.


Abstract: Twelve normal, healthy adult individuals, 9 men and 3 women, 25-48 years of age (mean, 38 years), were recruited in the study. After 12 hours of fasting, blood specimens were collected at 8:00 AM for prostaglandin E(2) (PGE(2)), PGF(2alpha), and thromboxane B(2) assays. Each individual then drank 250 ml of water containing 1.2 g/kg body weight of natural unprocessed honey, after which collection of blood was repeated at 1, 2, and 3 hours for estimation of prostaglandins. Each individual was asked to drink the same amount of honey diluted in water once a day for a maximum of 15 days. After 12 hours of fasting, morning blood specimens were collected on day 16, and plasma concentrations of thromboxane B(2) were measured. The quantitative analysis of prostaglandins was performed with use of an enzyme-linked immunosorbent (ELISA) test. Results showed that the mean plasma concentration of thromboxane B(2) was reduced by 7%, 34%, and 35%, and that of PGE(2) by 14%, 10%, and 19%, at 1, 2, and 3 hours, respectively, after honey ingestion. The level of PGF(2alpha) was decreased by 31% at 2 hours and 14% at 3 hours after honey ingestion. At day 15, plasma concentrations of thromboxane B(2), PGE(2), and PGF(2a) were decreased by 48%, 63%, and 50%, respectively. It may be concluded that honey can lower the concentrations of prostaglandins in plasma of normal individuals.


54. AL MAMARY, M; AL MEERI, A; AL HABORI, M (2002) Antioxidant activities and total phenolics of different types of honey. *Nutrition Research* 22 (9): 1041-1047. Abstract: Five unifloral Yemeni honeys (from 2 Acacia and 2 Ziziphus species, and 'a tropical flower') and 4 imported honeys (2 from USA, one each from Swistzerland and Iran) were analysed. Four of the Yemeni honeys had significantly higher total phenolics contents than the imported honeys. Percentage in vitro antioxidant activities of diluted honey samples increased with increasing honey content (50-200 l). The total antioxidant activity of diluted samples varied from –6.5% to 65.4% (A. ehrenbergina honey). There was a positive correlation between percentage antioxidant activity and total phenolics content. Accession date: 9 June 2003. Call number: 638.16. Library code: X. Language: En. Author address: Pharmacy Dept, Faculty of Medicine and Health Sciences, Univ. of Sana'a, Sana'a, Yemen. Apicultural Abstracts from IBRA: AA518/04

55. AL WABEL, N A; MOUSA, H M; OMER, O H; ABDEL-SALAM, A M (2007) Biological evaluation of synbiotic fermented milk against lead acetate contamination in rats. *Journal of Food Agriculture & Environment* 5 (3-4): 169-172. Abstract: The present study investigated some biological effects of synbiotic fermented milk in rats receiving lead acetate in drinking water. Synbiotic fermented milk was prepared by mixing probiotic fermented milk with honey, garlic, ginseng, cod liver oil and chicory inulin. Glutathione-S-transferase (GST), alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activities were estimated in rats receiving lead acetate alone and in rats receiving lead acetate and synbiotic milk, in addition to the negative control group. The obtained results showed a significant increase in the activities of ALT and AST in sera of rats receiving lead acetate compared with the negative control. The activities of ALT and AST increased from an average of 23.0 to 37.3 and from 160 to 220 IU/L, respectively. The activities of these enzymes in rats receiving lead together with the synbiotic milk were almost similar to the activities of the enzymes of rats fed basal diet (negative control). The mean values of ALT and AST in lead-treated group fed synbiotic fermented milk were 25 +/- 3.6 and 156 +/- 21.36 IU/L compared with the positive control 37.33 +/- 2.51 and 220.66 +/- 28.88 IU/L respectively. The obtained results showed that GST activity in sera of rat fed on synbiotic fermented milk was increased with mean value of 23.438 M/min compared with negative and positive controls with mean values of 12.01 and 13.95 M/min respectively. Data imply that synbiotic fermented milk containing honey, garlic, ginseng, cod liver oil and chicory inulin may play a role in protection against lead acetate contamination in rats by increasing the activity of the enzyme GST that requires the antioxidant glutathione as substrate, thus protecting the liver against the oxidative damage

56. AL WAILI, N S (2004) An alternative treatment for pityriasis versicolor, tinea cruris, tinea corporis and tinea faciei with topical application of honey, olive oil and beeswax mixture: an open pilot study. *Complementary Therapies in Medicine* 12 (1): 45-47. Abstract: Objective: To evaluate the possible role of honey, olive oil and beeswax in the treatment of skin fungal infections. Patients and methods: Thirty-seven patients with pityriasis versicolor, tinea cruris, tinea corporis and tinea faciei were studied. After clinical evaluation of redness, scaling, pruritis and burning/pain sensation and mycological assessment, honey mixture containing honey, olive oil and beeswax (1:1:1) was applied to the lesions three times daily for a maximum of 4 weeks. Results: Clinical response was obtained in 86% of patients with pityriasis versicolor, 78% of patients with tinea cruris and in 75% of patients with tinea corporis. Mycological cure was obtained in 75, 71 and 62%
of patients with PV, tinea cruris and tinea corporis, respectively. The patient with tinea faciei showed clinical and mycological cure 3 weeks after commencement of therapy. Conclusion: Honey mixture, may have place in the management of these skin conditions and rigorous, controlled trials are justified. (C) 2003 Elsevier Ltd. All rights reserved

57. AL WAILI, N S (2005) Clinical and mycological benefits of topical application of honey, olive oil and beeswax in diaper dermatitis. *Clinical Microbiology and Infection* 11 (2): 160-163. Abstract: Twelve infants suffering from diaper dermatitis were treated four times daily for 7 days with a mixture containing honey, olive oil and beeswax. The severity of erythema was evaluated on a five-point scale. Three infants had severe erythema and ulceration, four had moderate erythema, and five had moderate erythema with maceration. The initial mean lesion score of 2.91 +/- 0.79 declined significantly (p < 0.05) to 2.0 +/- 0.98 (day 3), 1.25 +/- 0.96 (day 5) and 0.66 +/- 0.98 (day 7). Candida albicans was isolated initially from four patients, but from only two patients after treatment. This topical treatment was safe and well-tolerated, and demonstrated clinical and mycological benefits in the treatment of diaper dermatitis.


59. AL WAILI, N S (2003) Intravenous and intrapulmonary administration of honey solution to healthy sheep: effects on blood sugar, renal and liver function tests, bone marrow function, lipid profile, and carbon tetrachloride-induced liver injury. *Journal of Medicinal Food* 6 (3): 231-247. Abstract: Safety of intravenous (i.v.) or intrapulmonary administration of different concentrations of honey and their effects on blood sugar, renal and liver function tests, bone marrow function, lipid profile, and carbon tetrachloride (CCl(4))-induced liver damage were studied. Healthy sheep of either sex, 6-8 months old, were assigned randomly into the following groups: sheep received i.v. infusion of 5% honey in normal saline at 10-day intervals for 50 days and were compared with sheep that received 5% dextrose; sheep received higher doses of honey (50 g of honey) by i.v. infusion daily for 10 days; sheep received four higher doses of honey (80 g each dose) for 2 weeks; sheep received subcutaneous injection of CCl(4) after four doses of i.v. infusion of 80 g of honey, and estimations of serum gamma-glutamyl transpeptidase (SGGT), serum glutamic oxaloacetic transaminase (SGOT), and serum glutamate pyruvate transaminase (SGPT) were performed daily for 10 days postinjection; sheep received i.v. infusion of 40 g of honey, and blood sugar estimation was performed for 3 h at 30-min intervals after infusion and compared with sheep that received 5% dextrose; sheep received rapid i.v. injection of 40% honey or 40% dextrose, and blood sugar was estimated before and after injection; sheep received various concentrations of honey in distilled water (0.5 mL/1.5 mL, 0.75 mL/1.75 mL and 1.2 mL/2.2 mL), and blood sugar estimation was performed before and after inhalation. Results showed that i.v. or intrapulmonary administration of honey did not cause any adverse effect. Intravenous delivery of honey by slow infusion caused improvement of renal and hepatic function, bone marrow function, and lipid profile. It reduced SGOT, SGPT, triglyceride, cholesterol, blood urea nitrogen, and blood sugar and elevated serum protein, serum albumin, hemoglobin, white blood cell, and neutrophil percentage. Similar results were obtained with the use of higher doses of honey. CCl(4) caused mild elevation of SGPT and SGGT and lowering of SGOT in sheep that received repeated i.v. administration of honey before administration of CCl(4), whereas in control sheep CCl(4) caused significant elevation of all the liver enzymes. Intravenous infusion of 40 g of honey caused elevation of blood sugar for 90 min postinfusion, whereas it decreased blood sugar at 2 and 3 h postinfusion as compared with fasting blood sugar. Dextrose caused significant elevation of blood sugar at all time intervals. Similar results were obtained with the use of 10% dextrose or 80 g of honey. Addition of honey to dextrose caused less hyperglycemia as compared with dextrose alone. Acute injection of 20 mL of 40% dextrose significantly elevated blood sugar for 3 h
postinjection, whereas little elevation in blood sugar was obtained after injection of 40% honey; the difference between honey and dextrose was significant. Inhalation of honey caused significant lowering of blood sugar during and after inhalation as compared with fasting blood sugar and water inhalation. The effect was greater with a higher concentration of inhaled honey. It might be concluded that slow i.v. infusion or rapid i.v. injection of honey in different concentrations was safe and could lower blood sugar and improve renal, hepatic, and bone marrow functions and lipid profile. Intravenous honey had a hepatoprotective effect against CCl(4)-induced liver injury. Inhaled honey was safe and reduced blood sugar significantly.


Abstract: Objectives: To investigate the effects of honey, olive oil and beeswax mixture on patients with atopic dermatitis (AD) or psoriasis vulgaris (PV). Materials and methods: Twenty-one patients with dermatitis and 18 patients with psoriasis were entered for patient-blinded, partially controlled study; 11 patients with dermatitis used topical betamethasone esters and 10 patients with psoriasis used clobetasol propionate. Honey mixture contained honey, beeswax and olive oil (1:1:1). Mixtures A, B, and C contained honey mixture with the corticosteroids ointment in a ratio of 1:1, 2:1, and 3:1 respectively. Patients with dermatitis were subjected to controlled bilateral half-body comparison to evaluate the efficacy of honey mixture against Vaseline, or mixture A against Vaseline-betamethasone esters mixture (1:1) in patients using topical corticosteroid treatment. In patients with psoriasis, the effect of honey mixture was compared with paraffin in an individual right/left-sites comparison, or mixture A against paraffin-clobetasol propionate mixture (1:1) in patients using corticosteroid topical therapy. In dermatitis, body lesions on right or left half-body were assessed for erythema, scaling, lichenification, excoriation, indurations, oozing and itching on a 0-4 points scale. In psoriasis, lesions of selected site were assessed for redness, scaling, thickening and itching, on a 0-4 points scale. Results: In honey mixture group, 8/10 patients with dermatitis showed significant improvement after 2 weeks, and 5/11 patients pretreated with betamethasone esters showed no deterioration upon 75% reduction of corticosteroid doses with use of mixture C. In psoriasis, 5/8 patients showed a significant response to honey mixture. In patients using clobetasol propionate, 5/10 patients showed no deterioration upon 75% reduction of corticosteroid doses with use of mixture C. Conclusion: Honey mixture appears useful in the management of dermatitis and psoriasis vulgaris. (C) 2003 Elsevier Ltd. All rights reserved


Abstract: Background: The objective of this research was to investigate the effect of the topical application of honey on recurrent attacks of herpes lesions, labial and genital, as compared to acyclovir cream. Material/Methods: Sixteen adult patients with a history of recurrent attacks of herpetic lesions, 8 labial and 8 genital, were treated by topical application of honey for one attack and acyclovir cream for another attack. Results: For labial herpes, the mean duration of attacks and pain, occurrence of crusting, and mean healing time with honey treatment were 35%, 39%, 28% and 43% better, respectively, than with acyclovir treatment. For genital herpes, the mean duration of attacks and pain, occurrence of crusting, and mean healing time with honey treatment were 53%, 50%, 49% and 53% better, respectively, than with acyclovir. Two cases of labial herpes and one case of genital herpes remitted completely with the use of honey. The lesions crusted in 3 patients with labial herpes and in 4 patients with genital herpes. With acyclovir treatment, none of the attacks remitted, and all the lesions, labial and genital, developed...
crust. No side effects were observed with repeated applications of honey, whereas 3 patients developed local itching with acyclovir. Conclusions: Topical honey application is safe and effective in the management of the signs and symptoms of recurrent lesions from labial and genital herpes.


Abstract: Purpose: To assess for differences in the ocular flora of patients with dry eye caused by tear deficiency and/or meibomian gland disease and to assess the effect of antibacterial honey on the ocular flora in these forms of dry eye. Methods: In this prospective, open-label pilot study, bacteria isolated from the eyelid margin and conjunctiva were identified and quantified before and at 1 and 3 months after initiation of treatment with topical application of antibacterial honey 3 times daily. Subjects had non-Sjogren tear deficiency (n = 20), Sjogren syndrome tear deficiency (n = 11), meibomian gland disease (n = 15), and non-Sjogren tear deficiency with meibomian gland disease (n = 20), and there were 18 non-dry eye subjects. Results: The total colony-forming units (CFUs) isolated from each of the dry eye subgroups before antibacterial honey use was significantly greater than the total CFU isolated from the non-dry eye group. Antibacterial honey use significantly reduced total CFUs for the eyelids and the conjunctiva of dry eye subjects from baseline at month 1 (eyelids: P = 0.0177, conjunctiva: P = 0.0022) and month 3 (eyelids: P < 0.0001, conjunctiva: P < 0.0001). At month 3, there were reductions in total CFUs for all dry eye subgroups such that the CFUs were not significantly different from those of the non-dry eye group. Conclusion: From these results there is sufficient preliminary data to warrant further study of the effects of antibacterial honey in chronic ocular surface diseases.


Abstract: Propolis has been used as a medicinal agent to treat infections and promote wound healing for centuries. The aim of the present study was to test the antimicrobial, antioxidant, and cytotoxic activities of a new type of Brazilian propolis, popularly called red propolis, as well as to analyze its chemical composition. The antimicrobial activity against Staphylococcus aureus ATCC 25923 and Staphylococcus mutans UA159 was evaluated and the chlorof orm fraction (Chlo-fr) was the most active with lower MIC ranging from 25 to 50 μg/ml. The hexane fraction (H-fr), having the highest concentration of total flavonoids, showed the best sequestrating activity for the free radical DPPH. The ethanolic extract of propolis (EEP) showed cytotoxic activity for the HeLa tumor cells with an IC50 of 7.45 μg/ml. When the EEP was analyzed by GC-MS, seven new compounds were found, among which four were isoflavones. Our results showed that the red propolis has biologically active compounds that had never been reported in other types of Brazilian propolis. (C) 2007 Elsevier Ireland Ltd. All rights reserved.


Abstract: OBJECTIVE: It has been proposed that natural honey may contain a 'sucralfate-like' substance. Recent studies have shown that sucralfate affords protection against ischaemia-reperfusion-induced injuries in the rat stomach. Therefore, the effect of honey was studied on ischaemia-reperfusion-induced gastric lesions, intraluminal bleeding, vascular permeability and non-protein sulphhydryls (NP-SH) in the rat stomach. METHODS: Rats were subjected to 30 min of gastric ischaemia in the presence of 100 mM HCl and reperfusion period of 60 min. Intraluminal bleeding was assessed macroscopically and the gastric lesions were graded microscopically under an inverted microscope. Vascular permeability was quantified by measuring spectrophotometrically the extravasated Evans blue dye in the stomach. NP-SH levels were measured spectrophotometrically. A luminol-dependent chemiluminescence method was used to assess antioxidant effects of honey in vitro. RESULTS: There were significantly more gastric lesions, more severe intraluminal bleeding, more leakage of Evans blue and depletion of NP-SH during the reperfusion period as compared to controls. Pre-treatment with honey (0.078-0.625 g/kg, orally) or dimethyl sulphoxide (0.02-0.08 g/kg, intraperitoneally) 30 min before the ischaemia-reperfusion dose-dependently reduced the gastric lesions and intraluminal bleeding and decreased the vascular permeability. Furthermore, honey reversed the ischaemia-reperfusion-induced depletion of NP-SH levels and inhibited the luminol-dependent chemiluminescence induced in a cell-free xanthine-xanthine oxidase system. CONCLUSION: These results suggest that gastric protection by honey may be a result of its antioxidant effect. It is suggested that this property of honey may be due to the presence of a 'sucralfate-like' substance.


Abstract: A collection of 91 isolates from different geographical origins of Paenibacillus larvae, the etiologic agent of American Foulbrood disease of honey bees, was characterized according to its biochemical type and susceptibility to oxytetracycline hydrochloride (OTC), the most commonly used antibiotic for the control of the disease. The majority of the Argentinian strains corresponded to the biochemical type II while only one culture from Rio Negro (Argentina), one from Buenos Aires (Argentina) and one from Cordoba (Argentina) presented characteristics of type V. In relation to their response to OTC it was found a 48% resistance within the collection of Argentinian strains; for this group, the values of minimal inhibitory concentration (MIC) were 10-15 micrograms/ml, while the susceptible ones presented MIC values under 5 micrograms/ml. All the isolates from France, Italy, New Zealand, Sweden, USA, Poland, Czech Republic and Germany were susceptible with MIC values under 5 micrograms/ml

75. ALIYAZIOGLU, Y; DEGER, O; OVALI, E; BARLAK, Y; HOSVER, I; TEKELIOGLU, Y; KARAHAN, S C (2005) Effects of Turkish pollen and propolis extracts on respiratory burst for K-562 cell lines. *International Immunopharmacology* 5 (11): 1652-1657.
Abstract: Bee-collected pollen and propolis are apicultural products which are composed of nutritionally valuable substances and contain considerable amounts of polyphenol substances which may act as potent antioxidants. We wanted to show if respiratory burst within a cancer cell lines could be influenced when incubated with pollen and propolis extracts or not. Pollen and propolis extracts at concentrations of 50, 25, 12.5 and 0 mg/ml were prepared by dimethyl sulfoxide (DMSO). K-562 cell cultures and mononuclear cell (MNC) cultures prepared from a peripheral blood sample to serve as control cells were incubated with extracts for 24 h. Determination of respiratory burst was carried out by intracellular dichlorofluorescein (DCFH) test by using flow-cytometric fluorescence analysis. While about 90% and 66% fluorescence was detected at zero concentrations for both K-562 and MNC cultures, fluorescence positivity decreased (between 3.8% and 11.8%) as concentrations of both propolis and pollen extracts increased for K-562 cell culture, but unchanged (between 20% and 83%) for MNC culture. It was concluded that pollen and propolis extracts inhibit respiratory burst within cancer cell lines probably by their antioxidant potential.


Abstract: The antioxidant activity of two selected Malaysian honeys, as well as their ethyl acetate extracts, were evaluated. The antioxidant activities were determined in terms of their anti radical power (ARP) as assessed by DPPH radical scavenging assay and their total antioxidant power (TAP), as assessed by FRAP assay. Total phenolic content of the extracts was determined according to the Folin-Ciocalteau procedure. The characteristic antioxidant activities showed a marked correlation with the total phenolic contents. These results indicated that honey has antioxidative and radical scavenging properties, which are mainly due to its phenolic content. This is the first report of the antioxidant properties of Malaysian honeys. (C) 2003 Elsevier Ltd. All rights reserved


ALLEN, K L; HUTCHINSON, G; MOLAN, P C (2000) The potential for using honey to treat wounds infected with MRSA and VRE. *Poster Paper First World Congress on Wound Healing, Melbourne, Australia*


Abstract: English Article The use of honey as a wound dressing is well established in traditional and modern medicine. There are many reports of its effectiveness in clearing bacterial infections in ulcers and abscesses, which suggest that it may be suitable for the intramammary treatment of mastitis. To evaluate this possibility, the species of bacteria that commonly cause mastitis in dairy cows were tested for their sensitivity to the antibacterial activity of honey. The growth of all seven species tested was completely inhibited by a typical honey (with antibacterial activity attributed to its content of hydrogen peroxide) at a concentration of 10% (v/v) in the agar plates, and two by 5% honey. Six of the species were completely inhibited by a typical manuka honey (with antibacterial activity attributed to its content of a non-peroxide component) at a concentration of 5% (v/v). Only one species was inhibited by 10% (v/v) artificial honey (sugars and gluconic acid as in honey). As honey is harmless to tissues and would leave no undesirable residues in milk, it would be of interest to now evaluate it therapeutically in clinical mastitis.

82. ALLEN, K L *Unpublished findings.* University of Waikato, Hamilton, New Zealand

83. ALLES, G K; ALLES, T P (1965) *Miel et santé.* Kirjastus Eesti Raamat Tallinn; 103 pp


Abstract: The antioxidant capacity related to the phenolic composition of monospecific honeybee-collected pollen extract from the mesquite tree (Prosopis juliflora) from Durango, Mexico, was evaluated in an in vitro-biological system (as inhibitor of lipid peroxidation on mouse hepatic microsomal preparations) and in an in vivo system (on homogenized liver of bromobenzene-intoxicated mice) by quantification of thiobarbituric acid-reactive substances (TBARS). The comparison of results obtained from these two different systems was also made. The results obtained suggest that pollen of *P. juliflora* is an important source of flavonoids, which can be considered as natural antioxidants. Mesquite pollen extracts showed antioxidant activity related to the flavonol concentration in both the in vitro-biological system and the in vivo system with a lower activity in the latter of those systems. Under in vivo conditions and in those in which a state of oxidation in not induced, a high concentration of flavonols in the extract of mesquite pollen can have a pro-oxidant effect. (c) 2006 Elsevier Inc. All rights reserved


Abstract: *Stenocactus multicostatus* subsp. *zacatecasensis* is a difficult group in taxonomic terms, because of that the search of no morphological features is justified. The phenolic profiles have shown a species-specific tendency and have been used with taxonomic purpose in many groups of plants. The pollen phenolic profile of *Stenocactus multicostatus* subsp. *zacatecasensis*, obtained by HPLC/DAD, and the intrapopulation variability are reported in this paper. The results suggest that the pollen phenolic profile of this taxon is complex, formed by 22 compounds: 14 flavonoids (3-O-glycosylflavonoids derivatives of kaempferol, quercetin and herbacetin) and eight phenolic acid derivatives. Different individuals can express from 11 to 16 compounds of that type profile. The pollen phenolic profile of this taxon tends to be species-specific and can be a significant taxonomic feature.


Abstract: The aim of the study was to evaluate the antimicrobial effect and the ability of honey to prevent Salmonella interitidis adhering to intestinal epithelial cells in vitro. Antimicrobial activity was demonstrated. Bacterial adherence was assayed using S. interitis cells that had been incubated first with honey and then with the intestinal epithelial cells. Results showed that honey at dilutions of up to 1:8 reduced bacterial adherence from 25.6 +/- 6.5 (control) to 6.7 +/- 3.3 bacteria per epithelial cell (P < 0.001). (c) 2005 Elsevier B.V. All rights reserved
Abstract: Background: The saprophagous and coprophagous maggots of the drone fly Eristalis tenax (Insecta, Diptera) have evolved the unique ability to survive in aquatic habitats with extreme microbial stress such as drains, sewage pools, and farmyard liquid manure storage pits. Therefore, they represent suitable models for the investigation of trade-offs between the benefits resulting from colonization of habitats lacking predators, parasitoids, or competitors and the investment in immunity against microbial stress. In this study, we screened for genes in E. tenax that are induced upon septic injury. Suppression subtractive hybridization was performed to selectively amplify and identify cDNAs that are differentially expressed in response to injected crude bacterial endotoxin (LPS). Results: Untreated E. tenax maggots exhibit significant antibacterial activity in the hemolymph which strongly increases upon challenge with LPS. In order to identify effector molecules contributing to this microbial defense we constructed a subtractive cDNA library using RNA samples from untreated and LPS injected maggots. Analysis of 288 cDNAs revealed induced expression of 117 cDNAs corresponding to 30 novel gene clusters in E. tenax. Among these immune-inducible transcripts we found homologues of known genes from other Diptera such as Drosophila and Anopheles that mediate pathogen recognition (e.g. peptidoglycan recognition protein) or immune-related signaling (e.g. relish). As predicted, we determined a high diversity of novel putative antimicrobial peptides including one E. tenax defensin. Conclusion: We identified 30 novel genes of E. tenax that were induced in response to septic injury including novel putative antimicrobial peptides. Further analysis of these immune-related effector molecules from Eristalis may help to elucidate the interdependency of ecological adaptation and molecular evolution of the innate immunity in Diptera.

Abstract: At a dermatology clinic in Italy, the number of patients experiencing adverse effects from honey bee sting therapy has increased. Many have suffered from sciatic pain due to disc herniation following approximately 1 5 stings to the lumbar region. In most patients granuloma, often with ulcers, had developed following retention of sting fragments in the skin. The use of bee sting therapy is discussed.

89. ALYANE, M; BENGUEDOUAR, L; KEBSA, W; BOUSSENANE, H N; ROUIBAH, H; LAHOUEL, M (2008) Cardioprotective effects and mechanism of action of polyphenols extracted from propolis against doxorubicin toxicity. 153
Abstract: Propolis is one of the major hive products of bees and is rich in flavonoids, which are known for antioxidant activities. It is well known that the chemical properties of phenolic acids or flavonoids, in terms of the availability of the phenolic hydrogens as hydrogen donating radical scavengers, predict their antioxidant properties. In this study, the flavonoids scavenging activity of propolis has been exploited to obtain protection against the peroxidative damage in rat heart mitochondria which was induced by the administration of an acute dose of doxorubicin (20mg kg(-1), i.p). The peroxidative lesions were evaluated biochemically and biophysically, 24 H after DXR administration. Abnormal biochemical changes in heart mitochondria from DXR treated rats including a marked increase in both malondialdehyde (MDA) And, anion superoxide production; decrease both of respiratory chain ratio (RCR= V3/V4) and P/O. Pretreatment of rats with propolis extract, given per os (100mg/kg/day) during four days prior to DXR injection, substantially reduced the peroxidative damage in the heart mitochondria: we showed significant reducing both of mitochondrial MDA formation and production of superoxide anion, restoration of RCR and P/O and reducing of rate and the amplitude of mitochondrial swelling. The data demonstrate that antioxidants from natural sources may be useful in
the protection of cardiotoxicity in patients who receive doxorubicin and as reported for its claimed beneficial effect on human health by biomedical literature


Abstract: Chronic combined exposure to ionizing radiation with dose of 0.25 Gy and cadmium chloride or atrazine to be present in drinking water at five-fold Limited Permissible Concentration (LPC) values led to the additively reduced intercellular K+ level in rat brain, that was at first choice caused by the active ion transport disorders in the case of irradiation, and by the changes in membrane permeability in the case of toxic loading. Applying of beta-carotene oil and bee pollen both abolished radiation effects, but no chemical toxicant ones. Authors supposed the selective action of the observed drugs to be connected with antioxidant activities of them


Abstract: This study compares the release of tetracycline and propolis incorporated into four silica-based bioactive glassy systems. The bioactive glasses, with composition (SiO2)(x)(P2O5)y(CaO)z, were prepared using a sol-gel process at room temperature. Tetraethoxysilane (TEOS), triethylphosphate, and calcium chloride were used as Si, P, and Ca precursors, respectively. The quantities of tetracycline and propolis incorporated were 2% in weight. For delivery assays, the samples were individually immersed in deionized water and buffered with trishydroxymethyl amino methane, pH 7.4, and kept in water bath (37 degrees C) for thirty days. Aliquots were withdrawn and analyzed by ultraviolet spectrophotometry in the tetracycline (270 nm) and propolis (420 nm) wavelengths. For the glass-tetracycline compounds, it was observed that four days after release had started all samples had released about 90% of the total tetracycline concentration. In contrast, 90% of the propolis was released in about 30 days’ time. Sample characterization was made using scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), Fourier transform infrared spectroscopic (FTIR), and thermogravimetry (TG). (c) 2006 Elsevier B.V. All rights reserved


Abstract: D-002 is a new natural product consisting of a mixture of aliphatic fatty alcohols, which shows antioxidant and anti-ulcer effects in experimental models. A new validated methodology for determining simultaneously residual n-hexane and acetone in D-002 using the headspace gas chromatography (HS/GC) is described. The very poor solubility of D-002 in most solvents did necessary sample preparations in solid state. Limit test conditions allowed a detection of residual n-hexane and acetone more sensitively than that recommended for such purposes in the general method of the European Pharmacopoeia. Validation assays, applied to both D-002 residual solvents, proved: suitable sensitivity; very high linearity (correlation coefficients >= 0.999, R.S.D. of slopes <= 0.8% and R.S.D. of response factors <= 5% and no biases) and accuracy (average recoveries between 94.7 and 100.1%); and precision was <= 2.1%. The method was found suitable for quality control and stability studies of this new product. (C) 2008 Published by Elsevier B.V


Abstract: The effect of adding dry honey to turkey breast meat on oxidative stability was measured using TEA, volatile headspace, and oxidative stability index. Ground turkey breast meat was mixed with different concentrations of dry honey (0, 1, 5, 10, 15, and 20%) then cooked in polyethylene bags to 72 C. Oxidative stability measurements were taken for raw meat and cooked meat and for cooked meat after 48 h of storage at 4 C. The proximate composition of the raw meat was 73.9% moisture, 23.2% protein, and 1.3% fat. Gas headspace analysis determined hexanal to be the most abundant volatile compound. Hexanal content decreased as the amount of added honey increased in both freshly cooked meat and in meat stored for 48 h at 4 C. The TEA values also decreased with increasing levels of added honey in the freshly cooked and 48-h-stored meats. The percentage inhibition of oxidation for the 5, 10, 15, and 20% samples increased from 50 to 76% for the freshly cooked meat and from 34 to 88% for the 48-h-stored meat. The oxidative stability index increased with increasing concentrations of honey from 0.28 h (control) to 7.73 h (20% honey). Addition of up to 15% honey inhibited the development of oxidative compounds in cooked turkey meat, with little further inhibition observed compared to 20% honey.


Abstract: The development of off-flavors from oxidation reactions in cooked turkey products is a common problem and results in a less desirable, rancid flavor. Various strategies have been evaluated to minimize this off-flavor development, including vacuum and modified atmosphere packaging, feeding antioxidants to animals, and use of antioxidants in the final product. A natural protein-sugar reaction called the Maillard reaction produces a brown pigment, flavors, and antioxidants. This research tested the addition of honey to turkey breast meat before processing to retard production of oxidation products related to off-flavor. Three levels (0, 5, 15%) of dry honey were mixed with raw turkey breast meat pieces, then the mixture was stuffed into casing and cooked. The cooking process facilitated the Maillard reaction and the development of an antioxidative effect. The cooked chubs were then cooled, sliced, and vacuum-packaged as individual slices. The slices were refrigerated and tested for color, flavor, oxidative rancidity, and microbial growth over 11 wk. Sensory panelists detected increased sweetness and no negative flavor impact on acceptability for turkey with added honey. The addition of honey enhanced the oxidative stability of the meat, as indicated by lower TBA values, hexanal content, and oxidative stability index. Honey did impart a slightly
darker color with lower lightness values but had no effect of redness and yellowness values

Abstract: Maillard reaction products (MRP) were synthesized from honey-lysine by refluxing with water for 4, 8, 12, 16, and 20 h. The MRP from each reaction time were added to and reacted with a linoleic acid buffered emulsion at 37 degrees C. The MRP from each of the five reaction times were added to the linoleic acid emulsion (LAE) at 1%, 5%, 10%, 15%, and 20% (v/v). The antioxidative effect of MRP on the LAE was determined spectrophotometrically at 234 nm. The MRP pH and brown pigment formation (450 nm) was measured. Absorbance at 450 nm increased from 0.6 to 1.6 between the 4 h and 20 h MRP treatments, respectively. The pH of the MRP decreased from 4 h to 20 h reaction solutions, ranging from 4.2 to 3.65. The antioxidative effect increased at each reaction time-increment. Within each reaction time, the antioxidative effect was maximized between 10% and 15% addition levels.

Abstract: Antioxidative effect of honey-lysine Maillard reaction products (MRPs) was verified in a linoleic acid emulsion and a separate study was conducted comparing the antioxidative effects of direct honey addition to addition of preformed MRPs to meat. Antioxidative effects were measured using the TBA analysis and hexanal content in turkey. Antioxidative effects increased with increasing levels of MRP or honey addition to meat. Addition of honey to meat had a greater antioxidative effect than adding synthesized MRP to turkey. It is possible that meat with honey added had a greater antioxidative effect compared to MRP addition due to a better dispersion or solubility of the MRP formed in meat during heating.


Abstract: We used the killing of Galleria mellonella (Lepidoptera: Pyralidae; the greater wax moth) caterpillar by the live vaccine strain (LVS) of Francisella tularensis to develop an invertebrate host system that can be used to study F. tularensis infection and the in vivo effects of antibacterial compounds on F. tularensis LVS. After injection into the insect hemocoel, F. tularensis LVS, killed caterpillars despite the association of LVS with hemocytes. The rate of killing depended on the number of bacteria injected. Antibiotic therapy with ciprofloxacin, levofloxacin or streptomycin administered before or after inoculation prolonged survival and decreased the tissue burden of F. tularensis in the hemocoel. Delayed drug treatment reduced the efficacy of antibacterials and especially streptomycin. The G. mellonella-F. tularensis LVS system may facilitate the in vivo study of F. tularensis, efficacy with antibacterial agents. (C) 2007 Elsevier Masson SAS. All rights reserved


115. ASAFOVA, N N; ORLOV, B N; KOZIN, R B (2001) *Physiologically active bee products*. Publisher Y.A. Nikolaev Nizhny Novgorod; 360 pp


Abstract: Propolis is a substance produced by honeybees. It is inhibitory to some bacteria species, mainly Gram-positive bacteria, but less inhibitory to Listeria monocytogenes (L.m) than to the other Gram-positive bacteria tested. In order to obtain selective growth of L.m. from contaminated samples, the effect of propolis in plating media and broths on various strains of bacteria was examined. Table I shows the effect of increasing concentrations of propolis in tryptose-agar (TA). L.m. tolerated higher concentrations of propolis than Streptococcus viridans and Staphylococcus aureus. L.m. grew well in tryptosebroth (TB) that contained 0.15 mg propolis pr. ml medium, while Streptococcus viridans and Streptococcus agalactiae were completely inhibited as seen in Table II. Table III shows that when serum was added to the agar, the inhibitory effect was reduced. It can also be seen that Gram-negative bacteria grew quite well on media that contained 0.19 mg propolis pr. ml. To reduce the growth of Gram-negative bacteria, nalidixic acid was added to the medium. Table IV illustrates growth of various species of bacteria in tryptosephosphatebroth (TFB) with or without propolis and nalidixic acid. Most of the strains tested were inhibited, but Pseudomonas aeruginosa and to some extent faecal streptococci were able to grow in the medium that contained the selective substances. As a conclusion it seems that propolis may be a valuable additive to a medium for the selective isolation of L.m


Abstract: Testicular torsion causes an enhanced formation of reactive oxygen species which contributes to the pathophysiology of ischemia-reperfusion injury in the testis. We evaluated here the effect of caffeic acid phenethyl ester (CAPE), a new antioxidant and anti-inflammatory agent on histopathological changes in testicular ischemia-reperfusion injury. Adult male Wistar rats were divided into six groups of five each: control group I (n = 5), sham operation group 2 (n = 5), torsion/detorsion (T/D) group 3 (n = 5), T/D + saline group 4 (n = 5), T/D + CAPE group 5 (n = 5) and T/D + CAPE group 6 (n = 5). Group I served to determine baseline values of histopathological parameters, group 2 animals that underwent sham operation served as a control, while groups 3-6 animals were subjected to left unilateral torsion (2 h) and detorsion (24 h) periods. All the groups were sacrificed 24 h later except group 6. CAPE was injected 2 days with the same dose to the group 6 and it was sacrificed 48 h later. One testis removed and fixed in Bouin's solution. After routine tissue processing myeloperoxidase (MPO) and inducible nitric oxide synthase (iNOS)
immunohistochemical methods were studied from paraffin embedded tissues. Treating rats with CAPE (applied at 10 μmol/kg, 30 min prior to T/D) attenuated the testicular injury and as well as the tissue levels of MPO. At the same time testis tissue showed a decrease in iNOS activity. Our results suggest that CAPE treatment have a protective role on testicular T/D and this effect may be due to inhibiting the neutrophil mediated cellular injury. (c) 2006 Elsevier Ltd. All rights reserved


Abstract: A novel electrochemical route to estimate the antioxidant capacity in honey samples is proposed just using flow injection analysis. The analytical strategy involved the selective oxidation of polyphenolic compounds using two different target potentials, + 0.8 and + 0.5 V, at two different pHs. An oxidation current obtained at the fixed potential was used as an analytical guide of the antioxidant activity of the target honeys. Chemometrics (correlation and principal component analysis, PCA) demonstrated the significance of the electrochemical protocol versus the traditional spectrophotometric ones in the evaluation of antioxidant capacity and revealed the role of detection potential as a screening variable. The proposed protocol is very simple and fast. However, the most relevant merit of the electrochemical procedure is its inherent versatility which allows the evaluation of the antioxidant activity under predesigned controlled oxidation conditions. In addition, since intercept was statistically zero, its corresponding antioxidant content using just a calibration factor is proposed thus simplifying the calibration-analysis process. As a result, an electrochemical antioxidant index (EAI) is proposed


Abstract: In this study, 20 of honey samples from Kars markets were investigated according to Turkish Standard (TS 3036) and Turkish Food Codex. The results indicated that the samples had commercial glucose (n:10), low diastatic index (n:13), high hydroxymethyl furfural level (n:1), high proportion of saccharose (n:4) and low contents of reducing sugars (n: 4). Staphylococci number were higher than 1 x10(2) cfu/g in 3 of 20 samples. The findings obtained in our study showed that any sample tested was in acceptable limits recommended by Turkish Standards


Abstract: The authors studied the effect of storage period and heat on the physical and chemical properties of honey and proceeded to study the antibacterial effect of honey on
Escherichia coli and Salmonella typhimurium. In samples of honey (Egyptian clover honey) that were heat-treated and stored over a long period of time, water content decreased, hydroxymethyl furfural (HMF) was produced and increased in concentration, and enzyme activity decreased. Colour, measured in optical density, was markedly affected in honey samples stored over long periods of time, as was the refractive index, but electrical conductivity remained unaffected by storage or heating. Similarly, the storage period had no effect on pH value. To study the therapeutic effect of honey on E. coli and S. typhimurium, 25 isolates of E. coli 0157:H7 (18.5%) and 49 isolates of S. typhimurium (36.2%) were isolated from 135 samples taken from children and calves (30 stool samples from children and 105 samples from calf organs and faecal swabs). Most E. coli 0157:H7 and S. typhimurium isolates were highly resistant to most antibiotic discs. In vitro, the antibacterial effect of honey was more pronounced on E. coli 01 57:H7 than on S. typhimurium. Water content, pH value, HMF and the presence of H-2(2)O all played an important role in the potency of clover honey as an antibacterial agent. In vivo, mice were used as a model for studying the parenteral usefulness of honey as an antibacterial agent against both pathogens. The antibacterial activity of honey that had been stored over a long period of time decreased and high concentrations of honey proved more effective as antibacterial agents. In this study there was lower mortality among mice treated with honey but the parenteral application of honey and its therapeutic properties require further investigation.


Abstract: Whether the modulation of antibody responses can contribute to the improvement of clinical symptoms in patients receiving allergen immunotherapy represents a controversial issue. We have used purified [seven recombinant (r) and one natural] timothy grass pollen allergens as well as recombinant B cell epitope-containing fragments of the major timothy grass pollen allergen, Phl p 1, to investigate humoral immune responses in eight allergic patients receiving grass pollen-specific immunotherapy. We found that the administration of aluminium hydroxide-adsorbed grass pollen extract induced complex changes in allergen/epitope-specific ;antibody responses: increases in IgG subclass (IgG1, IgG2, IgG4) responses against allergens recognized before the therapy were observed. All eight patients started to mount IgE and IgG4 responses to continuous Phl p 1 epitopes not recognized before the therapy and a de novo induction of IgE antibodies against new allergens was found in one patient. Evidence for a protective role of IgG antibodies specific for continuous Phl p 1 epitopes was provided by the demonstration that preincubation of rPhl p 1 with human serum containing therapy-induced Phl p-specific IgG inhibited rPhl p 1-induced histamine release from basophils of a grass pollen-allergic patient. Our finding that immunotherapy induced antibody responses against previously not recognized B cell epitopes indicates the vaccination character of this treatment. The fact that patients started to mount de novo IgE as well as protective IgG responses against epitopes may explain the unpredictability of specific immunotherapy performed with allergen extracts and emphasizes the need for novel forms of component-resolved immunotherapy.

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130. BALTRUSAITYTE, V; VENSKUTONIS, P R; CEKSTERYTE, V (2007) Antibacterial activity of honey and bee bread of different origin against S-aureus and S-epidermidis. Food
Technology and Biotechnology 45 (2): 201-208.

Abstract: The study is aimed at the evaluation of antimicrobial properties of honey and beebread products of different origin. The inhibitory action of 34 honey and 4 beebread samples was tested against Staphylococcus aureus and Staphylococcus epidermidis by the agar well diffusion method. Total antibacterial activity was evaluated by measuring the clear zone around the well, and expressed in phenol concentration possessing equivalent activity. Honey samples were tested after dilution to 50, 25 and 10 % (by mass per volume). The solutions containing 10 % (by mass per volume) of honey did not have any effect on the growth of bacteria; some honey samples had no inhibitory activity on any of the concentrations used. The contribution of catalase and neutralization to the antimicrobial activity of honey was also assessed. It was found that the antibacterial activity of the tested honey samples was dependent on hydrogen peroxide formation, while such dependence was not observed for the beebread samples. Floral source of honey and bacterial culture were other two factors related to the antibacterial activity. However, the possible contribution of phytochemicals, which may be transferred to honey, should be assessed by using other methods


Abstract: Phenolic extracts were isolated from 35 honey and nine beebread samples obtained from different sources in Lithuania by using Amberlite XAD-2 resin. The antioxidant properties of extracts were assessed by the ABTS(·+) radical cation decolourisation and DPPH radical scavenging activity. It was found that all honey and beebread extracts were able to scavenge free radicals, however their scavenging activity varied in a wide range, on average between 43.0% and 95.7%. The preliminary screening of phenolic compounds in honey samples was performed by high-performance liquid chromatography with UV and mass spectrometer detectors. The results obtained showed that all samples contain p-coumaric acid, kaempferol, chrysin and apigenin. This study demonstrates remarkable variations in antioxidant properties and content of phenolic compounds in honey from different sources; these variations should be considered in using honey as a source of natural dietary antioxidants. (c) 2006 Elsevier Ltd. All rights reserved


Abstract: At the Kaunas Medical University uniflora clover and rape honey was used for hepatitis A treatment and dandelion honey for the reduction of gastric juice acidity. Three groups of patients including 89 people between the age of 17-43 suffering from acute hepatitis A, were selected for the study. 15 patients from the control group received a treatment including 5% glucose infusions, polyvitamins, and other medications. One group of patients was treated with clover, while the other group - with rape honey. Medical treatment was not given to them. After treatment with clover and rape honey the alanine aminotransferase (ALT) decreased 9.0-12.7 times, bilirubin 2.6-3.1 times. Intravenous glucose infusions were not necessary for the patients treated for hepatitis A with 10% clover or rape honey solution. The highest increase in the pH of gastric juice - 56.5% (from pH 1.39 before treatment, to pH 2.18 after treatment) occurred in the group of patients treated with dandelion honey collected in 1996.


Abstract: The essential oil obtained by hydrodistillation from the fresh resin of Protium heptaphyllum was analyzed by GUMS. The main constituents were: alpha-pinene (10.5%), a-phellandrene (16.7%), limonene (16.9%), and terpinolene (28.5%). The
essential oil was tested in vitro for antimicrobial and antioxidant activities. The results showed a moderate antimicrobial, but significant antioxidant activity. These results suggested that this essential oil is beneficial to human health, having the potential to be used for medical purposes and to be utilized as anti-bacterial additives to skin cosmetics.


Abstract: Aim. To synthesise the evidence regarding honey's role in health care and to identify whether this evidence applies more specifically to cancer care. Design. Systematic review. Methods. The inclusion and exclusion criteria were agreed by two reviewers and a keyword strategy was developed. EMBASE, CINAHL, AMED, MEDLINE, COCHRANE and PUBMED databases were screened to identify suitable articles. The citation list from each included study was also screened for potentially suitable papers. The key findings from each study were entered onto a data extraction sheet. Results. In total, 43 studies were included in the systematic review, which included studies in relation to wounds (n = 19), burns (n = 11), skin (n = 3), cancer (n = 5) and others (n = 5). In addition, a systematic review regarding honey use in wound care was also included. While the majority of studies noted the efficacy of honey in clinical use, five studies found honey to be equally as effective as the comparator and three found honey to be less effective than the comparator treatment. Other research did not illustrate any significant difference between standard treatment regimes vs. honey treatment. Studies were generally poor in quality because of small sample sizes, lack of randomisation and absence of blinding. Conclusions. Honey was found to be a suitable alternative for wound healing, burns and various skin conditions and to potentially have a role within cancer care. Relevance to clinical practice. In the cancer setting, honey may be used for radiation-induced mucositis, radiotherapy-induced skin reactions, hand and foot skin reactions in chemotherapy patients and for oral cavity and external surgical wounds.

140. BARNES, J L (1973) Sugar sweetens the lot of patients with bedsores. *JAMA: the journal of the American Medical Association* 223: 122-123.


Abstract: The "in vitro" antibacterial activities of Turkish pollen and propolis extracts were investigated against 13 different species of agricultural bacterial pathogens including Agrobacterium tumefaciens, A. vitis, Clavibacter michiganensis subsp. michiganensis.
Erwinia amylovora, E carotovora pv. carotovora, Pseudomonas corrugata, P. savastanoi pv. savastanoi, P. syringae pv. phaseolicola, P. syringae pv. syringae, P. syringae pv. tomato, Ralstonia solanacearum, X. anthomonas campestris pv. campestris and X. axonopodis pv. vesicatoria. Among the tested bacteria, A. tumefaciens was the most sensitive one to 115 concentration of pollen extract, and the sensitivity of the bacteria followed the sequence A. tumefaciens > P. syringae pv. tomato, X axonopodis pv. vesicatoria > E. amylovora, P. corrugata, R. solanacearum, X campestris pv. campestris > A. vitis, C michiganensis subsp. michiganensis > E carotovora pv. carotovora, P. savastanoi pv. savastanoi, P. syringae pv. phaseolicola > P. syringae pv. syringae. P. syringae pv. phaseolicola was the most sensitive one to 1/10 concentration of propolis extract, and the sensitivity of the bacteria followed the sequence P. syringae pv. phaseolicola > P. savastanoi pv. savastanoi, P. corrugata, R. solanacearum > E. carotovora pv. carotovora, P. syringae pv. syringae, E amylovora, A. tumefaciens, A. vitis, C michiganensis subsp. michiganensis, P. syringae pv. tomato, X campestris pv. campestris, X. axonopodis pv. vesicatoria. The least active concentrations towards the tested bacteria were 1/100 of the pollen extract and 1/1000 of the propolis extract. This study is the first report on the antibacterial activities of pollen and propolis against the plant pathogenic bacteria. (c) 2005 Elsevier Ltd. All rights reserved


Abstract: The antibacterial activity of honey samples provided by apiarists and honey packers was tested against microorganisms usually isolated from skin wounds. The antibacterial activity was tested using the well-agar diffusion assay. The honey samples were tested without dilution, and at 75, 50, 30, and 10% (w/v) dilution. Most of the undiluted honey samples inhibited the growth of Staphylococcus aureus and Staphylococcus epidemidis. Some honey samples provided by apiarists also inhibited the growth of S. aureus even at 50% dilution. Undiluted honey samples also inhibited the growth of Staphylococcus uberis, Pseudomonas aeruginosa, Escherichia coli, and Klebsiella pneumoniae, although to a lesser extent. No inhibition of Micrococcus luteus and Enterococcus faecalis growth was detected. The diameters of the inhibition zones generated by honey samples provided by apiarists were larger than those generated by honey samples provided by honey packers. This observation may be explained by considering the provenance of the honey samples. (c) 2007 Published by Elsevier B.V


147. BAYAT, M; KARIMIPOUR, M; ALMASIEH, M (2005) Quantitative changes of mast cells following topical application of honey on third degree burns in rats, pp S255-S256.


150. BECK, B F; SMEDLEY, D (1944) *Honey and your health*. McBride New York, USA


156. BEKEMEIER, H; BRAUN, W; FRIEDRICH, E; KALA, H; METZNER, J; SCHNEIDEWIND, E; SCHWAIBERGER, R; WOZNIAK, K D (1973) [Microbiological, pharmacological and clinical studies on the efficiency of propolis]. Dermatologische Monatsschrift 159 (4): 443-449.

157. BELLIVEAU, J F; O'LEARY, G P; NGUYEN, B (1979) The analytical chemistry and screening procedures used to develop a "Yardstick" for arthritis based on the corticosteroid levels in blood, pp 28-32.


164. BERETTA, G; ORIOLI, M; FACINO, R M (2007) Antioxidant and radical scavenging activity of honey in endothelial cell cultures (EA.hy926). Planta medica 73 (11): 1182-1189. Abstract: The therapeutic properties of honey, once considered a form of folk or preventive medicine, are acquiring importance for the treatment of acute and chronic free radical-mediated diseases (atherosclerosis, diabetes and cancer). The aim of this work was to study the protective activity of a honey of multifloral origin, standardized for total antioxidant power and analytically profiled (HPLC-MS) in antioxidants, in a cultured endothelial cell line (EA.hy926) subjected to oxidative stress. Cumene hydroperoxide (CuOOH) was used as free radical promoter. Native honey (1 % w/v pH 7.4, 10(6) cells) showed strong quenching activity against lipophilic cumoxyl and cumoperoxyl radicals, with significant suppression/prevention of cell damage, complete inhibition of cell membrane oxidation, of intracellular ROS production and recovery of intracellular GSH. Experiments with endothelial cells fortified with the isolated fraction from native honey enriched in antioxidants, exposed to peroxyl radicals from 1,1-diphenyl-2-picrylhydrazyl (AAPH, 10 mM) and to hydrogen peroxide (H2O2, 50-100 mu M), indicated that phenolic acids and flavonoids were the main causes of the protective effect. These results provide unequivocal evidence that, through the synergistic action of its antioxidants, honey by
reducing and removing ROS, may lower the risks and effects of acute and chronic free radical induced pathologies in vivo

165. BERGER, F Von Biene, Honig und Wachs und ihrer kulturhistorischen und medizinischen Bedeutung. Art.Institut Orell Füssli Zürich; 102 pp


Abstract: Honey samples from the seven most common honey types in Slovenia were screened for total phenolic content by the modified Folin-Ciocalteu method, for potential antioxidant activity using the ferric reducing antioxidant power (FRAP) assay and by the 1, 1-diphenyl-2-picrylhydrazyl (DPPH) method for antiradical activity. In addition the colour characteristics of honey samples were analysed. The results of the study showed that total phenolic content, antioxidant activity and colour parameters differ widely among different honey types. Phenolic content expressed as gallic acid equivalent ranged from 44.8 mg/kg in acacia honey to 241.4 mg/kg in fir honey. Antioxidant activity was the lowest in the brightest acacia and lime honeys and the highest in darker honeys, namely fir, spruce and forest. The colour of the Slovenian honeys, analysed in this study was very variable and ranged from pale yellow to dark brown. Correlations between the parameters analysed were found to be statistically significant (p < 0.05). (c) 2007 Elsevier Ltd. All rights reserved

170. BETTS, J A; MOLAN, P C (2001) A pilot trial of honey as a wound dressing has shown the importance of the way that honey is applied to wounds. Paper of the European Wound Management Association Conference, Dublin, Eire


Abstract: It has been established that small x-irradiation dozes activate the lipid peroxidation and antioxidant system enzymes in mice liver. The introduction of bee pollen extract to animals normalized the activity of only several glutathione system enzymes in mice liver


Abstract: Propolis, a resinous wax-like beehive product has been used as a traditional remedy for various diseases due to a variety of biological activities of this folk medicine. In the present investigation, an attempt has been made to validate hepatoprotective activity of ethanolic extract of propolis (50-400 mg/kg, p.o.) against carbon tetrachloride (CCl4. 0.5 ml/kg, p.o.) induced acute liver injury in rats. Silymarin, a known hepatoprotective drug was used as a positive control. Administration of CCl4 altered various diagnostically important biochemical variables. Multiple treatment of propolis significantly prevented the release of transaminases, alkaline phosphatase, lactate dehydrogenase, gamma-glutamyl transpeptidase, urea and uric acid in serum; improved the activity of hepatic microsomal drug metabolizing enzymes, i.e., aniline hydroxylase and amidopyrine-N-demethylase; significantly inhibited lipid peroxidation and markedly enhanced glutathione in liver and kidney as well as brought altered carbohydrate contents (blood sugar and tissue glycogen), protein contents (serum, microsomal and tissue protein) and lipid contents (serum and tissue triglycerides, serum cholesterol, total and esterified cholesterol in tissue) towards control. Propolis treatment also reversed CCl4 induced severe alterations in histoarchitecture of liver and kidney in a dose dependent manner. Hepatoprotective activity of propolis at doses of 200 and 400 mg/kg was statistically compared to silymarin and found that propolis exhibited better effectiveness than silymarin in certain parameters, concluded its hepatoprotective potential. (C) 2008 Published by Elsevier Ltd


178. BINCOLETTO, C; EBERLIN, S; FIGUEIREDO, C A V; LUENGO, M B; QUEIROZ, M L S (2005) Effects produced by Royal Jelly on haematopoiesis: relation with host resistance against Ehrlich ascites tumour challenge. *International Immunopharmacology* 5 (4): 679-688. Abstract: Royal jelly (RJ) was shown to exhibit immunomodulatory properties, although its biological activity is still unclear. In order to elucidate the mechanism whereby RJ activates the immunological system, we examined the role of this substance on the haematopoietic response of Ehrlich ascites tumour (EAT)-bearing mice. Our results demonstrated that RJ prevented the myelosupression induced by the temporal evolution of the tumour and abrogated the splenic haematopoiesis observed in EAT-bearing mice. The stimulating effect of RJ was also observed in vitro on the multipotent bone marrow stem cells, evaluated by the long-term bone marrow cultures (LTBMCs). The study of survival clearly showed the antitumour activity of RJ. Treatment was given prophylactically for 20 days and therapeutically for 3, 8 and 13 days. Except for the treatment with the lower dose of 500 mg/kg, given for 23 days, all the other dose schedules were able to prolong survival. A more effective antitumoural response was observed with the more prolonged treatment regimen. In this regard, the administration of RJ for 33 days produced the highest protection reaching an extension of survival at about 38%, 71% and 85% for the doses of 500, 1000 and 1500 mg/kg, respectively, whereas with the 23 and 29 days treatment schedules, survival increased at a rate of 19% and 23%, respectively, and comparable results were found among the effective doses of RJ. Increased survival rate might be related to the decreased Prostaglandin E-2 (PGE(2)) levels observed in EAT-bearing mice after RJ treatment. These results point to RJ as a promising modifier of biological response leading to myeloprotection and antitumour activity. (C) 2004 Elsevier B.V. All rights reserved

179. BISWAL, B M; ZAKARIA, A; AHMAD, N M (2003) Topical application of honey in the management of radiation mucositis. A preliminary study. *Supportive Care in Cancer* 11 (4): 242-248. Abstract: Background: The aim of this study was to evaluate the effect of pure natural honey on radiation-induced mucositis. Patients and methods: Forty patients diagnosed with head and neck cancer requiring radiation to the oropharyngeal mucosal area were divided in to two groups to receive either radiation alone or radiation plus topical application of pure natural honey. Patients were treated using a 6-MV linear accelerator at
a dose rate of 2 Gy per day five times a week up to a dose of 60-70 Gy. In the study arm, patients were advised to take 20 ml of pure honey 15 min before, 15 min after and 6 h post-radiation therapy. Patients were evaluated every week for the development of radiation mucositis using the Radiation Therapy Oncology Group (RTOG) grading system. Main results: There was significant reduction in the symptomatic grade 3/4 mucositis among honey-treated patients compared to controls; i.e. 20% versus 75% (p 0.00058). The compliance of honey-treated group of patients was better than controls. Fifty-five percent of patients treated with topical honey showed no change or a positive gain in body weight compared to 25% in the control arm (p 0.053), the majority of whom lost weight. Conclusions: Topical application of natural honey is a simple and cost-effective treatment in radiation mucositis, which warrants further multi-centre randomised trials to validate our finding.

180. BKAILY, G; SIMAAN, M; JAALOUK, D; POTHIER, P (1997) Effect of apamin and melittin on ion channels and intracellular calcium of heart cells, Bee Products. Properties, Applications, and Apitherapy Symposium Tel Aviv: pp 203-211.

181. BLASA, M; CANDIRACCI, M; ACCORSI, A; PLACENTINI, M P; PIATTI, E (2007) Honey flavonoids as protection agents against oxidative damage to human red blood cells. Food Chemistry 104 (4): 1635-1640. Abstract: Honey phenol extracts separated on the base of their hydrophobicity were evaluated for the antioxidant content and for the ability to inhibit oxidative damage induced by radical species generated in the water phase or in the membrane of human erythrocytes. The water and ether fractions obtained from crude methanol extract of honey exhibited a phenolic content of 5.33 and 2.62 mg caffeic acid equivalents/100 g honey, respectively. These values correlate well with those of total antioxidant power, as assessed by FRAP assay (37.67 vs. 10.65 mu mol/100 g honey). Flavonoid contents were 2.57 and 1.64 mg catechin equivalents/100 g honey for ether and water fractions, respectively. Although both honey fractions protect erythrocytes against 2,2'-azobis(2-aminopropane)dihydrochloride-induced lysis, only the ether fraction was found to be active in inhibiting hemolysis but not methemoglobin and ferrylhemoglobin formation caused by H2O2. In addition, the ether fraction prevents tert-butylhydroperoxide-induced lipid peroxidation in whole erythrocytes and in isolated membranes. The significant antioxidant effect against damages induced by both water-soluble and hydrophobic exogenous oxidants suggests that the ether fraction, owing to its lipophilic character, can interact with red blood cell membrane, and the protective effect can be associated with the binding of the flavonoids to the membrane. On the other hand, the water fraction is more hydrophilic than ether fraction and it acts only from the outside of the membrane by scavenging the radicals before they attack the erythrocyte membrane. (c) 2007 Elsevier Ltd. All rights reserved.


Abstract: Biologically relevant compounds and the biological activity of bee venom (BV) are reviewed. Of all bee products BV producing most biological effects, also with the widest recognition in medicine, many of its components being used in experimental medicine and pharmacology. BV contains a variety of peptides, including melittin, apamin,adolapin, mast-cell-degranulating (MCD) peptide, enzymes, biologically active amines (i.e., histamine and epinephrine), and non-peptide components with a variety of pharmaceutical properties. BV has both beneficial and toxic effects. At normally applied doses the beneficial effects prevail. The toxic effects of the BV components are much stronger than that of the whole BV. Following beneficial biological effects have been reported: antibacterial, immuno-suppressive, immuno-stimulating, radiation-protective, anti-inflammatory, anti-rheumatic, pain-soothing and anti-coagulant. It induces increase of haemoglobin synthesis, accelerates heart beat, increases blood circulation, lowers blood pressure and cholesterol levels, activates the central nervous system and stimulates the building of endogenous cortisone, BV is successfully applied in the treatment of many diseases in both animals and humans. It has been applied in following diseases, arthritis, rheumatism, pain, cancer and in skin and respiration diseases. It has been applied as an anti-aggregation agent of blood platelets, as anti-arhythmic, cardiotonic, erythropoetic agent, against diseases of the eye and of the central nervous system. Success has been reported in multiple sclerosis cases. Both bee stings and injection of pure venom have been successfully used. The toxicity and the allergic effects of BV are also discussed.


205. BOGDANOV, S; GALLMANN, P (2008) Royal jelly and health: an overview. *Apimedica & Apiquality:* 61. Abstract: Composition of biologically relevant compounds and of the biologically activity of royal jelly (RJ) are reviewed. The significance of royal jelly for human nutrition is relatively small. Assuming that 5 to 10 g per day are consumed, about 1/5 of the recommended daily intake of the present vitamins, mainly of panthothenic acid, can be covered. The significance for human health lies in the biological effects of RJ 10 - hydroxydecenoic acid and of different peptides and proteins. RJ shows antibacterial, antiviral, fungicidal activity. The other biological and beneficial health effects of RJ is studied mostly in cell cultures and animal experiments. An important physiological property is similar to role of RJ in the bee colony stimulate growth, increase weight and tissue oxygen consumption, thus increasing performance and endurance. RJ increases the number of all blood cells. It increases the alpha globulins fraction, thus triggering an immunomodulating and activating activity. Due to these properties, RJ inhibits or slows down tumor growth. RJ reduces serum cholesterol and triglycerides levels, increases high-density lipoprotein-cholesterol levels, lowers plasma fibrinogen levels and thrombosis. Due to these effects RJ has a cardioprotective action and decreases the blood pressure. RJ induces stimulating, activating effects on the central and vegetative nervous system. These effects result in an improved muscle tonus and activity. RJ has also many other beneficiary effects, the most important being anti-inflammatory, hepatoprotective, anti-hypoxia, anti-oxidative, radiation-protective, hyperglycaemic and osteoporosis preventing. There are less controlled studies on therapeutic effects in humans. The most important are: bio-stimulatory effects, improving physical performance and resistance to hypoxia; improvement of the general conditions, increasing weight, appetite, increase of red blood cells and haemoglobin of children; bio-stimulating for older people and anti-atheriosclerosis effects.


207. BOLHAAR, S T H P; TIEMESSEN, M M; ZUIDMEER, L; VAN LEEUWEN, A; HOFFMANN-SOMMERGRUBER, K; BRUINZEELE-KOOMEN, C A F M; TAAAMS, L S; KNOL, E F; VAN HOFFEN, E; VAN REE, R; KNUST, A C (2004) Efficacy of birch-pollen immunotherapy on cross-reactive food allergy confirmed by skin tests and double-blind food challenges. *Clinical and Experimental Allergy* 34 (5): 761-769. Abstract: Summary Background The effect of birch-pollen immunotherapy (IT) on cross-
reactive food allergies is controversial. Objective The aim of this study was to investigate
the effect of birch-pollen IT on apple allergy and to evaluate recombinant allergens and
double-blind placebo-controlled food challenges (DBPCFCs) as monitoring tools. Methods
Twenty-five adult birch-pollen- and apple-allergic patients were randomly divided into two
groups, either receiving birch-pollen IT or symptomatic drugs only. IgE and IgG4
antibodies against birch pollen, apple, natural Bet v 1 and Mal d 1 were measured. In
addition, skin prick tests (SPT) were performed using recombinant Bet v 1 (rBet v 1) and
Mal d 1 (rMal d 1). Clinical outcome was evaluated by DBPCFC. CD4+CD25+ regulatory
T cells (Tregs) were isolated from peripheral blood and tested in functional assays.
Results Birch-pollen IT resulted in a significant decrease of SPT reactivity for rBet v 1 (30-
fold) and rMal d 1 (10-fold) already after 3 months. IgG4 antibodies were potently induced
against Bet v 1, displaying cross-reactivity to Mal d 1. Visual analogue scale scores
decreased >10-fold in 9/13 patients of the IT group, with three patients converting to
negative. In the control group, no decrease was observed. Birch-pollen IT did not lead to
detectable changes in the number or function of the CD4+CD25+ Tregs. Conclusions This
trial supports the claims that birch-pollen IT also decreases allergy to foods containing Bet
v 1-homologous allergens. Recombinant allergens and DBPCFCs have proven to be
useful tools for monitoring the effect of birch-pollen IT on linked food allergies

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PIERSCHBACHER, M D; RUOSLAHTI, E (1992) Natural inhibitor of transforming growth
factor-beta protects against scarring in experimental kidney disease. Nature 360: 361-
364.

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effect of naturally occurring long-chain fatty alcohols on cultured CNS neurons. FEB 213:
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determination of their univalent redox potentials: A pulse radiolysis study. Free Radical


215. BOSIO, K; AVANZINI, C; DAVOLIO, A; OZINO, O; SAVOIA, D (2000) In vitro activity of propolis
Abstract: Propolis, a multifunctional substance used by bees to maintain the safety of
their hives, is popular for its therapeutic potential against some micro-organisms. Ethanolic
extracts of two propolis specimens, collected from different. Areas within a region in the
north-west of Italy, were examined to evaluate their antimicrobial activity against 46
Streptococcus pyogenes strains. By both agar dilution and agar diffusion methods, the
minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) were
less than or equal to 234 mu g ml(-1), corresponding to a one in 512 dilution of the 12%
(w/v) extracts. One of the two propolis samples was more active and this extract was
shown to be richer in the flavonoids pinocembrin and galangin using HPLC. Therefore,
with a simple microbiological assay technique, in particular the agar dilution method, it
was possible to standardize the analysis of propolis samples to identify the quality
parameters of this natural product before use for medical treatment.

Abstract: To evaluate the synergistic action of starch on the antifungal activity of honey, a comparative method of adding honey with and without starch to culture media was used. Aspergillus niger was used to determine the minimum inhibitory concentration (MIC) of five varieties of honey. In the second step, lower concentrations of honey than the MIC were incubated with a set of concentrations of starch and then added to media to determine the minimum synergistic inhibitory concentration (MSIC). The MIC for the five varieties of honey without starch against A. niger ranged between 46% and 50% (v/v). When starch was incubated with honey and then added to media, an MIC drop was noticed with each variety and it ranged between 6% and 19.5%. Negative correlation has been established between the MIC drop and the Diastase Number.

Abstract: The role of amylase present in honey in enhancing its antibacterial activity was evaluated in the presence and absence of starch. Two strains of pathogenic bacteria have been used: Staphylococcus aureus and Escherichia coli. For S. aureus, the minimum inhibitory concentration (MIC) for the three varieties of honey tested without starch was 11%, 24%, and 29% (vol/vol), respectively. When starch was added with honey to the media the MIC obtained was 5%, 19%, and 25% (vol/vol), respectively. For E. coli, the MIC for the three varieties without starch was 23%, 28%, and 25% (vol/vol), respectively. When starch was added with honey to media, the MIC was 19%, 26%, and 23% (vol/vol), respectively. It is speculated that the amylase present in honey hydrolyzed the starch chains to randomly produce dextrin and maltose and that this increased the osmotic effect of the media, which consequently increased the antibacterial activity.


Abstract: The potential role of phospholipases in trypanosomiasis was investigated using bee venom phospholipase A2 (bvPLA2) as a model. The effects of bvPLA2 on the survival of Trypanosoma brucei brucei, 2 h and 12 h cultures of Enterobacter cloacae, Escherichia coli, Citrobacter freundii were studied. About 1 mg ml(-1) bvPLA2 was trypanocidal after 30 min. Some growth occurred at lower concentrations up to 2 h after treatment but viability decreased up to 8 h. Even very low concentrations of bvPLA2 (10(-12) mg ml(-1)) had some trypanocidal activity. Bee venom PLA2 was bactericidal to 2 h bacterial cultures but bacteriostatic to 12 h ones. Minimum bactericidal concentrations were 10(-5)-10(-6) mg ml(-1). The results showed that bvPLA2 had significant trypanocidal and antibacterial effects on Gram-negative bacteria. The relationship to events occurring during infection is discussed. Phospholipases may play a role in increased endotoxin levels in trypanosomiasis. (C) 2008 Elsevier Inc. All rights reserved.


Abstract: To assess the variation in antibacterial and antifungal activity of non-manuka honeys, a study was undertaken using 179 unifloral, unpasteurized honey samples obtained from commercial beekeepers throughout New Zealand. The honeys were tested against Staphylococcus aureus and Candida albicans, Escherichia coli and the
dermatophyte Trichophyton mentagrophytes using agar well diffusion, measurement of minimum inhibitory concentration and modified agar well diffusion methods, respectively. Of the 179 non-manuka honey samples assessed, none showed non-peroxide or anti-yeast antimicrobial activities. By contrast, 50% of the samples tested showed antibacterial activity against S. aureus, with activity ranging from 5.0-27.9% phenol equivalent. Approximately 30% of the samples tested showed antibacterial activity against E. coli; however, honey concentrations required for inhibition were, with one exception, in excess of 19%. Similarly, 35% of samples showed antifungal activity although the levels of activity measured were low.

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227. BRADY, N F; MOLAN, P C The sensitivity of enteropathogenic bacteria to the antibacterial activity of honey. *Paper in preparation*


Abstract: Local and international studies have established that numerous surgical patients use CMs prior to surgery. This usually does not cause problems, however some CMs are known or suspected to increase the risk of bleeding, alter BP and electrolyte status, or interact with drugs used peri-operatively. Use of CMs presurgery should be supervised by an informed clinician. Current evidence suggesting CMs [e.g. vitamin E and ginkgo] may increase bleeding or induce drug interactions requires further research to clarify their clinical significance. CMs that increase bleeding tendency in a dose-dependent manner are garlic, ginger and fish oils. Some CMs may improve patient outcomes and should be considered as part of holistic care. Coenzyme Q10 in cardiac surgery and topical honey application for wound healing are supported by strong evidence. Adequate dietary intake of nutrients is important peri-operatively, and adequate calories and protein are essential for optimal postoperative recovery. Hospital doctors and pharmacists should ask patients about CM use as part of a routine medicines history, record use on the medication chart and include in discharge summaries.


Abstract: The purpose of this investigation was to determine the antimicrobial and healing potential of propolis on direct dental pulp exposures. This study used 25 adult male rats. Pulp exposures were performed and animals were allocated to propolis and calcium hydroxide (Ca(OH)₂) groups. Animals were killed on days 5, 7, 10, and 14. The teeth were routinely processed for histological evaluation. Non-parametric tests were employed to analyze the data. No significant differences were found between study groups on the wound healing of the dental pulp. Both substances were comparable in exhibiting normal reorganization of the pulp and no increased vascularity, and were equally efficacious in maintaining a low inflammatory and microbial cell population as well as in stimulating the formation of reparative dentin.


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Abstract: Caffeic acid phenethyl ester (CAPE), a natural compound of bee propolis, selectively inhibits proliferation of transformed cells in several cancer models in vitro. To examine in vivo CAPE function, we used the newt regeneration blastema as a model system wherein the processes of de-differentiation and subsequent proliferation of undifferentiated cells mimic changes associated with oncogenic transformation and tumorigenesis. We have shown that a single dose of CAPE significantly increased cell proliferation at the stages of blastema growth and re-differentiation. At the de-differentiation stage, CAPE significantly stimulated proliferation of wound epidermis keratinocytes, but decreased proliferation in the blastema mesenchyme. Immunohistochemistry with a mesenchymal cell marker, vimentin, revealed a highly significant reduction of vimentin staining in the mesenchyme of CAPE-treated regenerates (p < 0.001). These results, together with morphological observations indicate that, at the de-differentiation stage, CAPE stimulated wound re-epithelization, increased keratinocyte proliferation and increased thickness of the wound epidermis. However, CAPE inhibited
mesenchyme formation and proliferation. The functional consequence of the CAPE inhibitory action was a delay in limb regeneration. (C) 2004 Wiley-Liss, Inc


Abstract: Penicillin and other antibiotics are routinely incorporated in insect culture media. Although culturing insects in the presence of antibiotics is a decades-old practice, antibiotics can exert deleterious influences on insects. In this article, we test the hypothesis that one of the effects of dietary penicillin is to increase oxidative stress on insects. The effects of penicillin on midgut concentrations of the oxidative stress indicator malondialdehyde (MDA) and on midgut antioxidant enzyme (superoxide dismutase [SOD], catalase [CAT], glutathione S-transferase [GST], and glutathione peroxidase [GPx]) and transaminases (alanine aminotransferase and aspartate aminotransferase) activities in greater wax moth, Galleria mellonella (L.), were investigated. The insects were reared from first instars on artificial diets containing 0.001, 0.01, 0.1, or 1.0 g penicillin per 100 g of diets. MDA content was significantly increased in the midgut tissues of each larval instar reared in the presence of high penicillin concentrations. Activities of antioxidant and transaminase enzymes did not show a consistent pattern with respect to penicillin concentrations in diet or age of larvae. Despite the increased penicillin-induced oxidative stress in gut tissue, antioxidant and transaminase enzymes did not correlate with oxidative stress level or between each other in larvae of other age stages except for the seventh instar. We found a significant negative correlation of MDA content with SOD and GST activities in seventh instars. SOD activity was also negatively correlated with
CAT activity in seventh instars. These results suggest that exposure to dietary penicillin resulted in impaired enzymatic antioxidant defense capacity and metabolic functions in wax moth larval midgut tissues and that the resulting oxidative stress impacts midgut digestive physiology.


Abstract: The honey bee non peroxide antibacterial activity was evaluated in 160 samples from four zones of the Zulia state: The Agronomy Faculty of the University of Zulia, La Rinconada, Mara and Caja Seca during the dry and rainy seasons. Twenty honey combs per zone and per season were sampled, obtaining 20 L of honey for test, making dilutions from 5, 10, 15, 20 25, 30, 35, 40, 45 to 50% (% w/v) of honey content using 0.2% (w/v) catalasa a diluent. The samples were analyzed using pathogenic strains of Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Bacillus subtilis, Listeria monocytogenes and Proteus mirabilis, with the agar diffusion technique. The results obtained showed that the Zulia state honeys had antibacterial activity (bacteriostatics) against the six bacteria selected. The most susceptible bacterium was Pseudomonas aeruginosa, over the range of concentrations assayed.

Abstract: This article discusses the use of venoms, copper, and zinc in the treatment of arthritis. The author examines the history and effectiveness of viper, bee, and ant venoms in order to determine whether these natural ingredients in anti-inflammatory medications help relieve a patient's symptoms. Copper and zinc studies may offer therapeutic benefits, but there is still no solid consensus on the potential role of these elements in treating arthritis.


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Abstract: English Article Bee pollen is a mix of bee-collected floral pollens which varies widely in composition. A systematic method for characterising bee pollens in terms of their constituent pollens is needed in view of the growing phytotherapeutic interest in bee pollen products. Studies involving three bee pollen samples collected from Portugal and New Zealand are reported, An approach based on flavonoid/phenolics profiles derived from high pressure liquid chromatography is demonstrated to be more precise and informative than traditional microscopy. This method provides a convenient means for identifying the contributing pollens, and for characterising bee pollens in terms of their predominant constituent pollens. The flavonoid/phenolics profiles obtained in the course of this work also highlight other observations of interest. For example: bees are shown to be highly selective pollen gatherers from the finding that bee pollens comprise pollen from only a few of the available species; pollen from only one floral source is found in each bee pollen pellet; and flavonoids are normally found as glycosides in pollens but are shown to
occur naturally as aglycones in Eucalyptus globulus pollen. Two of these aglycones, tricetin and 3-O-methylquercetin, are reported as pollen constituents for the first time. (C) 1997 by John Wiley & Sons, Ltd.

Abstract: The review is divided into 4 parts. The first part deals with pollen collection by the bees, harvest by the beekeepers and technologies in storage. The second part concentrates on nutritional aspects of pollen. Bee pollen is defined in the legislation as food. It contains significant quantities of several vitamins: provitamin A, vitamin E (tocopherol), niacin, thiamine, folic acid and biotin. The amount of the nutrition-relevant components varies strongly depending on the botanical source of the pollen. The nutritional content of pollen can be partly released by the digestive juices only a part of the pollen constituents is assimilated by humans.
In third section the main biological activities of pollen are reviewed: antioxidant, antimicrobial and antiinflammatory. In the fourth part the different therapeutic effects are summarized, as tested in experiments with cell, animals and humans. The most outstanding therapeutic action used in medicine is the antiprostatitis effect. However this effect is better studied with pollen preparations of flower pollen, although there are also positive results with bee pollen. Recently pollen based vaccines were successfully used in double blind clinical trials for desensitisation against hay fever. Besides, there are significant antianaemia, antiatherosclerotic, antosteoporosis and antiallergic effects, but mostly in animal studies. The main biologically active compounds are the flavonoids and the phytosterols. In conclusion, pollen can be regarded as functional food with promising health enhancing and therapeutic properties.

Abstract: The aim of this study was to determine the antioxidant activity, phenolic content and antibacterial activity of pollen extracts obtained with different concentrations of ethanol. Each extraction condition (ethanol solutions from 40 to 90%) had a different effect in the phenolic compounds content. Although, the pollen extract obtained at 60, 70 and 80% of ethanol showed relatively higher levels of phenolic compounds (>10 mg/g) and did not present statistical significant difference between the extraction conditions. The amount of total phenolics ranged from 3.6 to 8.1 and 6.6 to 10.9 mg GAE/g for Alagoas state and Paraná state pollen, respectively. The higher value for antioxidant activity index was 83.30% for the pollen from Alagoas state and 81.15 % for Paraná state pollen. The highest degree of antioxidant activity was found in the extraction at 60% of ethanol solution for Paraná state pollen, which also showed the highest concentration of polyphenol compounds. Staphylococcus aureus was inhibited by the ethanolic extract of Alagoas state pollen in all the concentrations of solvent, except the ethanolic extract of pollen at 90%. The extract at 60% of ethanol solution (Paraná sample) inhibited Bacillus subtilis, Pseudomonas aeruginosa and Klebsiella sp


Abstract: 1. Wood ants (Formica paralugubris) incorporate large amounts of solidified conifer resin into their nest, which reduces the density of many bacteria and fungi and protects the ants against some detrimental micro-organisms. By inducing an environment unfavourable to pathogens, the presence of resin may allow workers to reduce the use of their immune system. 2. The present study tested the hypothesis that the presence of resin decreases the immune activity of wood ants. Specifically, three components of the humoral immune defences of workers kept in resin-rich and resin-free experimental nests (antibacterial, lytic, and prophenoloxidase activities) were compared. 3. The presence of resin was associated with reduced bacterial and fungal densities in nest material and with a small decrease in worker antibacterial and lytic activities. The prophenoloxidase activity was very low in all workers and was not affected by the presence of resin. 4. These results suggest that collective medication with resin reduces pathogen pressure, which in turn decreases the use of the inducible part of the immune system. More generally, the use of plant secondary compounds might be an efficient and economical way to fight pathogens


Abstract: The composition and biological activities of propolis, a resinous hive product collected by honeybees from various plant sources, depends on various factors such as season and vegetation of the area. The aim of this study was to evaluate the influence of the seasonal effect on the ethanolic extracts of Brazilian propolis (EEP) type 6 and type 12, collected during 6 months in terms of antibacterial activity and phenolic composition. The antimicrobial properties were evaluated by MIC and MBC on S. mutans Ingbrbrit 1600 and the profile of chemical composition by UV-visible spectrophotometry, HPLC-RF and
GC-MS. The results demonstrated that the season in which propolis is collected influences its chemical composition, resulting in modifications in its antibacterial activity.


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Abstract: Background: The honey bee (Apis mellifera), besides its role in pollination and honey production, serves as a model for studying the biochemistry of development, metabolism, and immunity in a social organism. Here we use mass spectrometry-based quantitative proteomics to quantify nearly 800 proteins during the 5-6 day larval developmental stage, tracking their expression profiles. Results: We report that honey bee larval growth is marked by an age-correlated increase of protein transporters and receptors, as well as protein nutrient stores, while opposite trends in protein translation activity and turnover were observed. Levels of immunity factors prophenoloxidase and apismin are positively correlated with development, while others surprisingly were not significantly age-regulated, suggesting a molecular explanation for why bees are susceptible to major age-associated bee bacterial infections such as American Foulbrood or fungal diseases such as chalkbrood. Previously unreported findings include the reduction of antioxidant and G proteins in aging larvae. Conclusions: This data has allowed us to integrate disparate findings in previous studies to build a model of metabolism and maturity of the immune system during larval development. This publicly-accessible resource for protein expression trends will help generate new hypotheses in the increasingly important field of honey bee research.

Abstract: Background: The honey bee (Apis mellifera), besides its role in pollination and honey production, serves as a model for studying the biochemistry of development, metabolism, and immunity in a social organism. Here we use mass spectrometry-based quantitative proteomics to quantify nearly 800 proteins during the 5-6 day larval developmental stage, tracking their expression profiles. Results: We report that honey bee larval growth is marked by an age-correlated increase of protein transporters and receptors, as well as protein nutrient stores, while opposite trends in protein translation activity and turnover were observed. Levels of immunity factors prophenoloxidase and apismin are positively correlated with development, while others surprisingly were not significantly age-regulated, suggesting a molecular explanation for why bees are susceptible to major age-associated bee bacterial infections such as American Foulbrood or fungal diseases such as chalkbrood. Previously unreported findings include the reduction of antioxidant and G proteins in aging larvae. Conclusions: This data has allowed us to integrate disparate findings in previous studies to build a model of metabolism and maturity of the immune system during larval development. This publicly-
accessible resource for protein expression trends will help generate new hypotheses in the increasingly important field of honey bee research.


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Abstract: Results are compared with those of taking royal jelly.


Abstract: We recently demonstrated that two new prenylflavanones, propolin A and propolin B, isolated and characterized from Taiwanese propolis, induced cytotoxicity effect in human melanoma A2058 cells and shows a strong capability to scavenge free radicals. In this study, propolin A effectively induced a cytotoxic effect on five different cancer cell lines. Similar results were obtained for propolin B. DNA flow cytometric analysis and DNA fragmentation ladder indicated that propolin A and propolin B actively induced apoptosis in A2058 cells. To address the mechanism of the apoptosis effect of propolin A and propolin B, we evaluated the apoptosis-related proteins in A2058 cells. The levels of procaspase-8, Bid, procaspase-3, DFF45, and PARP were decreased in dose- and time course-dependent manners. Furthermore, also found propolin A and propolin B was capable of releasing cytochrome c from mitochondria to cytosol. The findings suggest that propolin A and propolin B may activate a mitochondria-mediated apoptosis pathway. On the other hand, our data show that propolin B inhibited xanthine oxidase activity more efficiently than propolin A or CAPE. However, CAPE suppressed ROS-induced DNA strand breakage more efficiently than propolin A or propolin B. All
these results indicated that propolin A and propolin B may trigger apoptosis of A2058 cells through mitochondria-dependent pathways and also shown that propolin A and propolin B were strong antioxidants. (c) 2006 Elsevier Ireland Ltd. All rights reserved

294. CHEN, L S; CHENG, L L (2004) CO2 assimilation, carbohydrate metabolism, xanthophyll cycle, and the antioxidant system of 'Honeycrisp' apple leaves with zonal chlorosis. Journal of the American Society for Horticultural Science 129 (5): 729-737. Abstract: To determine the cause of a characteristic zonal chlorosis of 'Honeycrisp' apple (Malus x domestica Borkh.) leaves, we compared CO2 assimilation, carbohydrate metabolism, the xanthophyll cycle and the antioxidant system between chlorotic leaves and normal leaves. Chlorotic leaves accumulated higher levels of nonstructural carbohydrates, particularly starch, sorbitol, sucrose, and fructose at both dusk and predawn, and no difference was found in total nonstructural carbohydrates between predawn and dusk. This indicates that carbon export was inhibited in chlorotic leaves. CO2 assimilation and the key enzymes in the Calvin cycle, ribulose 1,5-bisphosphate carboxylase/oxygenase, NADP-glyceraldehyde-3-phosphate dehydrogenase, phosphoribulokinase, stromal fructose-1,6-bisphosphatase, and the key enzymes in starch and sorbitol synthesis, ADP-glucose pyrophosphorylase, cytosolic fructose-1,6-bisphosphatase, and aldose 6-phosphate reductase were significantly lower in chlorotic leaves than in normal leaves. However, sucrose phosphate synthase activity was higher in chlorotic leaves. In response to a reduced demand for photosynthetic electron transport, thermal dissipation of excitation energy (measured as nonphotochemical quenching of chlorophyll fluorescence) was enhanced in chlorotic leaves under full sun, lowering the efficiency of excitation energy transfer to PSII reaction centers. This was accompanied by a corresponding increase in both xanthophyll cycle pool size (on a chlorophyll basis) and conversion of violaxanthin to antheraxanthin and zeaxanthin. The antioxidant system, including superoxide dismutase and ascorbate peroxidase and the ascorbate pool and glutathione pool, was up-regulated in chlorotic leaves in response to the increased generation of reactive oxygen species via photoreduction of oxygen. These findings support the hypothesis that phloem loading and/or transport is partially or completely blocked in chlorotic leaves, and that excessive accumulation of nonstructural carbohydrates may cause feedback suppression of CO2 assimilation via direct interference with chloroplast function and/or indirect repression of photosynthetic enzymes.


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   Abstract: Biological activities of different propolis extracts in Korea were examined for the evaluation of quality comparison with that from Brazil (BZ). Total polyphenol and flavonoid contents of propolis extracts from Yeosu (YS) and Cheorwon (CW), whose E-1cm(1%) values were higher than BZ, were also shown to be more abundant. The extracts of YS and CW also showed strong antioxidant activities, using the linoleic acid peroxidation and 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical-scavenging activity. However, the extract from BZ had less active antioxidant activity on linoleic acid peroxidation and DPPH free radical-scavenging activity of less than 70% than other extracts. The DPPH free radical-scavenging activity seems to relate with the antioxidant activity of linoleic acid peroxidation. The propolis with antioxidant activity also had DPPH free radical-scavenging activity. The extracts of YS and CW had effective antimicrobial activities on Staphylococcus aureus, Bacillus subtilis, Salmonella typhimurium and Candida albicans. Strong antioxidant, radical-scavenging and antimicrobial activities of YS and CW seemed to relate with high E-1cm(1%) values, total polyphenol, and flavonoid contents. (c) 2005 Swiss Society of Food Science and Technology. Published by Elsevier Ltd. All rights reserved

   Abstract: Four antibacterial peptide genes (apidaecin, hymenoptaecin, abaecin, and defensin) were cloned from the bumblebee Bombus ignitus, and cDNAs and their genomic structures were sequenced and characterized. Comparative analysis revealed that the four antibacterial peptides of B. ignitus had similar characteristics to other bee antibacterial peptides identified to date. The transcriptional expression profiles of the four
antibacterial peptide genes in the fat body of B. ignitus workers revealed that all four
antibacterial peptide genes were acutely induced in a similar manner by PBS injection or
LPS stimulation, indicating that antibacterial peptides from various classes are
simultaneously expressed in a single insect upon infection or injury. (c) 2008 Elsevier Inc.
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induced myocardiopathy in rats. Experimental and Molecular Pathology 62 (3): 190-198.

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exposed to minimally modified low density lipoprotein. Arzneimittel-Forschung / Drug
Abstract: An aqueous extract of propolis and the phenolic component of propolis, propol,
were assayed for antioxidative and antiapoptotic properties. Both additions inhibited
Cu2+-initiated low density lipoprotein (LDL) oxidation as characterized by a reduction of
the lag time, reduced the increase of relative electrophoretic mobility during oxidation and
markedly diminished apoptosis of human macrophages exposed to minimally modified
(mmLDL). Moreover, aqueous propolis extract and propol blocked the mmLDL-induced
decrease of glutathione (GSH) and the activation of the transcription factor NF-kappa B in
these cells. The potent phenolic antioxidant propol thus expands the capability of cells to
neutralize oxidative stress and to prevent apoptosis and is therefore suggested to
significantly contribute to the antiinflammatory and antioxidative effects of propolis.


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Abstract: This book covers beekeeping methods, management of apiaries, information on
honey bees and their colonies, and hive products. IBRA Library holds three chapters: I
Honey bees; II The social life of the colony; 4 Pollination, beekeeping and the
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572-574.
Abstract: Recent in vitro studies suggest that propolis and some of its phenolic
components are able to inhibit Helicobacter pylori growth. To date, there are no clinical
studies. Aims: To evaluate the effect of Brazilian green propolis on H. pylori-infected
individuals. Patients and methods: Eighteen (11 females, 7 males, mean age 47 years) participants were included. Before treatment, all participants were submitted to gastroscopy, and H. pylori infection was confirmed by histology, urease test, and C-13-urea breath test (UBT). Participants with UBT showing a delta over baseline (DOB) value higher than 4 parts per thousand were considered positive for H. pylori infection. Twenty drops from an alcoholic preparation of Brazilian green propolis were administered three times a day for 7 days. Clinical evaluation and UBT were performed at 1-3 days and at 40 days after the end of therapy to evaluate H. pylori suppression or eradication, respectively. Results: All participants took all medication and completed the study. Eighty-three percent of the subjects did not succeed in suppressing or eradicating H. pylori. Two participants reached partial suppression after treatment, but became positive again at UBT performed 40 days after treatment. Another participant presented negative at UBT 40 days after treatment, not confirmed by a second UBT performed 100 days after treatment. Conclusions: Brazilian green propolis used in popular dose showed minimal effect on H. pylori infection. Larger studies with longer duration, larger dose, and different frequency of administration of propolis extract should be undertaken to define its role on H. pylori therapy.


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Abstract: Three patients are presented who ingested a health food known as "bee pollen" and who experienced an immediate allergic reaction. Examination revealed that the bee pollen contained dandelion pollen, which belongs to the Compositae family as does ragweed. In vivo and in vitro studies demonstrated that the patients were sensitive to several Compositae family members, rather than to insect-derived antigens. In addition, radioallergosorbent inhibition studies confirmed the suspected cross-reactivity between the health food and Compositae pollens. This study indicates that atopic individuals may experience anaphylaxis from ingestion of antigens in certain food stuffs that cross-react with pollens to which they are sensitive.


Abstract: Honey is an ancient wound remedy that has gained acceptance in modern medicine with the development of modern wound care products. Its therapeutic attributes are thought to be related to its antimicrobial activity as well as its ability to stimulate rapid healing, yet it is not known whether these properties are correlated. Using 139 local Welsh honeys collected by amateur beekeepers and one manuka honey, we determined physical and chemical characteristics to establish authenticity. Antibacterial activity was estimated using an agar well diffusion bioassay and wound healing potential was estimated by quantifying the release of tumour necrosis factor-alpha (TNF-alpha) from monocytic cells exposed to honey. The manuka honey had total and non-peroxide activity equivalent to 18.5% (w/v) phenol; 71 of the Welsh samples possessed total activity, with 6.9% (w/v) the highest phenol equivalent, and none possessed non-peroxide activity. The mean TNF-alpha response following exposure of a monocytic cell line (Monomac 6) to manuka honey was 320 pg/ml +/- 39.9 (SEM) and for the Welsh honeys it was 547.5 pg/ml +/- 26.5 (SEM), ranging from 7.6 to 1437 pg/ml. Antibacterial activity and TNF-alpha response were not associated. Although the antiseptic potential of Welsh honeys was weak, their wound healing potential merits further investigation.


Abstract: The antibacterial action of honey in infected wounds does not depend wholly on its high osmolarity. We tested the sensitivity of 58 strains of coagulase-positive Staphylococcus aureus, isolated from infected wounds, to a pasture honey and a manuka honey. There was little variation between the isolates in their sensitivity to honey: minimum inhibitory concentrations were all between 2 and 3% (v/v) for the manuka honey and between 3 and 4% for the pasture honey. Thus, these honeys would prevent growth of S. Aureus if diluted by body fluids a further seven-fold to fourteen-fold beyond the point where their osmolarity ceased to be completely inhibitory. The antibacterial action of the pasture honey relied on release of hydrogen peroxide, which in vivo might be reduced by catalase activity in tissues or blood. The action of manuka honey stems partly from a phytochemical component, so this type of honey might be more effective in vivo. Comparative clinical trials with standardized honeys are needed.

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Abstract: Aims: To determine the sensitivity to honey of Gram-positive cocci of clinical
significance in wounds and demonstrate that inhibition is not exclusively due to osmotic effects. Methods and Results: Eighteen strains of methicillin-resistant Staphylococcus aureus and seven strains of vancomycin-sensitive enterococci were isolated from infected wounds and 20 strains of vancomycin-resistant enterococci were isolated from hospital environmental surfaces. Using an agar incorporation technique to determine the minimum inhibitory concentration (MIC), their sensitivity to two natural honeys of median levels of antibacterial activity was established and compared with an artificial honey solution. For all of the strains tested, the MIC values against manuka and pasture honey were below 10% (v/v), but concentrations of artificial honey at least three times higher were required to achieve equivalent inhibition in vitro. Comparison of the MIC values of antibiotic-sensitive strains with their respective antibiotic-resistant strains demonstrated no marked differences in their susceptibilities to honey. Conclusions: The inhibition of bacteria by honey is not exclusively due to osmolarity. For the Gram-positive cocci tested, antibiotic-sensitive and -resistant strains showed similar sensitivity to honey. Significance and Impact of the Study: A possible role for honey in the treatment of wounds colonized by antibiotic-resistant bacteria is indicated.


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inhibiting activity at micromolar level and a low cytotoxicity the cytotoxicity of the phenolic compounds was also studied. In all the assays used, the caffeic acid anilides and the caffeic acid dopamine amide showed an interesting antioxidant activity.

Abstract: Apophua simplicipes (Cresson) (Hymenoptera: Ichneumonidae) is a common parasitoid of the oblique banded leafroller, Choristoneura rosaceana (Harris) (Lepidoptera: Tortricidae) in organically managed apple orchards in the southern interior of British Columbia, Canada. The biological characteristics of a laboratory colony of A. simplicipes were studied. When held at 15 and 25 degrees C and provided with honey water, individual females survived an average of 60.6 +/- 6.1 and 29.8 +/- 4.7 days, oviposited 196.7 +/- 50.7 and 326.6 +/- 51.3 eggs and parasitized a total of 163.4 +/- 40.4 and 229.4 +/- 35.8 hosts, respectively. Females oviposited into first through fourth instar oblique banded leafrollers, with significantly more parasitism occurring in the first two instars compared to the third and fourth instars. No parasitoid larvae survived past the first larval stage in parasitized fourth instar hosts. Apophua simplicipes did not parasitize larvae of three-lined leafroller, Pandemis limitata (Robinson) (Lepidoptera: Tortricidae) which is sympatric with oblique banded leafrollers in orchards in the southern interior of British Columbia. Female predation and host feeding from wounds on early instars of both leafroller species was observed under laboratory conditions. In addition, early instar hosts exited diet feeding sites in response to the probing activity of the ovipositing wasps. A similar escape reaction in the orchard may cause a leafroller larva to move away from its feeding site, making it more vulnerable to predation or movement off the tree. Apophua simplicipes larvae emerged from fifth and sixth instar hosts. Parasitized oblique banded leafroller hosts consumed significantly less meridic diet than unparasitized female larvae from fifth instar through to parasitoid emergence or leafroller pupation. Our laboratory results suggest that A. simplicipes may reduce field populations of oblique banded leafroller and decrease pest feeding damage

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Abstract: Bleached and yellow beeswax were among the waxes studied


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Aggregation of Staphylococcus aureus following treatment with the antibacterial flavonol galangin. *Journal of Applied Microbiology* 103 (5): 1562-1567.

Abstract: Aim: The flavonol galangin, an antimicrobial constituent of the traditional medicines propolis and Helichrysum aureonitens, is being assessed as part of an ongoing investigation into the antibacterial activity of flavonoids. The present study sought to establish whether galangin has any aggregatory effect on bacterial cells. Methods and Results: In preparatory time-kill assays, 50 μg ml\(^{-1}\) of galangin was found to reduce colony counts of c. 5 x 10\(^7\) CFU ml\(^{-1}\)Staphylococcus aureus NCTC 6571 by approximately 15 000-fold during 60 min of incubation. Subsequent light microscopy studies demonstrated significant increases in the number of large clusters of bacterial cells in populations treated with the flavonol. Conclusion: Data presented here show that galangin causes aggregation of bacterial cells. Significance and Impact of the Study: The finding that galangin causes bacterial cells to clump together may implicate the cytoplasmic membrane as a target site for this compound's activity. More importantly, this observation indicates that decreases in CFU numbers detected in time-kill and minimum bactericidal concentration (MBC) assays in previous investigations were at least partially attributable to this aggregatory effect. This raises the possibility that galangin is not genuinely bactericidal in action, and calls into question the suitability of time-kill and MBC assays for determining the nature of activity of naturally occurring flavonoids.

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**References**


Abstract: Propolis is a resinous substance collected by honeybees from plant sources. Its antimicrobial activity has been well documented but little is specifically known about its activity on virulence factors of Candida albicans. The aim of this work was therefore to evaluate in vitro the propolis effect on yeast-mycelial conversion (Y-M), extracellular phospholipase activity and fungal adhesion to epithelial cells. The two propolis samples used significantly inhibited the C. albicans strains tested, showing a rapid (between 30 seconds and 15 minutes), dose-dependent cytoidal activity and an inhibitory effect on Y-M conversion at a concentration of 0.22 mg/ml. Moreover, the hyphal length was reduced.
even at lower propolis concentration. Propolis also caused a dose- and time-dependent inhibition of phospholipase activity. No clear effect was shown on adherence to buccal epithelial cells and surface structure hydrophobicity, but damage to the plasma membrane structure was demonstrated with the Propidium Iodide test.


Abstract: The antibacterial and antifungal action of propolis and eugenol were investigated by Petri dish bioassay method. The eugenol recorded the lowest activities as, compared to propolis with the exception to its effect on Aspergillus ochraceus. Propolis displayed both bacteriostatic and bacteriocidal actions depending on the concentration and type of the investigated bacteria. The Gram negative bacterium Escherichia coli was insensitive to the treatments. The efficiency of eugenol (200 ppm) and propolis (5% and 10%) on the growth of Aspergillus parasiticus as well as biosynthesis of Aflatoxins and also the growth of Aspergillus ochraceus and Ochratoxin A formation were determined through the ripening of Ras cheese. The obtained results revealed that eugenol and propolis delayed fungal growth by 30 and 90 days respectively. At the end of ripening flavour of treated cheese was developed and the cheese texture and appearance were improved.


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Abstract: Phytochemical investigation of a propolis sample from Alto Santo - Ceara, 
Brazil, allowed identification of triterpenes (lupeol, lupenone, germanicane, canaric acid) 
and flavonoids (quercetin, kaempferol and acacetin), which were identified by 
spectroscopic data (IR, MS, and NMR, including 2D techniques). This is the first report of 
canaric acid in propolis. Propol is extract and flavonoids showed antioxidant activity using 
a DPPH radical scavenging assay

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green propolis on experimental gastric ulcers in rats. Journal of Ethnopharmacology 110 
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Abstract: Propolis is a resinous hive product collected by honeybees from plants. The 
propolis produced in Southeastern of Brazil is known as green propolis because of its 
color. Modern herbalists recommend its use because it displays antibacterial, antifungal, 
antiviral, hepatoprotective, anti-inflammatory, immunomodulatory and anti-ulcer 
properties. The anti-ulcer activity of green propolis hydroalcoholic crude extract was 
evaluated by using models of acute gastric lesions induced by ethanol, indomethacin and 
stress in rats. Moreover, the effects of extract on gastric content volume, pH and total 
acidity, using pylorus ligated model were evaluated. Animals pretreated with propolis 
hydroalcoholic crude extract (50, 250 and 500 mg/kg) showed a significant reduction in 
lesion index, total affected area and percentage of lesion in comparison with control group 
(p < 0.05) in the ethanol-induced ulcer model. Green propolis extract, at a higher dose 
(500 mg/kg), displayed a significant protection by reducing (p < 0.05) the evaluated 
parameters in the gastric ulceration induced by indomethacin. In the stress-induced ulcer 
model it was observed a significant-reduction (p < 0.05) in those parameters in animals 
treated with green propolis extract (250 and 500 mg/kg). Regarding the pylorus ligated 
model it was observed that green propolis extract (250 and 500 mg/kg) displayed an anti-
secretory activity, which lead to a reduction in the gastric juice volume, total acidity and 
PH. These findings indicate that Brazilian green propolis displays good anti-ulcer activity, 
corroborating the folk use of propolis preparations, and contributing for its 
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406. DOBROWOLSKI, J W; VOHORA, S B; SHARMA, K; SHAH, S A; NAQVI, S A H; DANDIYA, P C (1991) Antibacterial, antifungal, antiamoebic, antiinflammatory and antipyretic studies on propolis bee products. Journal of Ethnopharmacology 35 (1): 77-82. Abstract: J. M. Gedye. Using a filter-paper disc method, propolis preparations from Poland were found to have some antibacterial activity against Gram-positive organisms grown on nutrient agar. They were slightly less effective against Gram-negative bacteria and showed no anti-amoebic activity. All preparations showed anti-inflammatory activity against formaldehyde-induced arthritis and induced paw oedema in rats. None showed antipyretic activity at the concentrations used. Library code: Bc. Language: En. Author address: Institute of Management and Protection of Environment, Krakow, Poland. Apicultural Abstracts from IBRA: 4500667

407. DOLCI, P; OZINO, O I (2003) Study of the in vitro sensitivity to honey bee propolis of Staphylococcus aureus strains characterized by different sensitivity to antibiotics. Annals of Microbiology 53 (2): 233-243. Abstract: The sensitivity level to propolis in 44 Staphylococcus aureus strains, 42 isolated from patients of hospital environment and 2 ATCC reference strains, has been studied. The strains considered showed different behaviour towards antibiotics typically used in the hospitals in order to contain both Gram positive and Gram negative bacteria. On the contrary all the S. aureus isolates studied showed sensitivity towards 2 propolis samples collected from two different areas of Piedmont (Italy). In particular it is important to underline that 11 isolates resistant to methicillin showed sensitivity to propolis. The analysis of variance calculated on values of the minimum concentration of propolis inhibiting microorganism growth did not show any significant differences to the sensitivity level to the product among the 44 isolates studied. The results obtained from the research appear to confirm the antimicrobial property of propolis and contribute to increase interest in the power of this natural product in medical field


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420. DRAGO, L; DE VECCHI, E; NICOLA, L; GISMONDO, M R (2007) In vitro antimicrobial activity of a novel propolis formulation (Actichelated((R)) propolis). *JOURNAL OF APPLIED MICROBIOLOGY* 103 (5): 1914-1921. Abstract: Aims: This study compared in vitro activities of Actichelated((R)) propolis (a multicomposite material obtained with mechano-chemical activation) and of a hydroalcoholic extract of propolis. Methods and Results: Minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC), determined by means of microdilution broth method, against five strains of Staphylococcus aureus, Streptococcus pyogenes, Haemophilus influenzae, Enterococcus spp., Escherichia coli, Proteus mirabilis and Pseudomonas aeruginosa, showed a greater potency of Actichelated((R)) propolis (MIC range: 0.016-4 mg flavonoids ml(-1)) in respect to the hydroalcoholic extract (MIC range: 0.08-21.4 mg flavonoids ml(-1)). Concentrations of Actichelated((R)) propolis active against adenovirus, influenza virus, parainfluenza virus and herpes virus type 1 were at least 10 times lower than those of the hydroalcoholic extract. Preincubation of Strep. pyogenes and H. influenzae with subinhibitory concentrations of Actichelated((R)) propolis (1/4 and 1/8 x MIC) significantly reduced the number of bacteria that adhered to human buccal cells. Conclusions: Actichelated((R)) propolis has proven to possess antibacterial and antiviral activity higher than a hydroalcoholic extract, being also able to interfere on bacterial adhesion to human oral cells. Significance and Impact of the Study: This new formulation of propolis showing better antimicrobial and physical characteristics could improve the application of propolis in respiratory tract infections


other changes in their oral hygiene and dietary habits. Saliva was collected at three time points: before the first rinse, and one hour and 7 days after the first rinse. A reduction in the concentration of S. mutans was observed in 49% of all samples collected after use of the extract, 26% showed no alterations, and an increasing in S. mutans was observed in 25%. Was performed with the Statistica for Windows 5.9 program using the Kruskal-Wallis test for analysis of variance and the Mann-Whitney U test, with the level of significance set at 5%. The propolis extract possesses in vivo antimicrobial activity against S. mutans present in the oral cavity and might be used as an alternative measure to prevent dental caries.

425. DUDUKURI, G R; KUMAR, P S; KUMAR, V B; ATHOTA, R R (1997) Immunosuppressive effect of honey on the induction of allergen-specific humoral antibody response in mice. *International Archives of Allergy and Immunology* 114 (4): 385-388. Abstract: English Article. Our study with honey for its possible immunomodulatory activity reveals the immunosuppressive activity on induction of murine humoral antibody responses against different allergens as determined by passive cutaneous anaphylaxis and Ouchterlony double immunodiffusion techniques. Ovalbumin (OVA)-specific IgE antibody responses elicited with various doses were completely suppressed by different sources of commercial honeys. Honey is also found to have suppressed the induction of OVA-specific humoral antibody responses in different strains of mice. The results obtained in this work confirm the immunosuppressive activity of honey and suggest its possible applicability in conditions requiring immunosuppression.


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433. DUNFORD, C; COOPER, R; MOLAN, P (2000) Using honey as a dressing for infected skin lesions. *NT Plus* 96 (14): 7-9. Abstract: Conventional treatments of a patient’s chronic infected lesions caused by meningococcal septicaemia were unsuccessful. The lesions were therefore dressed with pads impregnated with manuka honey which were changed every 3 d. After 10 weeks all lesions, and a pressure ulcer, had healed completely.
Abstract: Propolis (bee glue) is a natural resinous hive product, collected from various plant sources. It has attracted much attention as a useful substance applied in medicine due to its pharmacological activities. It was aimed to investigate the in vitro effects of an ethanolic extract of Adana propolis samples on the growth of Leishmania tropica. Parasite cells were treated with five concentrations (25, 50, 100, 500, and 750 μg/ml) of the propolis. The number of promastigotes in each concentration was calculated using a hemocytometer slide at 24, 48, and 72 h after being harvested. In the experiments, it was determined that the concentrations up to 100 μg/ml of the propolis did not exhibit antileishmanial activity against the parasites cells. At these concentrations, there was no changes in terms of morphologically. In addition, there was no statistically significant difference in terms of cell count between control and these three groups (p > 0.05). However, in culture media containing the propolis samples at 250, 500, and 750-μg/ml concentrations, statistically significant differences in cell counts were observed, as compared to the control group (p < 0.05). Our results demonstrate that ethanolic extracts of Adana propolis samples reduce the proliferation of L. tropica parasites significantly.

Abstract: Spherical and homogenous microparticles of poly(ε-caprolactone) (PCL), containing propolis were prepared by the emulsification-solvent evaporation technique. Using this method of preparation, a solid formulation of propolis, free of ethanol and suitable for manipulation and storage, was obtained from an ethanolic extract of propolis. The incorporation efficiency of propolis in the microparticles was almost 30% and around 60% of the substance was released in 48 h. In vitro propolis microparticles exhibited similar halo zones in the Petri plate test against Streptococcus mutans (GS5) with a 10-fold lower concentration than the free propolis extract showing that the encapsulated propolis in microparticles is more efficient as antibiotic.


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Abstract: **Objectives.** To assess the efficacy and safety of the pollen extract preparation Prostat/Poltit in the treatment of patients with chronic nonbacterial prostatitis/chronic pelvic pain syndrome.

**Methods.** In a double-blind study, 60 patients between 20 and 55 years old with chronic nonbacterial prostatitis/chronic pelvic pain syndrome were randomized to receive Prostat/Poltit or placebo for 6 months. The patients had been symptomatic for more than 6 months without response to any given therapy. The patients were evaluated at the start of the treatment and after 6 months of treatment with the help of a symptom questionnaire covering the symptoms in seven pain locations, five voiding symptoms, three storage symptoms, and four sex-related symptoms.

**Results.** The overall clinical evaluation of the treatment result showed that after treatment for 6 months more patients taking Prostat/Poltit were cured or improved than patients taking placebo. No adverse reactions to the treatment were found.

**Conclusions.** Prostat/Poltit is superior to placebo in providing symptomatic relief in men with chronic nonbacterial prostatitis/chronic pelvic pain syndrome.


Abstract: Honey has been used for medicinal purposes since ancient times. Its antibacterial effects have been established during the past few decades. Still, modern medical practitioners hesitate to apply honey for local treatment of wounds. This may be because of the expected messiness of such local application. Hence, if honey is to be used for medicinal purposes, it has to meet certain criteria. The authors evaluated its use for the split thickness skin graft fixation because of its adhesive and other beneficial effects in 11 patients. No complications such as graft loss, infection, and graft rejection were seen. Based on these results, the authors advised honey as a new agent for split thickness skin graft fixation. In recent years there has been a renewed interest in honey
wound management. There are a range of regulated wound care products that contain honey available on the Drug Tariff. This article addresses key issues associated with the use of honey, outlining how it may be best used, in which methods of split thickness skin graft fixations it may be used, and what clinical outcomes may be anticipated. For this reason, 11 patients who underwent different diagnosis were included in this study. In all the patients same medical honey was used for the fixation of the skin graft. No graft loss was seen during both the first dressing and the last view of the grafted areas. As a result, it has been shown that honey is also a very effective agent for split thickness skin graft fixations. Because it is a natural agent, it can be easily used in all skin graft operation for the fixation of the split thickness skin grafts.


Abstract: Twenty eight female Wistar rats weighing 150-200 g were used in this study and these animals were divided into 4 groups, each comprising 7 rats. The first group served as the control group, and groups 2, 3, and 4 were administered a single dose of 250 mg/kg.bw propolis, a single dose of 125 mg/kg.bw (1/2LD(50)) cypermethrin, and a single dose of 125 mg/kg.bw cypermethrin followed by a single dose of 250 mg/kg.bw propolis 30 min later, per os using a catheter, respectively. Twenty-four hours after propolis administration, blood and tissue (liver, kidney, and brain) samples were collected. Serum glucose, triglyceride, uric acid, cholesterol, aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphatase (ALP) activities/levels, plasma and tissue malondialdehyde (MDA) levels, and erythrocyte and tissue superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GSH-Px) activities were determined. Compared to group 1, significant increases in plasma and tissue MDA levels and kidney GSH-Px activity, and significant decreases in erythrocyte SOD and CAT, liver SOD and GSH-Px, kidney SOD and brain SOD, CAT and GSH-Px activities were determined in group 3. Compared to group 1, a significant increase in glucose and a significant decrease in triglyceride levels were determined in group 3. Values pertaining to group 4 were demonstrated to be closer to those of group 1.


Abstract: In this study, 28 Wistar female rats (200–250 g) were used and divided into four equal groups. Group 1 was allocated as the control group. Groups 2–4 were administered 100 mg/kg/bw/day bee pollen, 20 mg/kg/bw/day propoxur, and 100 mg/kg/bw/day bee pollen plus 20 mg/kg/bw/day propoxur by gavage for 14 days, respectively. At the end of the 14th day, blood and tissues (the liver, kidney, brain, and heart) were collected from all animals. Oxidative stress markers (MDA, CAT, SOD, GSH-Px) and some other biochemical parameters (total protein, albumin, glucose, cholesterol, triglyceride, BUN, creatinine, uric acid, magnesium, sodium, potassium, chloride, total bilirubin, GGT, LDH, AST, ALT, and ALP) were analyzed. According to the data obtained, propoxur was determined to lead to negative changes in most of the biochemical parameters investigated and the administration of bee pollen was determined to alleviate these effects.

Abstract: Objective. Graves' disease is an organ-specific autoimmune disease with unknown etiology. TSHR Ab plays the most important role for the pathogenesis of Graves' disease. Recently, the role of cytokines for the pathogenesis of Graves' disease has been studied extensively. Royal jelly (1111) is a creamy product secreted by young nurse worker bees (Apis mellifera), and it is synthesized in the hypopharyngeal and mandibular glands. R) has been reported to have such pharmacological characteristics as antitumor, antibacterial, antihyper-cholesterolemic, antiallergic, antiinflammatory, and immunomodulatory properties. The major aim of the present study is to evaluate the effect of RJ on autoimmunity in peripheral lymphocyte culture and to establish the therapeutic doses. Research Design and Methods. in the first phase, lymphocyte cell isolation from four voluntary healthy subjects was performed to find the effective concentration of RJ on immunity. Serial dilutions of the R) were prepared (0-5 mg/mL). All isolated lymphocyte cells were treated with the above diluted samples. MTT test was carried out after incubation of 72 h. In the second phase, six patients with Graves' disease, newly diagnosed by clinical and laboratory methods and admitted to my hospital and untreated were identified. RJ samples of 0 and 4 mg/mL were incubated in a culture medium for 72 h with isolated lymphocytes obtained from the patients. After incubation, MTT test in lymphocyte cell culture, Th1 cytokines IFN-gamma, TNF-alpha, and IL-12, and Th2 cytokines IL-4 and IL-10 levels by the enzyme amplified sensitivity immunoassay (EASIA) method and TSHR Ab by the radioreceptor method were determined. Results. The concentration causing lymphocytes to proliferate was found to be 4 mg/mL by MTT test after incubation of 72 h in cell culture medium. Of the cytokines produced and secreted from lymphocytes, IFN-gamma increased, whereas, other cytokines decreased in RJ concentration of 4 mg/mL. Significant differences were found only for IFN-gamma and TNF-a. IL-4 concentrations were kept near the level of significance. Of Th1/Th2 ratios, IFN-gamma/IL-4 and IFN-gamma/IL-10 ratios also exhibited significant differences between 0 and 4 mg/mL. RI treatment in lymphocytes from patients with Graves' disease shifted the Th1/Th2 cytokine ratio to the side of Th1 cytokine. Therefore, RJ using the treatment and establishing a remission of Graves' disease may be effective as an antithyroid drug treatment. TSHR Ab levels of lymphocyte cell culture supernatants treated with RI showed significant decreases. Also, the result may suggest that RJ may exert an effect similar to an antithyroid drug for decreasing TSHR Ab levels. Conclusions. RJ may be effective as an immunomodulatory agent in Graves' disease


Abstract: The plant flora has an important role in the ecology of Cryptococcus neoformans. It is estimated that the environmental spreading and contamination of human beings with this yeast occurs via contaminated particles of plants. Cultivation of canopy parts of plants in selective media is the most widely used isolation method of this yeast. Cryptococcus neoformans var. grubii was isolated from honeybee colonies in Eucalyptus forests but was not isolated from the places where this flora did not exist. Our results indicate that the occurrence of C. neoformans in honeybee colonies during the flowering season of Eucalyptus spp. trees can be an important bioindicator for environmental yeast presence. The screening of honeybee colonies is a practical and a rapid method for the monitoring of the C. neoformans presence in flowering plants.


Abstract: While honey bees (*Apis mellifera*) support a diverse microbial community, the impacts of most of their associated microbes on honey bee health remain unresolved. Here, pairwise inhibition assays were used to identify honey bee bacterial symbionts that inhibit a primary pathogen, the Gram-positive bacterium *Paenibacillus larvae larvae*. Four bacterial taxa isolated from bee larvae appeared especially promising with respect to inhibition of P.I. larvae and, in fact, completely inhibited P L larvae growth in pairwise plate assays. These isolates were identified by 16S ribosomal RNA sequencing as *Stenotrophomonas maltophilia*, *Acinetobacter sp.*, *Brevibacillus formosus* and *Bacillus fusiformis*. A PCR-based survey confirmed that these bacterial isolates are present in bee larvae, at frequencies ranging from 2% (1/48) for *B. formosus* to 79% (39/48) for *Acinetobacter sp*. An understanding of the distributions of these co-occurring bacteria could elucidate variation across colonies in susceptibility to American foulbrood disease. In addition, supplementation of colonies with these naturally occurring bacteria or their antagonistic products can provide a novel way of controlling foulbrood disease.

Abstract: Bee honey is a functional food which has a unique composition, antimicrobial properties and bifidogenic effect. In order to assess whether honey can inhibit the toxic effect of mycotoxins, the present study was undertaken. METHODS: Production of biomass and toxins by *Aspergillus parasiticus* and *Aspergillus ochraceus* were followed in media without and with honey. Although aflatoxins and ochratoxin A were administrated to male Swiss albino mice up to 1 mug and 10 ng/kg body weight/day respectively. The experimental animals were fed diets without or with 10% honey for two months. The changes in colonic probiotic bacteria, determinental colon enzyme glucuronidases, and genotoxicity were followed. RESULTS: Addition of 32% in its media increased the biomass of *A parasiticus*, while the biomass of *A. ochraceus* decreased and Ochratoxin A was not produced. When the honey was added at the ratio of 32 and 48% in the medium. No relationship was found between mycelium weight and production of mycotoxins. Oral administration of aflatoxins (mixture of B1, B2, G1 and G2) and Ochratoxin A. induced structural and numerical chromosomal aberrations in bone marrow and germ cells of male mice, whereas, honey treatment reduced the genotoxicity of mycotoxins. Also both toxins induced histopathological changes in liver and kidney. Feeding on diet supplemented with honey improved the histopathological changes in case of aflatoxin group, but not in the case of ochratoxin A group (except of kidney in two cases). No significant differences were found in the activity of colon beta-glucuronidase between group fed diet with or without honey. On the other hand, the colon bifido bacteria and lactobacilli counts were increased markedly in group receiving diet supplemented with honey. CONCLUSION: Substituting sugars with honey in processed food can inhibit the harmful and genotoxic effects of mycotoxins, and improve the gut microflora.


Abstract: OBD. G. Lowe The device is a container the size of a honey super, the sides of which consist of copper wires strung vertically 3.63 mm apart, alternately live and grounded. The bottom (removable) is also wired, whereas the lid is made of plastic net (1.5 mm mesh). A central rod provides a resting place for bees. When in use glass plates
covered with plastic sheet (through which the bees sting) are attached to the sides and bottom of the device, and alternating electric current (22 V, 50 Hz) is passed through the wires. The total 5-min operating period consists of alternating 3-s and 7-s periods, when the current is on and off, respectively. Each collection uses 2-4 combs of honey bees/colony; advice is given on selecting and handling the bees. In tests of the device, 8 colonies yielded an average of 0.21 g venom (0.026 g/colony). Bees from several colonies can be mixed and exposed to electric current simultaneously if desired.


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487. FEIKS, F K (1979) Ueber eine Möglichkeit der konservativen Therapie der Ulkuskrankheit Apimondia; Bucarest; pp 319-322. (Apimondia. edition)


Abstract: Cryptococcosis is a worldwide disease caused by the etiological agent Cryptococcus neoformans. It affects mainly immunocompromised humans. It is relatively rare in animals only affecting those that have received prolonged antibiotic therapy. The propolis is a resin that can present several biological properties, including antibacterial, antifungal and antiviral activities. The standard strain C. neoformans ATTC 90112 was used to the antifungal evaluation. The tests were realized with propolis ethanol extract (PEE) G12 in concentrations from 0.1 to 1.6 mg mL-1. The evaluation of MIC and MFC were done according to DUARTE (2002). The inhibitory effect of PEE G12 on the fungal growing was seen at the concentration of 0.2 mg mL-1 and 1.6 mg mL-1 was considered a fungicidal one.


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501. FIOLEK, M J (2008) Immunosuppressive effect of cyclosporin A on insect humoral immune response 19. Journal of Invertebrate Pathology 98 (3): 287-292. Abstract: Cyclosporin A suppressed humoral immune response of Galleria mellonella larvae. Insects were immunized with LPS Pseudomonas aeruginosa and then injected with cyclosporin A. Immunosuppressive effects were expressed both, in larvae treated with cyclosporin A at the initial phase of immune response and at the effector phase of antibacterial immunity. Cyclosporin A moderately decreased lysozyme activity and significantly decreased antibacterial activity peptides against Escherichia coli. Immunosuppressive effects of cyclosporin A were observed after immunoblotting with antibodies anti-G. mellonella lysozyme Tricine. SDS/PAGE shown that synthesis of antibacterial peptides of larvae treated with cyclosporin A was considerably inhibited. Insects of impaired immune response by cyclosporin A action lost protective immunity to insect bacterial pathogen A aeruginosa. (C) 2008 Elsevier Inc. All rights reserved.
Abstract: In this study we investigated some biological properties of flavonoids recovered in the aqueous (AqE) and ether (EtE) extracts from four Italian multifloral honeys. In particular, a cell-free assay was employed to detect direct reduction of ferricyanide, whereas an assay using intact human erythrocytes was used to measure the ability to donate electrons to a trans-plasma membrane oxidoreductase. It was found that the AqE displays greater "in vitro" ferricyanide-reducing activity than the EtE but, unlike the latter, is virtually ineffective in the cell-based assay. Uptake studies employing high-performance liquid chromatography/mass spectrometry (HPLC/MS) showed that the different results were explained by the inability of AqE components to cross the erythrocyte plasma membrane and by the excellent uptake of EtE flavonoids, which, once within the cell, donate electrons to the membrane oxidoreductase to efficiently reduce extracellular oxidants. The latter property appears to depend on the content of ether-soluble flavonoids in the starting honeys.

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Abstract: Honey can be used for the treatment of wounds, sores and skin burns, but it might be contaminated with Clostridium botulinum spores. In order to evaluate Costa Rican raw honey samples, the detection of neurotoxin gene sequences (corresponding to the bacterium) C. botulinum A, B, E and F was done with the polymerase chain reaction. A total of 64 raw honey samples, coming from different Costa Rican sites were analyzed. Reference C. botulinum strains type A (ATCC 19397), type B (ATCC 7949), type E (ATCC 17786) and type F (ATCC 25764) were used as templates for testing the effectiveness of the method. The process consisted in culturing the honey samples in prereduced triptose-peptone-glucose-yeast extract media (TGPY) for 5 days. After this, the bacteria lysate obtained was used for PCR. The amplicons, product of the reaction, were visualized using agarose gel 2%. From the 64 honey samples analyzed, none produced positive results in the PCR, since no amplicons were obtained. Even though, all the reference C bolulinum strains used as controls were visualized and showed the effectiveness of the extraction method and of the PCR used. The results obtained show promising therapeutic uses for honey from Costa Rica, but further evaluations shall be done in order to be sure of the safety of the product. Rev. Biol. Trop. 54(l): 29-34. Epub 2006 Mar 31


Abstract: Background: Immunotherapy involves the modulation of allergen-specific T-cell responses, either T(H)2-to-T(H)1 immune deviation or, in bee venom-treated patients, induction of IL-10 production by CD4(+)CD25(+) T cells. IL-111-producing CD4(+)CD25(+) regulatory T cells have emerged as potential mediators of immune tolerance in numerous murine models of immunopathology. Objective: The aim of this study was to evaluate the role of IL10 production and CD4(+)CD25(+) T cells in the response to grass pollen immunotherapy. Methods: PBMCs were isolated from patients after 1 year of grass pollen immunotherapy and from matched untreated atopic and healthy control subjects. After 6 days of in vitro stimulation with Phleum pratense, production of IL-10, IL-5, IL-4, and IFN-gamma and proliferation and numbers of CD4(+)CD25(+) T cells were measured. T cells were then stimulated for a further 5 hours with phorbol 12-myristate 13-acetate and ionomycin and assessed for intracellular IL-10 by means of flow cytometry. Results: Patients undergoing immunotherapy produced significantly, more IL-10 than atopic control subjects (patients undergoing immunotherapy, 116 +/- 21 pg/mL [n = 11]; atopic patients. 30 +/- 5 pg/mL [n = 11]; P < .001), and the number of CD4(+)CD25(+) cells identified after allergen stimulation was also greater in the immunotherapy group. The numbers of CD4(+)CD25(+) T cells correlated positively with activation as measured by proliferation in both of the control groups but not in the immunotherapy group. Moreover, only T cells from patients undergoing immunotherapy were positive for intracellular IL-10, and these were almost exclusively CD4(+)CD25(+) cells. Conclusion: Grass pollen immunotherapy results in a population of circulating T cells that express the IL-10(+)CD4(+)CD25(+) phenotype in response to allergen restimulation


525. FRANKEL, S; ROBINSON, G E; BERENBAUM, M R (1998) Antioxidant capacity and correlated characteristics of 14 unifloral honeys. Journal of Apicultural Research 37 (1): 27-31. Abstract: English Article The water-soluble antioxidant capacity of 19 samples of honey from 14 different floral sources was determined by a spectrophotometric assay. The highest concentration of antioxidants measured was 20.3 times that of the lowest, showing that great variation exists in the chemical nature of honey from different floral sources. Antioxidant content was positively correlated with both water content and honey colour. Because of the health benefits of dietary antioxidants, floral source should be a factor in evaluating the potential of honey as an antioxidant-containing food supplement.


531. FRIESE, K H; KRUSE, S; MOELLER, H (1996) [Acute otitis media in children. Comparison between conventional and homeopathic therapy]. HNO 44 (8): 462-466. Abstract: Within a prospective group study of five practicing otorhinolaryngologists, conventional therapy of acute otitis media in children was compared with homeopathic treatments. Group A (103 children) was primarily treated with homeopathic single remedies (Aconitum napellus, Apis mellifica, Belladonna, Capsicum, Chamomilla, Kalium bichromicum, Lachesis, Lycopodium, Mercurius solubilis, Okoubaka, Pulsatilla, Silicea). Group B (28 children) was treated by decongestant nose-drops, antibiotics, secretolytics and/or antipyretics. Comparisons were done by symptoms, physical findings, duration of therapy and number of relapses. The children of the study were between 1 and 11 years of age. The difference in numbers was explained by the children with otitis media being primarily treated by pediatricians using conventional methods. The median duration of pain in group A was 2 days and in group B 3 days. Median therapy in group A lasted 4 days and in group B 10 days. Antibiotics were given over a period of 8-10 days, while homeopathic treatments were stopped after healing. In group A 70.7% of the patients were free of relapses within 1 years and 29.3% had a maximum of three relapses. Group B had 56.5% without relapses and 43.5% a maximum of six relapses. Five children in group A were given antibiotics and 98 responded solely to homeopathic treatments. No side effects of treatment were found in either group.


Abstract: A defined pollen extract of selected plants has been reported to possess some pharmacological activities on chronic prostatitis or benign prostatic hyperplasia. This paper describes the antitumour potential of the water soluble fraction (Cernitin T60) of pollen extract against Lewis lung carcinoma implanted intraperitoneally in syngeneic mice. Cernitin T60 was not cytotoxic in cell cultures at concentrations up to 2.5 mg/mL, while it is significantly prolonged the life-span of mice carrying the tumour without any apparent side effects at 0.5 g/kg. In addition, Cernitin T60 demonstrated beneficial therapeutic effects in an additive fashion on the life-span of mice when it was combined with standard cytotoxic antitumour drugs such as adriamycin, cisplatin, vincristine, methotrexate, fluorouracil, or thioguanine. The antitumour potential of Cernitin T60 was completely abolished by treatment with inhibitors of macrophage functions (2-chloroadenosine or carrageenan), but not with a T-cell inhibitor (cyclosporin A). Cernitin T60 appears to be a potent immunostimulator of macrophage.


Abstract: Cerotic acid (one of the 3 fractions of bleached beeswax), and its soldium salt, were found to have satisfactory emulsifying properties.


Abstract: Thirty one honey samples were evaluated for their ability to inhibit the growth of ten bacterial pathogens: Escherichia coli O157:H7; Salmonella enterica ser. Typhimurium; Shigella sonnei, Pseudomonas aeruginosa; Bacillus cereus; Listeria monocytogenes, Staphylococcus aureus 9 144 and MRSA; Streptococcus mutans; and Enterococcus faecalis, using a well diffusion assay. All Gram-negative bacteria except P. aeruginosa were sensitive to all of the honey samples and also to artificial honey used as control at 25% concentration. S. sonnei was the pathogen whose growth was most inhibited by honey. P. aeruginosa exhibited overgrowth of surrounding wells inoculated with five honey samples. Each Gram-positive pathogen and the different strains of S. aureus exhibited different sensitivities to honeys. The three honeys from Galicia (Spain) were the most active. E. coli O157:H7, S. sonnei, MRSA, S. mutans and E. faecalis were studied for specific inhibitory activity. E. coli O157:H7, S. sonnei and E. faecalis were inhibited by high sugar concentration. The inhibition of MRSA and S. mutans was caused by hydrogen peroxide generation. MRSA was also inhibited by two unprocessed honeys due to the presence of proteinaceous compounds. Such activity is potentially of importance in honey used as wound dressing and also as a preservative in minimally processed foods.


542. GAO, H L; MENG, P D; LIU, F H; XU, Z D (1997) Propolis in der Behandlung von Zuckerkrankheit - Beobachtungen über die klinische Wirkung *Der XXXV. Internationale*
Abstract: Propolis has various biological activities such as antibacterial, antiviral, antioxidative, immunostimulating and anti-inflammatory, which are generally ascribed to the polyphenolic fraction. The aim of this study was to evaluate the absorption of the main polyphenols [caffeic acid (CA), pinobanksin-5-methyl ether (P-5ME), pinobanksin (Pb), chrysin (C), pinocembrin (P), galangin (G), pinobanksin3-acetate, pinobanksin esters and caffeic acid phenylethyl ester (CAPE)] from a dewaxed and standardized extract of propolis (EPID (R)). Fifteen healthy volunteers consumed 5 mL EPID (R) in water, corresponding to about 125 mg of flavonoids. Blood samples were collected before, each hour for 8 h and 24 h after EPID (R) intake. After deconjugation by beta-glucuronidase/sulfatase the plasma samples were analyzed by a selective liquid chromatography/tandem mass spectrometry (LC/MS/MS) method using morin as internal standard (I.S.). A kinetic profile characterized by two t(max), respectively at 1 h and about 5 h post-ingestion, was observed in all the subjects. The two peaks may be due to enterohepatic cycling. Among the various polyphenols ingested, only P-5ME, Pb, C, P and G were detected in plasma and C(max) t(1h) were 65.7 +/- 13.3, 46.5 +/- 12.7, 79.5 +/- 18.6, 168.1 +/- 16.3 and 113.7 +/- 16.8 ng/mL, respectively. These levels decreased significantly after 8 h and were no longer detectable 24 h after EPID (R) intake. The recovery of the extraction for CA, Pb, C, P, G and I.S. from spiked plasma was 95.2 +/- 3.1, 93.1 +/- 3.6, 91 +/- 2.5, 96.4 +/- 4.2, 93.4 +/- 2.4 and 85.5 +/- 2.4%, respectively. The results of this study evidence that flavonoids from EPID (R) are absorbed, metabolized and Pb-5ME and G seem to have apparent absorption, measured as (AUC/dose), higher than C, P and Pb.


Abstract: The ever-increasing report of drug resistance by bacteria and side effects of certain pharmaceutical products are leading to aversion to some synthetic drugs and resurgence of the use of alternative therapies, such as apitherapy i.e. therapy with bee products. Honey of the stingless bee, Trigona spp., is used in Ethiopia as a panacea against dozens of ailments and considered to be superior to honeybee honey. The kinetics of antibacterial actions of two stingless bee honey samples obtained from Ethiopia were investigated using a flow calorimetric method. Four Gram-positive and two Gram-negative bacterial species were tested in vitro. The minimal inhibitory concentration (MIC) values from the calorimetric experiments were compared with those obtained from petridish and spectrophotometric methods. The calorimetric method displayed antimicrobial activities of weak honey concentrations that could not be detected with standard microbiological methods. Calorimetric results also indicated that lower concentrations of honey have bacteriostatic where as higher concentrations show bactericidal actions. The MIC values obtained from the calorimetric method were several folds lower than those from the petridish and spectrophotometric methods, showing the very high sensitivity of the former one. Both honey samples have broad-spectrum antimicrobial actions against both Gram-positive and Gram-negative bacteria. (C) 2003 Elsevier B.V. All rights reserved


Abstract: The physicochemical properties, composition and antimicrobial activity of cinnamon essential oil (Cinnamomum zeylanicum) were studied. The bioactivity of this essential oil against Paenibacillus larvae was analyzed by means of a combination of in vitro techniques, such as the tube dilution method and bioautography, a method employed to localize antibacterial activity on a chromatogram. Cinnamaldehyde and eugenol proved to have antibacterial effects against P. larvae. Minimal inhibitory concentration (MIC) and minimal bactericide concentration (MBC) for C. zeylanicum essential oil were between 25-100 μg/ml and 125-250 μg/ml, respectively, for all strains. Essential oil and, especially, two of its main components presented inhibitory capacity against strains of P. larvae


Abstract: The reactive oxygen species (ROS) may ultimately cause or participate in the induction of a wide range of diseases including cancer, atherosclerosis, rheumatoid arthritis and diabetes. Thus, many studies focus in the possible anticancerogenic activity of isoflavonoids present in soy and red clover. However, achieving therapeutic effect and a broader use depends on the extract standardization and quality. Therefore, in the present study two commercial extracts (Isoflavin Beta (R) - mixture of isoflavonoids and the dry red clover extract) were characterized on their constituents (total flavonoids, isoflavonoids, total polyphenols and total proteins), and in vitro antioxidant activities. Both extracts presented significant antioxidant activity in all tests. Moreover, the active doses depended on each test, probably because of extract composition. Concluding, chemical composition and in vitro antioxidant activity might help to standardize plant extracts


560. GEUTH, S Zur Desensibilisierung der Bienengiftüberempfindlichkeit. Die Biene 96 (12-13)

561. GEYMAN, J P (1994) Anaphylactic reaction after ingestion of bee pollen. The Journal of the American Board of Family Practice / American Board of Family Practice 7 (3): 250-252. Abstract: Bee pollen allergy, although relatively rare, can present a life-threatening medical emergency. Conventional treatment of anaphylaxis is indicated, and further allergic workup is not necessary. There is little awareness of this hazard among the general population. Warnings to include product labeling of potential adverse reactions in sensitive individuals are urgently needed to protect the public from this hazard.


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Abstract: The analytical performances of a manual and a partially automated chemiluminescent (CL) assay, of total antioxidant capacity (TAC) were assessed. In both cases the light emitting reaction involved luminol, horseradish peroxidase and hydrogen peroxide, but the emission kinetics and the parameters taken into account to calculate TAC values were completely different. The major characteristics expressing the quality of the two analytical methods, i.e. inaccuracy, repeatability and reproducibility, sensitivity, time required for the analysis and detection limit, were estimated by using standard solutions of Trolox. The reliability of the automated method, in comparison with the more validated manual one, was demonstrated testing food samples such as honey, wine and dietary supplements and performing a statistical analysis of the results. The comparison of the two series of data by t-test resulted in p values in the range 0.1-0.01. The time required for the analysis of each sample was reduced to one third using the automated method. (C) 2004 Elsevier B.V. All rights reserved


574. GIUDICI, C (1923) Il miele e il migliore degli alimenti nutritivi e medicinali. Societa Ticinese Apicoltura Bellinzona, TI; 15 pp


Abstract: In the present study, attempts have been made to determine the effects of honey on intestinal morphology, postoperative adhesions, and the healing of colonic anastomoses in the rats after colonic resection and anastomosis. Thirty-six rats were randomly divided into three groups each including 12 animals. Colonic resection and anastomosis were performed on all animals. Rats were fed with standard rat chow in group I, standard rat chow plus 10 g/kg/day honey in group II and artificial honey including the same caloric amount with honey in group III. Adhesion scores, bursting pressures and histopathological examinations were evaluated. Colonic bursting pressures of honey group were significantly better than control and artificial honey groups. Histological analysis of anastomotic site showed that submucosa and muscularis propria were nearly filled with granulation tissue and regular fibrin matrix in honey group. There was statistically significant difference between the adhesion scores of honey vs artificial honey and control groups. The scores of histological changes of ileum in honey group were
significantly different from other groups. These results indicate a protective role of honey against intraabdominal adhesions and anastomotic dehiscence. Copyright (c) 2008 John Wiley & Sons, Ltd

Abstract: Propolis is a resinous hive product rich in antioxidant compounds. Capillary electrophoresis coupled to mass spectrometric detection can provide selective information about the analytes present in complex extracts of propolis and has turned out to be an attractive alternative to HPLC methods. Therefore, a CE-ESI-MS method has been developed for the analysis of antioxidant compounds obtained from propolis. For this purpose, different electrophoretic parameters such as the nature, pH, and concentration of the separation buffer, as well as electrospray parameters (dry gas temperature and flow, nebulising gas pressure, and make-up flow) have been carefully optimised. Different phenolic compounds (e.g. pinobanksin 3-acetate, naringenin, pinocembrin, chrysine, daidzein, quercetin 3',7-dimethyl ether, apigenin, and kaempferid) could be detected. To confirm the identity of the phenolic compounds in propolis extracts, accurate mass data of the molecular ions were obtained by TOF MS. Limits of detection ranging from 6 mg/100 g of raw propolis for chrysine to 58 mg/100 g of raw propolis for luteolin, were obtained.

Abstract: Aqueous extracts of beeswax and of other bee products inhibited germination and/or growth.


Abstract: The aim of this study was to investigate the antibacterial activity of propolis samples from Goias, Parana and Sao Paulo States, Brazil, and their flavonoids content. Ethanolic extracts of propolis (EEP) were prepared (30g of propolis in 70% ethanol), and the microorganisms Staphylococcus aureus and Escherichia coli were tested. The methodology employed was agar diffusion using filter paper discs. Ampicillin and tetracycline were used as controls. Antibacterial activity was determined by the reading of inhibition zone diameters (mm) after 24 hours incubation at 37 degrees C. Results demonstrated that EEP inhibited the growth of Staphylococcus aureus but not that of Escherichia coli. Tetracycline and ampicillin showed an efficient action against both bacteria. Flavonoids content was variable, depending on the propolis sample. According to the results, it may be concluded that EEP showed effective action against Gram-positive bacteria, independently on their geographic origin, and a positive correlation between antibacterial activity and flavonoids content.


587. GOUVÊA, L A; ZAULI, R C; RIBEIRO, I S; ALENCAR, S M; IKEGAKI, M (2005) Determination of the antimicrobial and antioxidant activity of the propolis (Type 6) from Bahia, Brazil *Apimondia abstracts Ireland 2005*, Apimondia International Apicultural Congress Dublin; Dublin; pp 121.

Abstract: In our laboratory KES group bacteria account for about 11% of all strains isolated from in-patients and are responsible for serious infections. Their well known increasing tendency to become resistant to beta-lactams prompted us to the KES strains isolated in medical or surgical patients in 1986. 87. 30 Klebsiella retrospectively review the susceptibility to antibiotics of strains out of 59 had been isolated in that period from patients previously treated with beta-lactams: no significant variation in resistance to cephalosporins, compared to the 29 strains from non treated patients, was noted. However in the treated group one strain of Klebsiella pneumoniae out of 24 showed resistance to ceftazidime and one of Klebsiella oxytoca was resistant both to cefotaxime (1 out of 16) and ceftriaxone (1 out of 12). 19 strains of Enterobacter spp. out of 32 had bees isolated from treated patients; a significant increase in resistance to 3rd generation cephalosporins (p less than 0.01), compared to the 13 strains isolated from non treated patients, was noted. Our findings suggest that it is advisable to review the in-use antibiotic policy keeping in mind the severity of the infections caused by KES group bacteria.


Abstract: P. Walker. An ethanolic extract of propolis was tested on 21 bacterial strains. It showed antibacterial activity against a range of commonly encountered cocci and Gram-positive rods, including *Mycobacterium tuberculosis*, but only limited activity against Gram-negative bacilli. Propolis (bee glue) was found to have antibacterial activity against a range of commonly encountered cocci and Gram-positive rods, including the human tubercle bacillus, but only limited activity against Gram-negative bacilli. These findings confirm previous reports of antimicrobial properties of this material, possibly attributable to its high flavonoid content Library code: Bc. Language: En. Author address: Department of Microbiology, National Heart and Lung Institute, Dovehouse Street, London SW3 6LY, UK. Apicultural Abstracts from IBRA: 4400298


594. GRECEANU, A; ENCIU, V (1976) Betrachtungen zur antibiotischen Wirkung von Propolis, Pollen und Honig *Neues in der Apitherapie*, Apimondia; Bukarest; pp 172-175.


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602. GREGORY, A G; TOSHITAKA, U; FUMIHIKO, T; DAISUKE, H (2008) Effect of vapors from fractionated samples of propolis on microbial and oxidation damage of rice during storage 136. Journal of Food Engineering 88 (3): 341-352. Abstract: The efficacy of vapors from polar and non-polar sub-fractions of propolis on microbial and oxidation control during rice (Oryza sativa, hinohikari var.) storage was evaluated. The sub-fractions (absolute ethanol, methylene chloride, hexane extracts: AEPEV, MCPEV and HEPEV, respectively) were infused in synthetic adsorbents and their volatiles released during storage (6 months). HEPEV, MCPEV and AEPEV treatments inhibited molding and post-inoculation bacterial colonization (1.1, 1.1, 0.9 and 1.3, 1.2, 1.1log(10)cfu/g reductions, respectively) on brown rice. AEPEV treatment suppressed fat acidity damage of milled rice at 30 degrees C to conventional cold storage level (5 degrees C) and differential Gram staining of bacteria isolated after the treatment indicated a dominant Gram-positive bacterial distribution. The concentrations providing 50% inhibition of 2',2'-diphenylpicrylhydrazyl free radical scavenging were 9.8, 3.2 and 2.8 mu g/mu l for hexane (HEPE), absolute ethanol (AEPE) and methylene chloride (MCPE) extracts, respectively. The oxidative degradation rate was lowest for AEPE (4.3 x 10(-4) min(-1)) and highest for HEPE (1.9 x 10(-3) min(-1)) in the beta-carotene bleaching assay. Gas chromatograph mass spectrometry revealed that AEPE had the highest amount of caffeic acid and caffeic acid phenethyl ester. Ultimately, the volatiles from the propolis sub-fractions had varied potential in rice quality preservation. (C) 2008 Elsevier Ltd. All rights reserved


617. GUISBERG; DAUER; STOTTER (1969) Melittin schützt vor Röntgenstrahlen. Nature


Abstract: OBJECTIVE: To compare the effect of a honey dressing vs an ethoxydiamaocacrine plus nitrofurazono dressing in patients with pressure ulcers. DESIGN: This 5-week randomized clinical trial evaluated the effect of a honey dressing on pressure ulcer healing. SETTING AND SUBJECTS: Thirty-six patients with a total of 68 stage 11 or III pressure ulcers referred from a university hospital in izmir were enrolled in the study. Twenty-six subjects completed the trial. INSTRUMENTS: Ulcers were measured with acetate tracings and Pressure Ulcer Scale for Healing (PUSH) evaluations. METHODS: Fifteen patients with 25 pressure ulcers were treated with honey dressings, and 11
patients with 25 pressure ulcers were treated with ethoxy-diaminoacridine plus nitrofurazone dressings. Wound healing was assessed weekly using the PUSH tool version 3.0. The primary outcome measure was the change in PUSH tool scores in each group at 5 weeks. RESULTS: The two groups were statistically similar with regard to baseline and wound characteristics. After 5 weeks of treatment, patients who were treated by honey dressing had significantly better PUSH tool scores than subjects treated with the ethoxy-diaminoacridine plus nitrofurazone dressing (6.55 +/- 2.14 vs 12.62 +/- 2.15, P <.001), CONCLUSION: By week 5, PUSH tool scores showed that healing among subjects using a honey dressing was approximately 4 times the rate of healing in the comparison group. The use of a honey dressing is effective and practical.

Abstract: High fluoride intake may affect biological systems by increasing free radicals, which may enhance lipid peroxidation levels of the tissues, thus leading to oxidative damage. Caffeic acid phenethyl ester (CAPE), a component of honeybee propolis, protects tissues from reactive oxygen species mediated oxidative stress in ischemia-reperfusion and toxic injuries. Several studies suggest that supplementation with antioxidant can influence fluoride induced tissue damage. The aims of this study was to investigate the possible role of malondialdehyde (NIDA) levels and activity of superoxide dismutase (SOD) and catalase (CAT), in the pathogenesis of fluoride-induced endometrial damage and to demonstrate the effect of CAPE, the potent antioxidant, in decreasing the toxicity. Twenty-four adult female rats were randomly divided into three experimental groups, as follows: control group, fluoride-treated group (F), and fluoride plus CAPE-treated group (F + CAPE). Fluoride was given orally as 30 mg/L NaF solution in spring water daily for 45 days. CAPE was co-administered intraperitoneally (i.p.) with a dose of 10 mu M/(kg day) for 46 days. Extensive formation of DNA strand breaks, the typical biochemical feature of apoptosis, was detected with the use of the terminal deoxynucleotidyl transferase (TdT)-mediated d UTP-biotin nick and labeling (TUNEL) method. The activities of antioxidant enzymes such as SOD and CAT as well as the concentration of MDA, as an indicator of lipid peroxidation, were measured to evaluate oxidative stress in homogenates of the endometrium. Fluoride administration increased MDA levels (p < 0.05), decreased SOD (p < 0.05) and CAT (p < 0.05) activities. CAPE co-administration with fluoride treatments caused significantly decreased NIDA levels (p < 0.05), increased SOD (p < 0.05) and CAT (p < 0.05) activities in endometrial tissue when compared with F alone. Diffuse apoptosis in glandular epithelium and stromal cells was found by TUNEL method in endometrial tissues of rats treated with fluoride. The severity of these lesions was reduced by administration of CAPE. In conclusion, our study demonstrated that NIDA may play an important role in the pathogenesis of fluoride-induced oxidative endometrial damage. CAPE may have protective aspects in this process by its antioxidant and anti-inflammatory effect. (c) 2007 Elsevier B.V. All rights reserved.

Abstract: We previously reported that royal jelly proteins (RJPs) hydrolyzed with protease N show the strong antioxidative activity against the peroxidation of linoleic acid. In this study, 29 antioxidative peptides were isolated from hydrolysate by membrane ultrafiltration, anion-exchange chromatography, gel filtration chromatography, and reverse-phase high performance liquid chromatography. We particularly focused on 12 small peptides with 2-4 amino acid residues: these structures were identified as Ala-Leu, Phe-Lys, Phe-Arg, Ile-Arg, Lys-Phe, Lys-Leu, Lys-Tyr, Arg-Tyr, Tyr-Asp, Tyr-Tyr, Leu-Asp-Arg, Lys-Asn-Tyr-Pro. Analysis of the antioxidative properties of these peptides revealed strong hydroxyl radical scavenging activity, but neither metal-chelating activity nor superoxide-anion radical scavenging activity differed significantly among these peptides. Moreover, three dipeptides (Lys-Tyr, Arg-Tyr, and Tyr-Tyr) containing Tyr...
residues at the C-terminal had strong hydroxyl-radical and hydrogen-peroxide scavenging activity. This suggests that the antioxidant properties of these peptides are due to a combination of these abilities to act as free-radical scavengers. Three tyrosyl dipeptides containing Tyr residues at their C-termini (Lys-Tyr, Arg-Tyr, and Tyr-Tyr) have phenolic hydroxyl groups, which scavenge the free radicals via the mechanism of donating a hydrogen atom from their hydroxyl group. (C) 2008 Elsevier Ltd. All rights reserved


Abstract: We previously reported that royal jelly proteins (RJPs) hydrolyzed with protease N show the strong antioxidative activity against the peroxidation of linoleic acid. In this study, 29 antioxidative peptides were isolated from hydrolysate by membrane ultrafiltration, anion-exchange chromatography, gel filtration chromatography, and reverse-phase high performance liquid chromatography. We particularly focused on 12 small peptides with 2-4 amino acid residues: these structures were identified as Ala-Leu, Phe-Lys, Phe-Arg, Ile-Arg, Lys-Phe, Lys-Leu, Lys-Tyr, Arg-Tyr, Tyr-Asp, Tyr-Tyr, Leu-Asp-Arg, Lys-Asn-Tyr-Pro. Analysis of the antioxidative properties of these peptides revealed strong hydroxyl radical scavenging activity, but neither metal-chelating activity nor superoxide-anion radical scavenging activity differed significantly among these peptides. Moreover, three dipeptides (Lys-Tyr, Arg-Tyr, and Tyr-Tyr) containing Tyr residues at the C-terminal had strong hydroxyl-radical and hydrogen-peroxide scavenging activity. This suggests that the antioxidant properties of these peptides are due to a combination of these abilities to act as free-radical scavengers. Three tyrosyl dipeptides containing Tyr residues at their C-termini (Lys-Tyr, Arg-Tyr, and Tyr-Tyr) have phenolic hydroxyl groups, which scavenge the free radicals via the mechanism of donating a hydrogen atom from their hydroxyl group. (C) 2008 Elsevier Ltd. All rights reserved


626. GUPTA, S K; SINGH, H; VARSHNEY, A C; PRAKASH, P; SINGH, S P (1993) Biochemical alterations during wound healing under the influence of natural honey and ampicillin in buffaloes. *Indian Veterinary Journal* 70: 45-47.


636. HAKIM, H (1994) *Le miel, Aliment - Médicament.* Faculté de Médecine de Bordeaux Bordeaux, France; 36 pp


Abstract: Propolis is a resinous substance collected by honeybees from various plant sources. We examined the antioxidant activity of Japanese propolis from various areas of Japan: Hokkaido, Akita (Minamiakita and Kazuno), Fukushima (Aizuwakamatsu and Futaba), Gifu, Nagano, Tokyo, Kanagawa, Shizuoka, Okayama, Tottori, Fukuoka and Okinawa. We prepared ethanol extracts of propolis (EEP), and evaluated the antioxidant activity of EEP samples by the beta-carotene bleaching and 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assay systems. Further, we identified the major constituents in EEP by HPLC analysis by a photodiode array (PDA) and mass spectrometric (MS) detection, and quantitatively analyzed each component. EEP from Akita (Minamiakita) and Okinawa had relatively strong antioxidant activity, and was correlated with total polyphenol contents. Propolis from Akita (Minamiakita) contained large amounts of the antioxidative compounds, caffeic acid and phenethyl caffeate. Propolis from Okinawa appeared to have antioxidants not seen in propolis from other areas


642. HAN, Q J; ZHENG, K L (1997) Klinische Behandlung von systemischer Sklerose mit Bienenstichen *XXXV. Internationaler Bienenzüchterkongress der Apimondia, Antwerpen,* Apimondia-Verlag; Bukarest, Rumänien; pp 420-422.
Dietary polyphenols represent a wide variety of compounds that occur in fruits, vegetables, wine, tea, extra virgin olive oil, chocolate and other cocoa products. They are mostly derivatives and/or isomers of flavones, isoflavones, flavonols, catechins and phenolic acids, and possess diverse biological properties such as antioxidant, antiapoptosis, anti-aging, anticarcinogen, anti-inflammation, anti-atherosclerosis, cardiovascular protection, improvement of the endothelial function, as well as inhibition of angiogenesis and cell proliferation activity. Most of these biological actions have been attributed to their intrinsic reducing capabilities. They may also offer indirect protection by activating endogenous defense systems and by modulating cellular signaling processes such as nuclear factor-kappa B (NF-κB) activation, activator protein-1 (AP-1) DNA binding, glutathione biosynthesis, phosphoinositide 3 (PI3)-kinase/protein kinase B (Akt) pathway, mitogen-activated protein kinase (MAPK) proteins [extracellular signal-regulated protein kinase (ERK), c-jun N-terminal kinase (JNK) and P38 ] activation, and the translocation into the nucleus of nuclear factor erythroid 2 related factor 2 (Nrf2). This paper covers the most recent literature on the subject, and describes the biological mechanisms of action and protective effects of dietary polyphenols.


657. HAUSEN, B M; EVERS, P; STÜWE, H T; KÖNIG, W A; WOLLENWEBER, E (1992) Propolis allergy (IV). Studies with further sensitizers from propolis and constituents common to propolis, poplar buds and balsam of Peru. Contact Dermatitis 26 (1): 34-44.


Abstract: In a year-long study, 51 MS patients were given therapeutic bee-venom injections; 68.6% showed improvement, which was described as 'dramatic' in 29.4% of the patients. Improvements in the various symptoms were assessed, and results are tabulated.


Abstract: One new and 11 previously known antioxidative compounds were isolated from Brazilian propolis. The new compound was determined as 3,4-dihydroxy-5-prenylcinnamic acid (3-[3,4-dihydroxy-5-(3-methyl-2-butenyl) phenyl]-2-(E)-propenoic acid) by various physical analyses (MS, IR, H-1-NMR, C-13-NMR, and 2D-NMR). The inhibitory activity of each compound against peroxidation of linoleic acid in a micelle solution was measured. We found that the novel compound possessed the highest potency (IC50, 0.17 μM) among them and was more effective than butylated hydroxytoluene (BHT; IC50, 0.36 μM) under the experimental conditions employed. Among the isolated antioxidative compounds, 3,5-diprenyl-4-hydroxycinnamic acid (artepillin C; IC50, 0.44 μM) was found to be most abundant in Brazilian propolis.


Abstract: Breakfast cereals were originally created as a health food. The whole grain is known to possess nutrients essential to health, with complex carbohydrates providing energy, while the fibre content that helps digestion has been linked to protection against colon cancer, lowering of blood cholesterol and protection against heart disease. Nutrient-rich cereals need to appeal to consumers accustomed to refined and sweetened
products. In formulating a cereal for optimum nutrition, the desired manufacturing practice, type of grain and parts of each grain to be used need to be selected. Grains can be fortified with specific vitamins and minerals. Wheat, rice, corn and oats are most utilized, with soya increasing in popularity. Antioxidants found in grains and in honey added to cereal are outlined. Complete nutrient systems offer precision and ease of use. Although soya is a legume, it is compatible with other grains, making cereals an ideal base for its incorporation. The choice of using a powdered or textured soya concentrate is process-dependent. Adding soya germ provides the most concentrated source of nutrients, and is used to increase the amount of isoflavones per serving. Using an oil high in trans fats may cause consumers to perceive the cereal as being unhealthy. DSJ.


669. HEGAZI, A G; EL HADY, F K A (2002) Egyptian propolis: 3. Antioxidant, antimicrobial activities and chemical composition of propolis from reclaimed lands. *Zeitschrift Fur Naturforschung C A Journal of Biosciences* 57 (3-4): 395-402. Abstract: The free radical scavenging effect of two propolis samples collected from reclaimed land, Egypt as well as of vitamin C and caffeic acid in 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical system was determined. The antimicrobial (Staphylococcus aureus; Escherichia coli and Candida albicans) activity was also investigated. The results of the free radical scavenging effect of El-Saff and Ismailia propolis showed a concentration-dependent activity. The antioxidant activity varied according to the examined material. It was obvious that caffeic acid and vitamin C showed the highest activity if compared with the propolis samples. El- Saff propolis had a higher antioxidant activity than Ismailia propolis, it showed a higher antibacterial activity against Staphylococcus aureus and a higher anti-fungal activity against Candida albicans. While the Ismailia propolis had a higher antibacterial activity against Escherichia coli, than El- Saff propolis. The chemical composition of propolis samples was investigated by GC/MS, where 75 compounds were identified, 22 being new for propolis. The Ismailia propolis was characterized by the presence of a highly significant amount of aromatic acid esters (47.3%) and triterpenoids (17.3%), while El-Saff propolis contained 3% and 1.9% respectively. The new esters belonged to 4-methoxyhydrocinnamic acid, hydroferulic acid and ferulic acid. El-Saff propolis had a very high significant amount (27%) of 2,6-bis-(pentanyloxy)-4-pentanylphenethanol, which is also a new compound for propolis.

670. HEGAZI, A G; AWADALLA, K Y; MANSOUR, S M (1997) Influence of honey and propolis on Rift Valley Fever Virus. *International Symposium on Apitherapy, Cairo, 8-9th March, 1997*


Abstract: This study aimed to investigate the practice of apitherapy - using bee products such as honey, pollen, propolis, royal jelly and bee venom to prevent or treat illness and promote healing - among German beekeepers and to evaluate their experiences with these therapies. A questionnaire incorporating two instruments on beekeepers physical and mental health and working practice was included in three German beekeeping journals and readers were asked to complete it. The instrument included questions on the use of apitherapy. Simple descriptive methods, bivariate correlation, cross-tabulation and one-way ANOVA were used to analyze the data. Altogether 1059 completed questionnaires were received. The beekeepers reported the most effective and favorable therapeutic effects with honey, followed by propolis, pollen and royal jelly. The factors associated with successful experiences were: age, number of hives tended, health consciousness, positive experiences with one product and self-administration of treatment. Beekeepers were asked for which condition they would employ propolis and pollen. They reported that they used propolis most frequently to treat colds, wounds and burns, sore throats, gum disorders and also as a general prophylactic, while pollen was most commonly used as a general prophylactic and, less frequently, in treating prostate diseases. No adverse experiences were reported. The potential benefit of bee products is supported by the positive experiences of a large group of beekeepers who use some of these products to treat a wide range of conditions. The indications and treatments given here may be important in selecting bee products and designing future trials.


Abstract: Objectives: Honey-impregnated wound dressings are now available on drug tariff in the UK, though the modes of action of honeys with antibacterial and wound healing properties are not entirely clear. The action of some but not all of these honeys is linked to the production of hydrogen peroxide on dilution of the honey with wound exudate. The present study investigates both free radical production and the antioxidant potential of some honeys, properties which may have a role to play in wound healing.

Methods: Free radical production and quenching of three honey types (manuka, antibacterial but non-peroxide-producing; pasture, antibacterial peroxide-producing; commercial heat processed, non-antibacterial) was investigated by electron paramagnetic resonance (EPR) spectroscopy; quenching was also examined using a superoxide quenching assay. Results: All honeys tested had antioxidant potential, with manuka able to completely quench added radicals within 5 min of spiking. Only the peroxide-producing honey (pasture PS9) was found to form radicals on dilution. Conclusions: The ability to modulate production and quenching of free radicals may contribute to the demonstrated ability of some honeys to help in resolving the state of inflammation typifying chronic wounds.


Abstract: In this study, we have analyzed the chemical composition and antiproliferative activity of propolis from three different and and semiarid regions of Sonora, Mexico. We identified and quantitated the main chemical constituents of propolis by HPLC-MS. The
most abundant constituents of propolis were pinocembrin, pinobanksin 3-acetate, and chrysin. Sonoran propolis had a strong antiproliferative activity on both murine and human cancer cell lines in a concentration-dependent manner. The propolis constituents CAPE, galangin, xanthomicrol and chrysin showed significant antiproliferative activity on most of the cancer cells tested. DNA harvested from cancer cell cultures treated with Sonoran propolis exhibited a ladder of internucleosomal DNA cleavage characteristic of apoptosis. In summary, we have identified and quantitated the main constituents of Sonoran propolis. These propolis samples possess a strong antiproliferative activity on cancer cell lines.


688. HODGSON, M J (1989) Investigation of the antibacterial action spectrum of some honeys. These at the University of Waikato, New Zealand


693. HORN, H; LÜLLMANN, C (1992) *Das grosse Honigbuch. Entstehung, Gewinnung, Zusammensetzung, Qualität, Gesundheit und Vermarktung.* Ehrenwirth Verlag München


Abstract: The HPLC method consisting of two columns and an on-line SPE system was developed for analysis of propolis extracts from Slovakia. The IEC column with spectrophotometric detection was tested for the separation of acids of the shikimate pathway and the C18 column with on-line spectrophotometric (chlorogenic, rosmarinic, p-hydroxybenzoic acids) and fluorimetric (p-hydroxybenzoic acid) detection was tested for separation and determination acids in the water extract of propolis. For the preconcentration of compounds the on-line SPE on the C18 preseparation guard column was used. The limits of determination were 0.2 gmL-1 for shikimic acid, 20 gmL-1 for quinic acid, 0.3 gmL-1 for chlorogenic acid, 0.5 gmL-1 for rosmarinic acid, 0.3 gmL-1 for p-hydroxybenzoic acid (UV), and 2 gmL-1 for p-hydroxybenzoic acid (FL). On the basis of chromatographic characteristics and optical properties (UV spectra) chlorogenic acid, quinic acid, and shikimic acid were characterized in tested samples of propolis. The p-hydroxybenzoic acid could not be determined in the propolis extract because the interferences of unknown compounds with the same retention factor occur.

Abstract: An HPLC method was developed for determination of some organic acids in propolis, honey, and pastilles. The on-line coupled Separon SGX C18 and Polymer IEX H-form column with mobile phase composed of sulphuric acid 9 mmol/L and methanol (95: 5) at a flow rate 0.8 mL/min and spectrophotometric detection at 215 nm were used for the determination of quinic acid and shikimic acid. Limit of detection of quinic acid was 10 mu g/mL and shikimic acid 0.43 mu g/mL. Limits of quantitation were 30 mg/mL for quinic acid and 1.26 mg/mL for shikimic acid. Shikimic acid concentrations from 4.2 to 309.0 mu g/g and quinic acid concentrations from 0.2 to 6.2 mg/g were determined in all tested bees products. The differences in the acid concentrations were observed for propolis samples from East and West Slovakia.

Abstract: The quantitative analysis of the three antibiotics-tetracycline (TC), oxytetracycline (OTC) and chlortetracyclinum (CTC) was carried out with a self-packed Hypersil C18 150 mm x 0.5 mm i.d. column. As little as 0.5 nanogram of antibiotics can be well detected, the capillary high performance liquid chromatographic method is 100 times more sensitive than that with ordinary HPLC method. The coefficients of linear correlation of mass concentration from 0.5 nanogram to 20 nanogram were rOTC = 0.99695, rTC =
0.99778 and rOTC = 0.98836. It showed that capillary HPLC is a good method used for sensitive analysis of antibiotics in honey


Abstract: We have previously shown that six propolins, A-F, could be isolated from Taiwanese propolis (TIP) and that they exerted a broad spectrum of biological activities. Recently, we isolated a seventh compound, propolin G. Its chemical structure has been identified by NMR and fast atom bombardment-mass spectrometry spectra and was found to be identical to a known compound, nymphaeol C. We used high-performance liquid chromatography to determine the relative contents of propolins C, D, F, and G in TP collected in various seasons and regions and found them to be relatively higher in TPs collected from May to July than from September to October. In our present study, we were interested in the various biological activities of TP extract as well as in propolin G as a pure compound. We found that propolin G could efficiently induce apoptosis in brain cancer cell lines (glioma and glioblastoma). The apoptosis might have been through a mitochondrial- and caspase-dependent pathway. This result demonstrated that the TP collection season was more an important factor than the geographical region. Propolis has been suggested to possess a potent antioxidant activity. We further evaluated the antioxidant property of propolin G using DPPH (1,2-diphenyl-2-picrylhydrazyl). Our results indicate that propolin G does possess free radical scavenging activity. We also evaluated the neuroprotective action of propolin G, TP, and BP (Brazilian propolis) extracts against oxidative stress in rat primary cortical neurons. Our data demonstrate that propolin G and TP extracts have a marked neuroprotective effect that is greater than BP extract. In conclusion, the isolation and characterization of propolin G from TP have demonstrated for the first time that this compound is a potent inducer of apoptosis in brain cancer cells and that this compound and TP extract exhibit a protective effect against oxidative stress in rat cortical neurons


Abstract: Larvae of the wax moth, Galleria mellonella (L.), were reared from first instar on a diet supplemented with 156, 620, 1,250, or 2,500 ppm boric acid (BA). The content of malondialdehyde (MDA, an oxidative stress indicator), and activities of the antioxidant enzymes [superoxide dismutase (SOD), (atalase (CAT), glutathione S-transferase (GST), and glutathione peroxidase (GPx)] were determined in the fat body and hemolymph in the 7th instar larvae and newly emerged pupae. Relative to control larvae, MDA was significantly increased in larval hemolymph, larval and pupal fat body, but decreased in the pupal hemolymph. Insects reared on diets with 156- and 620-ppm BA doses yielded
increased SOD activity but 1,250- and 2,500ppm doses resulted in decreased SOD activity in larval hemolymph. SOD activity was significantly increased but CAT was decreased in the larval fat body. High dietary BA treatments led to significantly decreased GST activity. However, they increased GPx activity in larval hemolymph. Dietary BA also affected larval survival. The 1,250- and 2,500-ppm concentrations led to significantly increased larval and pupal mortality and prolonged development. In contrast, the lowest BA concentration increased longevity and shortened development. We infer that BA toxicity is related, at least in part, to oxidative stress management.


Abstract: Apitherapy has become the focus of attention as a form of folk and preventive medicine for treating certain conditions and diseases as well as promoting overall health and well-being. In apitherapy, honey is the therapeutic agent used for dressing surgical wounds, burns or skin ulcers, as well as for dyspepsia, peptic ulcer, etc., because of its antioxidant activity. Therefore, it is important to determine the antioxidants in honey by analytical techniques. In the present study, the antioxidant activities of honeys from different floral sources were investigated by electron spin resonance (1,1-diphenyl-2-picylhydrazyl (DPPH) and H2O2/NaOH/DMSO scavenging systems), liquid chromatography with coulometric array detection (LC-ED), and liquid chromatography with electrospray mass spectrometry (LC-MS). The antioxidant activities of some unifloral honeys (acacia, Chinese milk vetch, buckwheat and manuka) were evaluated using the radical scavenging systems. It was shown that DPPH radical scavenging activity was significantly different among the honeys, with buckwheat and manuka honeys having significantly higher scavenging activity than acacia honey. In addition, only manuka honey had specific scavenging activity for superoxide anion radicals. The compound responsible...
for this activity in manuka honey was identified by LC-ED and LC-MS. Careful examination of the LC-ED chromatographic patterns of manuka and other honey samples revealed a distinct peak in the chromatogram of manuka honey to be methyl syringate (MSYR). The radical scavenging activity of MSYR was specific for superoxide anion radicals, similar to the case of manuka honey. (c) 2005 Society of Chemical Industry


Abstract: In this study, we investigate the effect of dietary Royal Jelly (RJ) on tissue DNA oxidative damage and on the life span of C3H/HeJ mice. In C3H/HeJ mice that were fed a dietary supplement of RJ for 16 weeks, the levels of 8-hydroxy-2-deoxyguanosine (8-OHdG), a marker of oxidative stress, were significantly reduced in kidney DNA and serum. Secondly, we determined the effect of dietary RJ on the life span in C3H/HeJ mice. The 50% mice survivals of intermediate- (about 6 mg/kg weight) and high-dose groups (about 60 mg/kg weight) were reached at significantly longer times than that of the control group according to the generalized Wilcoxon test (p < 0.05). The average survival times were 88 weeks for the control group vs. 79 weeks for the low-dose group (about 0.6 mg/kg weight), 112 weeks for the intermediate-dose group and 110 weeks for the high-dose group, respectively, showing that RJ extended the average survival time by about 25% compared to the control group. However, RJ did not extend the total life span. These results indicated that dietary RJ increased the average life span of C3H/HeJ mice, possibly through the mechanism of reduced oxidative damage. (C) 2003 Elsevier Inc. All rights reserved


Abstract: Twenty-five samples of propolis were collected from seven different regions in northern Argentina; ethanolic extracts of propolis were prepared from all samples, and the respective samples were examined for UV absorption spectra, RPHPTLC, RPHPLC, antimicrobial activity, antiradical activity, and total phenolic content. It was found that 16 of the 25 samples showed a phenolic profile similar to that found in samples from southern Brazil and corresponding to poplar-based propolis and that the rest of the samples showed a different profile and higher antimicrobial and antiradical activities.

723. ITO, J; CHANG, F R; WANG, H K; PARK, Y K; IKEGAKI, M; KILGORE, N; LEE, K H (2001) Anti-AIDS agents. 48. Anti-HIV activity of moronic acid derivatives and the new melliferone-
related triterpenoid isolated from Brazilian propolis. *Journal of Natural Products* 64 (10): 1278-1281.

Abstract: A new triterpenoid named melliferone (1), three known triterpenoids, moronic acid (2), anwuweizonic acid (3), and betulonic acid (4), and four known aromatic compounds (5-8) were isolated from Brazilian propolis and tested for anti-HIV activity in H9 lymphocytes. Moronic acid (2) showed significant anti-HIV activity (EC50 <0.1 μg/mL, TI > 186) and was modified to develop more potent anti-AIDS agents.


Abstract: Using sesame oil and beeswax


Abstract: English Article A simple, rapid and reproducible analytical method for thiabendazole (TBZ) and imazalil (IMA) in citrus fruit and banana has been developed. The method involves the use of an ion-exchange cartridge for sample clean-up followed by ion-pair high-performance liquid chromatography with ultraviolet detection. The recoveries of TBZ and IMA from citrus fruits spiked at levels of 10 μg/g and 5 μg/g were in the range of 94-98% and 93-98% with coefficients of variation of 0.5-2.2% and 1.6-2.7%, respectively. The recoveries of TBZ and IMA from banana spiked at levels of 3 μg/g and 2 μg/g were 94% and 94% with coefficients of variation 1.1% and 4.9%, respectively. The detection limits for TBZ and IMA were 0.1 μg/g in citrus fruit and 0.05 μg/g in banana. (C) 1998 Elsevier Science B.V. All rights reserved.


Abstract: At an experimental model of alimentary hyperlipoproteinemia the medical effect of specialized product "Zolotoi Rog", a composition of biologically active substances, antioxidants and honey, isolated from marine organisms, was analysed. The hypolipidemic effect of this product was defined at violations of lipid metabolism of blood and liver of animals. Deterioration of the processes of lipids peroxidation and raising activity of antioxidant system of an organism, were revealed


Abstract: Molten beeswax is one of the substances that can be used for coating the granules to make them adhesive.


Abstract: Endoplasmic reticulum (ER) stress has been implicated in the pathogenesis of neurodegenerative and ischemic disorders. The purpose of this study was to evaluate the effects of Chinese propolis and its constituents [chrysin, galangin, pinocembrin, caffeic acid, and caffeic acid phenethyl ester (CAPE)] against tunicamycin-induced neuronal cell death in SH-SYSY cells. Both Chinese propolis and chrysin concentration-dependently inhibited such cell death, the tunicamycin-induced activation of caspase-3, and the effects of tunicamycin on mitochondria [release of cytochrome c into the cytosol and disruption of
Furthermore, Chinese propolis and chrysin each inhibited staurosporine-induced cell death. These findings indicate that the inhibitory effects of Chinese propolis against neuronal cell death induced by ER stress or staurosporine may be exerted primarily by chrysin. Moreover, the mechanism underlying the protective effects may, at least partly, involve inhibitions of caspase-3 activity and the mitochondrial apoptotic pathway.


Abstract: Unprocessed honey is well recognized as wound-healing remedy. However, to make use of the honey clinically acceptable, it should be sterilized. It is well-established that the antibacterial activity is heat-labile either by using sterilization by autoclaving, but the effectiveness of gamma-irradiation on the antibacterial activity of honey is unknown. Therefore, an investigation was carried out to assess the effects of the antibacterial activity of Iranian honey using the commercial gamma-irradiation sterilization procedure. The honeys were divided into 4 groups (0, 5, 15 and 25 KGy). Then each group was divided four sub-groups non-irradiated and irradiated (non-heated, 25 degrees C, 35 degrees C, 45 degrees C). Microbiological test of the honeys were carried out against control organisms (Staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa) and clinically isolated organisms were tested in an agar disk diffusion assay. Results showed that there were no significant changes using the antibacterial activity of gamma-irradiation sterilization of honey, even the radiation was 25 KGy. The results of the study indicate that a better antibacterial activity is derived using the gamma-irradiation technique to maintain sterility and produced undesirable effect on antibacterial activity of honey.


Abstract: Objective: This case report describes the effects of bee stings on painful postherpetic neuralgia in a 51-year-old man. Case Report: The patient was stung by 3 bees in the distribution in which he had been experiencing postherpetic neuralgia. One day after the bee stings, the patient's painful postherpetic neuralgia was completely relieved, and the relief lasted for I and a half months. Subsequently, the patient's pain returned, but at significantly less intensity and frequency than what he had experienced prior to the bee stings. Conclusions: Bee venom and bee sting therapy have been shown to have both antinociceptive and anti-inflammatory properties, which may explain why the bee stings relieved the patient's postherpetic neuralgia. Bee sting or bee venom therapy should be further investigated as a potential treatment modality for postherpetic neuralgia.


736. JASPRICA, I; BOJIC, M; MORNAR, A; BESIC, E; BUCAN, K; MEDIC-SARIC, M (2007) Evaluation of antioxidative activity of Croatian propolis samples using DPPH center dot
Abstract: Propolis is one of the richest sources of plant phenolics (flavonoids and phenolic acids), which are widely recognized as rather strong antioxidants. The aim of our work was to use colored stable free radical (DPPH center dot and ABTS(center dot+)) spectrophotometric and thin-layer chromatographic (TLC) assays to study the antioxidative behavior of the phenolics (caffeic acid, galangin and pinocembrin) most commonly present in Croatian propolis samples obtained from different Croatian regions.

We propose a mathematical model providing a more sophisticated interpretation of the obtained results and a new parameter named antioxidative efficiency (AOE) is introduced. The kinetic behaviour of chosen standards determined by spectrophotometric assays follows the exponential decrease of the absorption curve. Explained numerically, AOE represents the absolute value of the first derivative of an absorbance curve in the point A(0)/e (where A0 is the absorbance measured at t = 0 and e is the natural logarithm base). The advantage of this newly introduced parameter is that it provides an easy and accurate mutual comparison between the rates of antioxidative efficiency of different propolis samples. A TLC assay was only applicable in the case of the DPPH center dot radical. Dose-response curves were described using a linear function with AOE expressed as a coefficient of the slope. The chromatographic method was shown to be very rapid, reliable and easy-to-perform

737. JATON, J C; ROULIN, K; ROSE, K; SIROTNAK, F M; LEWENSTEIN, A; BRUNNER, G; FANKHAUSER, C P; BURGER, U (1997) The secalosides, novel tumor cell growth inhibitory glycosides from a pollen extract. *Journal of Natural Products* 60: 356-360.


Abstract: The clinical usefulness of hemodialysis catheters is limited by increased infectious morbidity and mortality. Topical antiseptic agents, such as mupirocin, are effective at reducing this risk but have been reported to select for antibiotic-resistant strains. The aim of the present study was to determine the efficacy and the safety of exit-site application of a standardized antibacterial **honey** versus mupirocin in preventing catheter-associated infections. A randomized, controlled trial was performed comparing the effect of thrice-weekly exit-site application of Medihoney versus mupirocin on infection rates in patients who were receiving hemodialysis via tunneled, cuffed central venous catheters. A total of 101 patients were enrolled. The incidences of catheter-associated bacteremias in **honey**-treated (n = 51) and mupirocin-treated (n = 50) patients were comparable (0.97 versus 0.85 episodes per 1000 catheter-days, respectively; NS). On Cox proportional hazards model analysis, the use of **honey** was not significantly associated with bacteremia-free survival (unadjusted hazard ratio, 0.94; 95% confidence interval, 0.27 to 3.24; P = 0.92). No exit-site infections occurred. During the study period, 2% of staphylococcal isolates within the hospital were mupirocin resistant. Thrice-weekly application of standardized antibacterial **honey** to hemodialysis catheter exit sites was safe, cheap, and effective and resulted in a comparable rate of catheter-associated infection to that obtained with mupirocin (although the study was not adequately powered to assess therapeutic equivalence). The effectiveness of **honey** against antibiotic-resistant microorganisms and its low likelihood of selecting for further resistant strains suggest that this agent may represent a satisfactory alternative means of chemoprophylaxis in patients with central venous catheters.


Abstract: Propolis is a natural resinous substance, with a high polyphenol content, produced by honeybees and characterized by antimicrobial, anti-inflammatory and antioxidant properties, which make it useful for different therapeutic applications, especially in the stomatological field in the treatment of mild buccal diseases. The aim of this study was to prepare some polymeric film formulations for local delivery of propolis into the oral cavity. For this purpose, a commercial propolis fluid extract and three extracts (dry, ethanolic, glyceric) obtained from raw propolis were previously characterized with regard to their polyphenolic fraction composition and their antimicrobial properties against Candida albicans, Escherichia coli and Staphylococcus aureus strains. Commercial fluid extract, judged the most suitable in terms of polyphenol content and antimicrobial activity, was then incorporated into alginate, alginate-chitosan and agar films, prepared using a casting-solvent evaporation technique, which were finally evaluated in terms of thickness, total polyphenol content, in vitro polyphenol release profiles, swelling behaviour and antimicrobial properties. Our results demonstrate that polymeric films can be proposed as new propolis vehicles in the treatment of dental and buccal diseases.

760. JULL, A B; RODGERS, A; WALKER, N (2008) Honey as a topical treatment for wounds. *Cochrane Database of Systematic Reviews* (4) 
Abstract: Background Honey is a viscous, supersaturated sugar solution derived from nectar gathered and modified by the honeybee, Apis mellifera. Honey has been used since ancient times as a remedy in wound care. Evidence from animal studies and some trials has suggested honey may accelerate wound healing. Objectives The objective was to determine whether honey increases the rate of healing in acute wounds ( burns, lacerations and other traumatic wounds) and chronic wounds ( venous ulcers, arterial ulcers, diabetic ulcers, pressure ulcers, infected surgical wounds). Search strategy We searched the Cochrane Wounds Group Specialised Register ( May 2008), CENTRAL ( May 2008) and several other electronic databases ( May 2008). Bibliographies were searched and manufacturers of dressing products were contacted for unpublished trials. Selection criteria Randomised and quasi randomised trials that evaluated honey as a treatment for any sort of acute or chronic wound were sought. There was no restriction in terms of source, date of publication or language. Wound healing was the primary endpoint. Data collection and analysis Data from eligible trials were extracted and summarised using a data extraction sheet by one author and independently verified by a second author. Main results 19 trials ( n = 2554) were identified that met the inclusion criteria. In acute wounds, three trials evaluated the effect of honey in acute lacerations, abrasions or minor surgical wounds and nine trials evaluated the effect the honey in burns. In chronic wounds two trials evaluated the effect of honey in venous leg ulcers and one trial in pressure ulcers, infected post-operative wounds, and Fournier's gangrene respectively. Two trials recruited people with mixed groups of chronic or acute wounds. The poor quality of most of the trial reports means the results should be interpreted with caution, except in venous leg ulcers. In acute wounds, honey may reduce time to healing compared with some conventional dressings in partial thickness burns ( WMD - 4.68 days, 95% CI - 4.28 to - 5.09 days). All the included burns trials have originated from a single centre, which may have impact on replicability. In chronic wounds, honey in addition to compression bandaging does not significantly increase healing in venous leg ulcers ( RR 1.15, 95% CI 0.96 to 1.38). There is insufficient evidence to determine the effect of honey compared with other treatments for burns or in other acute or chronic wound types. Authors' conclusions Honey may improve healing times in mild to moderate superficial and partial thickness burns compared with some conventional dressings. Honey dressings as an adjuvant to compression do not significantly increase leg ulcer healing at 12 weeks. There is insufficient evidence to guide clinical practice in other areas.

Abstract: The antioxidant activities of the ethanolic extracts of propolis obtained by
different extraction methods (high hydrostatic pressure extraction, leaching at room temperature and heat reflux extraction) were investigated in relationship to their total polyphenol and flavonoid contents by two different assays, namely, the P-carotene bleaching and 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assay systems. The results showed that the ethanolic extracts of propolis obtained by high hydrostatic pressure extraction and leaching at room temperature had relatively strong antioxidant activities, which may be correlated with the total polyphenol and flavonoid contents. Antioxidant activities of ethanolic extracts of propolis obtained by high hydrostatic pressure extraction were the same as those of ethanolic extracts of propolis obtained by leaching at room temperature. Leaching at room temperature usually needs a few days, and can take even more than 7 cl, while high hydrostatic pressure extraction needs only 1 min. These findings further illustrate that the high hydrostatic pressure extraction has a bright prospect for extracting flavonoids from propolis.


766. KABALA-DZIK, A; STOJKO, R; SZAFLARSKA-STOJKO, E; WROBLEWSKA-ADAMEK, I; STOJKO, A; STOJKO, J; STAWIARSKA-PIETA, B (2004) Influence of honey-balm on the rate of scar formation during experimental burn wound healing in pigs. Bulletin of the Veterinary Institute in Pulawy 48 (3): 311-316. Abstract: The pharmacological activity of honey balm, its influence on wounds healing processes and the rate of scar formation in comparison with control groups were assessed. Clinical and histopathological studies showed that honey-balm not only shortened the period of wound healing, but also had a positive impact on the general health condition of the animals.


770. KAHLE, H; STUWE, H T; CROMWELL, O; FIEBIG, H (1999) Reactivity of T cells with grass pollen allergen extract and allergoid. International Archives of Allergy and Immunology 120 (2): 146-157. Abstract: Background: Successful allergen-specific immunotherapy is achieved with progressively increasing doses of allergen or allergoid. In order to gain further insight into the mechanism of action of allergoids several in vitro investigations were conducted. Methods: Peripheral blood mononuclear cells (PBMC) from grass pollen allergic and nonallergic subjects were stimulated with either grass pollen extract or allergoid and the proliferation and cytokine production (IL-5, IFN-gamma) were measured. Similar investigations were performed with Phl p 5-specific T cell lines (TCL) and clones (TCC). Dendritic cells and PBMC were compared in terms of their relative efficacies as antigen-
presenting cells. Results: Both allergen and allergoid induced proliferation and Th2 and Th1 cytokine synthesis by PBMC of allergic subjects, whereas PBMC of nonallergic subjects did not produce IL-5. The maximum level of IL-5 was obtained with a lower concentration than was necessary for maximal IFN-gamma production. Higher stimulation doses of allergen and allergoid shifted the cytokine profiles towards a Th1 phenotype. TCL and TCC clearly showed reactivity with both allergen and allergoid when using autologous PBMC for antigen presentation, but compared with the native allergen the reactivity of the allergoid was reduced with most of the TCC. Using dendritic cells for antigen presentation a pronounced increase of stimulation of the TCC especially for the allergoids becomes obvious. Conclusion: In common with grass pollen allergen the corresponding allergoids possess a strong allergen-specific T cell-stimulating capacity. However, the degree of T cell stimulation by the allergoid seems to be dependent on the type of the antigen-presenting cell. Both, allergen and allergoid, can modulate T cell responses in a dose-dependent manner.


775. KANBAR, G; ENGELS, W (2004) Number and position of wounds on honey bee (Apis mellifera) pupae infested with a single Varroa mite. *European Journal of Entomology* 101 (2): 323-326. Abstract: The Wounds inflicted Oil Pupae ill capped brood cells of the honey bee, Apis mellifera, infested with a single female of the ectoparasitic mite, Varroa destructor, were investigated after visualisation by vital staining with trypan blue. On average the mites made two integumental perforations for feeding oil prepupae and one oil Pupae. Most of the Punctures were oil particular ventral sites oil the abdomen. Possible reasons for this pronounced preference and the evolutionary aspects of this highly specialised parasite-host relationship are discussed

776. KANBAR, G; ENGELS, W; NICHOLSON, G J; HERTLE, R; WINKELMANN, G (2004) Tyramine functions as a toxin in honey bee larvae during Varroa-transmitted infection by Melissococcus pluton. *FEMS Microbiology Letters* 234 (1): 149-154. Abstract: From wounds of honey bee pupae, caused by the mite Varroa destructor, coccoïd bacteria were isolated and identified as Melissococcus pluton. The bacterial isolate was grown anaerobically in sorbitol medium to produce a toxic compound that was purified on XAD columns, gelfiltration and preparative HPLC. The toxic agent was identified by GC-MS and FTICR-MS as tyramine. The toxicity of the isolated tyramine was tested by a novel mobility test using the protozoon Stylomychia lemmiae. A concentration of 0.2 mg/ml led to immediate inhibition of mobility. In addition the toxicity was studied on honey bee larvae by feeding tyramine/water mixtures added to the larval jelly. The lethal dosis of tyramine on 4-5 days old bee larvae was determined as 0.3 mg/larvae when added as a volume of 20 mul to the larval food in brood cells. Several other biogenic amines, such as phenylethylamine. histamire. spermine, cadaverine, putrescine and...
trimethylamine, were tested as their hydrochloric salts for comparison and were found to be inhibitory in the Stylonychia mobility test at similar concentrations. A quantitative hemolysis test with human red blood cells revealed that tyramine and histamine showed the highest membranolytic activity, followed by the phenylethylamine, trimethylamine and spermine, while the linear diamines, cadaverine and putrescine, showed a significantly lower hemolysis when calculated on a molar amine basis. The results indicate that tyramine which is a characteristic amine produced by M. pluton in culture. is the causative agent of the observed toxic symptoms in bee larvae. Thus this disease, known as European foulbrood, is possibly an infection transmitted by the Varroa destructor mite. (C) 2004 Federation of European Microbiological Societies. Published by Elsevier B.V. All rights reserved


780. KAPLAN, N; MORPURGO, N; LINJAL, M (2007) Novel families of toxin-like peptides in insects and mammals: A computational approach. *Journal of Molecular Biology* 369 (2): 553-566. Abstract: Most animal toxins are short proteins that appear in venom and vary in sequence, structure and function. A common characteristic of many such toxins is their apparent structural stability. Sporadic instances of endogenous toxin-like proteins that function in non-venom context have been reported. We have utilized machine learning methodology, based on sequence-derived features and guided by the notion of structural stability, in order to conduct a large-scale search for toxin and toxin-like proteins. Application of the method to insect and mammalian sequences revealed novel families of toxin-like proteins. One of these proteins shows significant similarity to ion channel inhibitors that are expressed in cone snail and assassin bug venom, and is surprisingly expressed in the bee brain. A toxicity assay in which the protein was injected to fish induced a strong yet reversible paralytic effect. We suggest that the protein may function as an endogenous modulator of voltage-gated Ca2+ channels. Additionally, we have identified a novel mammalian cluster of toxin-like proteins that are expressed in the testis. We suggest that these proteins might be involved in regulation of nicotinic acetylcholine receptors that affect the acrosome reaction and sperm motility. Finally, we highlight a possible evolutionary link between venom toxins and antibacterial proteins. We expect our methodology to enhance the discovery of additional novel protein families. (C) 2007 Elsevier Ltd. All rights reserved


783. KAS'IANENKO, V I; SELEZNEVA, E I; MARKAROVA, N V (2002) [Effect of warm and cold honey solutions on acid-forming function of the stomach]. *Eksp.Klin.Gastroenterol.* (5): 114-130. Abstract: Apitherapy is treatment of diseases with biologically active products of beekeeping (BAPB), which is developing in an intensive way all over the world. The interest in
Apitherapy is explained, on the one hand, by a great number of natural compounds produced by bees as a result of their vital functions and having high physiological activity, and on the other hand, by the universal nature of bees occurrence and comparative simplicity of getting the bee-keeping products. In apitherapy literature many authors point to the fact that honey has an impact on gastric secretion: a cold honey solution stimulates, and a warm one inhibits acid excretion. Yet there are no results of studies confirming this action in all publications.


794. Kelly, E C (1941) *Medical Classics*. Williams and Wilkins Company Baltimore


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Abstract: Honey is not only used as nutrition but also used in wound healing and as an alternative treatment for clinical conditions ranging from gastrointestinal tract (GIT) problems to ophthalmic conditions. We did the literature search and found interesting facts about the nutritional and medicinal value of honey. No wonder, it is a good source of nutrition, the results of the studies prove that it also helps in wound healing. On burns, it has an initial soothing and later rapid healing effects. It has been used as wound barrier against tumour implantation in laparoscopic oncological surgery. No infection has been reported from the application of honey to open wounds. It has a potential therapeutic role in the treatment of gingivitis and periodontal disease. Based on these facts, the use of honey in the surgical wards is highly recommended and patients about to undergo surgery should ask their surgeons if they could apply honey to their wounds postoperation.


803. KHISMATULLINA (2005) Apitherapy. Perm, Russia

804. KHOTKINA, M L (1955) Honey as part of therapy for patients with stomach ulcers. Collection of papers from the Irkutsk State Medical Institute: 252-252.


Abstract: A cecropin-like antimicrobial peptide, Gm cecropin, was purified from hemolymph of larvae of the wax moth, Galleria mellonella, immunized against E. coli, and its antibacterial activity was examined in a radial diffusion assay. The molecular mass of Gm cecropin was 4,160.69 Da by matrix-assisted laser desorption ionization-time-of-flight mass spectrometry analysis. The full-length cDNA of the Gm cecropin precursor was cloned by a combination of RT-PCR, based on the N-terminal sequence obtained by Edman degradation, and 5'-RACE-PCR. Analysis of the cDNA showed that cecropin is synthesized as a prepropeptide, with a putative 22-residue signal peptide, a 4-residue propeptide and a 39-residue mature peptide with a calculated mass of 4,344.18 Da the difference between the calculated and measured masses suggests that Gm cecropin is a 37-residue peptide generated by removal of the C-terminal residue and amidation.


Abstract: Propolis has well-known antimicrobial activity as well as antioxidant, antitumoral, anti-inflammatory, and regenerative properties, but its effects on the immune response are not well understood. Furthermore, clinical application of this relatively efficacious agent in cancer and other diseases has been limited due to poor aqueous solubility and, consequently, minimal systemic bioavailability. Nanoparticle-based delivery approaches have the potential to render hydrophobic agents like propolis dispersible in aqueous media, thus circumventing the pitfalls of poor solubility. We have synthesized a polymeric nanoparticle-encapsulated formulation of propolis (propolis nanofood) utilizing micellar
aggregates of cross-linked and random copolymers of N-isopropylacrylamide (NIPAAm) with N-vinyl-2-pyrrolidone (VP) and poly(ethylene glycol) monoacrylate (PEG-A). Physicochemical characterization of the polymeric nanoparticles by dynamic laser light scattering and transmission electron microscopy confirms a narrow size distribution in the 50-nm range. Propolis nanofood, unlike free propolis, is readily dispersed in aqueous media. Propolis nanofood demonstrates comparable in vitro therapeutic efficacy, to free propolis against a panel of human pancreatic cancer cell lines, as assessed by cell viability and clonogenicity assays in soft agar. Future studies utilizing propolis nanofood are warranted in pre-clinical in vivo applications.


Abstract: Post-initiation modifying effects of dietary administration of a super critical extract of propolis on major organs were examined using a two-stage carcinogenesis model. Groups of 21 or 22 F344 female rats were treated sequentially with 2,2'-dihydroxy-di-n-propyl nitrosamine (DHPN, i.g.), 7,12-dimethylbenz[a]anthracene (DMBA, i.g.), 1,2-dimethylhydrazine (DMH, s.c.) and N-butyl-N-(4-hydroxybutyl)nitrosamine (BBN, in drinking water) during the first 3 weeks for initiation, and then administered diet containing 0.1 or 0.01% propolis for 33 weeks. Further groups were treated with the carcinogens alone, 0.1% propolis alone or basal diet alone. All surviving animals were killed at week 36, and major organs were examined histopathologically for development of preneoplastic and neoplastic lesions. The incidence and multiplicity of mammary carcinomas were significantly decreased by the 0.1 and 0.01% propolis treatments. In the urinary bladder, the incidence of PN hyperplasia but not tumors was, in contrast, significantly increased by 0.1% propolis. Similarly, the number and area of glutathione S-transferase placental form (GST-P)-positive liver foci were significantly elevated with this high dose. The results indicate that a low dose of a super critical extract of propolis may find application as a potent chemopreventor of mammary carcinogenesis. (C) 1999 Elsevier Science Ireland Ltd. All rights reserved.


816. KIVALKINA, V P; RYBKINA, N I; BARSKOV, A A; Geras'kin, I M; TALAN, V A (1976) [Fractionation of the mixture of volatile with steam components of propolis and the study of their antimicrobial activity]. Antibiotiki. 21 (5): 422-423.

817. KIVALKINA, V P; GOSRSHUMOVA, V I (1973) [Study of combined effect of antibiotics and propolis]. Antibiotiki. 18 (3): 261-263.

818. KIVALKINA, V P; BELOZEROVA, G A; KAMALOV, G H (1979) Stimulation of immunogenesis with propolis in the immunization of animals against Aujeszki disease IIIème Symposium


Abstract: An experimental model of gastroduodenitis combined with hyperlipidemia was used to study the effects of the product Zolotoi rog (Golden Horn) which is a composition of biologically active substances of marine organisms and honey. It was found that a course administration of Zolotoi rog in a dose 2.5 mg/kg b.w. improves histomorphology of gastric mucosa, acts hypolipidemically, raises reserves of the antioxidant system of the body and suppresses intensity of lipid peroxidation


Abstract: To investigate the long-term effect of feeding royal jelly (RJ) on the testicular function, 32-week old male golden hamsters were fed diet containing RJ at doses of 0 mu g/g diet (control), 50 mu g/g diet or 500 mu g/g diet for 12 weeks. At the end of the experiment, the hamsters were assessed for testicular function in terms of the amounts of intra-testicular free testosterone (TS) and histopathological changes. RJ diet groups showed higher TS levels and more intensive spermatogenesis than the control group in a dose-dependent manner. The intensity of spermatogenesis and TS levels in the 500 mu g of RJ/g diet group showed significant differences of p < 0.01 and p < 0.05, respectively, when compared with those in the control group. These results indicate that the long-term feeding of RJ inhibits the age-associated decline in the testicular function of male hamsters
Abstract: The aim of the present study was to determine the levels of some minerals, such as Na, K, Ca, Fe, Cu, Zn, Mn, Cr, Pb, in honey samples produced and consumed abundantly in Black sea region of Turkey. Three different floral and authentic honey samples, Anzer (n = 6) Bayburt (n = 8) and chestnut honeys (n = 15) were obtained from Black sea region of Turkey and analyzed by flame atomic absorption spectrophotometer (F-AAS). Both of the Anzer and Bayburt honeys are heterofloral and produced from a largest variety of mountain flowers in Anzer plateau near Ikizdere-Rize and Bayburt plateau, in the East-Black sea region of Turkey, respectively. Third group of monofloral botanical origin chestnut honey samples were supplied from Zonguldak in West Black sea region of Turkey. All samples were analyzed after nitric acid digestion. Nine minerals (Na, K, Ca, Fe, Cu, Zn, Mn, Cr, Pb) were quantified for each honey sample. Iron, copper, zinc, manganese, calcium, chromium and lead were determined by atomic absorption spectrophotometer and potassium, sodium by flame photometer. Na, K, Ca, Fe, Cu, Zn and Mn contents of minerals in honey samples were in the range of 28-41, 564-5007, 173-481, 3.2-6.7, 1.2-2.2, 1.2-17.2 and 1.2-17.2 μg g⁻¹, respectively. However, Cr and Pb were below detection limit (0.01 μg g⁻¹) of the flame AAS. The amounts of K, Na and Ca were the most abundant elements in tested honey samples. Anzer honey samples were high in iron and chestnut samples were in manganese. The results showed that mineral contents in the studied 29 honey samples are highly variable and depend on their geographical and botanical origin.

Abstract: Phenylpropanoids (PPs) belong to the largest group of secondary metabolites produced by plants, mainly, in response to biotic or abiotic stresses such as infections, wounding, UV irradiation, exposure to ozone, pollutants, and other hostile environmental conditions. It is thought that the molecular basis for the protective action of phenylpropanoids in plants is their antioxidant and free radical scavenging properties. These numerous phenolic compounds are major biologically active components of human diet, spices, aromas, wines, beer, essential oils, propolis, and traditional medicine. Last few years, much interest has been attracted to natural and synthetic phenylpropanoids for medicinal use as antioxidant, UV screens, anticancer, anti-virus, anti-inflammatory, wound healing, and antibacterial agents. They are of great interest for cosmetic and perfume industries as active natural ingredients. In the present review, the metabolic pathways of phenylpropanoid biosynthesis in plants and the mechanism of phenylpropanoid-mediated plant defense are described. Learning from plants, free radical-driven, molecular and cellular processes modulated by phenylpropanoids in human cell cultures in vitro and in the in vivo animal models of tumors, inflammation, and cellular damage are also reviewed.


844. KOULIERAKIS, P N (1997) Honey as a real treasure of health and power, The XXXVth Apimondia Congress, Antwerpen, Belgium


849. KRILOV, V (1995) *Bee venom (in Russian)*. Nizhny Novgorod University Nizhny Novgorod; 221 pp


Abstract: The anti-bacterial property and preservative nature of honey has been studied by evaluating the role of hydrogen peroxide in these properties, against bacterial strains isolated and identified from pasteurized milk samples. The antibacterial property of honey examined by agar incorporation assay and turbidometry, indicated a concentration dependent inhibition of bacterial growth in all catalase negative strains in comparison with catalase positive strains, highlighting a probable role of hydrogen peroxide. Samples of commercial milk stored at 4 degrees C in presence of honey were shown to inhibit opportunistic bacterial growth better compared to samples stored without honey. Due to the bactericidal property of hydrogen peroxide and its preservative nature, honey which is chiefly a combination of various sugars and hydrogen peroxide, can be used a preservative of milk samples

Abstract: Summary: In experiments in insulated rat's hearts under all-out myocard ischemia it was shown that the Bee Royal Jelly usage rendered a cardioprotective effect. Preliminary two weeks the Royal Jelly enterring brings to increasing of the shortenning activity of myocard after it's insulating in rats. It was showed that under reperfusion of stopped insulated heart the Royal Jelly promotes a correct rhythm of heartbeats recovering, enlarges factors of myocard shortenning and debilitation maximum velocity, developped intraventricular pressure, coronary blood current in contrast with checking. Exposed effects may be connected with the big amount of short-chain fat acids in Royal Jelly that are comprised to the heart metabolism very quickly after assimilating and created the fair supply of energy substratums in myocard. Similar to the most efficient direct energy actions preparation \V the coenzyme Q-10 - effect of Bee Royal Jelly was founded on given heart pathology model.


Abstract: By including of the bee venom in the therapeutic complex treatment of the patients with chronic cerebral ischemia (CCI) and chronic back pain (BP) we established that clinical picture of patients recovering patients coincided with rising EPEM, decreasing agregability and blood clotting time.


863. KUBOTA, K; KUMAKIRI, M; MIURA, Y; HINE, K; KORI, N; SAITO, H; MIYAZAKI, K; ARITA, T (1983) [Clinical studies on zinc oxide ointment replacing boric acid and zinc oxide ointment (JP8)]. Hokkaido Igaku Zasshi 58 (4): 400-405.
Abstract: A boric acid and zinc oxide ointment (J.P. VIII) is an unique preparation in Japan, which consist of boric acid (5%), zinc oxide (10%), vegetable oil (usually soybean oil or sesame oil) and yellow wax. The ointment is widely used in the area of Hokkaido, because not only of the customary prescription but also of the characteristic clinical efficiency. However, boric acid has been recognized to be harmful in these days. Therefore, a zinc oxide ointment consisting 10% zinc oxide, soybean oil and white beeswax was tentatively made and evaluated. The zinc oxide ointment presented the same consistency as the boric acid and zinc oxide ointment, measured with penetrometer. The clinical efficiency was also confirmed on six patients with chronic eczema and seven patients with psoriasis vulgaris. The effect on wound healing of the donor site of skin graft was as good as the previous preparation

Abstract: In this study, we investigated and compared some chemical properties and in vitro biological activities of three different types of Turkish honey. The first two honey samples were monofloral from chestnut and rhododendron flowers, collected from the east Black Sea region, and the third sample was the heterofloral form of astragalus (Astragalus microcephalus Willd.), thyme (Thymus vulgaris) and other several mountain flowers, collected from Erzincan in Eastern Anatolia. The chemical properties of the honey samples, such as total moisture, ash, total protein, sucrose, invert sugar, diastase activity, hydroxymethylfurfural content and acidity, were determined. Total phenolics, superoxide radical- and peroxynitrite-scavenging activities, and ferric reducing/antioxidant power measurements were used as antioxidant capacity determinants with +/--catechin, butylated hydroxytoluene, ascorbic acid, and trolox (R) used as reference. The antimicrobial activity was studied by the agar diffusion method, using eight bacteria and two yeasts. The mineral contents were also determined by an AAS method. The chestnut flower honey had the highest phenolic content, superoxide radical- scavenging activity and reducing power, while the heterofloral honey sample exhibited the highest peroxynitrite-scavenging activity. The antioxidant activities were also found to be related to the sample concentrations. The mineral content of the chestnut honey was much higher than the others. The samples showed moderate antimicrobial activity against some microorganisms, especially Helicobacter pylori ATCC 49503, Staphylococcus aureus ATCC 25923, Bacillus subtilis ATCC 6633, Candida tropicalis ATCC 13803 and Candida albicans ATCC 10231. The honey samples studied proved to be a good source of antioxidants and antimicrobial agents that might serve to protect health and fight against several diseases. (c) 2005 Elsevier Ltd. All rights reserved

865. KUJAWSKI, M W; NAMIESNIK, J (2008) Challenges in preparing honey samples for chromatographic determination of contaminants and trace residues. Trac-Trends in
Analytical Chemistry 27 (9): 785-793.
Abstract: The determination of contaminants and trace residues in honey has been of growing concern over the past few years, especially because these compounds can detract from the beneficial properties of honey, and, more importantly, if they are present in significant amounts, they can pose a serious threat to human health. Since honey has a complex matrix, it is often necessary to apply a clean-up step in order to eliminate interfering compounds prior to analysis. We briefly discuss the chemical composition and some medical properties of honey and describe the main sources of contamination of honey. We discuss the need for extensive sample preparation, including extraction and clean-up. (c) 2008 Elsevier Ltd. All rights reserved


868. KUMAZAWA, S; OHTA, T; KAJI, K; NAKAYAMA, T (2007) Antioxidant and antiangiogenic activities of propolis
Abstract: Propolis is a natural substance collected by honeybees from buds and exudates of certain trees and plants to protect their beehive from enemies. It is used in folk medicines in many regions of the world and has been reported to have various biological activities such as antibacterial and anticancer properties. Propolis usually contains a variety of chemical compounds such as polyphenols (flavonoids, phenolic acids and their esters), terpenoids, steroids, and amino acids. The composition of propolis depends upon the vegetation at the site of collection. We have studied the components in propolis from various geographic origins, and evaluated their biological activities. We here present the results of the antioxidant and antiangiogenic activities of propolis

Abstract: Propolis is a resinous substance collected by honeybees from various plant sources. The composition of propolis depends upon the vegetation at the site of collection. We previously isolated four prenylated flavonoids from propolis collected in Okinawa, Japan. In this study, further fractionation of the extracts of Okinawan propolis resulted in the isolation of a new prenylated flavonoid, prokinawan, and four known compounds. The structure of prokinawan was determined by MS and NMR spectroscopic methods. Furthermore, the antioxidant activity using 1,1-diphenyl-2-picryl-hydrazyl radical scavenging and beta-carotene bleaching systems was investigated. The present study proved that the position of the geranyl or prenyl groups on the flavonoid skeleton plays an important role in exhibiting antioxidant activity


872. KURIAKINA, N V; KURIAKIN, V V (1996) [The apitherapy of apical periodontitis]. Stomatologiia (Mosk) Spec No: 63-64.


Abstract: Background. Antibiotic resistance among microbes urgently necessitates the development of novel antimicrobial agents. Since ancient times, honey has been used successfully for treatment of infected wounds, because of its antibacterial activity. However, large variations in the in vitro antibacterial activity of various honeys have been reported and hamper its acceptance in modern medicine. Methods. We assessed the in vitro bactericidal activity of Revamil (Bfactory), a medical-grade honey produced under controlled conditions, and assessed its efficacy for reduction of forearm skin colonization in healthy volunteers in a within-subject-controlled trial. Results. With Bacillus subtilis as a test strain, we demonstrated that the variation in bactericidal activity of 11 batches of medical-grade honey was <2-fold. Antibiotic-susceptible and -resistant isolates of Staphylococcus aureus, Staphylococcus epidermidis, Enterococcus faecium, Escherichia coli, Pseudomonas aeruginosa, Enterobacter cloacae, and Klebsiella oxytoca were killed within 24 h by 10%-40% (vol/vol) honey. After 2 days of application of honey, the extent of forearm skin colonization in healthy volunteers was reduced 100-fold (P < .001), and the numbers of positive skin cultures were reduced by 76% (P < .001). Conclusions. Revamil is a promising topical antimicrobial agent for prevention or treatment of infections, including those caused by multidrug-resistant bacteria

879. LABORDE, J R (1945) Le miel - ses propriétés nutritives - ses applications médicales. Editions Bière Bordeaux, France


Abstract: Injection of low doses of bacteria into the aquatic larvae of the dipteran insect Chironomus plumosus induces the appearance in their hemolymph of a potent antibacterial activity. We have isolated two 36-residue peptides from this hemolymph which are active against Gram-positive bacteria. The peptides are novel members of the insect defensin family and their sequences present marked differences with those of insect defensins isolated from other dipteran species. We have developed a method for efficient renaturation of this cysteine-rich molecule and obtained a highly pure synthetic Chironomus defensin. (C) 1998 Elsevier Science Ltd. All rights reserved.


Abstract: The aim of this study was to assess the inhibitory effect of whole bee venom (BV) on adjuvant-induced arthritis in the rat. Rats were divided into pre-apitherapy, post-apitherapy and control experimental groups. The pre-apitherapy group was subcutaneously stung with a honeybee (Apis mellifera L.) and the control group was subcutaneously injected with 0.1 ml of physiological saline solution one day prior to complete Freund's adjuvant (CFA) injection. The post-apitherapy group was subcutaneously stung with a honeybee on day 14 after CFA injection. When arthritis had developed in the rat, the post-apitherapy group was subcutaneously administered whole BV every other day for a further 14 days. Clinical signs, hematological values and radiological features were observed during the entire experimental period. In the pre-apitherapy group, the development of inflammatory edema and polyarthritis was inhibited. Significant differences in lameness score, hind paw edema volume and radiological features were observed between control and pre-apitherapy rats. White blood cell counts indicated that the degree of leucocytosis was significantly different between the pre-apitherapy and control groups (p < 0.01). Inflammatory edema, polyarthritis and bone change into the tight hind paw were effectively inhibited in preapitherapy rats during the two-week period post-CFA injection. In conclusion, whole BV was found to inhibit arthritic inflammation and bone changes in the rat. This may be an alternative treatment for arthritis in humans.


Abstract: Phenolic constituents (total phenols, phenylpropanoids, flavonols and anthocyanins) and antioxidant ability were determined in bee pollen of 12 plant species. Antioxidant ability was measured as total antioxidant activity, radical-scavenging activity and activity against free hydroxyl radical. Great variability of phenolic contents was observed in the pollen of investigated species. Total antioxidant activity differed considerably (0.8-86.4% inhibition of lipid peroxidation), however, in most of the examined pollens, it was high and corresponded with the phenylpropanoid level. Great differences in the radical-scavenging activity (8.6-91.5% of DPPH neutralization) and in the hydroxyl radical-scavenging activity (10.5-98% inhibition of deoxyribose degradation) were
observed and were not correlated with the content of phenolic compounds. In most of the investigated plant species, antioxidative capacity of bee pollen was very high. (c) 2005 Elsevier Ltd. All rights reserved

Abstract: The ethanolic extract of the fruit bark from Magonia glabrata yielded shikimic acid, scopoletin, sitosterol glycoside and 2-O-methyl-L-inositol. Antioxidant, ichthyotoxicity and brine shrimp lethality activities were observed in this extract. The major constituent, 2-O-methyl-L-inositol, was found to be inactive in two assays but showed moderate activity as a radical scavenger. (c) 2006 Elsevier B.V. All rights reserved


897. LEPORE, G; GIURIA, H Quemaduras menores, tratamiento de urgencia y seguimiento ambulatorio. *Catedra de Cirugía Plastica y Quemados.Prof.J.Hornblas*

Abstract: Pseudomonas aeruginosa antibiotic resistance has led to the search of natural compounds, which would competitively block its fucose > fructose/mannose-binding lectin (PA-IIL) that mediates its biofilm formation and adhesion to animal cells. Such compounds were found in human milk (HM) and avian egg whites. The present research has revealed that honey and royal jelly (RJ), which are assigned to protect beehive progeny and are applied for human infection therapy, match HM in PA-IIL blocking. The function of their fructose (higher in honey) and mannosylated glycoproteins (higher in RJ) as powerful decoys in PA-IIL neutralization is of ecological/biological importance and implementability for the antibacterial adhesion therapeutic strategy


Abstract: To compare the protein complement of royal jelly (RJ) from high RJ producing honeybees (Apis mellifera L.), a strain of A. mellifera artificially selected for increased RJ production from Italian honeybees in China for more than two decades was compared to those of native Italian honeybees (A. mellifera L.) and Carnica honeybees (A. meliffera C.); the protein in RJ from these three strains of honeybees was partially identified by using a combination of two-dimensional polyacrylamide gel electrophoresis (2D-PAGE), matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF/MS), and a protein engine identification tool applied to the honeybee genome. The results showed that 152, 157, and 137 proteins were detected in the three species of RJ; among which 57, 57, 51 high abundant proteins were identified, respectively. Most identified spots, 45, 45, 41, were assigned to major royal jelly proteins (MRJPs). Remarkable differences were found in the heterogeneity of the MRJPs, in particular, MRJP3. Also, 3-glucose oxidase, 1-peroxiredoxin (PRDX), and 1-glutathione S-transferase (GST) S1 were identified in three RJ samples. Furthermore, during the determination of the peptides mass fingerprinting (PMF) of each spot, for the first time, PRDX and GST S1 proteins have been identified in RJ. Thus, the results suggest that the protein complement of high RJ producing honeybees is not different compared to native Italian honeybees, while a difference remains between Carnica honeybees.


114. LIN, M W; YANG, S R; HUANG, M H; WU, S N (2004) Stimulatory actions of caffeic acid phenethyl ester, a known inhibitor of NF-kappa B activation, on Ca2+-activated K+ current in pituitary GH(3) cells


Abstract: Caffeic acid phenethyl ester (CAPE), a phenolic antioxidant derived from the propolis of honeybee hives, is known to be an inhibitor of activation of nuclear transcript factor NF-kappaB. Its effects on ion currents have been investigated in pituitary GH(3) cells. This compound increased Ca2+-activated K+ current (I-K(Ca)) in a concentration-dependent manner with an EC50 value of 14 +/- 2 muM. However, the magnitude of CAPE-induced stimulation of I-K(Ca) was attenuated in GH(3) cells preincubated with 2,2'-azo-bis-(2-aminopropane) hydrochloride (100 muM) or t-butyl hydroperoxide (1 mM). CAPE (50 muM) slightly suppressed voltage-dependent L-type Ca2+ current. In inside-out configuration, CAPE (20 muM) applied to the intracellular face of the detached patch enhanced the activity of large conductance Ca2+-activated K+ (BKCa) channels with no modification in single-channel conductance. After BKCa channel activity was
increased by CAPE (20 μM), subsequent application of nordihydroguaiaretic acid (20 μM) did not further increase the channel activity. CAPE-stimulated channel activity was dependent on membrane potential. CAPE could also increase Ca2+ sensitivity of BKCa channels in these cells. Its increase in the open probability could primarily involve a decrease in the mean closed time. In current-clamp conditions, CAPE hyperpolarized the membrane potential and reduced the firing of action potentials. The stimulatory effects on these channels may partly contribute to the underlying mechanisms through which this compound influences the functional activities of neurons or neuroendocrine cells. Caution has to be used in attributing its response in the activation of NF-kappaB.


910. LINEEN, E; NAMIAS, N (2008) Biologic dressing in burns. Journal of Craniofacial Surgery 19 (4): 923-928. Abstract: Advances in cellular biology and knowledge in wound healing and growth factors have given us a wide variety of choices to attack the problem of the complex burn wound. Split-thickness skin grafting with autograft is at present the standard of care. It, however, is not an ideal substitute and frequently is not available for full-burn coverage. This article will review honey, human amnion, xenograft, allograft, cultured epithelial autograft, and various engineered commercial products for use in the biologic treatment of burn wounds.


912. LINSKENS, H F; JORDE, W (1997) Pollen as food and medicine - A review. Economic Botany 51 (1): 78-86. Abstract: English Review Pollen, the male gametophyte of flowering plants, is a high energy material, which is collected by insects and stored as food reserve. Pollen has been used traditionally by humans for religious purposes and as supplementary food. Pollen is a concentrated, energy and vitamin rich food that in contemporary times is not only consumed as a dietary component, but also is used in alternative medical treatments. Pollen has potential importance as a supplementary and survival food, and for conditioning of athletes. Pollen has been used medically in prostatitis, bleeding stomach ulcers and some infectious diseases, although such use has been questioned by the medical profession. Pollen may also be used for treatment and prevention of the high-altitude-sickness syndrome. Because some individuals are allergic to pollen, and various pollen species contain specific allergens, individual sensitivities must be tested before pollen is used as a treatment or as a supplementary food.


916. LIU, J R; YANG, Y C; SHI, L S; PENG, C C (2008) Antioxidant Properties of Royal Jelly Associated with Larval Age and Time of Harvest. Journal of agricultural and food chemistry 56 (23): 11447-11452. Abstract: This study aimed to evaluate the antioxidant properties of royal jelly (RJ) collected from larvae of different ages that were transferred in artificial bee queen cells for...
24, 48, and 72 h. RJ harvested from the 1 day old larvae 24 h after the graft displayed predominant antioxidant properties, including scavenging activity of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals, inhibition of linoleic acid peroxidation, and reducing power. Regardless of the initial larval age, lower antioxidant activities were observed in the RJ harvested later than 24 h except for the activity of superoxide dismutase. In addition, higher contents of proteins and polyphenolic compounds were determined in the RJ harvested 24 h than that harvested 48 or 72 h after the graft. It implied that the polyphenolic compounds may be the major component for giving the antioxidant activities in RJ. In summary, the time of harvest and the initial larval age did affect the antioxidant potencies in RJ, and RJ collected 24 h after the larval transfer showed the most substantial antioxidant activities.
and manuka honey). Methods. An agar dilution method was used to assess the activity of honeys against 13 bacteria and one yeast. The honeys were tested at five concentrations ranging from 0.1 to 20%. Results. Twelve of the 13 bacteria were inhibited by all honeys used in this study with only Serratia marcescens and the yeast Candida albicans not inhibited by the honeys. Little or no antibacterial activity was seen at honey concentrations < 1%, with minimal inhibition at 5%. No honey was able to produce complete inhibition of bacterial growth. Although Medihoney (R) and manuka had the overall best activity, the locally produced honeys had equivalent inhibitory activity for some, but not all, bacteria. Conclusions. Honeys other than those commercially available as antibacterial honeys can have equivalent antibacterial activity. These newly identified antibacterial honeys may prove to be a valuable source of future therapeutic honeys. (c) 2005 IMSS. Published by Elsevier Inc


931. MACEDO FREIRE ALCICI, N (1997) Heavy metals in propolis. Practical and simple procedures to reduce the lead level in the Brazilian propolis, Bee Products. Properties, Applications, and Apitherapy Symposium Tel Aviv: pp 231-238.


937. MAHAJAN, R P; PATIL, U K; PATIL, S L (2007) A facile microwave assisted synthesis and antimicrobial activities of naturally occurring (E)-cinnamyl (E)-cinnamates and (E)-aryl cinnamates. Indian Journal of Chemistry Section B-Organic Chemistry Including Medicinal Chemistry 46 (9): 1459-1465. Abstract: Benzaldehydes 1a-e on reaction with phosphorane 3 and aldehydes 2a-e with phosphorane 4 under microwave irradiation provide the (E)-cinnamyl (E)-cinnamates 5a-e and (E)-aryl cinnamates 6a-e respectively in high yield. Cinnamates 5a-e and 6a-e exhibit antibacterial and antifungal activity


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939. MALONE, F (1979) *Bees don't get arthritis*. Academy Books Rutland


944. MARGHITAS, L; DEZMIREAN, D; MOISE, A; BOBIS, O; LASLO, L; BOGDANOV, S (2009) Physico-chemical and bioactive properties of different floral origin honeys from Romania. *Food Chemistry* 112 (4): 863-867. Abstract: In this study, we investigated and compared the physico-chemical properties (moisture, colour, ash, and sugars content) as well as total phenols, total flavonoids and antioxidant activity of several honey samples (24) collected from different regions of Romania. The physico-chemical values were in the range of approved limits (conforming to EU legislation); excepting the monosaccharide values for one sample (T2). For this sample, the other values were within legislation limits. The results obtained showed that the most valuable honey is the honeydew one. Correlation between RSA and total phenols and total flavonoids, respectively, was determined, and a positive correlation was found. This study demonstrates remarkable variation in antioxidant properties and content of total phenols in honey, depending on its botanic or geographic source. (c) 2008 Elsevier Ltd. All rights reserved

945. MARGHITAS, L A; DEZMIREAN, D (2007) *Apicultura - De la stiinta la agribusiness si apiterapie*. Editura Academic Pres Cluj Napoca; 230 pp


947. MARNEWICK, J L; JOUBERT, E; SWART, P; VAN DER WESTHUIZEN, F; GELDERBLOM, W C (2003) Modulation of hepatic drug metabolizing enzymes and oxidative status by rooibos (Aspalathus linearis) and honeybush (Cyclopia intermedia), green and black (Camellia sinensis) teas in rats. *Journal of agricultural and food chemistry* 51 (27): 8113-8119. Abstract: Rooibos and honeybush teas significantly (P < 0.05) enhanced the activity of cytosolic glutathione S-transferase alpha. A significant (P < 0.05) to marginal (P < 0.1) increase in the activity of the microsomal UDP-glucuronosyl transferase was obtained with unprocessed rooibos and honeybush teas, respectively. Oxidized glutathione (GSSG) levels were significantly (P < 0.05) reduced in the liver of all tea treated rats while reduced glutathione (GSH) was markedly increased in the liver of the herbal tea treated rats. These changes resulted in a significant (P < 0.05) increase in the GSH/GSSG ratio by the unprocessed, processed rooibos and unprocessed honeybush teas. Green and black teas markedly to significantly decreased the oxygen radical absorbance capacity in liver homogenates, respectively. Modulation of phase II drug metabolizing enzymes and oxidative status in the liver may be important events in the protection against adverse effects related to mutagenesis and oxidative damage

A serious candidate to be applied topically due to its outstanding antioxidant properties. So, the purpose of this study was to develop stable topical formulations added with propolis extract in an attempt to prevent and/or treat the diseases occurring in skin caused by UV radiation. The antioxidant activity using a chemiluminescent method was used to evaluate the functional stability and the permeation/retention in skin of these formulations. In the long-term stability study, the formulations were stored at 25 +/- 2 degrees C/50% RH and at 40 +/- 2 degrees C/70% RH for 360 days. It was found in this study, that the formulations prepared with Polawax (R) showed functional and physical stability in the period of study. In addition, this formulation presented good results in the percutaneous study, allowing the antioxidant compounds present in the propolis extract to reach lower layers in pig ear skin and in the whole hairless mice skin (retention = 0.12 and 0.13 mu L of propolis/g of skin, respectively). In the in vivo study, it was also suggested that this formulation may be effective in protecting skin from UVB photodamage, nevertheless other assays need to be done in order to have a complete understanding of the protective effect of formulations added with propolis extract.

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Abstract: The antioxidant activities of extracts of propolis and of formulations added with these extracts were measured by scavenging different radicals in different systems. For the ethanolic extract of propolis (EEP) and the glycolic extract of propolis (GEP) the IC50 observed were respectively of 0.024 and 0.035 mu L/mL in scavenging hydroxyl radical, 0.016 and 0.012 mu L/mL in inhibiting lipid peroxidation, 0.22 and 0.24 mu L/mL in inhibiting chemiluminescence produced in the H2O2/luminol/horseradish peroxide (HRP) system and about 0.005 mu L/mL for both extracts in inhibiting chemiluminescence produced in the xanthine/luminol/xanthine oxidase (XOD) system. The antioxidant activity of extracts of propolis in the formulations was not able to be assessed neither using the deoxyribose assay, since the formulation components interfered in the assay measurements, nor using chemiluminescence in the H2O2/luminol/HRP system, since this method did not show to be sensitive for the extract of propolis evaluation. However, the antioxidant activity of extracts of propolis could be successfully evaluated in the formulations using both lipid peroxidation and chemiluminescence generated in the xanthine/luminol/XOD system inhibitions. (c) 2005 Published by Elsevier B.V


Abstract: Propolis is a resinous bee hive product that has many biological activities. Among these activities, the antioxidant activity deserves special interest since it suggests propolis could be successfully applied topically to prevent and treat skin damages. The skin is continuously exposed to free radicals generated in the aging process and by external stimuli such as sunlight. Thus, the development of topical formulations added with propolis extract is justified. However, it raises the necessity of being concerned about the methodologies that could be used to evaluate the propolis extract release from these formulations. So, p-coumaric acid content using HPLC and the antioxidant activity using chemiluminescence were used to assess the release of propolis extract from topical formulations. A low fat content formulation (F1) and a high fat content formulation (F2) were evaluated and they showed that after 6 h, 4.6 mu g/cm(2) (F1) and 2.75 mu g/cm(2) (F2) of the p-coumaric acid was released, while it was found that both formulations released about 0.85 mu L/cm(2) of the antioxidant activity as propolis extract equivalent (AAPEE). Thus, once the antioxidant activity of propolis extract may be the result of the synergic action of several compounds, the obtained results indicate that a release study would be more conclusive if the antioxidant activity was evaluated, besides the measurement of a marker compound content. (c) 2006 Elsevier B.V. All rights reserved

952. MARTIN, R A P; HORTIGUELA, L V; LOZANO, P L; CORTINA, M D R; CARRETERO, C D (2008) In Vitro Antioxidant and Antimicrobial Activities of Spanish Honeys. INTERNATIONAL JOURNAL OF FOOD PROPERTIES 11 (4): 727-737. Abstract: Sixty-seven Spanish honeys from different floral origins, nectars and honeydews, were examined for potential antimicrobial and antioxidant activities. Antioxidant capacities were determined in terms of their antiradical capacity using the stable free radical DPPH. The bacterial species Micrococcus luteus and Staphylococcus aureus were used as the resistant microorganism in the antibacterial assays. The results showed that honeydew honeys presented higher antioxidant capacities than nectar honeys. On the other hand, honey capacity to inhibit Micrococcus luteus and Staphylococcus aureus was firstly evaluated by an agar diffusion method. Secondly, the active samples were tested with a spectrophotometric method to quantify their non-peroxide antimicrobial capacity to inhibit Staphylococcus aureus. We did not observed any relationship between the physicochemical parameters of the samples, and their ability to inhibit these microorganisms. The results obtained by the spectrophotometric method show that this method is easy and useful in the evaluation of the antibacterial capacity of honeys.


958. MASTEROV, G D (1995) [Apitherapy in the combined treatment of patients with pulmonary tuberculosis taking into account the hypophyseal-adrenal system indices]. Likars'ka sprava / Ministerstvo oхorony zdrov'ia України (1-2): 120-122. Abstract: Apitherapy (Venom of bees and apiculture products) was included into combined treatment of 93 in-patients with pulmonary tuberculosis. Apitherapy had a beneficial effect on the organism of tuberculosis patients, manifested by enhancement of the treatment effectiveness and normalization of indices of endocrine system. It is recommended that the instruction on apitoxinotherapy be amended, in particular, by substantially supplementing the paragraph with indications and contraindications for giving it in active tuberculosis.

959. MASTEROV, G D; NERSESIAN, O N (1995) [The role of apitherapy in the combined treatment of patients with chronic nonspecific lung diseases]. Likars'ka sprava / Ministerstvo oхorony zdrov'ia України (3-4): 155-158. Abstract: The authors suggest that apitherapy should be used in the treatment of patients with chronic non-specific pulmonary diseases (ChNPD) in order that it might be more effective. Apitherapeutic complex (bee venom and bee keeping apiculture produce) has been applied to the treatment of 104 ChNPD patients. High effectiveness of apitherapy in
a combined treatment of ChNPD patients was demonstrated as was their stimulating and normalizing influence on the function of the adrenals


Abstract: Known already as one of the most valuable hive products, propolis is more and more widely used in various food supplements and beverages. The scientific studies carried out in various laboratories all over the world also proved its beneficial effects as a therapeutic agent for many human diseases. As a result, this is an attempt to point out some significant aspects on propolis chemical composition, biochemical aspects, and pharmacological actions as well as some possibilities to approach the best method for its conditioning in order to use it in medical treatments. Some aspects concerning the requirements of the medical and pharmaceutical authorities for its standardization as well as the Romanian scientific and medical experience in this respect are discussed.


965. MATSUNO, T; JUNG, S K; MATSUMOTO, Y; SAITO, M; MORIKAWA, J (1997) Preferential cytotoxicity to tumor cells of 3,5-diprenyl-4-hydroxycinnamic acid (Artepillin C) isolated from propolis. *Anticancer Research* 17 (5A): 3565-3568.
Abstract: English Article. A tumoricidal substance was isolated from Brazilian propolis as guided by cytotoxicity assay on HuH 13 (human hepatocellular carcinoma) cell and was characterized to be 3-[4-hydroxy-3,5-bis (3-methyl-2-butenyl) phenyl]-2-propenoic acid (3,5-diprenyl-4-hydroxycinnamic acid (artepillin C)). It exhibited preferential cytotoxicity to tumor cells cultured in vitro. The cytotoxicity observed seemed to be partly attributable to apoptosis-like DNA fragmentation. The compound showed antitumor activity more effective than that of 5-fluorouracil to transplantable human tumor cell lines when tested on histoculture drug response assay system.


Abstract: The 1,2-dicarbonyl compounds 3-deoxyglucosulose (3-DG), glyoxal (GO), and methylglyoxal (MGO) were measured as the corresponding quinoxalines after derivatization with orthophenyldiamine using RP-HPLC and UV-detection in commercially available honey samples. Whereas for most of the samples values for 3-DG, MGO, and GO were comparable to previously published data, for six samples of New Zealand Manuka (Leptospermum scoparium) honey very high amounts of MGO were found, ranging from 3 8 to 761 mg/kg, which is up to 100-fold higher compared to conventional honeys. MGO was unambiguously identified as the corresponding quinoxaline via photodiodearray detection as well as by means of mass spectroscopy. Antibacterial
activity of honey and solutions of 1,2 dicarbonyl towards Escherichia coli (E. coli) and Staphylococcus aureus (S. aureus) were analyzed using an agar well diffusion assay. Minimum concentrations needed for inhibition of bacterial growth (minimum inhibitory concentration, MIC) of MGO were 1.1 mM for both types of bacteria. MIC for GO was 6.9 mM (E. coli) or 4.3 mM (S. aureus), respectively. 3-DG showed no inhibition in concentrations up to 60 mM. Whereas most of the honey samples investigated showed no inhibition in dilutions of 80% (v/v with water) or below, the samples of Manuka honey exhibited antibacterial activity when diluted to 15-30%, which corresponded to MGO concentrations of 1.1-1.8 mM. This clearly demonstrates that the pronounced antibacterial activity of New Zealand Manuka honey directly originates from MGO.


Abstract: The 1,2-dicarbonyl compounds 3-deoxyglucosulose (3-DG), glyoxal (GO), and methylglyoxal (MGO) were measured as the corresponding quinoxalines after derivatization with orthophenylendiamine using RP-HPLC and UV-detection in commercially available honey samples. Whereas for most of the samples values for 3-DG, MGO, and GO were comparable to previously published data, for six samples of New Zealand Manuka (Leptospermum scoparium) honey very high amounts of MGO were found, ranging from 3.8 to 761 mg/kg, which is up to 100-fold higher compared to conventional honeys. MGO was unambiguously identified as the corresponding quinoxaline via photodiodearry detection as well as by means of mass spectroscopy. Antibacterial activity of honey and solutions of 1,2-dicarbonyl towards Escherichia coli (E. coli) and Staphylococcus aureus (S. aureus) were analyzed using an agar well diffusion assay. Minimum concentrations needed for inhibition of bacterial growth (minimum inhibitory concentration, MIC) of MGO were 1.1 mM for both types of bacteria. MIC for GO was 6.9 mM (E. coli) or 4.3 mM (S. aureus), respectively. 3-DG showed no inhibition in concentrations up to 60 mM. Whereas most of the honey samples investigated showed no inhibition in dilutions of 80% (v/v with water) or below, the samples of Manuka honey exhibited antibacterial activity when diluted to 15-30%, which corresponded to MGO concentrations of 1.1-1.8 mM. This clearly demonstrates that the pronounced antibacterial activity of New Zealand Manuka honey directly originates from MGO.


Research 21 (1): 1-16.
Abstract: Rooibos (Aspalathus linearis) and honeybush (Cyclopia intermedia) are popular tisanes in their native South Africa and have a growing worldwide market. Both herbal teas are used traditionally for medicinal purposes and are rich in polyphenols with rooibos a rare source of the dietary dihydrochalcones, aspalathin and nothofagin. The principal polyphenols in honeybush include the xanthone mangiferin and the Havonones hesperitin and isokuranetin. Despite their divergent phytochemical and nutrient compositions, rooibos and honeybush share potent antioxidant and antimutagenic activities in vitro. Animal model studies indicate both herbal teas possess potent antioxidant, immune-modulating and chemopreventive actions. However, human studies of rooibos are limited and of honeybush are absent. No adverse effects of rooibos or honeybush consumption as tisanes have been reported. Copyright (c) 2006 John Wiley & Sons, Ltd

977. MCLENNAN, S V; BONNER, J; CHARLTON, A; LO, L; YUE, D K; TWIGG, S M (2008) Propolis improves wound healing in experimental diabetes
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978. MCLENNAN, S V; BONNER, J; MILNE, S; LO, L; CHARLTON, A; KURUP, S; JIA, J H; YUE, D K; TWIGG, S M (2008) The anti-inflammatory agent Propolis improves wound healing in a rodent model of experimental diabetes. Wound Repair and Regeneration 16 (5): 706-713. Abstract: Foot ulcers and poor wound healing are problematic for patients with diabetes. The beehive protectant Propolis can improve wound healing but whether it can improve healing in diabetic wounds has not been investigated. In this study, the effect of a single application of Propolis on epithelial closure, wound morphology, cellular infiltrate, and blood vessel density were investigated. Diabetes was induced in rats using streptozocin. After 6 weeks, diabetic and control animals were wounded and the wounds were treated with Propolis or saline as control. At days 6 and 12 animals were sacrificed and wounds were excised. Compared with controls, diabetes decreased epithelial closure and reepithelialization but had no effect on wound contraction. These delays were prevented by Propolis. At day 12, the impaired macrophage infiltration (C:1.49 +/- 0.09 vs. D:0.25 +/- 0.14), persistent neutrophil infiltration (C:0.22 +/- 0.19 vs. D:1.33 +/- 0.81), and increased myeloperoxidase activity (fourfold) in diabetic wounds were prevented by Propolis. Diabetes had no effect on wound volume, vessel number, or branch points. These novel data indicate that Propolis can accelerate wound healing in diabetics. As neutrophil infiltration is normalized, its mechanism of action may be through anti-inflammatory pathways. This result and the established safety profile of Propolis provide a rationale for studying topical application of this agent in a clinical setting

979. MEDHI, B; PRAKASH, A; AVTI, P K; SAIKIA, U N; PANDHI, P; KHANDUJA, K L (2008) Effect of Manuka honey and sulfasalazine in combination to promote antioxidant defense system in experimentally induced ulcerative colitis model in rats
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77605. Indian Journal of Experimental Biology 46 (8): 583-590. Abstract: Manuka honey (MH, 5g/kg) provided protection against trinitro-benzo-sulphonic acid induced colonic damage. Combination therapy (MH+sulfasalazine) also reduced colonic inflammation and all the biochemical parameters were significant compared to control and MH alone treated group. Combination therapy showed additive effect of the MH which restored lipid peroxidation and improvement of antioxidant parameters. Morphological and histological scores were significantly reduced in combination groups. In inflammatory model of colitis, oral administration of MH (5g/kg) and combination with sulfasalazine (360 mg/kg) with MH (5g/kg) significantly reduced the colonic inflammation. The results indicate the additive effect of Manuka honey with sulfasalazine in colitis

Abstract: D-002 is a mixture of higher aliphatic primary alcohols purified from beeswax with antioxidant effects. Acute hepatotoxicity induced with CCl4 in rats has been related to increased hepatic lipid peroxidation and prevented with some antioxidants. This study investigated whether D-002 could prevent the acute CCl4-induced hepatotoxicity in rats. Animals were randomly distributed into four groups: a negative control treated orally with the vehicle and three groups injected with CCl4 (1 mL/kg) and treated orally either with the vehicle (positive control) or with D-002 (25 and 100 mg/kg). Eighteen hours after CCl4 dosing, rats were anesthetized, and livers were removed for histopathological studies. Some portions were taken and homogenized for assessing malondialdehyde (MDA) concentrations. Positive, but not negative, controls showed ballooned cells, swollen hepatocytes, and lipid-included hepatocytes, as well as necrotic areas and inflammatory infiltrates. D-002 (25 and 100 mg/kg) dose-dependently and significantly (P < .01) decreased the frequency of all abnormal liver cell types and increased that of normal hepatocytes compared with the positive controls, not showing necrotic areas or inflammatory infiltrates. D-002 dose-dependently decreased hepatic MDA levels, but only in the highest dose group were these levels significantly lower than in the positive control. In conclusion, D-002 effectively prevented the histological liver disturbances and lowered MDA levels, a marker of cellular lipid peroxidation, in rats treated with CCl4. Since increased liver lipid peroxidation has been postulated as a cause of CCl4-induced liver damage in rats, the preventive effects of D-002 could be due to its antioxidant action, but such a proposal still requires further research.


982. MENGHINELLO, P; CUCCHIARINI, L; PALMA, F; AGOSTINI, D; DACHA, M; STOCCHI, V (1999) Simultaneous analysis of flavonoid aglycones in natural products using an RP-HPLC method. Journal of liquid chromatography & related technologies 22 (19): 3007-3018. Abstract: An RP-HPLC method for the simultaneous separation of the 16 main flavonoid aglycones and 3 important glycosides present in natural samples was developed. The separation was performed on a Supelcosil LC-318 column with eluants containing water, acetonitrile, and trifluoroacetic acid. The method was successfully applied to the analysis of propolis extract, a complex natural product containing flavonoid aglycones. Hydrolysis conditions able to convert all the flavonoid glycosides into the corresponding aglycones were optimised on different plant extracts. The chromatographic analysis supplied an accurate description of the qualitative and quantitative composition of the aglycones in these samples.

983. MENNITI-IPPOLITO, F; MAZZANTI, G; VITALONE, A; FIRENZUOLI, F; SANTUCCIO, C (2008) Surveillance of suspected adverse reactions to natural health products - The case of propolis. Drug safety 31 (5): 419-423. Abstract: Natural health products are promoted to the public as equally or more effective and less toxic than conventional drugs. However, some 'natural' medicines are known to have adverse effects. From April 2002 to August 2007, 18 suspected adverse reactions associated with propolis-containing products were reported to the national surveillance system of natural health products, coordinated by the Italian National Health Institute. Sixteen reports concerned allergic reactions (with dermatological or respiratory symptoms), while two concerned the digestive tract. Some of the reactions were serious: six patients were admitted to hospital or visited an emergency department and in two of these a life-threatening event was reported. In seven patients (four of whom were children), an allergic predisposition was indicated. Propolis, a resinous substance collected by honeybees from the buds of living plants, has been used for several purposes (dermatitis, laryngitis, oral ulcers) because of its wide range of suggested activities (antibacterial, antiviral, antifungal, anti-inflammatory, antioxidant and chemopreventive actions). However, propolis is also a potent sensitizer and should not be used in patients with an allergic predisposition, in particular an allergy to pollen. In Italy, products containing bee derivatives (bee pollen, royal jelly or propolis) are available to the public as food supplements. No label warning of possible adverse reactions is found on...
the packaging, although it is well known that atopic and asthmatic individuals may be at an increased risk of allergic reactions after using these products. The public and healthcare practitioners should be aware of the risk of allergic reactions to products derived from bees and a warning should be added to the packaging of these products.


Abstract: The antibacterial activity of honey samples from different sources were collected and investigated against Bacillus cereus, Staphylococcus aureus ATCC 25923, Pseudomonas aeruginosa ATCC 27853, Klebsiella pneumoniae ATCC 27736, Morganella morganii, Micrococcus luteus NRRL B-4375, Escherichia coli ATCC 35218, and Candida albicans. Pathogens exhibited different sensitivities towards the honey samples. The results showed that majority of the honey samples (75%) generally inhibited the bacteria tested. The honey samples which were obtained from Izmir (samples 1 and 2) proved more effective as inhibitors against P. aeruginosa, E. coli, and S. aureus. The honey which was obtained from Mug. la (sample 5) exhibited high antacandidal activity on C. albicans. A comparison of the honey samples on the basis of pollen content revealed that they were heterofloral, and samples which had highest antibacterial activity against P. aeruginosa, E. coli, and S. aureus were dominated by pollen from Chenopodiaceae/Amaranthaceae (sample 1), and Trifolium, Trigonella, Cyperaceae, Zea mays and Anthemis taxa (sample 2). The honey proved more effective on bacteria than antibiotics.


Abstract: Chrysin, apigenin, flavonoids, flavanones, naringenin, ethyl oleate, 3,4-dimethoxy-cinnamic acid and 9-octadecenoic acid were the predominant components of propolis samples collected from different regions of Turkey. The extracts of P3 from Denizli-Baskarci, P5 from Denizli and P7 from Tekirdag had effective antibacterial activities on Gram-negatives. Chrysin, which has antibacterial activity, was found to be high concentration. The extracts of P3, P2B from Aydin and P6 from Konya had much more effective antibacterial activities on Gram-positives. The total antioxidant activity increased with the increasing amount of extracts added to linoleic acid emulsion. All doses of propolis ethanol extract displayed antioxidant activity.

987. MERRIL, J S (1957) Composition and therapeutic properties of honey: selected, references. USDA Beltsville, USA; 11 pp


Abstract: After a survey of the literature on the antimicrobial activity of the bee product propolis, the authors discuss their own findings as compared to the chemotherapeutical agents streptomycin, oxytetracycline, chloramphenicol, nystatin, griseofulvin and sulphanermazine. According to the results obtained by testing 25 isolated constituents on Bacillus subtilis, Staphylococcus aureus, Candida albicans and Trichophyton mentagrophytes, the antimicrobial properties of this mixture of natural substances are
mainly attributable to the flavonoids pinocembrin, galangin, pinobanksin, pinobanksin-3-acetate as well as to the p-coumaric acid benzyl ester and a caffeic acid ester mixture. None of the isolated substances was as potent as the antibiotics tested for the purpose of comparison. The relatively good antimycetic activity of the 5,7-dihydroxyflavanone pinocembrin seems noteworthy. Finally, possible mechanisms of the antimicrobial action of the flavonoids are discussed.


Abstract: The degenerative gonartriosis represents an invalidant disease, due to the repetitive painless periods which creates a perturbation of the usual activities of the patients. The usual known therapeutic methods having less efficiency were completed with an alternative method: bee venom therapy on some acupoints.

**MATERIALS AND METHODS**

The studied group was formed from 22 patients, divided in two groups; one group of 12 patients received bee venom on acupoints, the other group of 10 patients was treated with acupuncture associated with some homeopathic injection administrated intra-articular.

**RESULTS AND DISCUSSION**

In the analysis of the results were considered some evaluation index; the degree of the functional impotency, the mobility of the knee, the character of the pain, the form and aspect of the knee. Analyzing these indexes has been concluded a significant amelioration of the clinical symptoms of the group of patients. The rate of efficiency at the group treated with VeneX-20 was 83.3% in comparison with the group treated with acupuncture where the rate of efficiency was only 70%.

**CONCLUSION**

The therapy with VeneX-20 permits a more rapid socio-professional re-insertion of the patients.


1002. MIRZOEVA, O K; GRISHANIN, R N; CALDER, P C (1997) Antimicrobial action of propolis and some of its components: the effects on growth, membrane potential and motility of bacteria. Microbiological Research 152 (3): 239-246. Abstract: English Article The effect of the natural bee product propolis on the physiology of microorganisms was investigated using B. Subtilis, E. Coli and R. Sphaeroides. An ethanolic extract of propolis had a bactericidal effect caused by the presence of very active, but labile, ingredients. The exact bactericidal effect of propolis was species dependent: it was effective against gram-positive and some gram-negative bacteria. Propolis and some of its cinnamic and flavonoid components were found to uncouple the energy transducing cytoplasmic membrane and to inhibit bacterial motility. These effects on the bioenergetic status of the membrane may contribute to the antimicrobial action of propolis and its observed synergism with selected antibiotics.


1004. MISHIMA, S; YOSHIDA, C; AKINO, S; SAKAMOTO, T (2005) Antihypertensive effects of Brazilian propolis: Identification of caffeoylquinic acids as constituents involved in the hypotension in spontaneously hypertensive rats. Biological & Pharmaceutical Bulletin 28 (10): 1909-1914. Abstract: Brazilian propolis was extracted with water or various concentrations of ethanol and were administered orally to spontaneously hypertensive rats (SHR) and the effects on blood pressure and heart rate were determined. Single oral administration of 100 mg/kg of propolis extracts decreased the blood pressure in SHR. Significant decrease in blood pressure was observed with propolis extracted with 25 and 70% ethanol. SHR were given orally 5 mg/kg of propolis extracted with 25 or 70% ethanol, twice a day for 28 d and the effects on blood pressure and heart rate were compared with control rats. While the blood pressure in the control group increased day by day, the increase was slower in rats treated with 25 and 70% ethanol extracts of propolis. The hypotensive activity of propolis extracted with 25% ethanol was more significant compared with control group than with 70% ethanol. Di- and tri-caffeoylquinic acids (CQAs) were found to be characteristic components of propolis extracted with 25% ethanol. A single oral administration of 3,4-diCQA, 3,5-diCQA, and 3,4,5-triCQA each at a dose of 10 mg/kg were conducted in SHR. These three components were found to have antihypertensive effects and therefore contribute to the antihypertensive effects of propolis extract. These results suggest that 25% ethanol extract of propolis is useful for prevention and treatment of hypertension.


1013. MLADENOV, S (1978) Pcelnité produkti hrana i lekarstvo (BG)/The bee products - food and medicine. Medizina i Fizkultura Sofia; 213 pp


Abstract: Propolis is a resinous natural hive product derived from plant exudates collected by honey bees. Due to biological and pharmacological activities, it has been extensively used in folk medicine. The present study was designed to measure the antioxidant power of ethanolic extracts of propolis samples from different parts of Iran with "ferric reducing ability of plasma" (FRAP) assay and compare the results with Trolox at concentrations of 100, 1000 and 2000 mu g/ml. FRAP values of propolis ethanolic extracts were in the range of 31.5 +/- 14.6 to 1650 +/- 72 mu M, whereas the values of Trolox ranged from 125.25 +/- 9.95 to 3381.64 +/- 1113.83 mu M. The FRAP values of Tehran propolis ethanolic extract and Trolox at concentration of 100 mu g/ml did not show any significant difference (P > 0.05). Total flavonoid and polyphenol contents of ethanolic extracts of propolis samples, determined by using aluminum nitrate and Folin-Ciocalteu colorimetric methods, were in the range of 1.22 +/- 0.33-7.79 +/- 0.39 g/100 g and 3.08 +/- 0.02-8.46 +/- 0.03 g/100 g crude extract of propolis, respectively. The result of this experiment may show that propolis as a natural source of antioxidant compounds may be of use in prevention of free radical-related diseases. (c) 2006 Elsevier Ltd. All rights reserved

Abstract: Propolis is a resinous natural hive product derived from plant exudates collected by honeybees. Due to biological and pharmacological activities, it has been extensively
used in folk medicine. The present study was designed to investigate the chemical composition, sub-chronic toxicity, antimicrobial activity of Iranian propolis ethanolic extract, which has not been studied previously. One hundred and nine compounds were identified by gas chromatography-mass spectrometry analysis. Forty-five days subchronic toxicity of oral propolis extract was investigated in male rats. During the study no significant behavioral and clinical toxicity has been seen in animals however, hematologic, blood biochemistry and histopathologic data studies exhibited some significant differences between the groups. The ethanolic extract of propolis inhibited the growth of all examined microorganisms including bacteria and fungi with the highest antimicrobial activity against Gram-positive bacteria such as Staphylococcus aureus and Staphylococcus epidermidis.

(c) 2006 Elsevier Ltd. All rights reserved


1029. MOLAN, P C (1999) Establishing honey as a recognised medicine. The Apimondia Congress Vancouver, Canada


1046. MOLAN, P C; ALLEN, K L; TAN, S T; WILKINS, A L (1989) Identification of components responsible for the antibacterial activity of manuka and viper's bugloss honeys, Annual Conference of the New Zealand Institute of Chemists


Abstract: There is increasing usage of honey as a dressing on infected wounds, burns and ulcers, but there is some concern that there may be a risk of wound botulism from the clostridial spores sometimes found in honey. Therefore an investigation was carried out to assess the effect on the antibacterial activity of honey of a commercial sterilization procedure using gamma-irradiation (25 kGy). Two honeys with antibacterial activity due to enzymically-generated hydrogen peroxide and three manuka honeys with non-peroxide antibacterial activity were investigated. The honeys were tested against *Staphylococcus aureus* in an agar well diffusion assay. There was no significant change found in either type of antibacterial activity resulting from this form of sterilization of honey, even when the radiation was doubled to 50 kGy. Testing of honey seeded with spores of *Clostridium perfringens* and *C. tetani* (10<sup>000</sup> and 1000 spores/g honey, respectively) showed that 25 kGy of gamma-irradiation was sufficient to achieve sterility.


Abstract: English Article The pollen grains in honey reveal the types of plants that were around when the bees produced the honey, thus it is valid to use melissopalynology to determine the geographical origin of honeys, but there are several reasons why it is less valid for determining the botanical origin of honeys.


Abstract: The cytokine macrophage migration inhibitory factor (MIF) has recently emerged as a crucial factor in the pathogenesis of rheumatoid arthritis (RA). It is debated whether the MIF meditated tautomeric conversion of either phenylpyruvate or of its other phenolic substrates is implicated in the pro-inflammatory action of this cytokine. Traditional herbal remedies have been used for centuries to alleviate inflammatory ailments of many kinds including arthritis. Several of their active ingredients identified are mono- or poly-phenol derivatives. In the present study the effect of some anti-inflammatory plant phenols on MIF mediated tautomerism of phenylpyruvate was investigated. Curcumin and caffeic acid were found to be the most potent inhibitors, exhibiting IC50 values in the submicromolar range.
range in the ketonase assay. Resveratrol and umbelliferon were almost as potent inhibitors as the antipyretic-analgetic drug acetaminophen. Our results reveal MIF as a possible target for the herbal anti-rheumatic agents. (c) 2005 Elsevier B.V All rights reserved


1086. MONTEVERDI, T; REITANO, S (1972) Eutrophic effect of a "natural food" (queen honeybee larvae) in a group of psychiatric patients. Minerva Dietologica 12 (4): 133-144.


1088. MOREIRA, L; DIAS, L G; PEREIRA, J A; ESTEVINHO, L (2008) Antioxidant properties, total phenols and pollen analysis of propolis samples from Portugal. Food and Chemical Toxicology 46 (11): 3482-3485. Abstract: Pollen analysis, total phenols content and antioxidant activity were studied for the first time in Portuguese propolis samples from Bornes and Fundao regions. Total phenols content was determined by colorimetric assay and their amount was of 329 mg/g of GAE in Bornes sample and 151 mg/g of GAE in Fundao propolis. The antioxidant capacity of propolis extracts was assessed through the scavenging effects on DPPH (2,2-diphenyl-1-picrylhydrazyl) and reducing power of iron (III)/ferricyanide complex assays. A concentration-dependent antioxidative capacity was verified in DPPH and reducing power assays. Low values of EC50 on DPPH scavenging assay were obtained for Bornes and Fundao propolis (of 6.22 μg/mL and 52.00 μg/mL, respectively). For reducing power the values were 9.00 μg/mL, for Bornes propolis, and 55.00 μg/mL, for Fundao propolis. The high activity of propolis from Bornes could be related with their different pollen composition. The results obtained indicate that Portuguese propolis is an important source of total phenols showing antioxidant properties that could be beneficial for human health. (C) 2008 Elsevier Ltd. All rights reserved


1091. MORLOT, M (1997) Congrès international d'apithérapie de Tel-Aviv (Israël) - 26-30 mai 1996. Résumés de quelques communications. UNAF (Union nationale de l'apiculture française), Paris No spécial "Apithérapie" (76-79)


127


Abstract: We investigated mechanism(s) where propolis induces apoptosis in human leukemic U937 cells. Propolis inhibited the proliferation of U937 cells in a dose-dependent manner by inducing apoptosis and blocking cell cycle progression in the G2/M phase. Western blot analysis showed that propolis increases the expression of p21 and p27 proteins, and decreases the levels of cyclin B1, cyclin A, Cdk2 and Cdc2, thereby contributing to cell cycle arrest. DAPI staining assay revealed typical morphology features of apoptotic cells. Propolis-induced apoptosis was also confirmed by assays with annexin V-FITC, PI-labeling and DNA fragmentation assay. The increase in apoptosis level induced by propolis was associated with down-regulation of Bcl-2 and activation of caspase-3, but not with Bax. These results suggest that propolis-induced apoptosis is related to the selective activation of caspase-3 and induction of Bcl-2/Bax regulation. (C) 2008 Elsevier B.V. All rights reserved


Abstract: The present study aimed at investigating the susceptibility of the microorganisms Pseudomonas aeruginosa, Salmonella typhi, Escherichia coli, Staphylococcus aureus, and Bacillus subtilis to ethanolic extracts of propolis (EEP) from three regions of Kenya (Taita, Tana and Samburu). Propolis was extracted using four different concentrations of ethanol: pure, 70%, 50%, and 30%. Ethanol (70%) and Streptomycin were used as controls. The agar diffusion method using filter paper disks was employed. Antibacterial activity was determined as an equivalent of the inhibition zones diameters (in millimeters) after incubation at 37 degrees C for 24h. Significant differences in the antibacterial activities of propolis were observed among the three regions, depending on the test microorganisms and on the procedure used for the preparation of propolis extract. Bacillus subtilis and Staphylococcus aureus were the most susceptible bacteria and 70% EEP had the best antibacterial effect.


Abstract: Objectives: Honey has had a valued place in traditional medicine for centuries. Renewed interest in honey for various therapeutic purposes, including treatment of infected wounds, has led to the search for different types of honey with antibacterial
activity. In this study, we have assessed the antibacterial activity of different types of honey (manuka honey from Australia, heather honey from the United Kingdom, and locally marketed Indian honey). Methods: The agar dilution method was used to assess the antibacterial activity of honey against 152 isolates of Pseudomonas aeruginosa by determining minimum inhibitory concentrations. Results and conclusions: The locally available (khadi kraft) honey produced the best activity against Pseudomonas aeruginosa and was found to be better than all of the imported varieties of therapeutic honey.


1104. MULLER, U; FRICKER, M; WYMANN, D; BLASER, K; CRAMERI, R (1997) Increased specificity of diagnostic tests with recombinant major bee venom allergen phospholipase A2. Clinical and Experimental Allergy 27 (8): 915-920.

Abstract: English Article Background: In diagnosis of type I allergy recombinant allergens have potential advantages over conventional allergenic extracts, both regarding specificity and reproducibility. Objectives We therefore decided to study honey bee venom (BV) and its major allergen phospholipase A2 (PLA2) in native and recombinant form for diagnosis of bee sting allergy. Method We investigated 85 patients with a history of a recent systemic allergic bee sting reaction and positive intracutaneous skin test to BV, and 21 controls with no history of allergic bee sting reaction and negative skin test to BV. Intracutaneous skin tests and determination of specific IgE by ImmunoCAP(R) to BV, native PLA (nPLA) and recombinant PLA (rPLA) were done in all patients and controls. Results In skin testing 84 (99%) of the 85 patients reacted to nPLA and 81 (95%) to rPLA, while none of the 21 controls was positive with nPLA or rPLA. Specific serum IgE to BV could be detected in 82 of the patients (96%), to nPLA in 73 (86%) and to rPLA in 66 (78%). Four (19%) of the controls had a positive CAP to BV, one (4.8%) to nPLA and none to rPLA. Analysis of discordant results in CAP showed, that most patients with specific IgE to BV, but not to nPLA and rPLA, had positive skin tests to both PLA preparations and low levels of BV specific IgE. Patients with specific IgE to nPLA but not to rPLA were usually sensitized to minor allergens of BV which contaminated the commercial nPLA. Conclusions PLA is the major allergen in BV. While diagnostic tests with BV are more sensitive, the specificity of tests with PLA, especially rPLA is clearly increased as compared with BV.


1106. MUNN, P (1998) Beeswax & propolis for pleasure and profit. Cardiff, UK; International Bee Research Association; v + 30 pp

Abstract: OBDD. G. Lowe The purpose of this book is to encourage beekeepers to explore the commercial possibilities of hive products other than honey. B. Reynolds (pp. 1-4) describes the history of beeswax usage, the main geographical origins of beeswax today, refining beeswax and the problem of adulteration, and the varied uses of beeswax. M. Stoakley (pp. 5-9) gives advice on 'what beekeepers can do with their beeswax', including collecting, washing, melting and straining it, and using it in various ways once it has been processed. P. J. Houghton (pp. 10-15) explores the scientific reasons for the medicinal uses of propolis and discusses its chemical constituents. J. Fearnley (pp. 16-19) describes 'developing propolis commercially', particularly as a health product. Finally, R. Krell (pp. 20-27) describes propolis products as a means of 'adding value to beekeeping'. He describes collection methods, storage, extraction, ethanol-extracted propolis (EEP), propolis products, labelling, and quality control. The 2 appendixes give tips on candle-making, and information on further reading and beekeeping equipment suppliers in the UK.

1107. MUNN, P; JONES, R (2001) Honey and healing. International Bee Research Association IBRA Cardiff, GB; 50 pp
Abstract: A comparison of the phenolic content of several Chilean honeys showed great variations in flavonoid concentration among the samples analysed. Higher amounts of phenolics are found in honey from dry climates. The antioxidant effect of extracts, using ORAC analysis, did not correlate with the flavonoid content or with the total phenolic concentration.

Abstract: Viscidone (0.5%), vanillin, 3',4'-(methylendioxy) acetophenone, 3-ethoxy-4-methoxybenzaldehyde, cinnamic acid, 3-methoxy-4-hydroxymethyl ester were isolated from propolis of hives from Cuncumen. This is the first report on propolis composition of an arid and a Mediterranean type climate area.


Abstract: OB. Walker This literature survey cites 19 references which have reported the effectiveness of honey in healing wounds. The encouraging results of some clinical trials suggest that more work should be done on this medicinal property of honey.


Abstract: English Article Background: Specific immunotherapy with honeybee venom (BV) is highly effective, but allergic side effects can occur during treatment. Immunotherapy
with peptides containing major T-cell epitopes of the relevant allergen or allergens provides an alternative strategy without these problems. Objective: The study investigates the immunologic mechanisms and clinical effects of immunotherapy with T-cell epitope peptides of the major BV allergen, the phospholipase A2 (PLA). Methods: Five patients with IgE-mediated systemic allergic reactions to bee stings were treated with a mixture of three T-cell epitope peptides of PLA. Ten patients allergic to BV receiving whole BV immunotherapy served as control subjects. Increasing doses of the peptide mixture, up to a maintenance dose of 100 μg, were administered subcutaneously within 2 months. The patients were then challenged with PLA and 1 week later with a bee sting. The cellular and humoral immune response was measured in vitro. Results: No allergic side effects were caused by the peptide immunotherapy, and all patients tolerated the challenge with PLA without systemic allergic symptoms. Two patients developed mild systemic allergic reactions after the bee sting challenge. After peptide immunotherapy, specific proliferative responses to PLA and the peptides in peripheral blood mononuclear cells were decreased in successfully treated patients. The production of T-H2 and T-H1 cytokines was inhibited, and B cells were not affected in their capacity to produce specific IgE and IgG4 antibodies. Their levels increased after allergen challenge in favor of IgG4. Conclusions: Immunotherapy of BV allergy with short T-cell peptides of PLA induces epitope-specific anergy in peripheral T cells and changes the specific isotype ratio in a fashion similar to that of conventional immunotherapy in successfully treated patients.


Abstract: Background: Rheumatoid arthritis (RA) is a prevalent and debilitating disease that affects the joints. Infiltration of blood-derived cells in the affected joints upon activation generate reactive oxygen/nitrogen species, resulting in an oxidative stress. One approach to counteract this oxidative stress is the use of antioxidants as therapeutic agents. Objectives. Kalpaamruthaa (KA), a modified indigenous Siddha preparation constituting Seinecarpus anacardium nut milk extract (SA), Emblica officinalis (EO) and honey was evaluated for its synergistic antioxidant potential in adjuvant induced arthritic rats than sole SA treatment. Materials and methods: Levels/activities of reactive oxygen species (ROS)/reactive nitrogen species (RNS), myeloperoxidase, lipid peroxide and enzymic and non-enzymic antioxidants were determined in control, arthritis induced, SA and KA treated (150 mg/kg b.wt.) animals. Results and conclusion: The levels/activities of ROS/RNS, myeloperoxidase and lipid peroxide were increased significantly (p < 0.05) and the activities of enzymic and non-enzymic antioxidants were in turn decreased in arthritic rats, whereas these changes were reverted to near normal levels upon SA and KA treatment.
treatment. KA showed an enhanced antioxidant potential than sole treatment of SA in adjuvant induced arthritic rats. KA via enhancing the antioxidant status in adjuvant induced arthritic rats than sole SA treatment proves to be an important therapeutic modality in the management of RA and thereby instituting the role of oxidative stress in the clinical manifestation of the disease RA. The profound antioxidant efficacy of KA than SA alone might be due to the synergistic action of the polyphenols such as flavonoids, tannins and other compounds such as vitamin C and hydroxycinnamates present in KA.

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Abstract: Enzymatic hydrolysates were prepared from royal jelly using three enzymes (pepsin, trypsin, and papain), and their antioxidative properties were evaluated. The yield of these hydrolysates was very high, about 20-26% on a raw weight basis. In comparison with the antioxidative activities of water extract and alkaline extract of royal jelly, the antioxidative activities and scavenging activities against active oxygen species such as superoxide anion radical and hydroxyl radical were high in the sample with a low protein concentration. These results suggest that once royal jelly is hydrolyzed using enzyme, the hydrolysate possesses much higher antioxidative activity and scavenging activity against active oxygen species. Royal jelly will act as a medicinal food in the human body


Abstract: water extract (WSR) and an alkaline extract (ASR) were prepared from fresh royal jelly from Chinese bees. The yields were about 8.3 and 6.3% on a dry weight basis, respectively. On SDS-PAGE analysis, the protein patterns of the two extracts were very similar, but not identical. Antioxidant activities, in both extracts, increased, depending on the concentration of the sample. The scavenging activities, against superoxide radical of WSR and ASR were high, and the activities at 100 mg/ml were the same as that of 5 mM ascorbic acid. Although the activities of WSR and ASR, at 50 and 100 mg/ml, did not match that of 1 mM tocopherol, the samples scavenged hydroxyl radical to about 50-60%.

This shows that the protein fractions in royal jelly have high antioxidative activity and scavenging ability against active oxygen species. Royal jelly seems applicable in both health food and medicine. (C) 2003 Elsevier Ltd. All rights reserved


Abstract: The antioxidative abilities of pollen extracts were evaluated using lipid peroxidation model system. Ethanol-soluble fraction (ESF) was most active followed by hot-water fraction (HWF). These abilities of pollen extracts were higher than that of 5 mM ascorbic acid and were similar to that of 1 mM alpha-tocopherol. Superoxide-scavenging capacities were decreased in the order water-soluble fraction > HWF > ESF. ESF showed the highest hydroxyl radical scavenging ability among these samples. The pollen extracts showed DPPH radical scavenging ability. Particularly the ability of ESF gradually increased with passage of the time (about 80% to 10 min). It suggests that the extracts of the pollen are good scavengers of active oxygen species. This property of the pollen seems to be important in prevention of various diseases such as cancer, cardiovascular diseases, and diabetes.


1132. NAHMIAS, F (1995) *El extraordinario poder curativo de la miel*. Spain


Abstract: Fibroblast growth factor-2 (FGF-2) is implicated in normal growth and development as well as response to injury in many tissues, including the heart. We showed previously that FGF-2 is cardioprotective when provided acutely to cardiomyocytes, to ex vivo perfused hearts, and in vivo. However, FGF-2 is normally produced and released in the heart, suggesting that a chronic increase in endogenous FGF-2 levels will result in injury-resistant hearts. In agreement, isolated hearts from FGF-2-overexpressing transgenic (TG) mice displayed increased cardiomyocyte survival after global ischemia and reperfusion. Echocardiography has now been used to assess cardioprotection in an isoproterenol model of injury in FGF-2 TG versus non-TG mice in vivo.

Mice were assessed at 24 h as well as 2 and 4 weeks after isoproterenol administration. A significant decrease in Tissue Doppler parameters was observed in both TG and non-TG mice when compared to baseline, but non-TG mouse hearts had significantly reduced left ventricular endocardial velocity when compared to the TG mice, predicting an improved outcome for the FGF-2-overexpressing mice. An assessment of cellular infiltration in heart sections stained with haematoxylin and eosin revealed a significant 6-fold increase in the size of these regions in TG mice when Effects of natural honey as a pharmacologic preconditioning agent on ischemia/reperfusion (I/R) induced arrhythmias and infarct size were investigated in isolated rat heart. The hearts were subjected to 30 min regional ischemia followed by 120 min reperfusion. In control group, the hearts were perfused by a modified Krebs-Henseleit solution, however, in the test groups they were perfused by enriched Krebs solution with honey (0.25, 0.5 and 1%) 10 min before to 10 min after ischemia. The arrhythmias were analyzed based on the Lambeth conventions. The infarct size was determined by TTZ and planimetry methods. At the ischemia, the number of ventricular ectopic beats (VEBs) in the control group was 667±116 while perfusion of honey (0.25, 0.5 and 1%) reduced it to 128±35 (p b0.01), 161 ± 35 (p b0.01) and 303 ± 94 (p b0.05), respectively. The time spent in ischemic ventricular tachycardia (VT) was markedly lowered by the same concentrations. In addition, honey (0.25 and 0.5%) decreased the incidence of VT from 100% (control) to 13% (p b0.001) and 25% (p b0.01), respectively. During reperfusion, the number of VEBs and VT were significantly reduced by all used concentrations. Honey (0.25%) significantly decreased the incidence and time spent for reversible ventricular fibrillation. Moreover, perfusion of honey (0.25, 0.5 and 1%) reduced infarct size from 46.3 ±2.9% (control value) to 3.3±1.3, 9.2±1.9 and 11.7±2.2%, respectively (p b0.001 for all). The results showed antiarrhythmic and anti-infarct properties of natural honey as a preconditioning agent. Antioxidant activity of honey, scavenging of free radicals and presence of energy sources such as glucose might be involved in these protective effects.


Abstract: We investigated whether water extract of Brazilian green propolis (WEP) and its main constituents, caffeoylquinic acid derivatives, exert neuroprotective effects via antioxidant actions. Life sciences.Pt.2: Biochemistry, general and molecular biology 80 (4): 370-377.
concentration-dependently inhibited oxidative stress-induced neurotoxicity [achieved using L-buthionine-(SR)-sulfoximine (BSO) to deplete glutathione in combination with glutamate to inhibit cystine uptake] in cultured retinal ganglion cells (RGC-5, a rat ganglion cell line transformed using E1A virus). At their effective concentrations against oxidative stress-induced retinal damage, WEP, 3,4-di-caffeoylquinic acid, 3,5-dicaffeoylquinic acid, and chlorogenic acid (but not cinnamic acid derivatives) inhibited lipid peroxidation (LPO) in mouse forebrain homogenates. Thus, the neuroprotective effects of WEP and caffeoylquinic acid derivatives paralleled those against LPO. These findings indicate that WEP and caffeoylquinic acid derivatives have neuroprotective effects against retinal damage in vitro, and that these effects may be partly mediated via antioxidant effects. (c) 2006 Elsevier Inc. All rights reserved


1138. NARDI, U (1996) *Apitherapia. Curarsi con il miele, polline, propoli, pappa reale e veleno d'api.* Aporie Edizione Roma, Italia

Abstract: Honey has been used long ago to treat wounds and cutaneous ulcers, and its healing properties have recently been rediscovered. Its applications on wounds or infected burns give satisfactory results. In a study of 40 patients with wounds of various origin honey provided healing in 88 percent of the cases. At the end of the healing process a few microorganisms were isolated from the wounds, but they did not prevent consolidation. This treatment, therefore, seems to be effective; moreover, as it is simple and inexpensive it should be better known and added to the list of commonly used antiseptic products


Abstract: Flavonoids have recently been found in large amounts in knotwood and stemwood of several tree species. Six flavonoids, two flavonoid glucosides, and one cinnamic acid derivative were isolated from Jack pine and European aspen knotwood and structurally characterised using GC-MS, HR-MS, and NMR spectroscopic analyses. Isolated compounds were further assessed on basis of their potency to inhibit lipid peroxidation and scavenge peroxyl radicals. All tested compounds possessed antioxidant properties close to that of the reference compound Trolox

Abstract: English Article Waxes of 23 samples of propolis of Apis mellifera mostly from Brazil yielded monoesters as main constituents, followed by hydrocarbons. The methyl and acetyl esters of the carboxylic acids and alcohols, respectively, derived from the monoesters, and the hydrocarbons were analysed by gas chromatography/electron
impact-mass spectrometry. The hydrocarbons comprise n-alkanes and alkenes, the main homologues being C27H56, C29H60, C31H64 and C33H68. Iso-Alkanes in low amounts were found in some samples. The main carboxylic acids are C-16:0, C-18:0, C-18:1. The primary alcohols range from C-24 to C-34, C-30 being generally the main constituent. A wide variation in the distribution of hydrocarbons, acids and alcohols was found comparing one sample with another. The composition of propolis wax is similar to that of comb wax, which suggests that propolis waxes are probably secreted by the bees, rather than originating from plants. (C) Inra/DIB/AGIB/Elsevier, Paris.

1145. NEPOTE, V; MESTRALLET, M G; GROSSO, N R (2004) Natural antioxidant effect from peanut skins in honey-roasted peanuts. *Journal of Food Science* 69 (7): S295-S300. Abstract: The purpose of this work was to determine the antioxidant effect of extracts obtained from peanut skins on honey roasted peanuts. A consumer test, chemical analysis, and descriptive sensory analysis were performed on samples of honey roasted peanuts without antioxidants (HRP), honey roasted peanuts with natural antioxidant from peanut skins (HRP-NA), and honey roasted peanuts with butylated hydroxytoluene (HRP-BHT). The consumer acceptance test was performed on fresh products at day 0 to determine whether the addition of antioxidant has an effect on the product acceptance by the consumers. The chemical analyses, peroxide and thioarbituric acid reactive substance (TBARS) values, and the descriptive analysis were performed during 126 d of storage to determine the antioxidant effect of peanut skin extracts on product stability. Peroxide and TBARS values as well as oxidized and cardboard flavors increased, and roasted peanutty flavor decreased across the storage time for all samples. Addition of natural antioxidants from peanut skins did not affect the acceptance of the product but provided protection against lipid oxidation being a little less efficient compared with BHT. Peroxide value reached 10 meq O2/kg after 19.6 d in HRP, 28.0 d in HRP-NA, and 34.0 d in HRP-BHT.


1151. NIKOLOFF, S; GEORGIEWA, E; KALEWA, M; WASSILEFF, W; TODOROFF, W; DRJANOWSKI, S (1975) Zur hypotensiven Wirkung der Propolis *Der XXV. Internationale Bienenzüchterkongress Grenoble, Frankreich 1975*, Apimondia-Verlag; Bukarest, Rumänien; pp 244-245.

1152. NIRALA, S K; BLHADAURIA, M (2008) Propolis reverses acetaminophen induced acute hepatorenal alterations: A biochemical and histopathological approach. *Archives of Pharmacal Research* 31 (4): 451-461. Abstract: The present study has been conducted to evaluate the curative effect of propolis extract, a honey bee-hive product, against acetaminophen (APAP) induced oxidative stress and dysfunction in liver and kidney. Animals were challenged with APAP (2 g/kg,
p.o.) followed by treatment of propolis extract (100 and 200 mg/kg, p.o.) once only after 24 h. Release of trans-aminases, alkaline phosphatase, lactate dehydrogenase, and serum bilirubin were increased, whereas hemoglobin and blood sugar were decreased after APAP administration. Antioxidant status in both the liver and kidney tissues were estimated by determining the glutathione, malondialdehyde content and activities of the CYP enzymes, which showed significant alterations after APAP intoxication. In addition, activities of adenosine triphosphatase, acid phosphatase, alkaline phosphatase, and major cell contents (total protein, glycogen and cholesterol) were also altered due to APAP poisoning. Propolis extract successfully reversed the alterations of these biochemical variables at higher dose. Improvements in hepatorenal histoarchitecture were also consistent with biochemical observations. The results indicated that ethanolic extract of propolis has ability to reverse APAP-induced hepatorenal biochemical and histopathological alterations probably by increasing the antioxidative defense activities due to various phenolic compounds present in it.


1156. NIWA, Y; HANSSEN, M (1989) Protection for life. Thorston Publishing Group


1159. NOURI-ARIA, K T; WACHHOLZ, P A; FRANCIS, J N; JACOBSON, M R; WALKER, S M; WILCOCK, L K; STAPLE, S Q; AALBERSE, R C; TILL, S J; DURHAM, S R (2004) Grass pollen immunotherapy induces mucosal and peripheral IL-10 responses and blocking IgG activity. Journal of Immunology 172 (5): 3252-3259.

Abstract: T regulatory cells and IL-10 have been implicated in the mechanism of immunotherapy in patients with systemic anaphylaxis following bee stings. We studied the role of IL-10 in the induction of clinical, cellular, and humoral tolerance during immunotherapy for local mucosal allergy in subjects with seasonal pollinosis. Local and systemic IL-10 responses and serum Ab concentrations were measured before/after a double-blind trial of grass pollen (Phleum pratense, Phil P) immunotherapy. We observed local increases in IL-10 mRNA-positive cells in the nasal mucosa after 2 years of immunotherapy, but only during the pollen season. IL-10 protein-positive cells were also increased and correlated with IL-10 mRNA(+) cells. These changes were not observed in placebo-treated subjects or in healthy controls. Fifteen and 35% of IL-10 mRNA signals were colocalized to CD3(+) T cells and CD68(+) macrophages, respectively, whereas only 1-2% of total CD3+ cells and 4% of macrophages expressed IL-10. Following immunotherapy, peripheral T cells cultured in the presence of grass pollen extract also produced IL-10. Immunotherapy resulted in blunting of seasonal increases in serum allergen Phi p 5-specific IgE, 60- to 80-fold increases in Phi p 5-specific IgG, and 100-fold increases in Phi p 5-specific IgG4. Post-immunotherapy serum exhibited inhibitory activity, which coeluted with IgG4, and blocked IgE-facilitated binding of allergen-IgE.
complexes to B cells. Both the increases in IgG and the IgG "blocking" activity correlated with the patients' overall assessment of improvement. Thus, grass pollen immunotherapy may induce allergen-specific, IL-10-dependent "protective" IgG4 responses.


1162. O’LEARY, G P J; BELLIVEAU, J; MATOOK, G; GREENE, E (1979) The adjuvant-induced rat model as an experimental system to investigate a theory that corticosteroid acetates can be used as an indicator of arthritis in man, pp 23-27.


1164. OCAKCI, A; KANTER, M; CABUK, M; BUYUKBAS, S (2006) Role of caffeic acid phenethyl ester, an active component of propolis, against NaOH-induced esophageal burns in rats. International Journal of Pediatric Otorhinolaryngology 70 (10): 1731-1739. Abstract: Objectives: This study was evaluated to investigate the efficacy of caffeic acid phenethyl ester (CAPE), which is a natural honeybee product exhibits a spectrum of biological activities including anti-microbial, anti-inflammatory, antioxidant and anti-tumoral actions, on the prevention of stricture development after esophageal caustic injuries in the rat. Methods: Thirty healthy mate Wistar albino rats were utilized in this study. The rats were randomly allotted into one of three experimental groups: group A (sham) animals were uninjured. Caustic esophageal burn was created by applying 1 ml 37.5% NaOH to the distal esophagus. Group B rats were injured but untreated. Group C rats were injured and received CAPE (10 μmol/kg/day i.p. for 28 days). Efficacy of the treatment was assessed by measuring the esophageal transit time, stenosis index, histopathologic damage score and biochemically by determining tissue hydroxyproline content, lipid peroxidation and antioxidant enzyme activities. Results: The esophageal transit time, the stenosis index, histopathologic damage score and the hydroxyproline level were significantly increased in the untreated group compared with the sham and CAPE-treated groups. Treatment with CAPE decreased tissue hydroxyproline Levels, histological damage, and the stenosis index, but except the esophageal transit time. Caustic esophageal burn also increased the lipid peroxidation and decreased the antioxidant enzyme activities in the untreated group. CAPE treatments decreased the elevated lipid peroxidation and also increased the reduced antioxidant enzyme activities. In corrosive esophageal burn group with no treatment, the most consistent findings were degenerative changes and increased in submucosal collagen content, and the luminal narrowing. CAPE treatment protected esophagus. Nevertheless, there was the slight increase in submucosal collagen. Conclusions: It is concluded that CAPE has a preventive effect on the stricture development after esophageal caustic injuries in the rat. (C) 2006 Elsevier Ireland Ltd. All rights reserved

1165. ODDO, L P; HEARD, T A; RODRIGUEZ-MALAYER, A; PEREZ, R A; FERNANDEZ-MUNO, M; SANCHO, M T; SESTA, G; LUSCO, L; VIT, P (2008) Composition and Antioxidant Activity of Trigona carbonaria Honey from Australia. Journal of Medicinal Food 11 (4): 789-794. Abstract: Stingless bees (Tribe Meliponini) are a diverse group of highly eusocial bees distributed throughout the tropics and subtropics. Trigona carbonaria honey, from Australia, was characterized by traditional physicochemical parameters (acidity, sugars, diastase, electrical conductivity, hydroxymethylfurfural, invertase, nitrogen, and water content) and other compositional factors (flavonoids, polyphenols, organic acids, and water activity), as well as total antioxidant capacity and radical scavenging activity. For the Australian T. carbonaria, the traditional analytical parameters were similar to those
previously reported for neotropical stingless bee honey and confirm that honeys produced by Meliponini bees possess several physicochemical properties that are distinctly different from Apis mellifera honey, with higher values of moisture (26.5 +/- 0.8 g of water/100 g of honey), water activity (0.74 +/- 0.01), electrical conductivity (1.64 +/- 0.12 mS/cm), and free acidity (124.2 +/- 22.9 mEq/kg of honey) and a very low diastase activity (0.4 +/- 0.5 diastase number) and invertase activity (5.7 +/- 1.5 invertase number). The sugar spectrum was quite different from that of A. mellifera honey, with 20.3 +/- 2.9 g of maltose/100 g of honey. The values of pH (4.0 +/- 0.1), lactonic acidity (4.7 +/- 0.8 mEq/kg of honey), sucrose (1.8 +/- 0.4 g/100 g of honey), and fructose/glucose ratio (1.42 +/- 0.13) fell in the same ranges as those of A. mellifera honey. Citric (0.23 +/- 0.09) and malic (0.12 +/- 0.03) acid concentrations (in g/kg of honey) of T. carbonaria honeys were in the range described for A. mellifera honey. D-Gluconic was more concentrated (9.9 +/- 1.3 g/kg of honey), in the range of Italian Castanea, Thymus, Arbutus, and honeydew honeys. Flavonoid content was 10.02 +/- 1.59 mg of quercetin equivalents/100 g of honey, and polyphenol contents were 55.74 +/- 6.11 mg of gallic acid equivalents/100 g of honey. The antioxidant activity, expressed as percentage of 2,2’-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) cation (ABTS(-)) decolorization, was 233.96 +/- 50.95 mu M Trolox equivalents, and free radical 1,1-diphenyl-2-picrylhydrazyl (DPPH) depletion was 48.03 +/- 12.58 equivalents of ascorbic acid. All reported values are averages +/- standard deviation. The antioxidant activity can represent an important added value for T. carbonaria honey, to initiate a medicinal approach for both nutritional and pharmaceutical applications, besides further physicochemical characterization.


Abstract: One novel and three known hydroxycinnamic acid derivatives having antioxidant activities were isolated from a Brazilian bee pollen. They were identified as kaempferol 3-O-[2-O-p-coumaroyl]-alpha-L-arabinopyranoside, N-1, N-5, N-10-tri-p-coumaroyl spermidine, N-1, N-5, N-10, N-14- tetra-p-coumaroyl spermine, and monocaffeoyl-tri-p-coumaroyl spermine, respectively. The structure of the kaempferol glycoside was established on the basis of spectroscopic and chemical investigations. Among the isolated compounds, monocaffeoyl-tri-p-coumaroyl spermine showed the strongest free radical-scavenging activity, which was almost identical to that of a-tocopherol. On the other hand, the antioxidant effect of tri-p-coumaroyl spermidine on autooxidation of linoleic acid was strongest and nearly equal to that of ce-tocopherol.


Abstract: We studied the immunomodulatory effects of royal jelly (RJ), the principal food source of the queen honeybee, in this study, suppression of allergic reactions by RJ was investigated in DNP-KLH immunized mice (DNP-KLH mice). Oral administration of RJ (1 g/kg) to DNP-KLH mice significantly decreased the serum levels of antigen-specific Ig E and significantly inhibited DNP-KLH mediated-histamine release from mast cells, resulting in the suppression of immediate hypersensitivity reactions of ear skin. In DNP-KLH mice, IFN-gamma (Th1 cytokine) production from CD4(+) T cells was suppressed and IL-4 (Th2 cytokine) production from CD4(+) T cells was increased as compared to normal mice. On the other hand, RJ improved the balance of Th1/Th2 cell responses from Th2-dominant to Th1-dominant. RJ significantly increased GSH levels in macrophages from DNP-KLH mice. In addition, the administration of RJ to DNP-KLH mice increased IL-12 p40 mRNA expression and NO production, and decreased PG E2 production from macrophages as compared to untreated DNP-KLH mice. These results suggested that RJ suppressed antigen-specific Ig E production and histamine release from mast cells in association with...
the restoration of macrophage function and improvement of Tn1/Th2 cell responses in DNP-KLH mice. (C) 2001 Elsevier Science B.V, All rights reserved.


Abstract: Objective: To clinically compare the healing of abscess wounds dressed with either crude undiluted honey or Edinburgh University solution of lime (EUSOL). Design: A prospective clinical randomized study. Location: The Isolation Children's Ward of the Wesley Guild Hospital, Ilesa, an affiliate of the Obafemi Awolowo University, Ile-Ife, Nigeria. Subjects: Thirty-two (32) Nigerian children with 43 pyomyositis abscesses. Interventions: All subjects had fresh surgical incision and drainage of the abscesses and a 21-day course of ampicillin plus cloxacillin (Ampiclox) and gentamicin; the wounds were left to close spontaneously with twice-daily wound dressing with packing of the abscess cavity with either honey- or EUSOL-soaked gauze in two randomized treatment groups. Outcome measures: The clinical conditions of the wound sites were documented on days 1, 3, 7, and 21 as either clean or dirty, dry or wet, granulation tissue present or absent, and epithelialization present or absent; the length of hospital stay was also measured. Results: Honey-treated wounds demonstrated quicker healing and the length of hospital stay was significantly shorter in patients with honey-treated wounds than those treated with EUSOL (t = 2.45, p = 0.019). Conclusions: Honey is a superior wound dressing agent to EUSOL. Honey is recommended for the dressing of infected wounds, more so in tropical countries, where it is most readily available.


Abstract: Purpose: The aim of this study was to investigate the antimicrobial and anti-inflammatory properties of an ethanolic extract of propolis, a natural resin produced by honeybees, and to determine synergistic activity between ciprofloxacin and propolis in the treatment of experimental Staphylococcus aureus keratitis. Methods: Sixteen young New Zealand white rabbits were given intrastromal injections of S. aureus strains. Twenty-four hours later, the rabbits were randomly divided into 4 groups: group 1 was treated with topical 0.3% ciprofloxacin drops along with the ethanolic extract of propolis drops; group 2 received topical 0.3% ciprofloxacin drops; group 3 was administered the ethanolic extract of propolis drops, and group 4, the control group, was treated with phosphate-buffered saline (PBS) drops. Drugs were instilled 8 times/day for 72 h. Twenty-four and 96 h after inoculation of bacteria, the eyes were examined by slit lamp to assess corneal opacity. Corneas were removed to count bacteria. Results: Slit lamp examination showed that the corneal opacity scores were significantly lower in eyes that received propolis plus ciprofloxacin than in those treated with ciprofloxacin (p = 0.041) or propolis (p = 0.006) or control eyes treated with PBS (p = 0.0001). There was no significant difference in eyes treated with ciprofloxacin and propolis (p = 1.00). There were significantly fewer bacteria in eyes that received propolis plus ciprofloxacin than in those treated with ciprofloxacin (p = 0.001) or propolis (p = 0.001) or control eyes treated with PBS (p = 0.0001). There was no significant difference in eyes treated with ciprofloxacin and propolis (p = 0.38). Conclusions: Taking these findings into consideration, we suggest that the ethanolic extract of propolis has antimicrobial and anti-inflammatory properties for S. aureus.
keratitis. The combination of ciprofloxacin and propolis had better therapeutic effects than either agent alone. Copyright (C) 2005 S. Karger AG, Basel

1173. OKUMURA, K; KIYOHARA, Y; KOMADA, F; IWAKAWA, S; HIRAI, M; FUWA, T (1990) Improvement in wound healing by epidermal growth factor (EGF) ointment. Effect of nafamostat, gabexate, or gelatin on stabilization and efficacy of EGF. Pharm. Res. 7: 1289-1293.


1178. ONLEN, Y; DURAN, N; ATIK, E; SAVAS, L; ALTUG, E; YAKAN, S; ASLANTAS, O (2007) Antibacterial activity of propolis against MRSA and synergism with topical mupirocin. Journal of Alternative and Complementary Medicine 13 (7): 713-718. Abstract: Objectives: The aim of the present study was to investigate the activity of the propolis and its combinations with mupirocin against methicillin-resistant Staphylococcus aureus (MRSA) in nasal carriage. Methods: This study was carried out between June and August 2005. To infect nares of the rabbits, MRSA (ATCC 33591) strain was used. Minimum inhibitory concentration was determined according to National Committee for Clinical Laboratory Standards. Each inoculum was prepared in the same medium at a density adjusted to a 0.5 McFarland turbidity standard (10^5 colony-forming units [cfu]/mL) and diluted 1: 100 for the broth microdilution procedure. Ten microliters (10 muL) (10^5 cfu/mL) of the bacterial suspension containing approximately 1000 cfu of MRSA was administered with sterile microsyringe through both nostrils of each rabbit. Ninety-six (96) hours after inoculation, the presence of infection was confirmed by using bacterial cultures. Twenty-six young New Zealand rabbits were randomly divided into 4 groups. Each treatment group (1, 2, and 3) included 7 rabbits and control group (group 4) included 5 rabbits. Group 1 was treated with topical mupirocin + ethanolic extract of propolis drops, group 2 received topical mupirocin, group 3 was administered ethanolic extract of propolis drops, and the control group (group 4) was only treated with phosphate-buffered solution drops for 7 days. At the end of study, nasal cultures and smears were obtained for bacterial count and cytologic examination. Results: The colony numbers of bacteria in group 1 were determined to be significantly lower than in group 2 (p= 0.0001), group 3 (p = 0.0001), and group 4 (p = 0.0001). The mean bacterial cell counts of groups 1-4 were 360.2 +/- 52.4 cfu/mL, 4120.6 +/- 860.4 cfu/mL, 5980.8 +/- 1240.6 cfu/mL, and 11500.0 +/- 2568.4 cfu/mL, respectively. Mupirocin + propolis administration (group 1) resulted in a significant reduction in the polymorphonuclear leukocyte (PMNL) count in the mucous membranes of rabbits compared with the other treatment groups (p < 0.05). Conclusions: Propolis addition to mupirocin regimen was found to result in more profound reduction in bacterial cell count and inflammatory response compared with the rest of the treatment modalities.

Abstract: The aim of the current study was to evaluate the effects of five different treatment combinations to find out whether propolis could be an alternative or an adjunctive treatment, in experimental Pseudomonas aeruginosa keratitis. Intrastromal P aeruginosa strains were given to both eyes of 20 young New Zealand white rabbits. The rabbits were randomly divided equally into five treatment groups; ciprofloxacin and dexamethasone drops (C+D), ciprofloxacin drop (C), ciprofloxacin and propolis drops (C+P), propolis drop (P), 3% ethanol drop (control), respectively. Directly before the first treatment and 108h after inoculation, the eyes were examined by slit lamp to assess the corneal opacity and rabbits were sacrificed for bacterial count. The mean corneal opacity scores and the mean bacterial counts log cfu/ml were significantly different in the treatment groups (P = 0.001; ANOVA). According to post hoc tests for both the mean bacterial counts and corneal opacity scores, C+D, C, C+P groups were found to be statistically the same (P > 0.05), and although the P group had significantly better scores than the control group it did not reach the scores of the rest of the treatment groups (P < 0.01). We conclude that propolis may be a useful adjunctive agent but should not be regarded as a replacement for traditional antibiotic therapy for P aeruginosa keratitis in rabbits. (c) 2006 Elsevier GmbH. All rights reserved

Abstract: The effect of honey on blood alcohol metabolism and the accompanying changes in serum triacylglycerol and blood pressure were investigated using volunteers. Fifty consenting undergraduates in apparent good health, between the ages of 15 and 30 years (23.6 +/- 7.4), were recruited for the study. The subjects were moderate alcohol drinkers (<30 g ethanol/day), matched in body weight and frame size. The participants were given ethanol (0.5 g/kg) and ethanol + honey (0.5 g/kg + 1.25 ml/kg) on two different occasions separated by 1 week. The results show that honey significantly (p < 0.01) increased blood alcohol disappearance and elimination rates by 32.4 and 28.6%, respectively, but reduced the intoxication time (that is, the time taken to attain zero blood alcohol level) and its degree (the peak blood alcohol level) by 30.0 and 4.4%. Ethanol + honey further increased serum triacylglycerol and blood pressure by 20.8 and 1.3/1.4% when compared with the proportion induced by ethanol after about 10 h of ingestion. The occasional use of honey as an anti-intoxicating agent may be approved. Meanwhile, further studies on how to ameliorate or prevent the associated increase in serum triacylglycerol and blood pressure is required. Copyright (C) 2005 S. Karger AG, Basel


1185. ORSI, R O; SFORCIN, J M; FUNARI, S R C; FERNANDES, A; RODRIGUES, P; BANKOVA, V (2007) Effects of propolis from Brazil and Bulgaria on Salmonella serovars
Abstract: Propolis shows biological properties such as antibacterial action. This bee product has a complex chemical composition, which depends on the local flora where it is produced. Salmonella serovars are responsible for human diseases that range from localized gastroenteritis to systemic infections. The aim of the present study was to investigate the susceptibility of Salmonella strains, isolated from food and infectious processes, to the antibacterial action of Brazilian and Bulgarian propolis, as well as to determine the behavior of these bacteria, according to the incubation period, in medium plus propolis. Dilution of ethanolic extract of propolis in agar was the used method. Brazilian and Bulgarian propolis showed an antibacterial action against all Salmonella serovars. The minimal inhibitory concentrations (MIC) of propolis were similar, although they were collected in different geographic regions. Salmonella typhimurium, isolated from human infection, was more resistant to propolis than Salmonella enteritidis.


Abstract: The effect of propolis [it is a water-soluble derivative (WSDP)] and related polyphenolic compounds of propolis (caffeic acid, caffeic acid phenethyl ester and quercetin), honey, royal jelly and bee venom on tumour growth, metastasizing ability and induction of apoptosis and necrosis in murine tumour models (mammary carcinoma and colon carcinoma) was investigated. WSDP and related polyphenolic compounds showed significant anti-metastatic effect ($P < 0.01$ and $P < 0.001$) given either before or after tumour-cell inoculation. Oral or systemic application of WSDP or caffeic acid significantly reduced subcutaneous tumour growth and prolonged the survival of mice. Honey also exerted pronounced anti-metastatic effect ($P < 0.05$) when applied before tumour-cell inoculation (peroral $2 \text{ g kg}^{-1}$ for mice or $1 \text{ g kg}^{-1}$ for rats, once a day for 10 consecutive days). Royal jelly did not affect metastasis formation when given intraperitoneally or subcutaneously. However, intravenous administration of royal jelly before tumour-cell inoculation significantly ($P < 0.05$) inhibited metastasis formation. When mice were given $10^5$ tumour cells intravenously immediately after bee venom injection, the number of tumour nodules in the lung was significantly lower ($P < 0.001$) than in untreated mice or mice treated with bee venom subcutaneously. Local presence of bee venom in the tissue caused significant delay in subcutaneous tumour formation. These findings clearly demonstrate that anti-tumour and anti-metastatic effects of bee venom are highly dependent on the route of injection and on close contact between components of the bee venom and tumour cells. These data show that honey bee products given orally or systemically may have an important role in the control of tumour growth and tumour metastasizing ability.


Abstract: English Article Although it has been known for many centuries that honey can accelerate wound healing, there have only been isolated reports of its use in the healing.
of burns, ulcers, infected wounds and open wounds. None of these reports developed a model to assess the changes in morphological and biochemical properties due to topical application of honey on cutaneous wounds. In the present investigation, efficacy of honey in the healing of cutaneous wounds of rabbits was studied on the basis of histopathological and biochemical changes. For this reason 40 healthy White New Zealand rabbits were randomly assigned to four equal groups. Using aseptic surgical technique, a 3 cm incision was made on the skin of the left thigh of each rabbit and the wounds of live rabbits in each group were twice daily treated with topical application of 5 ml pure unheated honey. The other half remained as untreated controls. Rabbits in groups A, B, C and D were biopsied on days 2, 7, 14 and 21 postoperatively respectively, and biopsies from the lesions of all groups were collected for histopathological studies and from groups C and D for biomechanical evaluations as well. Treated lesions showed less oedema, fewer polymorphonuclear and mononuclear cell infiltration, less necrosis, better wound contraction, improved epithelialization and lower glycosaminoglycan and proteoglycan concentration on days 2 and 7 postoperatively and consequently an improved tissue ultimate strength and yield strength on days 14 and 21 postoperation. These findings suggest that honey applied topically on cutaneous wounds accelerates the healing processes and appears to have an important property that makes it ideal as a dressing for cutaneous wounds.

    Abstract: Propolis is a multifunctional material used by bees in the construction and maintenance of their hives. Propolis possesses several biologic activities such as anti-inflammatory, antibacterial, antioxidant, antifungal, antiviral, and tissue regenerative, among others. The purpose of this study was to determine the ability of propolis to serve as a temporary storage medium for the maintenance of periodontal ligament (PDL) cell viability of avulsed teeth. PDL cells were obtained from healthy third molars and cultured in Dulbecco’s Modified Eagles Medium (DMEM). Cultures were subjected to 10% propolis solution, 20% propolis solution, long-shelf life light milk with lower fat content (milk), Hank’s Balanced Salt Solution, tap water as the negative control, and DMEM as the positive control. Tissue culture plates were incubated with experimental media at 37 degrees C for 1, 3, 6, 12, or 24 hours. PDL cell viability was assessed by trypan blue exclusion. Statistical analysis of the data was accomplished by using one-way analysis of variance complemented by the Tukey test. The level of significance was 5% (p < 0.05). The results showed that 10% propolis was a more effective storage medium than other groups. In conclusion, propolis can be recommended as a suitable transport medium for avulsed teeth.
    Abstract: The antimicrobial activity of pollen and propolis extracts was investigated against 20 species of bacteria. A wide range of antibacterial activity was shown. Only the growth of B. amyloquefaciens, B. megaterium, E coli and E coli 01 57:H7 was not affected at all concentrations of both extracts. Among the bacteria tested, the most sensitive were S. aureus for a 1/5 level of pollen extract and L. monocytogenes for a 1/10
level of propolis extract. The most active extract level on growth of bacteria was a 1/10 concentration of propolis. At the other extreme, the inhibitory effects of propolis extract concentrations on growth of bacteria were higher when compared with the respective pollen extract concentrations. The least active concentrations towards the tested bacteria were the 1/50 level of pollen extract and the 1/1000 level of propolis extract. In conclusion it is to be stated that the extracts could be used as antibacterial agents

Abstract: The inhibitory extracts from different regions of Turkey were investigated in culture media. The least active concentration towards the tested fungus was 2% of both extracts. But, the inhibitory effects of all propolis extracts on mycelial growth were higher when compared with pollen extracts. While the effect of a 5% level of Antakya propolis extract increased with increasing incubation period, the antifungal effect of pollen extract from the same region on mycelial growth was less than that of the control group. As a result, none of the extracts tested completely inhibited mycelial growth. The highest inhibition rate was established at the 5% level of Taskent and Alanya propolis samples.

Abstract: The antioxidant activities of methanol extracts of propolis were tested in natural olive oil stored at 60 degreesC. The concentration of extracts in olive oil varied from 0.02 to 0.08%. Extracts at 0.06 and 0.08% concentrations had better antioxidant activity as compared to butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT) at 0.01% levels. The greatest antioxidant activities were exhibited by propolis balsam extract at 0.08% levels. It can be said that the antioxidant activity of propolis increases with concentration. This product is considered as a new source of natural antioxidants.

Abstract: Myocardial ischemia-reperfusion (MI/R) represents a clinically relevant problem associated with thrombolysis, angioplasty, and coronary bypass surgery. MI/R injury is known to occur on restoration of coronary flow after a period of myocardial ischemia. Injury of myocardium caused by I/R includes cardiac contractile dysfunction, arrhythmias, as well as irreversible myocyte damage. Prevention of myocardial death in acute coronary syndromes is the immediate goal of therapy. The main factor concerned with the experimental generation of reperfusion damage is oxygen-derived free radicals. This MI/R injury has been shown to be salvaged by supplementing antioxidants to diseased hearts. Caffeic acid phenethyl ester (CAPE), an active component of propolis extract, has antioxidant and anti-inflammatory properties, and may function in cardiac protection against I/R-induced damage. To test this hypothesis, we randomly assigned 14 male Wistar rats for necrosis experiments. To produce myocardial necrosis, the left main coronary artery was occluded for 30 min, followed by 120 min of reperfusion in anesthetized rats. CAPE (50 muM kg(-1)) was given intravenously 10 min before occlusion and continued during ischemia by infusion pump. The volume of infarct and the risk zone was determined by planimetry of each tracing and multiplying by the slice thickness. Infarct was normalized by expressing it as a percentage of the area at risk. Compared to control group, CAPE administration statistically reduced the myocardial infarct size/area of risk zone (50 +/- 4% and 32 +/- 6%, respectively) and the myocardial infarct size (23 +/- 3% and 9 +/- 4%, respectively) in rat model of ischemia-reperfusion. In conclusion, this result shows that CAPE is important in reducing I/R-induced myocardial damage. (R) 2004 The Canadian Society of Clinical Chemists. All rights reserved


Abstract: A 52-year-old woman presented with a large ulcerative tumour on the side of her face (4 x 3.9 x 1.1 cm), resulting from multiple bee [Apis mellifera] stings, used as a treatment for paraesthesia over a period of 1 year. Histology showed epidermal ulceration with granulomatous inflammatory cell infiltration of many eosinophils; no micro-organisms or foreign bodies were identified. Intrallesional triamcinolone acetonide was not effective, but an excellent outcome was obtained using carbon dioxide laser vaporization of the lesion. Accession date: 13 November 2000. Call number: 638.178. Library code: 13 ref. Language: En. Author address: Dept of Dermatology, Wonkwang Univ. School of Medicine, 344-2 Shinyong-dong, Iksan, Chonbuk 570-180, Korea Republic. Apicultural Abstracts from IBRA: AA614/01

Abstract: Two hemolymph proteins were isolated from the wax moth, Galleria mellonella, larvae by a two-step procedure consisting of acid extraction and reversed phase (RP)-HPLC. One was an apolipophorin III (apoLp-III) previously characterized as a lipopolysaccharide (LPS) binding protein in the hemolymph of G. mellonella. The other was confirmed to be a new protein with a molecular mass of 23,768.69 Da, referred to as Gm protein-24. The full-length cDNA of Gm protein-24 was cloned from the fat body. The cDNA structure showed that it is a 219-residues protein derived from the precursor of 236 amino acids. The effects of apoLp-III and Gm protein-24 have been tested on the insect immune immunity. ApoLp-III enhanced the activity of antibacterial peptide such as cecropin but Gin protein-24 had no effect on cecropin activity. On the other hand, Gm protein-24 and apoLp-III were both involved in the activation of prophenoloxidase (PPO) cascade, which has been regarded as a critical immune reaction in insect hemolymph. Of note, the Gm protein-24 was a significantly stronger activator of PPO cascade than apoLp-III. (C) 2004 Elsevier Ltd. All rights reserved

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PEIREN, N; DE GRAAF, D C; VANROBAEYS, F; DANNEELS, E L; DEVREESE, B; VAN BEEURNEN, J; JACOBS, F J (2008) Proteomic analysis of the honey bee worker venom gland focusing on the mechanisms of protection against tissue damage 46


Abstract: Honey bee workers use venom for the defence of the colony and themselves when they are exposed to dangers and predators. It is produced by a long thin, convoluted, and bifurcated gland, and consists of several toxic proteins and peptides. The present study was undertaken in order to identify the mechanisms that protect the venom gland secretory cells against these harmful components. Samples of whole venom glands, including the interconnected reservoirs, were separated by two-dimensional gel electrophoresis and the most abundant protein spots were subjected to mass spectrometric identification using MALDI TOF/TOF-MS and LC MS/MS. This proteomic study revealed four antioxidant enzymes: CuZn superoxide dismutase (SOD1), glutathione-S-transferase sigma 1 isoform A (GSTS1), peroxiredoxin 2540 (PXR2540) and thioredoxin peroxidase I isoform A (TPX1). Although glutathione-S-transferase (GST) has also been associated with xenobiotic detoxification, the protein we found belongs to the GST Sigma class which is known to protect against oxidative stress only. Moreover, we could demonstrate that the GST and SOD activity of the venom gland was low and moderate, respectively, when compared to other tissues from the adult honey bee. Several proteins involved in other forms of stress were likewise found but it remains uncertain what their function is in the venom gland. In addition to major royal jelly protein 9 (MRJP9), already found in a previous proteomic study, we identified MRJP8 as second member of the MRJP protein family to be associated with the venom gland. Transcripts of both MRJPs were amplified and sequenced. Two endocuticular structural proteins were abundantly present in the 2D-gel and most probably represent a structural component of the epicuticular lining that protects the secretory cells from the toxins they produce. (C) 2008 Elsevier Ltd. All rights reserved


Abstract: Propolis is a natural product dispensed ill pharmacies and natural product warehouses. Its properties have long been acknowledged in traditional medicine, yet presently there is no monographic standard. The propolis properties most cited in the literature are its anti-inflammatory, antioxidant, and antiseptic properties, as well as its ability to act as an antineoplastic agent. In this paper, the pharmacologic and analytical data for propolis are reviewed, with the aim of providing a standardization technique that allows the production of effective and safe propolis products


PEREIRA, A D; DE ANDRADE, S F; SWERTS, M S D O; MAISTRO, E L (2008) First in vivo evaluation of the mutagenic effect of Brazilian green propolis by comet assay and micronucleus test 81. Food and Chemical Toxicology 46 (7): 2580-2584.

Abstract: Propolis is a hive product containing chiefly beeswax and plant-derived substances such as resin and volatile compounds. Propolis has been used in various
parts of the world as an antiseptic and wound healer since ancient times, and interest in
the product has recently increased. Considering the lack of data concerning the in vivo
mutagenicity of green propolis, the capacity of this natural product to cause damage to
the DNA was evaluated, using the alkaline single-cell gel electrophoresis (SCGE) and
micronucleus test, in the peripheral blood cells of mice. The doses tested by gavage were
1000, 1500 and 2000 mg/kg. Micronucleus and SCGE assays showed that green propolis
causéd an increase in the damage to DNA in the peripheral blood cells of mice. The
polychromat: normochromic erythrocytes ratio was not statistically different from the
negative control. Considering the doses and the results obtained in this study, the acute
consumption of green propolis produced some mutagenic effects on the blood cells of
mice. (C) 2008 Elsevier Ltd. All rights reserved

Abstract: The antioxidant effect of several polyphenolic compounds is well known.
However, little is known about the antioxidant capacity of Venezuelan honey, which has a
high content of polyphenolic compounds. In this work, the antioxidant capacity of a
genuine honey produced in Merida, Venezuela was Studied using the ferrous iron
oxidation with xylene orange method, the thiobarbituric acid method, and the
determination of antioxidant activity. We found that this honey has the capacity to
decrease significantly the concentration of lipid hydroperoxides and malondialdehyde,
produced during the lipid peroxidation process, in a comparable way with other widely
studied antioxidants such as melatonin and vitamin E. It was found that the antioxidant
activity in the 50% honey dilution, the highest concentration we tested, was equivalent to
a concentration of uric acid of 0.62 mM

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composition and antioxidant capacity of Spanish honeys. Journal of agricultural and food
Abstract: The amino acid composition of 53 honey samples from Spain, consisting of 39
floral, 5 honeydew, and 9 blend honeys, has been determined. Physicochemical
characteristics, polyphenolic content, amino acid composition, and estimation of the
radical scavenging capacity against the stable free radical DPPH of the honey samples
were analyzed. The resulting data have been statistically evaluated. The results showed
that pH, acidity, net absorbance, electrical conductivity, and total polyphenolic contents of
the honeys showed a strong correlation with the radical scavenging capacity. The
regression between the radical scavenging capacity of honey and amino acid contents
was high with 18 of the 20 amino acids detected, with correlation values higher than those
obtained for polyphenolic content. These results suggest that the amino acid composition
of honey is an indicator of the sample’s scavenging capacity

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après inoculation du virus paragrippal du type 3 et administration thérapeutique de

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Abstract: From 01/01/1981 to 31/12/1986 inclusive, the S.A.M.U. of Lyon investigated 143 anaphylactic accidents in an extra-hospital environment. The allergological study has shown that 36.3% of the patients are already the victims of a similar incident (in 9.8% of cases, with the same product). The main causative products are the analgesics and non-steroid anti-inflammatory compounds, hymenoptera venoms and antibiotics. In about 1 in 4 cases the enquiry gave negative results. In 1 case in 2 there was a cardiovascular collapse; however it was not possible to establish the relationship between the severity of the clinical picture and the different classes of products. There were no deaths. In comparison with preceding studies there were no developments in the place occupied by the causative products.

Abstract: Free radicals and oxidants play a dual role as both toxic and beneficial compounds, since they can be either harmful or helpful to the body. They are produced either from normal cell metabolisms in situ or from external sources (pollution, cigarette smoke, radiation, medication). When an overload of free radicals cannot gradually be destroyed, their accumulation in the body generates a phenomenon called oxidative stress. This process plays a major part in the development of chronic and degenerative illness such as cancer, autoimmune disorders, aging, cataract, rheumatoid arthritis, cardiovascular and neurodegenerative diseases. The human body has several mechanisms to counteract oxidative stress by producing antioxidants, which are either naturally produced in situ, or externally supplied through foods and/or supplements. This mini-review deals with the taxonomy, the mechanisms of formation and catabolism of the free radicals, it examines their beneficial and deleterious effects on cellular activities, it highlights the potential role of the antioxidants in preventing and repairing damages caused by oxidative stress, and it discusses the antioxidant supplementation in health maintenance.


Abstract: Commonly used medicinal plant extracts with standardized content of polyphenols were investigated for their total antioxidant activity (TAA). Green tea, oligomeric procyanidins (from grape seed and pine bark), bilberry, and ginkgo exhibited TAA in the range of 5.12-2.57 mM Trolox, thereby indicating a valuable antioxidant capacity. Witch hazel, propolis EPID, artichoke, and hawthorn afforded lower TAA (1.54-0.44 mM Trolox), whereas echinacea, ginseng, passionflower, sweet clover, and eleuthero were rather ineffective (TAA < 0.32 mM Trolox). Excipients normally used to prepare the extracts did not interfere with the assay, and a good correlation between the content of polyphenols and the TAA was assessed. The measured TAA was higher than those calculated from the content and antioxidant potential of specific components, as exemplified for green tea and ginkgo extracts. This may be attributed to the presence in these extracts of other substances with antioxidant capacity. On the other hand, some components (such as ginkgolides in ginkgo extract) insensitive to the TAA assay played an important antioxidant role in vivo. These results suggest that TAA determination is of interest for a comparative evaluation of in vitro antioxidant potential, but it needs to be combined with in vivo data for adequate assessment of the antioxidant capacity of medicinal plant extracts.
phytomedicine - bee honey, propolis (1.8%) and extract of Eucalyptus globulus (3.7%), commonly used in Brazil in treatment of breathing diseases. In order to evaluate the acute toxicity, groups of Swiss mice (n= 10/group) received a single dose of phytomedicine (7.5, 15, 25 or 35mL/kg; p.o.) or saline 0.9% (5mL/kg; p.o.). This essay registered 20% and 40% of mortality rate with doses of 25 and 35 ml/kg, respectively. Animals presented lethargy and deaths were preceded by convulsion. The absence or presence of phytomedicine chronic toxicity was evaluated through biochemical and hematological analysis on rats (n= 10/group) blood samples using daily oral doses of phytomedicine (7.5 or 15 ml/kg) or saline 0.9% (5ml/kg; p.o.), during 90 days. The chronic toxicity essay did not show any treatment-related abnormalities in hematological parameters (red blood cell, hemoglobin, hematocrit, mean corpuscular hemoglobin, mean corpuscular volume, mean corpuscular hemoglobin concentration; leucocytes and platelets). Concerning to biochemical parameters (glucose, urea, cholesterol, HDL-cholesterol, triglycerides; alanine aminotranferase, aspartate aminotranferase, alkaline phosphatase and total proteins), only the group treated with phytomedicine (7.5 mg/ml), revealed significant difference (p < 0.01) in the concentration of triglycerides (102.0 +/- 8.8 in males and 100.0 +/- 8.8 in females) when compared to control group (86.8 +/- 8.8 in males and 84.6 +/- 8.8 in females). No significant differences were found between the treated and control group in regard to body weight gain mean, neither organs (heart, spleen, liver, kidney, suprarenal gland, stomach, lungs, testicles, ovaries and womb) weight. The macroscopic analysis of many visceras did not show any significant differences between treated and control group. Thus, through this preclinical assay, it appears that no toxicological hazard (acute and chronic) is related to the use of tested phytomedicine.


Abstract: This study was designated to evaluate the preclinical toxicity of the phytomedicine - bee honey, propolis (1.8%) and extract of Eucalyptus globulus (3.7%), commonly used in Brazil in treatment of breathing diseases. In order to evaluate the acute toxicity, groups of Swiss mice (n= 10/group) received a single dose of phytomedicine (7.5, 15, 25 or 35mL/kg; p.o.) or saline 0.9% (5mL/kg; p.o.). This essay registered 20% and 40% of mortality rate with doses of 25 and 35 ml/kg, respectively. Animals presented lethargy and deaths were preceded by convulsion. The absence or presence of phytomedicine chronic toxicity was evaluated through biochemical and hematological analysis on rats (n= 10/group) blood samples using daily oral doses of phytomedicine (7.5 or 15 ml/kg) or saline 0.9% (5ml/kg; p.o.), during 90 days. The chronic toxicity essay did not show any treatment-related abnormalities in hematological parameters (red blood cell, hemoglobin, hematocrit, mean corpuscular hemoglobin, mean corpuscular volume, mean corpuscular hemoglobin concentration; leucocytes and platelets). Concerning to biochemical parameters (glucose, urea, cholesterol, HDL-cholesterol, triglycerides; alanine aminotranferase, aspartate aminotranferase, alkaline phosphatase and total proteins), only the group treated with phytomedicine (7.5 mg/ml), revealed significant difference (p < 0.01) in the concentration of triglycerides (102.0 +/- 8.8 in males and 100.0 +/- 8.8 in females) when compared to control group (86.8 +/- 8.8 in males and 84.6 +/- 8.8 in females). No significant differences were found between the treated and control group in regard to body weight gain mean, neither organs (heart, spleen, liver, kidney, suprarenal gland, stomach, lungs, testicles, ovaries and womb) weight. The macroscopic analysis of many visceras did not show any significant differences between treated and control group. Thus, through this preclinical assay, it appears that no toxicological hazard (acute and chronic) is related to the use of tested phytomedicine.


1240. POPESCU, M P; PALOS, E; POPESCU, F (1985) Studiiul eficacitatii terapiei biologice complexe cu produse apicole in unele afectiuni oculare localizate palpebral si conjunctival in raport

Abstract: Validated spectrophotometric procedures were used to quantify three main groups of bioactive substances (phenolics, flavones/flavonols, flavanones/dihydroflavonols) in 114 samples of poplar-type propolis from different geographic origins. From the results, we characterized raw poplar propolis in terms of minimum content of its bioactive components (antimicrobial and antioxidant) as follows: 45% resin, 21% total phenolics, 4% total flavones/flavonols; 4% total flavanones/dihydroflavonols, and a maximum Minimum Inhibitory Concentration (MIC) against S. aureus of 250 μg/mL. A significant negative correlation was observed between the amount of total phenolics and MIC. The results indicate that measuring the concentrations of groups of active compounds, rather than individual components, is an appropriate approach in developing quality standards for propolis.


1254. POTSCHINKOVA, P A (1975) Traitement des pharyngites chroniques par electrophorese avec de la propolis XXVe Congres International d’Apiculture Apimondia Grenoble, France, 8 - 14 septembre 1975q, Editions Apimondia; Bucarest, Roumanie; pp 190.


1257. POTSCHINKOVA, P (1986) Ptschelnite produkti w medizinata. BAN Publishing Sofia

Abstract: To evaluate the effect of different doses of Manuka honey in experimentally induced inflammatory bowel disease in rats. Adult Wistar rats of either sex were used (n = 30). Colitis was induced by a single intracolonic administration of TNBS dissolved in 35% ethanol. The rats (n = 30) were divided into five groups (n = 6) and were treated with vehicle (ethanol), TNBS, Manuka honey (5 g/kg, p.o.), Manuka honey (10 g/kg, p.o.) or sulfasalazine (360 mg/kg, p.o.) body weight for 14 days. After completion of treatment, the animals were killed and the following parameters were assessed: morphological score, histological score and different antioxidant parameters. Manuka honey at different doses provided protection against TNBS-induced colonic damage. There was significant protection with Manuka honey 5 g/kg as well as with 10 g/kg body weight compared with the control (p < 0.001). All the treated groups showed reduced colonic inflammation and all the biochemical parameters were significantly reduced compared with the control in the Manuka honey treated groups (p < 0.001). Manuka honey at different doses restored lipid peroxidation as well as improved antioxidant parameters. Morphological and histological scores were significantly reduced in the low dose Manuka honey treated group (p < 0.001). In the inflammatory model of colitis, oral administration of Manuka honey 5 g/kg and Manuka honey 10 g/kg body weight significantly reduced the colonic inflammation. The present study indicates that Manuka honey is efficacious in the TNBS-induced rat colitis model, but these results require further confirmation in human studies. Copyright (C) 2008 John Wiley & Sons, Ltd


Abstract: Propolis is a resinous substance collected by bees (Apis mellifera) from different
trees and bushes. Due to its antifungal, antibacterial, antiviral and antiparasitic properties, it has continued to be very popular throughout the time showing variable activity depending on its geographical origin. In Mexico, information about this product is very limited. The aim of this work was to evaluate the antifungal activity of four propolis ethanolic extracts from three different Mexican states, and four commercial extracts on Candida albicans growth. A reference strain (ATCC 10231) and 36 clinical isolates of C. albicans were used. The Minimal Inhibitory Concentration (MIC) was determined by the dilution on agar method. Growth curves on Sabouraud Dextrose broth with and without different propolis ethanolic extracts concentrations were performed. In addition, whether the effect was fungistatic or fungicide was determined. The propolis ethanolic extract obtained from Cuautitlan Izcalli, State of Mexico, showed the best biological activity, inhibiting 94.4% from the clinical isolates at 0.8 mg/ml; the reference strain was inhibited at 0.6 mg/ml. The propolis effect was fungistatic in low concentrations and fungicide in concentrations higher to MIC. The Mexican propolis ethanolic extract could be further investigated for its alternative use for the treatment of some C. albicans infections.


1271. RAKHA, M; NABIL, Z; HUSSEIN, A (2008) Cardioactive and Vasoactive Effects of Natural Wild Honey Against Cardiac Malperformance Induced by Hyperadrenergic Activity. Journal of Medicinal Food 11: 91-98. Abstract: Induction of hyperadrenergic activity was experimentally achieved in urethane-anesthetized rats using epinephrine (adrenaline). Acute administration of epinephrine (100 ?g/kg) for 2 hours induced several cardiac disorders and vasomotor dysfunction. Pretreatment with natural wild honey (5 g/kg) for 1 hour prior to the injection with epinephrine (100 ?g/kg) protected the anesthetized normal rats from the incidence of epinephrine-induced cardiac disorders and vasomotor dysfunction. Moreover, posttreatment with natural wild honey (5 g/kg) following the injection with epinephrine (100 ?g/kg) for 1 hour showed several ameliorative outcomes to the electrocardiographic parameters and vasomotor dysfunction of anesthetized stressed rats. Furthermore, natural wild honey preserved the positive inotropic effect of epinephrine in both cases. Also, the total antioxidant capacity (AOC) of natural wild honey was found to be very pronounced. Levels of both reduced glutathione and ascorbic acid (vitamin C) were considered relatively high in natural wild honey. Activity of superoxide dismutase (SOD) was also high, whereas catalase activity was relatively low, especially when compared to the value of SOD activity. It would appear from the results of the present study that natural wild honey may exert its cardioprotective and therapeutic effects against epinephrine-induced cardiac disorders and vasomotor dysfunction directly, via its very
pronounced total AOC and its great wealth of both enzymatic and nonenzymatic antioxidants involved in cardiovascular defense mechanisms, besides its substantial quantities of mineral elements such as magnesium, sodium, and chlorine, and/or indirectly, via the enhancement of the endothelium-derived relaxing factor nitric oxide release through the influence of ascorbic acid (vitamin C)

Abstract: Induction of hyperadrenergic activity was experimentally achieved in urethane-anesthetized rats using epinephrine (adrenaline). Acute administration of epinephrine (100 μg/kg) for 2 hours induced several cardiac disorders and vasomotor dysfunction. Pretreatment with natural wild honey (5 g/kg) for 1 hour prior to the injection with epinephrine (100 μg/kg) protected the anesthetized normal rats from the incidence of epinephrine-induced cardiac disorders and vasomotor dysfunction. Moreover, posttreatment with natural wild honey (5 g/kg) following the injection with epinephrine (100 μg/kg) for 1 hour showed several ameliorative outcomes to the electrocardiographic parameters and vasomotor dysfunction of anesthetized stressed rats. Furthermore, natural wild honey preserved the positive inotropic effect of epinephrine in both cases. Also, the total antioxidant capacity (AOC) of natural wild honey was found to be very pronounced. Levels of both reduced glutathione and ascorbic acid (vitamin C) were considered relatively high in natural wild honey. Activity of superoxide dismutase (SOD) was also high, whereas catalase activity was relatively low, especially when compared to the value of SOD activity. It would appear from the results of the present study that natural wild honey may exert its cardioprotective and therapeutic effects against epinephrine-induced cardiac disorders and vasomotor dysfunction directly, via its very pronounced total AOC and its great wealth of both enzymatic and nonenzymatic antioxidants involved in cardiovascular defense mechanisms, besides its substantial quantities of mineral elements such as magnesium, sodium, and chlorine, and/or indirectly, via the enhancement of the endothelium-derived relaxing factor nitric oxide release through the influence of ascorbic acid (vitamin C)


1276. RAMIREZ, M (1989) Propoleos en el tratamiento de quemados. *Jornadas Nacionales de Asistencia integral del niño quemado*

Abstract: Honeys from various floral sources were analyzed to select for utilization as a sweetener and potential source of antioxidants in the formulation of a salad dressing. On the basis of various indicators of potential antioxidant effectiveness, such as the ORAC (oxygen radical absorbance capacity) assay and identification of phenolic profile carried out by HPLC analysis, clover and blueberry honeys were selected. Dressings were stored under accelerated conditions (37 degrees C) for six weeks and at ambient (23 degrees C) and refrigeration (4 degrees C) temperatures for one year. Salad dressings incorporating honey provided protection against oxidation to a degree similar to that of EDTA, as
determined by peroxide value and p-anisidine value. This demonstrates the potential for honey to be used as a substitute for EDTA and sweetener (such as HFCS) in commercial salad dressings.


1282. REINHARDT, K (2007) Evolutionary consequences of sperm cell aging. *Quarterly Review of Biology* 82 (4): 375-393. Abstract: Animal breeding research, reproductive biology, and cellular biogerontology show that fertilization rates and zygote viability critically depend on sperm age. Sexual selection research focuses on differences between male genotypes in sperm performance, such as motility, competitive ability, or compatibility with eggs, but without considering sperm age. A combined view (that the thermodynamically inevitable decline in sperm performance selects for traits in diploid individuals to prevent fertilization with aged sperm) has received very little attention. In this paper, I correct this bias and show that many male and female traits affect sperm aging or the sperm age distribution at any reproductive event. Such traits coincide well with condition-dependent traits considered sexually selected: multiple mating by both sexes, high sperm production rates, the delivery of dense ejaculates containing many sperm (including nonfertilizing types), the packaging of sperm into spermatophores, male and female sperm ejection, sexual coercion, as well as the production of showy antioxidants and various cellular and nuclear repair mechanisms. I conclude that altering the sperm age distribution at any step during reproduction can be an origin of sexually selected traits, and may explain presently observed paternity variation without assuming genetic incompatibility of gametes.


doses of 25, 50 and 100 mg/i.p. Significantly decreased the activity of alanine amino transferase (EC 2.6.1.2) in serum and the levels of malondialdehyde in mouse liver after induction with a dose of 64 mg/kg of allyl alcohol. However, propolis did not increase the concentration of reduced glutathione in mouse liver which is depleted by allyl alcohol. Propolis also reduced liver damage induced by allyl alcohol in mice. This effect was observed by electron microscopy. The hepatoprotective effects of propolis were dose-dependent and they were produced when propolis was administered 30 min before allyl alcohol administration. It is indicated that the ethanolic extract of red propolis exerts potential hepatoprotective effects in this experimental model which is probably caused by antioxidative properties (e.g. Scavenging action against oxygen radicals) of this extract.


Abstract: Baccharis dracunculifolia DC (Asteraceae), a native plant from Brazil, have been used as an antipyretic, stomachic and health tonic in Brazil. The objective of the present study was to investigate the potential mutagenic effect of B. dracunculifolia ethyl acetate extract (Bd-EAE) and its influence on the mutagenicity induced by the chemotherapeutic agent doxorubicin (DXR) using the rat bone marrow and peripheral blood micronucleus test. Wistar rats were divided into 10 treatment groups. Five groups received DXR (90 mg/kg body weight, b.w., intraperitoneally) to induce mutagenicity and three of these groups received a single oral dose of Bd-EAE at a concentration of 6, 12 or 24mg/kg b.w. prior to DXR administration. A vehicle-treated control group and Bd-EAE control groups were also included. The results showed that Bd-EAE itself was not mutagenic, in the rat micronucleus assay. In animals treated with Bd-EAE and DXR, the number of MNPCES was significantly decreased compared to animals receiving DXR alone. HPLC analysis of the extract obtained permitted the identification of the following phenolic compounds: caffeic acid, p-coumaric acid, aromadendrin-4'-O-methyl ether, 3-prenyl-p-coumaric acid (drupanin), 3,5-diprenyl-p-coumaric acid (artepillin C) and baccharin. The putative antioxidant activity or the interference of one or more of the active compounds of Bd-EAE with mutagenic metabolic pathways may explain its effect on DXR mutagenicity. (c) 2007 Elsevier B.V. All rights reserved


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1304. RINSCH, E Der Honig als Heilmittel: Die Wirkung des Honigs bei der Ernährung der Rinder, neue Untersuchungen. unknown: 1.


1308. RISI, E; LABRUT, S (2003) Use of monopediculated advancing flaps in the wound treatment in birds. Pratique Medicale et Chirurgicale de l Animal de Compagnie 38 (4): 343-349. Abstract: Healing by second intention of wounds is sometimes a long and dull act in birds. Pain - which is responsible for feather picking, poor posture of wound dressings and stress of manipulation are nothing better than harmful factors to quality of care it? those species. Techniques of monopediculated advancing flaps dermatoplasty (single flap or H-plasty) constitute a solution often interesting - to these wounds. After describing the operative technique this article presents four clinical cases in a rock dove, a turkey vulture, a honey buzzard and a common buzzard with or without success; it also details the advantages and drawbacks of those techniques in birds.


Abstract: Chemical acupuncture with diluted bee venom (DBV), termed apipuncture, has been traditionally used in oriental medicine to treat several inflammatory diseases and chronic pain conditions. In the present study we investigated the potential anti hyperalgesic and antiallodynic effects of apipuncture in a rat neuropathic pain model. DBV (0.25 mg/kg, subcutaneous) was injected into the Zusanli acupoint 2 weeks after chronic constrictive injury (CCI) of the sciatic nerve. Between 5 and 45 minutes after DBV injection, we observed a significant reduction in the thermal hyperalgesia induced by CCI, but apipuncture failed to reduce CCI-induced mechanical allodynia. We subsequently examined whether this antihyperalgesic effect of apipuncture was related to the activation of spinal opioid receptors and/or alpha(2)-adrenoceptors. Intrathecal pretreatment with naloxone (10 mug/rat), an opioid receptor antagonist, did not reverse the antihyperalgesic effect of apipuncture, whereas pretreatment with idazoxan (40 mug/rat), an alpha(2)-adrenoceptor antagonist, completely blocked the effect of apipuncture. These results indicate that DBV-induced apipuncture significantly reduces the thermal hyperalgesia generated by CCI and also suggest that this antihyperalgesic effect is dependent on the activation of alpha(2)-adrenoceptors, but not opioid receptors, in the spinal cord. Perspective: The antinociceptive effect of apipuncture was evaluated in a rodent neuropathic pain model. The relieving effect of apipuncture on thermal hyperalgesia was found to be mediated by spinal alpha(2)-adrenoceptors, but not opioid receptors. These data suggest that apipuncture might be an effective alternative therapy for patients with painful peripheral neuropathy, especially for those who are poorly responsive to opioid analgesics.


Abstract: RS Rootbernstein/Michigan State Univ/Dept Physiol/E Lansing, MI 48824 USA

Abstract: Honey is essentially a concentrated sugar solution, containing mainly fructose and glucose, but also maltose, sucrose, phenolic acids, enzymes such as glucose oxidase, catalase and peroxidase, vitamins and minerals. It has antibacterial effects, contains antioxidants, decreases inflammatory edema, stimulates the immune response, stimulates the neovascularisation and the multiplication of fibroblasts and epithelial cells, reduces the need for surgical debridement, clears of foul odour, increases the flow of lymph and forms an energy source for epithelial cells in a wound area. Honey has antibacterial activity due to the production of hydrogen peroxide after dilution with water, its high osmolarity, acidity and phytochemical compounds. Besides these direct antibacterial effects, honey applied to a wound forms a viscous, protective and physical barrier against invading pathogens. Interesting side qualities of honey are: a diminishing effect on tumor implantation and prevention of peritoneal adhesions. In veterinary medicine honey, in its different constitutional forms, makes a good non-antibiotic alternative for products currently used in wound therapy. Honey or honey based products can be applied to grazes, abrasions and erosions in the inflammatory and debridement phase: the inflammatory response is supported and debridement accelerated. Granulation tissue can then form more rapidly and epithelization of the tissue is promoted. It is also a good opportunity for treating a acute or chronic dermatitis. In older wounds that are difficult to manage with conventional therapy like burn wounds or infected surgical wounds honey is also effective, as it has a debriding, antibacterial and immune response stimulating effect, initiating the wound healing process.

Abstract: Propolis, a natural product derived from plant resins collected by honeybees, has been used for thousands of years in traditional medicine all over the world. The composition of the propolis depends upon the vegetation of the area from where it was collected and on the bee species. In this study, we investigated the antioxidant activity of a propolis sample, provided by NATURANDES-CHILE, collected in a temperate region of central Chile. In addition, this natural compound was tested for its antiproliferative capacity on KB (human mouth epidermoid carcinoma cells), Caco-2 (colon adenocarcinoma cells) and DU-145 (androgen-insensitive prostate cancer cells) human tumor cell lines. Results showed that this Chilean propolis sample exhibits interesting biological properties, correlated with its chemical composition and expressed by its capacity to scavenge free radicals and to inhibit tumor cell growth. (C) 2004 Elsevier Inc. All rights reserved.
1329. RYAN, G B; MAJNO, G (1977) *Inflammation*. Upjohn Kalamazoo, Michigan


1335. SAINÉ, J (1979) Treatment of arthritis, pp 22.


Abstract: Design, synthesis, and structural and functional studies of rigid-rod ionophores of different axial electrostatic asymmetry are reported. The employed design strategy emphasized presence of(a) a rigid scaffold to minimize the conformational complexity, (b) a unimolecular ion-conducting pathway to minimize the suprastructural complexity and monitor the function, (c) an extended fluorophore to monitor structure, (d) variable axial rod dipole, and (e) variable terminal charges to create axial asymmetry. Studies in isoelectric, anionic, and polarized bilayer membranes confirmed a general increase in activity of uncharged rigid push-pull rods in polarized bilayers. The similarly increased activity of cationic rigid push-pull rods with an electrostatic asymmetry comparable to that of cr-helical bee toxin melittin (positive charge near negative axial dipole terminus) is shown by fluorescence-depth quenching experiments to originate from the stabilization of, transmembrane rod orientation by the membrane potential. The reduced activity of rigid push-pull rods having an electrostatic asymmetry comparable to that in or-helical natural antibiotics (a positive charge near the positive axial dipole terminus) is shown by structural studies to originate from rod "ejection" by membrane potentials comparable to that found in mammalian plasma membranes. This structural evidence for cell membrane recognition by asymmetric rods is unprecedented and of possible practical importance with regard to antibiotic resistance.


Abstract: Propolis is a hive product containing chiefly beeswax and plant-derived substances such as resin and volatile compounds. Propolis has been used as an antiseptic and wound healer since ancient times and interest for the product has increased recently. Probably few plant species contribute as major resin sources. Green propolis derives mainly from vegetative apices of Baccharis dracunculifolia (alecrim plants). However, wide variation detected in the chemical composition suggests contributions from alternative resin plant sources. Predominant components of the resin of
green propolis are cinnamic acids, chiefly compounds bearing prenyl groups. Terpenoid compounds, such as sesqui, di and pentacyclic triterpenoids, have been detected in many, but not all, samples investigated. Propolis research has uncovered potentialities of substances previously isolated from plants and has detected constituents of plant origin that would hardly be known otherwise


1340. SALIMOV, R M (1973) [Effectiveness of treating bees for paratyphoid]. Veterinariia. 49 (5): 77-78.


Abstract: Presented in the work are data on interrace differences in mechanisms of formation of antioxidant and phenoloxidase complexes in honeybees of the Middle Russian (Apis mellifera L.) and Caucasian (Apis mellifera caucasica Gorb.) geographic races. Different degree has been revealed of activation of these complexes depending on their localization in the insect organism and providing different strategy of adaptation to temperature stress. A diverse role of ascorbic acid in regulation of the honeybee protective system has been shown


Abstract: Recurrent aphthous stomatitis (RAS) is a common, painful, and ulcerative disorder of the oral cavity of unknown etiology. No cure exists and medications aim to reduce pain associated with ulcers through topical applications or reduce outbreak frequency with systemic medications, many having serious side effects. The purpose of this pilot study was to evaluate the potential of a product to reduce the number of outbreaks of RAS ulcers. Propolis is a bee product used in some cultures as treatment for mouth ulcers. In this randomized, double-blind, placebo-controlled study, patients were assigned to take 500 mg of propolis or a placebo capsule daily. Subjects reported a baseline ulcer frequency and were contacted biweekly to record recurrences. Data were analyzed to determine if subjects had a decrease of 50% in outbreak frequency. The data indicated a statistically significant reduction of outbreaks in the propolis group (Fisher's exact test, one sided, p=0.04). Patients in the propolis group also self-reported a significant improvement in their quality of life (p=0.03). This study has shown propolis to be effective in decreasing the number of recurrences and improve the quality of life in patients who suffer from RAS. Propolis should be evaluated further in a larger sample clinical trial


Abstract: It has been established that the use of apitherapy (pollen and propolis) to treat
patients with ischemic insults leads to deeper positive shifts in indices of the antioxidant system and brain blood supply. This, in its turn, makes for rapid and complete restoration of disturbed and lost functions of the patients’ organism.

1347. SAMPER, R M; PINERO PEREZ, A; CABALLORO, M; RAMOS, J; CUZA, A L; RIVERA GIRAL, T (1997) Two decubitus ulcer patients in critical situation treated with honey and propolis (honey with propolis mixture, HPm used to treat burns). XXXVth Apimondia Congress, Antwerpen, Belgium


Abstract: Aims: Venoms of snakes, scorpions, bees and purified venom phospholipase A(2) (PLA(2)) enzymes were examined to evaluate the antibacterial activity of purified venom enzymes as compared with that of the crude venoms. Methods and Results: Thirty-four crude venoms, nine purified PLA(2)s and two L-amino acid oxidases (LAAO) were studied for antibacterial activity by disc-diffusion assay (100 μg ml(-1)). Several snake venoms (Daboia russelli russelli, Crotalus adamanteus, Naja sumatrana, Pseudechis guttata, Agkistrodon halys, Acanthophis praelongus and Daboia russelli siamensis) showed activity against two to four different pathogenic bacteria. Daboia russelli russelli and Pseudechis australis venoms exhibited the most potent activity against Staphylococcus aureus, while the rest showed only a moderate activity against one or more bacteria. The order of susceptibility of the bacteria against vipers’ venom was -S. aureus > Proteus mirabilis > Proteus vulgaris > Enterobacter aerogenes > Pseudomonas aeruginosa and Escherichia coli. The minimum inhibitory concentrations (MIC) against S. aureus was studied by dilution method (160-1.25 μg ml(-1)). A stronger effect was noted with the vipers’ venom (20 μg ml(-1)) as compared with elapidae venom (40 μg ml(-1)). The MIC were comparable with those of the standard drugs (chloramphenicol, streptomycin and penicillin). Conclusion: The present findings indicate that vipers’ (D. russelli russelli) and elapidae (P. australis) venoms have significant antibacterial effects against gram (+) and gram (-) bacteria, which may be the result of the primary antibacterial components of LAAO, and in particular, the PLA(2) enzymes. The MIC were comparable with those of the standard drugs (chloramphenicol, streptomycin and penicillin). Significance and Impact of the Study: The activity of LAAO and PLA(2) enzymes may be associated with the antibacterial activity of snake venoms.

1349. SAMY, R P; PACHIAPPAN, A; GOPALAKRISHNAKONE, P; THWIN, M M; HIAN, Y E; CHOW, V T K; BOW, H; WENG, J T (2006) In vitro antimicrobial activity of natural toxins and animal venoms tested against Burkholderia pseudomallei. BMC Infectious Diseases 6 Abstract: Background: Burkholderia pseudomallei are the causative agent of melioidosis. Increasing resistance of the disease to antibiotics is a severe problem in treatment regime and has led to intensification of the search for new drugs. Antimicrobial peptides are the most ubiquitous in nature as part of the innate immune system and host defense mechanism. Methods: Here, we investigated a group of venoms (snakes, scorpions and honey bee venom) for antimicrobial properties against two strains of Gram-negative bacteria Burkholderia pseudomallei by using disc-diffusion assay for in vitro susceptibility testing. The antibacterial activities of the venoms were compared with that of the isolated L-amino acid oxidase (LAAO) and phospholipase A(2) (PLA(2)s) enzymes. MICs were determined using broth dilution method. Bacterial growth was assessed by measurement of optical density at the lowest dilutions (MIC 0.25 mg/ml). The cell viability was measured using tetrazolium salts (XTT) based cytotoxic assay. Results: The studied venoms showed high antimicrobial activity. The venoms of C. adamanteus, Daboia russelli russelli, A. halys, P. australis, B. candidus and P. guttata were equally as effective as Chloramphenicol and Ceftazidime (30 μg/disc). Among those tested, phospholipase A(2) enzymes (crotoxin B and daboiatoxin) showed the most potent antibacterial activity.
against Gram-negative (TES) bacteria. Naturally occurring venom peptides and phospholipase A(2) proved to possess highly potent antimicrobial activity against Burkholderia pseudomallei. The XTT-assay results showed that the cell survival decreased with increasing concentrations (0.05-10 mg/mL) of Crotalus adamanteus venom, with no effect on the cell viability evident at 0.5 mg/mL. Conclusion: This antibacterial profile of snake venoms reported herein will be useful in the search for potential antibacterial agents against drug resistant microorganisms like B. pseudomallei

1350. SANDERS, M; FELLOWES, O (1979) Broad therapeutic and biological activity of venom toxoids, pp 33-43.


Abstract: Denture stomatitis presents as a chronic disease in denture-bearing patients, especially under maxillary prosthesis. Despite the existence of a great number of antifungal agents, treatment failure is observed frequently. Propolis, a natural bee product, possesses well-documented antifungal and anti-inflammatory activities. The purpose of this study was to evaluate the clinical efficacy of a new Brazilian propolis gel formulation in patients diagnosed with denture stomatitis. Thirty complete-denture wearers with denture stomatitis were enrolled in this pilot study. At baseline, clinical evaluation was performed by a single clinician and instructions for denture hygiene were provided. Fifteen patients received Daktarin (R) (Miconazole gel) and 15 received Brazilian propolis gel. All patients were recommended to apply the product four times a day during one week. Clinical evaluation was repeated by the same clinician after treatment. All patients treated with Brazilian propolis gel and Daktarin (R) had complete clinical remission of palatal edema and erythema. This new Brazilian propolis gel formulation had efficacy comparable to Daktarin (R) and could be an alternative topical choice for the treatment of denture stomatitis. Copyright (C) 2008 John Wiley & Sons, Ltd

1353. SARIKURKCU, C; TEPE, B; DAFERERA, D; POLISSIOU, M; HARMANDAR, M (2008) Studies on the antioxidant activity of the essential oil and methanol extract of Marrubium globosum subsp globosum (lamiaceae) by three different chemical assays. *Bioresource Technology* 99 (10): 4239-4246.

Abstract: This study is designed to examine the chemical composition and in vitro antioxidant activity of the essential oil and sub-fractions of the methanol extract of Marrubium globosum subsp. globosum. The GC and GC-MS analysis of the essential oil were resulted in the determination of 84 components representing 88.2% of the oil. The major constituents of the oil were spathulenol (15.8%), beta-caryophyllene (9.0%), caryophyllene oxide (7.9%), germacrene D (6.5%), and bicyclogermacrene (3.1%). Antioxidant activities of the samples were determined by three different test systems namely DPPH, beta-carotene/linoleic acid and reducing power assay. In DPPH system, the weakest radical scavenging activity was exhibited by the essential oil (1203.38 +/- 7.18 mu g ml(-1)). Antioxidant activity of the polar sub-fraction of methanol extract was superior to the all samples tested with an EC50 value of 157.26 +/- 1.12 mu g ml(-1). In the second case, the inhibition capacity (%) of the polar sub-fraction of methanol extract (97.39% +/- 0.84) was found the strongest one, which is almost equal to the inhibition capacity of positive control BHT (97.44% +/- 0.74). In the case of reducing power assay, a similar activity pattern was observed as given in the first two systems. Polar sub-fraction was the strongest radical reducer when compared with the non-polar one, with an EC50 value of 625.63 +/- 1.02 mu g ml(-1). The amount of the total phenolics was highest in polar sub-fraction (25.60 +/- 0.74 mu g/mg). A positive correlation was observed between the antioxidant activity potential and total phenolic level of the extracts. On the other hand,
total flavonoid content was found equal for the both sub-fractions. (C) 2007 Elsevier Ltd. All rights reserved


1362. SAWAYA, A C H F; PALMA, A M; CAETANO, F M; MARCUCCI, M C; CUNHA, I B D; ARAUJO, C E P; SHIMIZU, M T (2002) Comparative study of in vitro methods used to analyse the activity of propolis extracts with different compositions against species of Candida. Letters in Applied Microbiology 35 (3): 203-207. Abstract: Aims: Propolis is known for its activity against micro-organisms and different in vitro assays have been used to evaluate this activity, frequently with contradictory results. Methods and Results: Brazilian propolis from the state of Sao Paulo was extracted by maceration using different concentrations of ethanol and water. The resultant extracts were analysed by chromatographic methods. Several microbiological methods were compared to determine which one best evaluated the activity of the propolis extracts against species of Candida, with average minimal inhibitory concentration values between 6 and 12 mg ml(-1). Conclusions: Agar dilution in plates showed the clearest results. These were in agreement with the chromatographic analyses, which also identified the active substances. Significance and Impact of the Study: Although the active substances identified in this sample are typical of Brazilian propolis, their activity against Candida had not been recognized previously, demonstrating the importance of standardizing the correct combination of microbiological and chromatographic analyses.

1363. SCAZZOCCHIO, F; D'AURIA, F D; ALESSANDRINI, D; PANTANELLA, F (2006) Multifactorial aspects of antimicrobial activity of propolis. Microbiological Research 161 (4): 327-333. Abstract: We investigated the antibacterial activity of sub-inhibitory concentrations of ethanolic extract of propolis (EEP), and its effect on the antibacterial activity of some antibiotics. Some clinically isolated Gram-positive strains were used. Moreover, sub-inhibitory concentrations of EEP were used to value its action on some important virulence factors like lipase and coagulase enzymes, and on biofilm formation in Staphylococcus aureus. Our results indicated that EEP had a significant antimicrobial activity towards all tested clinical strains. Adding EEP to antibacterial tested drugs, it drastically increased the antimicrobial effect of ampicillin, gentamycin and streptomycin, moderately the one of chloramphenicol, ceftriaxan and vancomycin, while there was no
effect with erithromycin. Moreover, our results pointed out an inhibitory action of EEP on lipase activity of 18 Staphylococcus spp. strains and an inhibitory effect on coagulase of 11 S. aureus tested strains. The same EEP concentrations showed a negative interaction with adhesion and consequent biofilm formation in S. aureus ATCC 6538P. (c) 2006 Elsevier GmbH. All rights reserved


1365. SCHACHT (1928) Der Honig und die Gesundheit des deutschen Volkes. Thüringer Imkerbote 8 (8): 221-223.


Abstract: Ethanol extract of propolis (EEP) has antibacterial, antiviral, antiprotozoal and antifungal properties. In addition to many biological effects. Our laboratory has demonstrated a synergistic effect of EEP and antibiotics on the growth of Staphylococcus aureus, and suggested that the bactericidal effect of EEP was expressed mainly on virulent mycobacteria rather than on non-virulent (attenuated) ones. The present study was designed to reconfirm the latter finding, by subjecting 17 different mycobacteria strains to EEP, and evaluating whether there is a correlation between the virulence of the mycobacteria strains studied and their susceptibility to EEP. Our findings demonstrate that while the four non-virulent strains studied are not susceptible to EEP, out of the 13 virulent strains studied seven are susceptible and six are resistant to it. These results suggest that while there is no full correlation between virulence of the mycobacteria tested and their susceptibility to EEP, the few strains that were resistant to EEP were non-virulent.

Abstract: Ethanol extract of propolis exerts a strong anti-bacterial activity, in addition to antifungal, antiviral and antiprotozoal properties. In previous studies from these laboratories we have demonstrated that the intensity of the bactericidal activity of EEP is correlated with the virulence of the mycobacteria tested, and that EEP has a synergistic effect with antibiotics on growth of staphylococcus aureus. In the present study we investigated whether the same synergism and correlation exists between EEP and some anti-tuberculosis drugs on tuberculosis mycobacteria with different degrees of virulence. Six standard strains and 11 wild strains of mycobacteria were exposed for 30 days to EEP, with or without streptomycin, rifamycin, isoniazid or ethambutol. Out of the 17 strains, 8 were resistant to at least two standard antibiotics. And were considered “multi-resistant strains”. The rest were either susceptible or resistant to only one of the antimycobacterial drugs. Antagonism was recorded only in one case, when Staphylococcus aureus were treated with a mixture of EEP and ethambutol, suggesting that a chemical bond could have been formed between this anti-tuberculosis antibiotic and one of the active components of the ethanol extract of propolis. 
The ability of ethanolic extract of propolis to protect mice against gamma irradiation. Zetitschrift fur Naturforschung C 44: 1049-1052. Abstract: Male mice were injected intraperitoneally with EEP before and after exposure to 6 Gy gamma radiation from a <sup>(60)</sup>Co source. Controls not receiving EEP died within 12 weeks, but EEP-treated mice survived and the leucocyte count, and plaque-forming activity in the spleen, returned to normal. It is suggested that the protective effect of EEP is due to the presence of an antioxidant and a free radical scavenger. P. Walker. 

Library code: Bc. Language: En. Apicultural Abstracts from IBRA: 4200343


1386. SCIFO, C; CARDILE, V; RUSSO, A; CONSOLI, R; VANCHERI, C; CAPASSO, F; VANELLA, A; RENIS, M (2004) Resveratrol and propolis as necrosis or apoptosis inducers in human prostate carcinoma cells


Abstract: Vegetables and fruit help the prevention and the therapy of several kinds of cancer because they contain micronutrients, a class of substances that have been shown to exhibit chemopreventive and chemotherapeutic activities. In the present study the effects of resveratrol (100 and 200 μM), a phytoalexin found in grapes, and of the ethanolic extract of propolis (50 and 100 μg/ml), a natural honeybee hive product, were tested in androgen-resistant prostate cancer cells (DU145), a cell line resembling the last stage of prostate carcinoma. A comparison between the activity of these micronutrients and vinorelbine bitartrate (Navelbine), a semisynthetic drug normally used in the therapy of prostate cancer, was conducted. Several biochemical parameters were tested, such as cell viability (MTT assay), cell membrane integrity (lactate dehydrogenase release), cell redox status (nitric oxide formation, reactive oxygen species production, reduced glutathione levels), Genomic DNA fragmentation (COMET assay) with special attention on the presence of apoptotic DNA damage (TUNEL test), and possible mitochondrial transmembrane potential alteration (ΔΨ). Our results point out the anticancer activity of resveratrol and propolis extract in human prostate cancer, exerting its cytotoxicity through two different types of cell death: necrosis and apoptosis, respectively. The data obtained suggest the possible use of these micronutrients both in alternative to classic chemotherapy, and in combination with very low dosage of vinorelbine (5 μM).


1388. SEALEY, D F (1988) Chromatographic investigations of the antibacterial activity in manuka honey. *These at the University of Waikato, New Zealand*


Abstract: Propolis is a natural substance produced by honeybees upon collection and transformation of resins and exudates from plants. Comparative studies on propolis collected from a wide range of countries are crucial for linking its provenance to antibacterial activity and thus ensuring that the beneficial properties of propolis are used more efficiently by the general public. This study reports the in vitro screening of ethanol extracts of propolis (n = 40), collected from a wide range of countries within the tropical, subtropical and temperate zones, and on the comparison of their activity against a range of Gram-positive and Gram-negative bacteria using a broth microdilution assay. The results obtained revealed that propolis extracts were mostly active against Gram-positive bacteria. The samples were subjected to principal component analysis (PCA) in order to
model their activity against Gram-positive microorganisms. Three distinct clusters were distinguished in the PCA mapping based on MIC values, categorizing samples with strong (MIC range 3.9-31.25 mg/L), moderate (MIC range 31.25->500 mg/L) and weak antibacterial activity or inactivity (MIC >= 500 mg/L only). It is hypothesized that for samples of tropical provenance differences in the activity profiles may depend on the climatic characteristics of the collection sites. High antibacterial activity was observed for samples from locations characterized by a wet-tropical rainforest-type climate. Copyright (c) 2008 John Wiley & Sons, Ltd


Abstract: Anzer tea (Thymus praecox, subsp. caucasicus var. caucasicus) naturally grows in the eastern Black Sea region of Turkey. Anzer tea, a creeping plant with crimson-pink flowers, is important for honey production in the region. In the present study, content, composition and antimicrobial properties of Anzer tea's essential oil were investigated. Essential oil content of dried aerial plant parts varied between 1.53% and 2.05%. Essential oil composition was studied by means of gas chromatography-mass spectrometry, and 26 components were identified. The major components were thymol (47.45%), gamma-terpinene (8.73%), p-cymene (8.30%), terpinyl acetate (4.88%) and carvacrol (4.60%). Essential oil was also screened for its antibacterial activity. In a screen for antibacterial activity, Anzer tea essential oil had significant activity against Staphylococcus aureus, Bacillus subtilis, Escherichia coli and Candida albicans. (C) 2007 Society of Chemical Industry


Abstract: Background Cutaneous injury causes a depression in antioxidant status, as reactive oxygen species (ROS) are produced in response to injury. Aim To determine the effects of caffeic acid phenetyl ester (CAPE), an antioxidant and anti-inflammatory agent, on wound healing in rats. Methods In total, 40 male rats were divided into two groups: one group treated with CAPE (n = 20) and a second untreated control group (n = 20). A linear full-thickness incision was performed on the back of each rat and sutured. After incision, CAPE was given to the treatment group and saline to the control group. On days 1, 3, 7 and 14, five animals in each group were killed, and wound tissues dissected for biochemical and histopathological analysis. Results Wound tissues showed a significant increase in glutathione and nitric oxide levels, and a significant decrease in malondialdehyde levels and superoxide dismutase levels in the CAPE group compared with the control group. Histopathology of the wound tissues displayed rapid epithelium development in the CAPE group compared with the control group. Conclusions This study has demonstrated that CAPE partly accelerates full-thickness wound healing by its antioxidant and ROS-scavenging capabilities


Abstract: In this study, the effects of propolis and vitamin C (L-ascorbic acid) supplementation in diets were investigated on feed intake (FI), body weight (BW), body weight gain (BWG), feed conversion rate (FCR) and digestibility and on egg production and qualities (weight, mortality, shell thickness) in laying hens exposed to heat stress. A total of 150 Hyline White Leghorn, aged 42 weeks, hens was divided into five groups of 30 hens. Chicks were randomly divided into 1 positive control, 1 control and 3 treatment
groups. The chicks were kept in cages in temperature-controlled rooms at 22 degrees C for 24 h/d (positive control, Thermoneutral, TN group) or 34 degrees C for 9 h/d from 08.00-17.00 h followed by 22 degrees C for 15 h (control, heat stress, HS group) and fed a basal diet or basal diet supplemented with vitamin C (250 mg/kg of L- ascorbic acid/kg of diet) or two levels of propolis (2 and 5 g of ethanol extracted propolis/kg of diet). Increased FI (p < 0.05) and improvement in FCR (p < 0.05), hen day egg (p < 0.05) and egg weight (p < 0.05) were found in Vitamin C and propolis-supplemented laying hens reared under heat stress conditions. Mortality rate was higher in the control group than TN, vitamin C and propolis groups (p < 0.05). Digestibility of dry matter, organic matter, crude protein and ether extract improved with increasing of both dietary vitamin C and propolis (p < 0.05). Vitamin C or propolis supplementation did not affect either the percentage shape index, yolk index or haugh unit and albumen index (p > 0.05). However, the egg shell thickness and egg shell weight appeared to be increased in Vitamin C and propolis groups in comparison to HS group birds (p < 0.05). In conclusion, dietary supplementation of laying hens with anti-oxidants (vitamin C and propolis) can attenuate heat stress-induced oxidative damage. These positive effects were evidenced by increased growth performance and digestibility, improvement of egg shell thickness and egg weight in comparison to non-supplemented birds. Moreover, supplementation with propolis (5 g/kg diet) was the most efficient treatment


1399. SHAKARIAN, G A; AKOPIAN, Z M (1973) [Antibiotic concentration in the body of bees and in honey]. Veterinariia. 9: 93-95.


1402. SHAKARIAN, G A; AKOPIAN, Z M (1973) [Concentration and duration of retention of antibiotics in honey]. Antibiotsiki. 18 (10): 925-926.


propolis were determined by alpha, alpha-diphenyl-beta-picrylhydrazyl (DPPH) radical-scavenging and ferric thiocyanate (FTC) methods, using alpha-tocopherol and butylated hydroxytoluene (BHT) as references. The DPPH assay showed that ethanol extract possessed significantly higher activity compared with BHT and petroleum ether extract but lower than that of alpha-tocopherol. Results from the FTC assay indicated that the activity of ethanol extract was higher than that of alpha-tocopherol and petroleum ether extract but lower than BHT. Basically, this antioxidant activity was dose-dependent and ethanol extract exhibited higher activity than that of petroleum ether extract at the same concentration. Additionally, the chemical constituents of propolis were determined, and results showed that the propolis contained high content of antioxidant compositions, such as flavonoids (73.00 g kg(-1)), total phenolic compounds (134.40 g kg(-1)), and Vitamin E (0.16 g kg(-1)), which contributed greatly to its strong antioxidant activity.


Abstract: A method was developed for the analysis of 14 sulfonamide antibiotics and chloramphenicol in honey. These antibiotics have been banned for use in food-producing animals; yet, their residues were found in many samples, illustrating the need for a multisidue analysis for these antibiotics in honey. The method described here uses an acid hydrolysis step to liberate the sugar-bound sulfonamides followed by a solid-phase extraction to remove potential interferences. Analysis was by liquid chromatography-electrospray ionization-tandem mass spectrometry in negative mode for all 15 analytes. This MRM method generated two structurally significant transitions per compound, and it was designed to conform to U.S. Food and Drug Administration MS confirmation guidelines. It also provides 4-EU identification points. One hundred sixteen samples from 25 countries were analyzed, and 38% were found to contain at least one target antimicrobial. Five different target compounds were found in honey from 13 different countries.


Abstract: The effects of different unifloral honeys (buckwheat, clover, and sage), carbohydrates (fructose, glucose, and sucrose), and antioxidants (vitamin E, BHT), and Trolox((R)) (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid) on heterocyclic aromatic amine (HAA) formation and overall mutagenicity in fried ground patties were evaluated. The inhibition of total HAA formation was achieved with buckwheat (55%), clover (52%), and sage (51%); and they also reduced overall mutagenicity 36, 31, and 26%, respectively. The addition of fructose, glucose, or fructose and glucose together, at levels comparable to their occurrence in honey, reduced (p < 0.05) mutagenicity and HAA formation by amounts comparable to that found with honey.


Abstract: The effects of marinade ingredients, namely lemon juice, soy sauce, minced garlic, and 3 levels of buckwheat honey and clover, and 3 marinade formulations containing these ingredients, were evaluated for their influence on heterocyclic aromatic amine (HAA) formation. Buckwheat and clover honeys were chosen for their high and low antioxidant capacity, respectively. Garlic and lemon juice, as well as honey, were effective in reducing HAA formation and overall mutagenicity. For both types of honey, 30% honey in the marinade formulation was most effective in inhibiting HAA formation and overall mutagenicity. Marinades containing buckwheat honey were the most effective. Increasing marinating time had no effect on HAA formation in cooked meats.


Abstract: We studied the effect of Brazilian propolis on scratching behavior induced by compound 48/80 and histamine in ICR mice. Propolis granular A.P.C dose-related inhibited scratching behavior induced by compound 48/80 and significant inhibition were observed at 1000 mg/kg. However, histamine-induced scratching behavior was not inhibited by propolis granular A.P.C even at 1000 mg/kg. Propolis ethanol extract at 10 gg/ml or more inhibited histamine release from rat mast cells induced by compound 48/80. In addition, it blocked increased vascular permeability induced by compound 48/80. The inhibitory effect of propolis on scratching behavior induced by compound 48/80 was gradually enhanced by repeated administration, and 500 mg/kg propolis granular A.P.C, which caused no effect through single administration, significantly inhibited scratching behavior after repeated administration for 4 weeks. From these findings, it is assumed that the inhibition of scratching behavior induced by propolis occurs through a mast cell-dependent mechanism. (C) 2004 Published by Elsevier B.V.


Abstract: The antilipid peroxidative action of the ethanol extract of Brazilian propolis at a concentration of 47% (w/v) was evaluated by examining the inhibitory effect of the extract on the formation of hydroperoxide- and endoperoxide-type lipid peroxides during heating of authentic polyunsaturated fatty acids and on Fe3+-ADP/ascorbic acid- and Fe3+-ADP/NADPH-dependent lipid peroxidation reactions in rat liver microsomes. Hydroperoxide-type lipid peroxides were measured by the haemoglobin-methylene blue method and endoperoxide-type lipid peroxides by the thiobarbituric acid (TBA), Fe3+-TBA and LPO-586 methods. Propolis ethanol extract inhibited dose-dependently the formation of hydroperoxide- and endoperoxide-type lipid peroxides during heating of linoleic acid, linolenic acid or arachidonic acid and the amount of the extract causing a half inhibition of these lipid peroxide formations ranged between 20 and 75 mug. Propolis ethanol extract inhibited dose-dependently both Fe3+-ADP/ascorbic acid- and Fe3+-ADP/NADPH-dependent lipid peroxidation reactions in rat liver microsomes when lipid peroxides produced in both reactions were measured by the TBA method. The amount of propolis extract causing a half inhibition of the Fe3+-ADP/ascorbic acid-dependent lipid peroxidation was about 5 mug, while that of the extract causing a half inhibition of the Fe3+-ADP/NADPH-dependent lipid peroxidation was about 0.15 mug. These results indicate that the propolis ethanol extract exerts an antilipid peroxidative action at very low doses. Copyright (C), 2002 John Wiley Sons, Ltd.


1418. SHKLIAR, N P (1966) [Honey therapy of patients with trichomonas urethritis]. Vrachebnoe Delo 3: 142.

1419. SHORT, T; JACKSON, R; BEARD, G (1979) Usefulness of bee venom therapy in canine arthritis, pp 13-17.


1422. SILICI, S; UNLU, M; VARDAR-UNLU, G (2007) Antibacterial activity and phytochemical evidence for the plant origin of Turkish propolis from different regions. WORLD JOURNAL OF MICROBIOLOGY & BIOTECHNOLOGY 23 (12): 1797-1803. Abstract: Honeybees collect propolis from practically any abundant plant source in the neighborhood of the hive, be it populus, eucalyptus, pine, sugarcane, cashew nut or orange trees. We have described that the origin plants of Turkish propolis are Populus sp., Eucalyptus sp. and Castanea sativa. In our previous study, propolis samples from Middle Anatolia displayed the typical pattern of "poplar" propolis: they contained pinobanksin, caffeic and ferulic acids and their esters. The propolis samples examined in this study were shown not to contain polar phenolics. The main components of Eucalyptus propolis were aromatic acids, mainly cinnamic acid and its esters, that are usually found in Eucalyptus species resins. The second distinct sample originated from West Anatolia. Although it contained low amounts of phenolic substances and aromatic acids, its main components were sugars and glycosides. The study revealed that there was no significant difference between propolis samples in antibacterial activity, however the yeasts were shown to be more sensitive to eucalyptus-propolis. Gram negative bacteria were susceptible to none of the samples tested.

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1425. SILVESTRE, N; STRANIERI, G; BEZERQUE, P (1984) Anaesthesia troncular de propoleos comparado con lidocaina. International Dental Research


1427. SIMICS, M (1994) Bee venom: exploring the healing power. Apitronic Publishing Calgary, Alberta, Canada


Abstract: Author A single blind placebo controlled local therapy trial was carried out on 190 patients involving the use of materials topically and by iontophoresis for treatment of pain and/or inflammation. The materials used comprised (1) purified propolis and propolis saturated with antiinflammatory trace metal elements and (2) propolis saturated with trace metal elements and poplar bud ointment saturated with trace metal elements. Both methods of application using all the preparations significantly relieved symptoms. The preparations saturated with metallic ions were more effective. The mild effect of the placebo treatment is explained by the treatment procedure itself. Side-effects were not observed.


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Abstract: Native propolis was defined as propolis powder collected from the continental part of Croatia and prepared according to a patented process that preserves all the propolis natural nutritional and organoleptic qualities. Nine phenolic compounds (out of thirteen tested) in propolis sample were detected by high performance liquid chromatography (HPLC) analysis. Among them chrysin was the most abundant (2478.5 μg/g propolis). Contrary to moderate antioxidant activity of propolis examined in vitro (ferric reduction antioxidant power; FRAP-assay), propolis as a food supplement modulated antioxidant enzymes (AOE) and significantly decreased lipid peroxidation processes (LPO) in plasma, liver, lungs, and brain of mice. The effect was dose- and tissue-dependent. The lower dose (100 mg/kg bw) protected plasma from oxidation, whereas the higher dose (300 mg/kg bw) was pro-oxidative. Hyperoxia (long-term normobaric 100% oxygen) increased LPO in all three organs tested. The highest vulnerability to oxidative stress was observed in lungs where hyperoxia was not associated with augmentation of AOE. Propolis protected lungs from hyperoxia by increased catalase (CAT) activity. This is of special importance for lungs since lungs of adult animals are highly vulnerable to oxidative stress because of their inability to augment AOE activity. Because of its strong antioxidant and scavenging abilities, native propolis might be used as a strong plant-based antioxidant effective not only in physiological conditions but also in cases that require prolonged high concentration of oxygen.


1452. SONG, Y S; JIN, C B; JUNG, K J; PARK, E H (2002) Estrogenic effects of ethanol and ether extracts of propolis. Journal of Ethnopharmacology 82 (2-3): 89-95. Abstract: Propolis obtained from honeybee hives has been used in Oriental folk medicine as an anti-inflammatory, anti-carcinogenic, or immunomodulatory agent. The potential estrogenic activity of propolis was investigated in vitro using the MCF-7 human breast cancer cell proliferation, human estrogen receptor (hER) binding and yeast-based steroid receptor transcription, and in vivo using the immature rat uterotrophic effect. Treatments with ethanol extract of propolis (EEP) and ether extract of propolis (REP) enhanced MCF-7 cell proliferation in concentrations ranging from 0.8 to 4 μg/ml. Both EEP and REP competed for binding of [H-3]17beta-estradiol to the hER with IC50 values of 9.14 and 9.72 μg/ml, respectively. In yeast estrogen receptor transcription assay, both EEP and REP were found to be estrogenic with EC50 values of 9.48, and 8.55 μg/ml, respectively. Animals treated with EEP or REP for 4 days (500-1000 mg/kg per day, s.c.) exhibited significant dose-dependent increases in uterine wet weight. However, in the yeast androgen and progesterone receptor transcription assays, either EEP or REP was found not to be active. The results suggest that propolis produces estrogenic effects through activation of estrogen receptors. (C) 2002 Elsevier Science Ireland Ltd. All rights reserved.

Abstract: Propolis obtained from honeybee hives has been used in Oriental folk medicine as an anti-inflammatory, anti-carcinogenic, or immunomodulatory agent. However, the molecular basis for anti-inflammatory properties of propolis has not yet been established. Since nitric oxide (NO) synthesized by inducible nitric oxide synthase (iNOS) has been known to be involved in inflammatory and autoimmune-mediated tissue destruction, modulation of NO synthesis or action represents a new approach to the treatment of inflammatory and autoimmune diseases. The present study, therefore, examined effects of ethanol extract of propolis (EEP) on iNOS expression and activity of iNOS enzyme itself. Treatment of RAW 264.7 cells with EEP significantly inhibited NO production and iNOS protein expression induced by lipopolysaccharide (LPS) plus interferon-gamma (IFN-gamma). EEP also inhibited iNOS mRNA expression and nuclear factor-kappa B (NF-kappaB) binding activity in a concentration-dependent manner. Furthermore, transfection of RAW 264.7 cells with iNOS promoter linked to a chloramphenicol acetyltransferase (CAT) reporter gene, revealed that EEP inhibited the iNOS promoter activity induced by LPS plus IFN-gamma through the NF-kappaB sites of the iNOS promoter. In addition, EEP directly interfered with the catalytic activity of murine recombinant iNOS enzyme. These results suggest that EEP may exert its anti-inflammatory effect by inhibiting the iNOS gene expression via action on the NF-kappaB sites in the iNOS promoter and by directly inhibiting the catalytic activity of iNOS. (C) 2002 Elsevier Science Ireland Ltd. All rights reserved.
The results showed that prenylated compounds are sensitive to drying, but their losses may be considerably reduced under low temperatures, around 40 degrees C. The antioxidant activity of the spray dried propolis was determined by the diphenylpicrylhydrazyl (DPPH) method and showed a quadratic dependency on the temperature; extract feed rate and the interaction between them. However, spray dried propolis extracts presented antioxidant activities similar to the original propolis tincturae.

1458. SOYLU, E M; OZDEMIR, A E; ERTURK, E; SAHINLER, N; SOYLU, S (2008) Antifungal activity of propolis against postharvest disease agent Penicillium digitatum. Asian Journal of Chemistry 20 (6): 4823-4830. Abstract: The in vitro and in vivo antifungal activity of the propolis was evaluated against fungal pathogen Penicillium digitatum, causal agent of green mold of citrus fruits. The germination of conidia completely inhibited by 10, 50 and 100 μg mL(-1) concentrations of propolis extracted in 70 % ethanol. The same concentrations of propolis extracted in 35 % ethanol also inhibited conidial germination by 31, 68 and 93 % respectively. The in vivo effect of propolis on the spoilage of Star Ruby grapefruits by Penicillium was also evaluated at room temperature. None of the concentrations of propolis extracted in 70 % ethanol prevented the fungal growth on artificially inoculated fruits. The 100 μg mL(-1) propolis extracted in 70 % ethanol, however, provided complete inhibition of naturally occurring green mold disease on wounded but uninoculated control fruits.


1462. STAMBOLIU, D (1965) Preliminary researches regarding the utilisation of some melliferous products in the auxiliary therapeutics of hepatic pathology. XXth Apimondia Congress, Bucharest, Romania: 555-557.


1474. STEPANOVIĆ, S; ANTIC, N; DAKIC, L; SVABIĆ-VLAHOVIĆ, M (2003) In vitro antimicrobial activity of propolis and synergism between propolis and antimicrobial drugs. Microbiological Research 158 (4): 353-357. Abstract: The aim of this study was to investigate antimicrobial properties of ethanolic extract of 13 propolis (EEP) samples from different regions of Serbia against 39 microorganisms (14 resistant or multiresistant to antibiotics), and to determine synergistic activity between antimicrobials and propolis. Antimicrobial activity of propolis samples was evaluated by agar diffusion and agar dilution method. The synergistic action of propolis with antimicrobial drugs was assayed by the disc diffusion method on agar containing subinhibitory concentrations of propolis. Obtained results indicate that EEP, irrespectively of microbial resistance to antibiotics, showed significant antimicrobial activities against Gram-positive bacteria (MIC 0.078%-1.25% of EEP) and yeasts (0.16%-1.25%), while Gram-negative bacteria were less susceptible (1.25%->5%). Enterococcus faecalis was the most resistant Gram-positive bacterium, Salmonella spp. the most resistant Gram-negative bacteria, and Candida albicans the most resistant yeast. EEP showed synergism with selected antibiotics, and displayed ability to enhance the activities of antifungals. The shown antimicrobial potential of propolis alone or in combination with certain antibiotics and antifungals is of potential medical interest


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travailient les metaux non ferreux aux conditions ecologiques nocives par l'administration du miel standard. **XXXIth Apimondia Congress Warsaw, Poland**: 539-540.


SUN, F; HAYAMI, S; HARUNA, S; OGIRI, Y; TANAKA, K; YAMADA, Y; IKEDA, K; YAMADA, H; SUGIMOTO, H; KAWAI, N; KOJO, S (2000) In vivo antioxidative activity of propolis evaluated by the interaction with vitamins C and E and the level of lipid hydroperoxides in rats. *Journal of agricultural and food chemistry* 48 (5): 1462-1465.

Abstract: In vivo antioxidative activity of propolis was evaluated on the basis of ameliorative effects on the oxidative stress induced by vitamin E deficiency in rats. The control group was fed vitamin E-deficient diet, and the propolis group was fed vitamin E-deficient diet supplemented with 1% of propolis for 4 and 8 weeks. Comparisons were made in tissue concentrations of vitamin C, vitamin E, and lipid hydroperoxides between these groups. No significant difference was observed in tissue vitamin E concentration between these groups after both 4 and 8 weeks. After 4 weeks, the plasma vitamin C concentration of the propolis group was significantly higher than that of the control group. After 8 weeks, the tissue concentrations of vitamin C in the kidney, stomach, small intestine, and large intestine of the propolis group were significantly higher than those of the control group. These results suggest that some components of propolis are absorbed to circulate in the blood and behave as a hydrophilic antioxidant that saves vitamin C. The concentration of lipid hydroperoxides in the large intestine of the propolis group was significantly lower than that of the control group after 8 weeks. These results suggest that propolis exerts its antioxidative effect where it is assumed to accumulate, such as on the kidney, where it is excreted, and on the gastrointestinal tract, where propolis influences these tissues even from the outside of the cell.


Abstract: OBJECTIVES: The antitumor effect of bee honey against bladder cancer was examined in vitro and in vivo. Methods: Three human bladder cancer cell lines (T24, 253J and RT4) and one murine bladder cancer cell line (MBT-2) were used in these experiments. In an in vitro study, the antitumor activity was assessed by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay, TdT-mediated dUTP-biotin nick end labeling (TUNEL) assay, 5-Bromodeoxyuridine (BrdU) labeling index and flowcytometry (FCM). In the in vivo study, cancer cells were implanted subcutaneously in the abdomens of mice, and the effects were assessed by the tumor growth. RESULTS: In vitro studies revealed significant inhibition of the proliferation of T24 and MBT-2 cell lines by 1-25% honey and of RT4 and 253J cell lines by 6-25% honey. BrdU labeling index was significantly lower. FCM showed lower S-phase fraction, as well as absence of aneuploidy compared with control cells. In the in vivo studies, intraläsional injection of 6 and 12% honey as well as oral ingestion of honey significantly inhibited tumor growth. CONCLUSION: Bee honey is an effective agent for inhibiting the growth of T24, RT4, 253J and MBT-2 bladder cancer cell lines in vitro. It is also effective when administered intraläsional or orally in the MBT-2 bladder cancer implantation models. Our results are promising, and further research is needed to clarify the mechanisms of the antitumor activity of honey.


Abstract: Reactive oxygen species have been implicated in pathogenesis injury after ischaemia-reperfusion (I/R). Caffeic Acid Phenethyl Ester (CAPE), an active component of honeybee propolis extract, exhibits antioxidant and anti-inflammatory properties. The aim of this study was to investigate the effects of CAPE on erythrocyte membrane damage after hind limb I/R. Rats were divided into two groups: I/R and I/R with CAPE pre-treatment. They were anaesthetized with intramuscular ketamine 100 mgkg(-1). A 4-h I/R period was performed on the right hind limb of all animals. In the CAPE-treated group, animals received CAPE 10 pm by intraperitoneal injection 1 h before the reperfusion. At the end of the reperfusion period, a mid-sternotomy was performed. A 5-ml blood sample was withdrawn from the ascending aorta for biochemical assays. Serum and erythrocyte membrane MDA levels were significantly lower in the CAPE-treated group when compared to the I/R group (p = 0.001 and p < 0.001, respectively). Erythrocyte membrane Na+-K+ ATPases activity in the CAPE-treated group was significantly higher than the I/R group (p < 0.001). In conclusion, CAPE seems to be effective in protecting against oxidative stress. Therefore, we suggest that in order to decrease I/R injury, pre-administration of CAPE may be a promising agent for a variety of conditions associated with I/R. Copyright (C) 2004 John Wiley Sons, Ltd


Abstract: Antimicrobial activity of honey has been attributed to hydrogen peroxide, which is produced by naturally occurring glucose oxidase, and phenolic compounds, although lethality of and inhibition by these and other components against microorganisms vary greatly, depending on the floral source of nectar. This study was undertaken to compare honeys from six floral sources for their inhibitory activity against *Escherichia coli* O157:H7, *Salmonella typhimurium*, *Shigella sonnei*, *Listeria monocytogenes*, *Staphylococcus aureus*, and *Bacillus cereus*. A disc assay revealed that development of zones of inhibition of growth depends on the type and concentration of honey, as well as the test pathogen. Growth of *B. cereus* was least affected. The inhibition of growth of *S. sonnei*, *L. monocytogenes*, and *S. aureus* in 25% solutions of honeys was reduced by treating solutions with catalase, indicating that hydrogen peroxide contributes to antimicrobial activity. Darker colored honeys were generally more inhibitory than light colored honeys. Darker honeys also contained higher antioxidant power. Since antimicrobial activity of the darker colored test honeys was not eliminated by catalase treatment, non-peroxide components such as antioxidants may contribute to controlling the growth of some foodborne pathogens. The antibacterial properties of honeys containing hydrogen peroxide and characterized by a range of antioxidant power need to be validated using model food systems. (C) 2001 Elsevier Science B.V. All rights reserved.


Abstract: Propolis has been used in folk medicine since ancient times and is known for its antimicrobial, antiparasitic, antiviral, anti-inflammatory, antitumoral and antioxidant properties. In view of the great therapeutic interest in propolis and the small number of studies regarding its mechanism of action, the aim of the present study was to evaluate the mutagenic and antimutagenic effects of propolis using Chinese hamster ovary cells. Parameters such as the frequency of chromosome aberrations and mitotic index were analyzed. The results showed that, on one hand, the highest propolis tested concentration displayed a small but significant increase in the frequency of chromosome aberrations, and on the other hand, it was observed that the lowest tested concentration significantly reduced the chromosome damage induced by the chemotherapeutic agent doxorubicin. The present results indicate that propolis shows the characteristic of a “Janus” compound, i.e., propolis is genotoxic at higher concentrations, while at lower concentrations it display a chemopreventive effect on doxorubicin-induced mutagenicity. Flavonoids may be the components of propolis responsible for its both mutagenic and antimutagenic effects, once these compounds may act either as pro-oxidant or as free radicals scavenger, depending on its concentration. (c) 2006 Elsevier Ltd. All rights reserved.

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Abstract: Introduction: Propolis is the generic name for the resinous substance collected by honeybees, which is known to have antioxidant, anti-inflammatory, apoptosis-inducible effects. Anastomotic dehiscence after colorectal surgery is an important cause of morbidity and mortality. We aimed to assess the effect of propolis on healing in an experimental colon anastomosis in rats. Methods: Forty adult male Wistar albino rats were randomly assigned into 5 treatment groups with 8 rats in each: Group I, anastomosis+no treatment; Group II, anastomosis+oral propolis (600 mg/kg/d); Group III, anastomosis+oral ethyl alcohol (1 cc/d); Group IV, anastomosis+rectal propolis (600 mg/kg/d); Group V, anastomosis+rectal ethyl alcohol (1 cc/d). The bursting pressures, hydroxiproline levels and histopathological changes in each group were measured. Results: When bursting pressures were compared between groups, we observed that they were increased in the groups treated with propolis in contrast to all other groups. Hydroxiproline levels in the propolis groups were also significantly increased in contrast to the other groups. There was also a statistically significant difference in histopathological changes between the treatment types. When propolis administration methods were compared, we did not observe a statistically significant difference. Conclusion: Propolis has a significantly favourable effect on healing in experimental colon anastomosis, independent from the method of administration.


Abstract: Contain beeswax.


Abstract: In recent years, the use of honey has re-emerged as a remedy for wound treatment. Effects of honey have been related to the presence of an unidentified component that induces release of inflammatory cytokines from monocytes. The present study was intended to further characterize the reported in vitro effects of honey. Our results show that natural honeys induce interleukin-6 release from Mono Mac 6 cells as well as release of reactive oxygen species from all-trans retinoic acid (ATRA).
differentiated HL-60 cells. The natural honeys contained substantial amounts of endotoxin, and the responses observed in the cell based assays were similar to the responses induced by endotoxin alone. In addition, we determined that the immunomodulatory component present in the natural honeys was retained in the ultra filtered fraction with a molecular weight greater than 20 kDa. The component was resistant to boiling and its immunomodulatory activity could be abrogated by the addition of polymyxin B. We speculate that the observed in vitro immunomodulatory effects of honey might solely be explained by the endotoxin content in the natural honeys. (c) 2008 Elsevier Ltd. All rights reserved


manuka and pasture honey but was not altered in primed cells. These results could explain the suggested therapeutic properties of honey in promoting wound healing. (C) 2001 Academic Press.


Abstract: Honey is used as a therapy to aid wound healing. Previous data indicate that honey can stimulate cytokine production from human monocytes. The present study further examines this phenomenon in manuka honey. As inflammatory cytokine production in innate immune cells is classically mediated by pattern recognition receptors in response to microorganisms, bacterial contamination of honey and the effect of blocking TLR2 and -4 on stimulatory activity were assessed. No vegetative bacteria were isolated from honey; however, bacterial spores were cultured from one-third of samples, and low levels of LPS were detected. Blocking TLR4 but not TLR2 inhibited honey-stimulated cytokine production significantly. Cytokine production did not correlate with LPS levels in honey and was not inhibited by polymyxin B. Further, the activity was reduced significantly following heat treatment, indicating that component(s) other than LPS are responsible for the stimulatory activity of manuka honey. To identify the component responsible for inducing cytokine production, honey was separated by molecular weight using microcon centrifugal filtration and fractions assessed for stimulatory activity. The active fraction was analyzed by MALDI-TOF mass spectroscopy, which demonstrated the presence of a number of components of varying molecular weights. Additional fractionation using miniaturized, reverse-phase solid-phase extraction resulted in the isolation of a 5.8-kDa component, which stimulated production of TNF-alpha via TLR4. These findings reveal mechanisms and components involved in honey stimulation of cytokine induction and could potentially lead to the development of novel therapeutics to improve wound healing for patients with acute and chronic wounds.

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Abstract: Background: Propolis is widely used in apitherapy, preparations, and food and beverage additives. Various extraction techniques were applied in the extraction of the biologically active constituents of poplar type propolis in order to compare their efficiency. The methods employed were: traditional maceration extraction, ultrasound extraction (UE), and microwave assisted extraction (MAE). Results: The total amounts of extracted phenolics and flavonoids were determined, and the effectiveness of the methods compared. MAE was very rapid but led to the extraction of a large amount of non-phenolic and non-flavonoid material. UE gave the highest percentage of extracted phenolics. Conclusion: Compared to the maceration extraction, MAE and UE methods provided high extraction yield, requiring short timeframes and less labour. UE was shown to be the most efficient method based on yield, extraction time and selectivity


Abstract: The effects of caffeic acid phenethyl ester (CAPE), an antioxidant derived from propolis, on the infarct volume elicited by focal cerebral ischemia were studied on Long-Evans rats. Cerebral infarction was induced by microsurgical procedures with ligation of the right middle cerebral artery (MCA) and clipping of bilateral common carotid arteries (CCA) for 60 min. The rats were sacrificed 24 h later and serial brain slices of 2 min thickness were taken and stained for the measurement of infarct area. CAPE was administered intravenously 15 min before MCA occlusion. Pretreatment of CAPE (0.1, 1 and 10 µg/kg) significantly reduced the total infarct volume from 169.6 +/- 14.5 mm(3) (control) to 61.0 +/- 24.1 mm(3) (0.1 µg/kg CAPE), 47.4 +/- 9.1 mm(3) (1 µg/kg CAPE), and 42.4 +/- 8.7 mm(3) (10 µg/kg CAPE), respectively. Plasma nitric oxide (NO) content was significantly increased in rats subjected to focal cerebral ischemia. It is concluded that CAPE possesses neuroprotective properties in focal cerebral ischemia injury in rats possibly through its antioxidant effect and/or via the upregulation of NO production. (c) 2005 Elsevier Inc. All rights reserved


Abstract: Honeybee (Apis mellifera) venom (BV) has been reported to exhibit anticancer effects, but its mode of action at the cellular and molecular levels remains largely
unknown. We found that honeybee venom induced apoptosis in human melanoma A2058 cells but not in normal skin fibroblast Detroit 551 cells. The BV-induced apoptosis was accompanied by generation of reactive oxygen species and alteration of mitochondrial membrane potential transition. Treatment with antioxidants significantly attenuated BV-induced apoptosis. Although caspase-2 and -3 were slightly activated by BV, inhibitors of caspase-2 and -3 could not block BV-induced apoptosis in A2058 cells. Data from immunostaining indicated that EncloG and AIF were translocated from mitochondria to the cytosol or nucleus, suggesting that BV induces apoptosis in A2058 cells via a caspase-independent pathway. In addition, cJun N-terminal kinases (JNK) and ERK were rapidly activated after a 5 min incubation with BV, while p38 and AKT were inactivated after 30 min administration of BV. Inhibition of JNK significantly attenuated BV-triggered apoptotic death. Moreover, BV induced a rapid and marked increase in cytosolic calcium ion. Incubation of cells under calcium-free conditions effectively diminished BV-induced apoptosis. Furthermore, when the calcium-free treatment was combined with ouabain, the recovery of cellular calcium fluctuation protected A2058 cells against BV-induced apoptosis. Finally, treatment of A2058 cells with melittin, the major component of BV, resulted in similar elevation of calcium levels and cell killing effects, suggesting that melittin is the major determinant in BV-triggered cell death. These observations provide a molecular explanation for the antiproliferative properties of BV, and suggest that this agent may be useful in treating melanoma. (C) 2008 Elsevier Ltd. All rights reserved

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1566. UWAI, K; OSANAI, Y; IMAIZUMI, T; KANNO, S I; TAKESHITA, M; ISHIKAWA, M (2008) Inhibitory effect of the alkyl side chain of caffeic acid analogues on lipopolysaccharide-induced nitric oxide production in RAW264.7 macrophages 131 77654. Bioorganic & Medicinal Chemistry Letters 16 (16): 7795-7803. Abstract: Caffeic acid esters, one of the components of propolis, are known to show a variety of biological effects such as anti-tumor, anti-oxidant, and anti-inflammatory activities. Although, the anti-inflammatory activities of caffeic acid esters have been studied by analyzing their structure, the detailed mechanisms of their activities remain unclear. Thus, in this study, we examined the function of the ester functional group and
the alkyl side chain (alcoholic part) and transformed caffeic acid to several derivatives. The inhibitory effect of these derivatives on NO production in murine macrophage RAW264.7 cells was dependent on the length and size of the alkyl moiety, and undecyl caffeate was the most potent inhibitor of NO production. In addition, individual experiments using undecanol, caffeic acid, undecanol plus caffeic acid, and undecyl caffeate showed that the connection between caffeic acid and the alkyl chain is critical for activity. Amide and ketone derivatives showed that not only the ester functional group but also the amide and ketone functional groups exhibit an inhibitory effect on NO production. (C) 2008 Elsevier Ltd. All rights reserved


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1576. VARDAR-UNLU, G; SILICI, S; UNLU, M (2008) Composition and in vitro antimicrobial activity of Populus buds and poplar-type propolis. WORLD JOURNAL OF MICROBIOLOGY & BIOTECHNOLOGY 24 (7): 1011-1017. Abstract: The antibacterial activity of propolis has been widely investigated. Since reports dealing with antimicrobial activity of the origin of propolis are not available, this study was carried out aiming to analyse the in vitro antimicrobial activity of the methanol extracts of poplar type propolis and Populus (Populus nigra, P. alba, P. tremuloides) buds as its sources against standard strains of a panel of microorganisms by determining the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). The concentrations of the "poplar" phenolics were relatively high (4.5%) and some
compounds typical for P. nigra such as pinobanksin and 4,3 acetyloxycaffeate were found in the propolis sample by GC-MS. The poplar type propolis and Populus bud exudates were found to inhibit most clinically important microorganisms in a wide spectrum including pathogenic yeasts but not Gram-negative bacteria.

Abstract: English Article Honey has been described in ancient and modern medicine as being effective in the healing of various infected wounds. In this report we present our experience in nine infants with large, open, infected wounds that failed to heal with conventional treatment. Conventional treatment was defined as having failed if after greater than or equal to 14 d of intravenous antibiotic and cleaning the wound with chlorhexidine 0.05% W/V in aqueous solution and fusidic acid ointment the wound was still open, oozing pus, and swab cultures were positive. All infants showed marked clinical improvement after 5 d of treatment with topical application of 5-10 ml of fresh unprocessed honey twice daily. The wounds were closed, clean and sterile in all infants after 21 d of honey application. There were no adverse reactions to the treatment. We conclude that honey is useful in the treatment of post-surgical wounds that are infected and do not respond to conventional systemic and local antibiotic treatment.

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Abstract: Reactive oxygen species play an important role in cancer and metastasis. Kalpaamruthaa is a modified Siddha preparation, which has been formulated in our laboratory. The preparation is an amalgamation of Semecarpus anacardium (SA), Emblica officinalis (EO) and honey, which gives an extra protectiveness to mammary carcinoma bearing animals (Sprague-Dawley stains were used for this study). The aim of our research is to determine the therapeutic efficiency of the drug with respect to lipid peroxidation and antioxidant status. The levels of lipid peroxides and antioxidant levels were measured in blood, and vital organs (liver, kidney and breast tissue) of control and experimental animals. In cancer condition, the LPO was increased and antioxidant levels were decreased. On drug (SA and KA) administration, decreased LPO and increased antioxidant levels were seen in control and experimental animals. This may be due to additive property of the drugs (SA, Emblica and honey), which possesses anticancer effect. The present study shows the good therapeutic efficacy of Kalpaamruthaa against mammary carcinoma.


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Abstract: Aims: To evaluate the antibacterial and free-radical scavenging (FRS) activities of propolis collected from three different areas of Sonoran Desert in northwestern Mexico.
Methods and Results: The antibacterial and FRS activities of Sonoran propolis were determined by the broth microdilution method and the DPPH (1,1-diphenyl-2-picrylhydrazyl) assay, respectively. Propolis samples had antibacterial activity against only Gram-positive bacteria. The UP sample showed the highest antibacterial activity against Staphylococcus aureus [minimal inhibitory concentration (MIC) 100 µg ml(−1)] in a concentration-dependent manner (UP > CP > PAP). Caffeic acid phenethyl ester (CAPE), a UP propolis constituent, had very high growth-inhibitory activity towards Gram-positive bacteria, particularly against S. aureus (MIC 0.1 mmol l(−1)). To our knowledge, this is the first study showing a strong antibacterial activity of CAPE against S. aureus. Additionally, propolis CP exhibited high FRS activity (86% +/- 0.3 at 100 µg ml(−1)) comparable with those of the reference antioxidants vitamin C (87.4% +/- 1.7 at 70 µmol l(−1)) and BHT (66.07% +/- 0.76 at 140 µmol l(−1)). The propolis compounds CAPE and rutin showed high FRS activity (90.4% +/- 0.2 and 88.5% +/- 0.8 at 70 µmol l(−1), respectively). Conclusions: Sonoran propolis UP and CAPE had strong antibacterial activity against S. aureus. In addition, propolis CP showed potent FRS activity comparable with those of vitamin C and BHT. Significance and Impact of the Study: The strong antibacterial and antioxidant properties of Sonoran propolis and some of its constituents support further studies on the clinical applications of this natural bee product against S. aureus and several oxidative damage-related diseases.


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Abstract: Background: Among atopic individuals, levels of allergen-specific IgG antibodies have been inversely associated with the degree of allergen sensitization. Additionally, allergen-specific IgG antibodies are markedly increased by allergen injection immunotherapy. These observations have led to proposals that allergen-specific IgG antibodies might have protective properties in atopic individuals. Objective: We hypothesized that after grass pollen immunotherapy, these antibodies disrupt IgE-dependent allergen processing by antigen-presenting cells. Methods: We have developed a novel flow cytometric assay based on detection of allergen-IgE binding to the low-affinity IgE receptor on B cells to examine the blocking effects of sera collected from 18 patients who participated in a double-blind, controlled trial of grass pollen immunotherapy for 1 year. Results: In all 10 patients who received active therapy, there was induction of activity that inhibited allergen-IgE binding to B cells (P = .02, vs placebo subjects), as well as subsequent allergen presentation to T cells. This activity copurified with IgG and was
allergen specific, because sera taken from patients treated with grass pollen immunotherapy but who were also birch pollen sensitive did not inhibit IgE-birch pollen allergen binding to B cells. Conclusion: We conclude that allergen-specific IgG antibodies induced by immunotherapy can disrupt formation of allergen-IgE complexes that bind to antigen-presenting cells and facilitate allergen presentation.


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1615. WANG, B J; LIEN, Y H; SU, C L; WU, C P; YU, Z R (2006) Fractionation using supercritical CO2 influences the antioxidant and hepatoprotective activity of propolis against liver damage induced by tert-butyl hydroperoxide. *International Journal of Food Science & Technology* 41: 68-75. Abstract: The ethanolic extract (E) of propolis was further fractionated with supercritical CO2 into four fractions (R, F1, F2 and F3). The extracts and the four fractions were characterised in terms of antioxidant and hepatoprotective activity against tert-butyl hydroperoxide (t-BHP)-induced damage in vitro and in a rat model. The in vitro study revealed that pre-treatment with propolis extract or its fractions significantly protected the primary hepatocytes against damage by t-BHP (P < 0.05). The hepatoprotective capacity increased with the dose of propolis. The R and F1 fractions had the highest flavonoid contents and most effectively protected the liver from damage by t-BHP. This study also demonstrated that the oral pretreatment with propolis (50 and 100 mg kg(-1)) 5 days before a single dose of t-BHP (1.5 mM kg(-1), s.c. injection) was administered significantly kept the serum levels of hepatic enzyme markers (aspirate aminotransferase and alanine aminotransferase) low, even after treatment with t-BHP (P < 0.05). A pathological examination showed that lesions of liver were partially protected by treatment with propolis extract and fractions. Oxidative stress induced by t-BHP led to lipid peroxidation (malondialdehyde) and changes in the levels of the antioxidant enzymes. However, all the fractions, except F3 at low concentration (50 mg kg(-1)), markedly suppressed lipid peroxidation and any increase in the activity of antioxidant enzymes.


Abstract: Honey has been used since ancient times as a flavorful sweetener and for its therapeutic and medicinal effects. Consumers' demand for natural, healthy products has driven renewed interest in honey's health benefits. The commonly encountered food mutagen, Trp-p-1, has been demonstrated to be mutagenic in bacteria and carcinogenic in animals. Chemically, honey is quite complex. Honey is comprised primarily of sugars; however, it contains many other potentially biologically active components, such as antioxidants. Sugars have been reported to display both mutagenic and antimutagenic effects in different systems; antioxidants often display antimutagenic activity. Little information exists about potential antimutagenic effects of honey. Anti mutagenicity of honeys from seven different floral sources against Trp-p-1 was tested via the Ames assay and compared to that of a sugar analogue and to individually tested simple sugars. All honeys exhibited significant inhibition of Trp-p-1 mutagenicity; most demonstrated a linear correlation between percentage inhibition and log transformed honey concentration from 10 μg/mL to 20 mg/mL. Each displayed significant degrees of inhibition of mutagenicity above concentrations of 1 mg/mL, with individual variations in degree of effectiveness. Buckwheat honey displayed the greatest inhibition at 1 mg/mL, with slightly less effectiveness at higher concentrations. A sugar analogue demonstrated a pattern of inhibition similar to that of the honeys, with enhanced antimutagenicity at concentrations greater than 1 mg/mL. Glucose and fructose were also similar to honeys and were more antimutagenic, than maltose and sucrose.


Abstract: The impact of heat and filtration on the antioxidant capacity of clover and buckwheat honey during storage was analyzed. Processing clover honey did not significantly impact antioxidant capacity (determined by oxygen radical absorbance capacity [ORAC] assay); processing lowered the antioxidant capacity of buckwheat honey (33.4%). The antioxidant capacity of honeys was reduced after 6 mo of storage with no impact of storage temperature or container type detected at the end point of the storage period. Processed and raw clover honey antioxidant capacity decreased about 30%. Processed buckwheat honey decreased 24% in antioxidant capacity, whereas raw buckwheat honey decreased 49%. Antioxidant capacity of processed and raw honeys was similar after storage. Phenolic profiles, peroxide accumulation, 5-(hydroxymethyl)-2-furaldehyde (HMF), gluconic acid, and total phenolics were also analyzed. The impact of storage on antioxidant components of processed and raw honey was complex.


Abstract: Propolis is a widely used natural remedy and a range of biological activities have been attributed to it. The chemical composition of propolis is highly variable and its
quality is often controlled on the basis of one or two marker compounds. In order to progress towards a method for the quality control of this complex material, HPLC and H-1-NMR approaches as methods of quality control have been compared. HPLC analyses of 43 samples of propolis were carried out and six marker compounds were quantified in each sample. The same samples were analysed using H-1-NMR and the spectra were then converted into their first derivative forms and digitised using the software application MestRe-C. The digitised data were subjected to principal component analysis using the software application Simca-P. It was found that the chemical composition of propolis mapped well according to the geographical origins of the samples studied when the first three principal components were used to display them. In addition, each sample was assessed for anti-oxidant activity, and the results were then overlaid onto the sample groupings according to H-1-NMR data. It was observed that anti-oxidant properties also mapped quite well according to geographical origin. Copyright (c) 2006 John Wiley & Sons, Ltd


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Abstract: Understanding the architecture of genetic variation, that is the number, effect, location, and interaction, of genes responsible for phenotypic variability in nature is important for the understanding of microevolutionary processes. In this study, we have used a quantitative trait loci (QTL) approach to uncover the genetic architecture of fitness-relevant traits associated with reproduction and immune defense in male Bombus terrestris bumblebees. Three male reproductive investment traits, the number and length of the produced sperm and the size of the accessory glands, were studied. Two branches of the insect innate immune system, the activation of the Phenoloxidase-cascade and the hemolymph's antibacterial activity, were investigated. We found that variation in most of the studied traits is based on a network of minor QTLs and epistatic interactions. Unexpectedly, there was no evidence for phenotypic or genetic trade-offs between the presumably costly investment in immune defense and reproductive effort in this population for the measured traits. In fact, we found a positive correlation, both, in phenotype and genetic architecture for the number of produced sperm and antibacterial activity against an insect pathogen. A major finding for all traits analyzed was that the epistatic interactions accounted for a major proportion of the explained phenotypic variance. Especially for traits involved in immune defense, this pattern highlights the possible role of parasites in the evolution and maintenance of recombination and sexual reproduction.


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Abstract: The objective of this study was to evaluate the effects of heat processing on the antioxidant capacity of mead (honey wine). Soy and buckwheat honey musts were subjected to 2 heat treatments and fermented into wine. Total phenolic concentration was determined. High-performance liquid chromatography (HPLC) phenolic profiling was performed on the methanol fraction of Amberlite extraction. Antioxidant capacity was evaluated by headspace-solid phase microextraction/gas chromatography-mass spectrometry (H-SPME/GC-MS). ORAC values of experimental meads (3.62 mM Trolox...
equivalent) were comparable to those of commercial white wine (3.66 mM Trolox equivalent). No significant difference in antioxidant capacity due to heat treatment or honey type was observed. There was no difference in total phenolics between heat treatments in buckwheat mead; however, soy mead made from high-heated must had significantly greater phenolic concentration than the gently heated mead (alpha = 0.05). Linear regression analysis indicated a strong positive correlation between total phenolic concentration and antioxidant capacity by ORAC (r = 0.99077; P < 0.0001). HPLC analysis of phenolic profiles in the methanol fractions of Amberlite extraction of the meads indicated significantly higher levels of certain phenolics as a result of the high-heat process in buckwheat mead, but not in soy mead. Differences in volatile components that potentially impact flavor were noted between high and low heat treatments. Results of this study suggest dramatic heat treatments that are often avoided because their flavor impact in mead production have the potential to alter the antioxidant capacity of mead by changing phenolic profiles


1652. WONG, C M; WONG, K H; CHEN, X D (2008) Glucose oxidase: natural occurrence, function, properties and industrial applications 4. *Applied Microbiology and Biotechnology* 78 (6): 927-938. Abstract: Glucose oxidase (GOX) from Aspergillus niger is a well-characterised glycoprotein consisting of two identical 80-kDa subunits with two FAD co-enzymes bound. Both the DNA sequence and protein structure at 1.9 angstrom have been determined and reported previously. GOX catalyses the oxidation of D-glucose (C6H12O6) to D-gluconolactone (C6H10O6) and hydrogen peroxide. GOX is produced naturally in some fungi and insects where its catalytic product, hydrogen peroxide, acts as an anti-bacterial and anti-fungal agent. GOX is Generally Regarded As Safe, and GOX from A. niger is the basis of many industrial applications. GOX-catalysed reaction removes oxygen and generates hydrogen peroxide, a trait utilised in food preservation. GOX has also been used in baking, dry egg powder production, wine production, gluconic acid production, etc. Its electrochemical activity makes it an important component in glucose sensors and potentially in fuel cell applications. This paper will give a brief background on the natural occurrence, functions as well as the properties of glucose oxidase. A good coverage on the diverse uses of glucose oxidase in the industry is presented with a brief outline on the working principles in the various settings. Furthermore, food grade GOX preparations are relatively affordable and widely available; the readers may be encouraged to explore other potential uses of GOX. One example is that GOX-catalysed reaction generates significant amount of heat (similar to 200 kJ/mol), and this property has been mostly neglected in the various applications described so far.


1660. XU, R X (1990) Burn treatment with raw honey. *China National Science and Technology Center*, Peking, China

1665. YAGHOUBI, M J; GHBORANI, G; SOLEIMANIAN, Z S; SATARI, R (2007) Antimicrobial activity of Iranian propolis and its chemical composition. *Daru-Journal of Faculty of Pharmacy* 15 (1): 45-48. Abstract: The objective of this study was to investigate the antimicrobial activity of ethanol extract of Iranian propolis on some microorganisms using disc diffusion method. The chemical composition of the propolis was also investigated using thin layer chromatography and spectrophotometric methods. Ethanol extract of propolis showed activity only against Gram-positives and fungi, whereas no activity was observed against Gram-negatives. Thin layer chromatography screening revealed the presence of pinocembrine, caffeic acid, kaempferol, phenethyl caffeate, chrysin, and galangin in Iranian propolis. The total flavonoid and phenolic contents were 7.3% and 36%, respectively, which suggests that the strong antimicrobial activity of Iranian propolis may be due to high levels of phenolic and flavonoid compounds.


1667. YAMAMOTO, K; BANNO, Y; FUJII, H; MIAKE, F; KASHIGE, N; ASO, Y (2005) Catalase from the silkworm, Bombyx mori: Gene sequence, distribution, and overexpression. *Insect Biochemistry and Molecular Biology* 35 (4): 277-283. Abstract: Living organisms require mechanisms regulating reactive oxygen species (ROS) such as hydrogen peroxide and superoxide anion. Catalase is one of the regulatory enzymes and facilitates the degradation of hydrogen peroxide to oxygen and water. Biochemical information on an insect catalase is, however, insufficient. Using mRNA from fat body of the silkworm, Bombyx mori, a cDNA encoding a putative catalase was amplified by reverse transcriptase-polymerase chain reaction and sequenced. The deduced amino acid sequence comprised 507 residues with more than seventy residues forming a scaffold for a heme cofactor conserved. The sequence showed 71% and 66% identities to those of the Drosophila melanogaster and Apis mellifera catalases, respectively; the catalase from B. mori was estimated to be phylogenetically close to that from A. mellifera. The transcripts of the gene and the catalase activity were distributed in diverse tissues of B. mori, suggesting its ubiquitous nature. Using the gene, a recombinant catalase (rCAT) was functionally overexpressed in a soluble form using Escherichia coli, purified to homogeneity, and characterized. The pH-optimum of rCAT was broad around pH 8.0. More than 80% of the original rCAT activity was retained after incubation in the following conditions: at pH 8-11 and 4 degrees C for 24 h; at pH 7 and temperatures below 50 degrees C for 30 min. The Michaelis constant for hydrogen peroxide was evaluated to be 28 mM at pH 6.5 and 30 degrees C. rCAT was suggested to be a member of the typical catalase family. (c) 2005 Elsevier Ltd. All rights reserved.


Abstract: In the present study, the ethanol extract of propolis (EEP) collected in Taiwan was prepared and assayed for the effects concentration, incubation temperature, pH and cell age on the antimicrobial activity against Streptococcus mutans, a dental cavity-causing oral pathogen. Additionally, cell leakage of Str. mutans in presence of EEP was also examined. It was found EEP exerted bacteriostatic and bactericidal effects against Str. mutans, respectively, at concentrations of 1.875 and 3.75 μg/mL or more. At 37 degrees C, Str. mutans was more sensitive to EEP than at 25 degrees C while most resistant at 4 degrees C. Cells of test organism were most susceptible to EEP at acid pH followed by neutral and alkaline pH. It was also noted that cells of Str. mutans in the stationary phase were more resistant, while cells in the mid-exponential phase were more susceptible to EEP. After exposure to EEP, a marked increase in the 260 nm absorbance for the supernatant of culture, was observed, indicating the release of UV-absorbing materials. Scanning electron micrographs also showed an increase in material with irregular shape on the surface of EEP-treated Str. mutans cells.


Abstract: Radiation at 25 and 50kGy showed no effect on the acidic pH of the local honey, Gelam, and its antimicrobial property against Staphylococcus aureus but significantly reduced the viscosity. Honey stored up to 2 years at room temperature retained all the properties studied. Radiation sterilized Gelam honey significantly stimulated the rate of burn wound healing in Sprague-Dawley rats as demonstrated by the increased rate of wound contraction and gross appearance. Gelam honey attenuates wound inflammation; and re-epithelialization was well advanced compared to the treatment using silver sulphadiazine (SSD) cream. To enhance further the use of honey in wound treatment and for easy handling, Gelam honey was incorporated into our hydrogel dressing formulation, which was then cross-linked and sterilized using electron beam at 25 kGy. Hydrogel with 6% of honey was selected based on the physical appearance. (C) 2007 Elsevier Ltd. All rights reserved.


Abstract: Old and recent reports show that honey has beneficial effects on the skin as antiseptic for wounds, burns and ulcers and as a healing promotor. Many investigators confirmed the usefulness of honey in the treatment of skin infections as well as internal
diseases. The factors behind these effects are not completely explained. The aim of this study is: a) to investigate the antimicrobial activity of crude honey, b) to separate the fractions responsible for its activity, c) to formulate the honey extract as semisolid dosage forms, d) to study its release, and e) to determine its stability. The results showed that the ethylacetate honey extract showed antibacterial, anticandida and antifungal effects at low concentration. The release of honey extract from different ointment bases was depending on the constituents of the base, and its stability was found to be temperature and base dependent.


1681. ZAISS (1938) Etwas von der innerlichen Anwendung des Honigs, besonders bei Herzkrankheiten. *Der Landarzt - Wochenschrift für ärztlichen Meinungsaustausch* 19 (Nr. 41)

1682. ZAITZ (1935) Der Honig in äusserlicher Anwendung, 3pp. *Deutscher Imkerführer* 9 (1)

1683. ZAITZ Imkerliches und Aerztliches vom Honig. Ein Rundfunkvortrag. 2pp. *unknown*


Abstract: The antioxidant properties of 15 honey samples from different floral sources and various Slovak regions were investigated by means of electron paramagnetic resonance spectroscopy. Cation radical of ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonate) diammonium salt), DPPH(1,1-diphenyl-2-picrylhydrayl) and hydroxyl radicals generated by the photochemical decomposition of hydrogen peroxide were used as oxidants. The antioxidant activities found with ABTS(center dot+), expressed as trolox equivalent antioxidant capacity (TEAC), ranged from 0.15 to 1.14 mmol kg(-1), and those determined with DPPH, from 0.04 to 0.32 mmol kg(-1). TEAC values correlated well with results found by elimination of DPPH, and both values revealed a linear relationship with the concentration of phenolics obtained with the Folin-Ciocalteu phenol test (expressed as gallic acid equivalents, GAE). The colour coordinates (CIE L*a*b*), as well as reflectance spectra determined for original honeys using a white background, demonstrated that the colour difference (Delta E*) and coordinate b* interrelate with TEAC values. The radical-scavenging capacities (RSC) of the honey samples determined in the experiments with photochemically decomposed hydrogen peroxide, generating reactive (OH)-O-center dot radicals in the presence of spin trapping agent, differ from those found with ABTS(center dot+) and DPPH. Here, probably, the reactive (OH)-O-center dot radicals, having higher redox potential, are scavenged by a variety of compounds not effective with ABTS(center dot+) and DPPH (e.g., saccharides, proteins). (c) 2008 Elsevier Ltd. All rights reserved


Abstract: Aqueous extracts of Tunisian honey and dried thyme [Thymus sp.], at a range of dilutions (1:1 to 1:1000), were tested for antiviral activity against Rubella virus in African green monkey kidney cell cultures. Honey had good anti-Rubella activity supporting its
use in traditional medicines. Honey killed the virus at all concentrations, but thyme had no effect on virus survival.


Abstract: AIM: To investigate the role of nuclear factor-kappaB (NF-kappaB) inhibitor caffeic acid phenethyl ester (CAPE) in the proliferation, collagen synthesis and apoptosis of hepatic stellate cells (HSCs) of rats. METHODS: The HSCs from rats were isolated and cultured in Dulbecco’s Modified Eagle’s Medium (DMEM) and treated with CAPE. The proliferation and collagen synthesis of HSCs were determined by H-3-TdR and H-3-proline incorporation respectively, and the expression of type I, III procollagen genes was further explored by in situ hybridization. Apoptosis cell indices (AIs) were examined using terminal deoxynucleotidyl transferase-mediated DIG-dUTP nick end labeling (TUNEL). RESULTS: In activated HSC in culture, CAPE significantly inhibited H-3-TdR and H-3-proline incorporation by HSCs at concentrations of 5 mumol/L and 10 mumol/L respectively. CAPE also reduced the type I procollagen gene expression (P < 0.05) at higher concentration. Apoptosis of HSC was induced by CAPE and the AIs were time-and dose-dependently increased from 2.82 +/- 0.73% to 7.66 +/- 1.25% at 12 h (P < 0.01) and from 3.15 +/- 0.88% to 10.61 +/- 2.88% at 24 h (P < 0.01). CONCLUSION: CAPE inhibits proliferation and collagen synthesis of HSC at lower concentration and induces HSC apoptosis at higher concentration.

1691. ZIUMAN, B V (1971) [Embryonic cultures of bee cells]. Veterinariia. 8: 42-44.


