Abacateiro - Perseana americana

Árvore mediana de copa bastante densa; folhas simples; inflorescência em panículas; fruto piriforme comum nas Américas Central e do Sul. O fruto é delicioso e nutritivo.

Princípio Ativo: Carboidratos, proteínas, gordura, taninos, perseito, metilchavicol, metil-eugenol, dopamina, esparagina, ácidos málico e acético.

Partes Usadas: Frutos, folhas, caroço, casca de árvore e sementes

Usos Populares:

• (chá ou a infusão ) diurético - ação direta no túbulo renal-cistites, uretrites;
• melhora a secreção biliar e evita a formação de gases estomacais e intestinais (carminativo), melhora a diarréia;
• emenagoga - estimula o fluxo menstrual;
• relaxa a musculatura lisa brônquica.diminui o ácido úrico;

Uso Cientificamente Comprovados ou em Estudo:

• anti-reumático, inibe a degradação da cartilagem e estimula a sua reparação (1, 2, 6, 9);
• analgésico e anti inflamatório (3, 4, 16)
• anti oxidante (16)
• preventivo contra o câncer (16)
• reduz a inflamação peri odontal (7)
• melhora a evolução das placas de psoriase (8)
• protetor hepático (11)
• diminui o apetite (5)
• Anti-fungico (15)
• Tratamento da giardíase (18)
• Melhora a absorção do ferro (26)

Efeitos colaterais

• Tóxica para alguns animais (17, 19, 20, 21, 22, 23, 24, 25, 27)

Biblioteca

1. Avocado/soybean unsaponifiables increase aggrecan synthesis and reduce catabolic and proinflammatory mediator production by human osteoarthritic chondrocytes.
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OBJECTIVE: To investigate the effects of avocado (A)/soybean (S) unsaponifiables on the metabolism of human osteoarthritic (OA) chondrocytes cultured in alginate beads over 12 days. METHODS: Enzymatically isolated OA chondrocytes were cultured in alginate beads in a well defined culture medium for 12 days, in the presence or not of 10-10 M interleukin 1beta (IL-1beta). DNA content was measured using a fluorometric method. Production of aggrecan (AGG), stromelysin-1 (MMP-3), tissue inhibitor of metalloproteinases-1 (TIMP-1), macrophage inflammatory protein-1beta (MIP-1beta), IL-6, and IL-8 were assayed by specific enzyme amplified sensitivity immunoassays. Prostaglandin (PG) E2 was measured by a specific radioimmunoassay and nitrite by a spectrophotometric method based on the Griess reaction. A commercial avocado and soybean mixture of unsaponifiables (A1S2) and each component separately were tested in a range of 0.625 to 40.0 micro g/ml. RESULTS: After 12 days' incubation, A1S2 increased AGG synthesis and accumulation in alginate beads in a dose and time dependent manner. A1S2 promoted the recovery of aggrecan synthesis after 3 days of IL-1beta treatment. A1S2 was a potent inhibitor of basal and IL-1beta stimulated MMP-3 production. The procedure also weakly reversed the inhibitory effect of IL-1beta on TIMP-1 production. A1S2 inhibited basal production of MIP-1beta, IL-6, IL-8, NO*, and PGE2 by OA chondrocytes and partially counteracted the stimulating effect of IL-1 on PGE2. Compared to avocado or soybean added separately, the mixture had a superior effect on NO* and IL-8 production. CONCLUSION: A1S2 stimulated aggrecan production and restored aggrecan production after IL-1beta treatment. In parallel, A1S2 decreased MMP-3 production and stimulated TIMP-1 production. These results suggest A1S2 could have structure-modifying effects in OA by inhibiting cartilage degradation and promoting cartilage repair.


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Abstract: Osteoarthritis (OA) is a common, chronic and painful condition. It is the most common of all rheumatic disorders and is destined to become one of the most prevalent and costly diseases in our society. The conventional therapeutic options employed in the management of OA are simple analgesics and NSAIDs, but these options frequently produce sub-optimal benefit and are associated with an adverse-safety profile. Unsurprisingly patients are looking to alternative and complementary medicine. The aim of this article was to review the available literature on the effectiveness and safety of 'natural remedies' for the treatment of OA. Computerised literature searches were carried out for systematic reviews and randomised controlled trials examining the role of 'natural remedies' in the treatment of OA. There have been few randomised controlled trials of 'natural remedies' that have satisfied the internationally agreed standards. There was, however, evidence of efficacy for glucosamine, chondroitin sulfate and possibly avocado/soybean unsaponifiables for the symptomatic relief of OA. To date, it is not established whether any of the 'natural remedies' are capable of chondroprotection. Even if 'natural remedies' are only modestly effective, they are widely available and well tolerated, suggesting that they may play a significant role in the management of OA in the elderly.


Joseph LB, Koukouras K.

4. Analgesic and anti-inflammatory effects of the aqueous extract of leaves of Persea americana mill (laureaceae).

Adeyemi OO, Okpo SO, Ogunti OO.
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Abstract: The aqueous extract of Persea americana leaves produced a dose-dependent
inhibition of both phases of formalin pain test in mice, a reduction in mouse writhing induced by acetic acid and an elevation of pain threshold in the hot plate test in mice. The extract also produced a dose-dependent inhibition of carrageenan-induced rat paw edema. The results obtained indicate that the extract possesses analgesic and anti-inflammatory effects.

5. Defatted avocado pulp reduces body weight and total hepatic fat but increases plasma cholesterol in male rats fed diets with cholesterol.

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Abstract: The potential use of avocado as a fiber source was evaluated. The total dietary fiber content of fresh avocado fruit of the Ettinger variety was 5.2 g/100 g. Approximately 75% was insoluble, and 25% soluble. The water-holding capacity of dry defatted avocado pulp was similar to that of cellulose, and trypsin inhibitors were not detected. The dietary and metabolic consequences of the avocado pulp were studied in male rats fed normal and hypercholesterolemic diets. Rats consumed semipurified diets containing either avocado pulp as the dietary fiber source or cellulose (control) with or without 10 g/kg cholesterol and 5 g/kg cholic acid. Food consumption and body weight gain were lower in rats fed avocado compared with those fed cellulose. Relative cecum weight was higher in avocado-fed rats. Plasma and hepatic cholesterol levels did not differ in rats fed diets without cholesterol, but plasma cholesterol was greater in avocado-fed than in cellulose-fed rats that consumed cholesterol. Regardless of dietary cholesterol, hepatic total fat levels, as evaluated histologically, but not directly, were lower in avocado-fed rats. These data suggest the presence of an appetite depressant in avocado and that avocado pulp interferes with hepatic fat metabolism.


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OBJECTIVE: To evaluate the structural effect of avocado/soybean unsaponifiables (ASU) in the treatment of patients with symptomatic osteoarthritis (OA) of the hip.

METHODS: Patients with regular painful primary OA of the hip (European League Against Rheumatism 1980 criteria) and a joint space still > or = 1 mm (Kellgren grade 1 to 3, assessed by an independent observer prior to inclusion) entered a prospective, multicenter, randomized, parallel group, double-blind, placebo-controlled trial of 2 years duration. Patients had at least a 6-month history of regular pain and an algofunctional index (AFI) > or = 4. The primary assessment criterion was a decrease of the joint space width (JSW) on plain anteroposterior radiographs of the pelvis performed in standing position, measured at the narrowest points by 2 independent readers, previously tested and selected and blinded to both the treatment and the time sequence. Secondary criteria were standard clinical outcome measurements (AFI, pain on a visual analog scale, consumption of nonsteroidal antiinflammatory drugs and patient's and investigator's global assessments).

RESULTS: One hundred sixty-three patients were included: 102 men and 61 women (mean age 63.2 +/- 8.7 years). A total of 108 patients (72 men and 36 women; mean age 64 +/- 7.9 years) were radiologically evaluable at 23.7 +/- 2.6 months (ASU group; n = 55) and 23.7 +/- 3.2 months (placebo group; n = 53). Overall comparison of the evolution of JSW showed no difference between the ASU and placebo groups, from 23.7 +/- 0.93 to 1.87 +/- 1.10 mm and from 2.5 +/- 0.94 to 1.9 +/- 1.33 mm, respectively (intergroup P value at end point = 0.9). When patients were divided into 2 subgroups according to the median value of the baseline JSW (2.45 mm), the joint space loss in the most severely affected subgroup of patients (baseline JSW < or = median) was significantly greater in the placebo group than in the ASU group: from 1.69 +/- 0.58 to 0.84 +/- 0.77 mm (-0.86 +/- 0.62 mm) and from 1.66 +/- 0.42 to 1.22 +/- 0.7 mm (-0.43 +/- 0.51 mm), respectively (P < 0.01). The JSW decrease was identical, with no difference in ASU and placebo groups, in the less severely affected subgroup of patients (baseline JSW > median). Clinical parameters in the 2 groups did not differ significantly throughout the study. CONCLUSION: This pilot
randomized, double-blind, placebo-controlled trial failed to demonstrate a structural effect of ASU in hip OA. However, in a post-hoc analysis, ASU significantly reduced the progression of joint space loss as compared with placebo in the subgroup of patients with advanced joint space narrowing. These results suggest that ASU could have a structural effect but require confirmation in a larger placebo-controlled study in hip OA.

7. Effect of avocado and soybean unsaponifiables on gelatinase A (MMP-2), stromelysin 1 (MMP-3), and tissue inhibitors of matrix metalloproteinase (TIMP-1 and TIMP-2) secretion by human fibroblasts in culture.
Laboratory of Physiopathology of Non-Mineralized Tissues, Faculty of Dental Surgery, University of Paris V, Montrouge, France.

BACKGROUND: In inflamed periodontal tissues, gingival fibroblasts are able to express matrix metalloproteinases (MMPs) and their natural inhibitors, tissue inhibitors of matrix metalloproteinases (TIMPs). They can also respond to growth factors and cytokines. In this study, the in vitro effects of avocado and soybean unsaponifiable residues (ASU), their fractions (avocado unsaponifiable [ASF] or soy unsaponifiable [SSF]) on MMP-2 and MMP-3, and the activity and secretion of their inhibitors TIMP-1 and TIMP-2 were investigated using cultured human gingival fibroblasts. METHODS: Gingival fibroblasts were cultured for 72 hours with ASU, ASF, and SSF at concentrations of 0.1, 0.5, 2.5, 5, and 10 microgram/ml of culture medium, after pretreatment or no pretreatment for 1 hour with interleukin-1beta (IL-1beta). MMP-2 and MMP-3 were detected and quantified in the culture media after zymography and image analysis. TIMP-1, TIMP-2, MMP-2, and MMP-3 were also evidenced by dot blotting and quantified by image analysis. RESULTS: In the absence of IL-1beta, a slight decrease in the secretion of MMP-2 was observed with lower doses of ASU, ASF, and SSF. The decrease of MMP-3 secretion was clearly marked with all fractions especially at low concentrations (0.1 and 2.5 microgram/ml). A slight decrease in TIMP-2 secretion was seen for low doses of ASU, ASF, and SSF, while a small increase was seen at higher concentrations. Concerning TIMP-1, no significant variation was observed in culture medium for low concentrations, and a decrease was noted for 5 and 10 microgram/ml of ASU, ASF, and SSF. As anticipated, IL-1beta induced a marked release of MMP-2, MMP-3, and TIMP-1, but no variation for TIMP-2 was seen. AsU, ASF, and SSF reversed the IL-1beta effect on gingival fibroblasts for MMP-2 and MMP-3, particularly with doses varying from 0.1 to 2.5 microgram/ml and for TIMP-1, particularly with doses varying from 2.5 to 10 microgram/ml. CONCLUSIONS: These findings suggest a potential role for avocado and soy unsaponifiable extracts to prevent the deleterious effects of IL-1beta that occur during periodontal diseases.

8. Vitamin B(12) cream containing avocado oil in the therapy of plaque psoriasis.
Dermatology. 2001;203(2):141-7
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BACKGROUND: There are already many effective topical therapies available for use in the treatment of chronic plaque psoriasis. Unfortunately, these treatments are often associated with a rather significant risk of undesirable effects. OBJECTIVE AND METHODS: In this randomized, prospective clinical trial, the effects of the vitamin D(3) analog calcipotriol were evaluated against those of a recently developed vitamin B(12) cream containing avocado oil in an intraindividual right/left-side comparison. The trial population consisted of 13 patients, 10 men and 3 women, with chronic plaque psoriasis. The observation period was 12 weeks; the effects of therapy were assessed on the basis of a PASI score adapted to the right/left-side comparison technique, the subjective evaluations of the investigator and patients and the results of 20-MHz sonography. RESULTS: There was a more rapid development of beneficial effects with the use of calcipotriol in the initial 8 weeks, although differences in effects were significant only at the time point of therapy week 8 (p < 0.05). After 12 weeks, neither the PASI score nor 20-MHz sonography showed significant differences between the two treatments. While
the efficacy of the calcipotriol preparation reached a maximum in the first 4 weeks and then began to subside, the effects of the vitamin B(12) cream containing avocado oil remained at a constant level over the whole observation period. This would indicate that the vitamin B(12) preparation containing avocado oil may be suitable for use in long-term therapy, a hypothesis further supported by the fact that the investigator and the patients assessed the tolerability of the vitamin B(12) cream containing avocado oil as significantly better in comparison with that of calcipotriol. CONCLUSION: The results of this clinical trial provide evidence that the recently developed vitamin B(12) cream containing avocado oil has considerable potential as a well-tolerated, long-term topical therapy of psoriasis. Copyright 2001 S. Karger AG,

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Abstract: What is the level of evidence for current symptomatic agents (SYSADOA) in patients with osteoarthritis? Existing publications which met the inclusion criteria were rated by calculating the effect size of the compounds and applying a quality assessment score of the study methodology. This produced a median effect size for the primary outcome measure, pain, of 1.37 (range 0.37-1.50) for chondroitin-sulphate and 0.57 (range 0.26-1.02) for glucosamine-sulphate in patients with knee osteoarthritis. These effect sizes were strongly diminished when only recent high-quality studies were considered (effect size of pain for chondroitin-sulphate 0.37 and for glucosamine-sulphate 0.26). Effect sizes for functional improvement and overall WOMAC index (pain, stiffness and function) were in the same range for both compounds. So far, and in contrast to recent claims, there is no reliable scientific evidence that these two substances have structure-modifying actions with respect to prohibiting, healing or restoring cartilage lesions. There is only scarce or no scientific evidence for the effects of nutrients in patients with knee, hip or hand osteoarthritis. Several large company-sponsored and independent trials with several of these nutripharmaceuticals are ongoing in Europe and the USA. Copyright 2001 Harcourt Publishers Ltd.

10. Acetyl-CoA carboxylase inhibitors from avocado (Persea americana Mill) fruits.
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Abstract: A methanol extract of avocado fruits showed potent inhibitory activity against acetyl-CoA carboxylase, a key enzyme in fatty acid biosynthesis. The active principles were isolated and identified as (5E,12Z,15Z)-2-hydroxy-4-oxoheneicosa-5,12,15-trienyl (1), (2R,12Z,15Z)-2-hydroxy-4-oxoheneicosa-12,15-dienyl (2), (2R*,4R*)-2,4-dihydroxyheptadec-16-enyl (3) and (2R*,4R*)-2,4-dihydroxyheptadec-16-ynyl (4) acetates by instrumental analyses. The IC50 of the compounds were 4.0 x 10(-6), 4.9 x 10(-6), 9.4 x 10(-6), and 5.1 x 10(-6) M, respectively.

11. Liver injury suppressing compounds from avocado (Persea americana).
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Abstract: To evaluate the protective activity of fruits against liver injury, 22 different fruits were fed to rats with liver damage caused by D-galactosamine, a powerful liver toxin. As measured by changes in the levels of plasma alanine aminotransferase (ALT) and aspartate aminotransferase (AST), avocado showed extraordinarily potent liver injury suppressing activity. Five active compounds were isolated and their structures determined. These were all fatty acid derivatives, of which three, namely, (2E,5E,12Z,15Z)-1-hydroxyheneicosa-2,5,12,15-tetraen-4-one, (2E,12Z,15Z)-1-hydroxyheneicosa-2,12,15-trien-4-one, and (5E,12Z)-2-hydroxy-4-oxoheneicosa-
12. Biological screening of selected medicinal Panamanian plants by radioligand-binding techniques.
Caballero-George C, Vanderheyden PM, Solis PN, Pieters L, Shahat AA, Gupta MP, Vauquelin G, Vlietinck AJ.
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Nineteen plants from the Republic of Panama were selected by their traditional uses in the treatment of hypertension, cardiovascular, mental and feeding disorders and 149 extracts were screened using radioligand-receptor-binding assays. The methanol:dicloromethane extracts of the bark and leaves of Anacardium occidentale L., the leaves of Begonia urophylla Hook., the roots of Bocconia frutescens L., the stems and leaves of Cecropia cf.obtusifolia Bertol., the branches of Clusia coclensis Standl., the bark of Cochlospermum vitifolium (Willd.)Spreng., the leaves of Dimerocostus strobilaceus Kuntze, the bark of Guazuma ulmifolia Lam., the leaves of Persea americana Mill. and the branches of Witheringia solanaceae L'Her. inhibited the [3H]-AT II binding (angiotensin II AT1 receptor) more than 50%. Only extracts of the roots of Dimerocostus strobilaceus Kuntze and the stems of Psychotria elata (Sw.) Hammel were potent inhibitors of the [3H] NPY binding (neuropeptide Y Y1 receptor) more than 50% and the ethanolic extracts of the leaves of Cecropia cf. obtusifolia Bertol., the leaves of Hedysosmum bonplandianum H.B.K., the roots of Bocconia frutescens L., the stem of Cecropia cf. obtusifolia Bertol. and the branches of Psychotria elata (Sw.) Hammel showed high inhibition of the [3H] BQ-123 binding (endothelin-1 ET(A) receptor) in a preliminary screening. These results promote the further investigation of these plants using the same assays.

13. Plant activation of aromatic amines mediated by cytochromes P450 and flavin-containing monooxygenases.
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To know the mechanisms involved in the activation of promutagenic aromatic amines mediated by plants, we used Persea americana S117 system (S117) for the activation of 2-aminofluorene (2-AF) and m-phenylenediamine (m-PDA) in Ames assays. In these assays, the effect of the diphenylene iodonium (DPI), an inhibitor of flavin-containing monooxygenases (FMOs), of the 1-aminobenzotriazole (1-ABT), an inhibitor of cytochromes P450 (cyt-P450s) and of the methimazole, a high-affinity substrate for FMOs, was studied. The efficacy of both inhibitors and of the methimazole was verified to find that they did partially inhibit the mutagenesis of both aromatic amines, activated with rat liver S9. Similarly, both inhibitors and methimazole did produce a significant decrease in 2-AF and m-PDA mutagenesis, when the activation system was S117, indicating that, similar to what occurs in mammalian systems, plant FMOs and cyt-P450s can metabolize aromatic amines to mutagenic product(s). However, the affinity of both FMOs and cyt-P450s of plant for 2-AF and m-PDA was different. Data obtained indicate that the activities of plant FMOs must be the main enzymatic system of m-PDA activation while, in 2-AF activation, plant cyt-P450s have the most relevant activities. In addition, peroxidases of the S117 system must contribute to 2-AF activation and some isoforms of FMOs and/or cyt-P450s of the S117 system, uninhibited by the inhibitors used, must be the responsible for a partial activation of m-PDA.

14. [Neutralization of the hemorrhagic effect induced by Bothrops asper (Serpenes: Viperidae) venom with tropical plant extracts]
[Article in Spanish]
Castro O, Gutierrez JM, Barrios M, Castro I, Romero M, Umana E.
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Organic extracts representing 48 species included in 30 families of Costa Rican tropical plants were evaluated for their ability to neutralize hemorrhagic activity induced by the venom of the snake Bothrops asper. A bioassay in mice was used, based on intradermal injection of either venom or venom-extract mixtures followed by the measurement of hemorrhagic areas. Total inhibition of hemorrhage was observed with the ethanolic, ethyl acetate and aqueous extracts of Bursera simaruba, Clusia torresii, C. palmana, Croton draco, Persea americana, Phoebe breneesii, Pimenta dioica, Sapindus saponaria, Smilax culeumeca and Virola koschnyi. Chemical analysis of these extracts identified catequines, flavones, anthocyanines and condensed tannins, which may be responsible for the inhibitory effect observed, probably owing to the chelation of the zinc required for the catalytic activity of venom's hemorrhagic metalloproteinases.


(E,Z,Z)-1-Acetoxy-2-hydroxy-4-oxo-heneicosa-5,12,15-triene was isolated from avocado, Persea americana Mill., idioblast cells. It inhibited spore germination of the fungal pathogen Colletotrichum gloeosporioides. Full characterization is also reported for two additional compounds that have been described and partially characterized previously.


One known, (2R)-(12Z,15Z)-2-hydroxy-4-oxo-heneicosa-12,15-dien+ ++-1-yl acetate (1), and two novel compounds, persenone A (2) and B (3), have been isolated from avocado fruit (Persea americana P. Mill), as inhibitors of superoxide (O(2)(-)) and nitric oxide (NO) generation in cell culture systems. They showed marked inhibitory activities toward NO generation induced by lipopolysaccharide in combination with interferon-gamma in mouse macrophage RAW 264.7 cells. Their inhibitory potencies of NO generation (1, IC(50) = 3.6; 2, IC(50) = 1.2; and 3, IC(50) = 3.5 microM) were comparable to or higher than that of a natural NO generation inhibitor, docosahexaenoic acid (DHA; IC(50) = 4.3 microM). Furthermore, compounds 1-3 and DHA markedly suppressed tumor promoter 12-O-tetradecanoylphorbol-13-acetate-induced O(2)(-) generation in differentiated human promyelocytic HL-60 cells (1, IC(50) = 33.7; 2, IC(50) = 1.4; 3, IC(50) = 1.8; and DHA, IC(50) = 10.3 microM). It is notable that they were found to be suppressors of both NO- and O(2)(-) -generating biochemical pathways but not to be radical scavengers. The results indicate that these compounds are unique antioxidants, preferentially suppressing radical generation, and thus may be promising as effective chemopreventive agent candidates in inflammation-associated carcinogenesis.


It is well known that when lactating livestock eat avocado (Persea americana) leaves they may develop non-infectious mastitis and agalactia. This is associated with extensive coagulation necrosis of the secretory acinar epithelium and interstitial oedema, congestion, and haemorrhage. Similar lesions have been produced in mammary glands of lactating mice fed a diet containing a small percentage of freeze-dried avocado leaf. Tests using these animals have been used to isolate the active principle, termed "persin," from avocado leaves. The purified persin was examined using IR, NMR, and UV spectroscopy and mass spectrometry, and identified as (Z,Z)-1-(acetyloxy)-2-hydroxy-
12,15-heneicosadien-4-one. Persin has previously been isolated from avocado leaves and shown to have antifungal properties and to be toxic to silkworms. Our tests have shown that persin at the dose rate of 60-100 mg/kg has the same effect on mammary glands in lactating mice as leaves from avocado. Enantioselective syntheses of the R and the S isomers of persin and related derivatives were carried out. These compounds were tested for activity required to induce widespread lactating mammary gland necrosis in mice, and only the R isomer was found active. At doses of persin above 100 mg/kg necrosis of myocardial fibres may occur and hydrothorax may be present in severely affected animals. The mechanism of action of persin on both the mammary gland and the myocardium remain to be resolved.

18. [In vitro effect against Giardia of 14 plant extracts]
[Article in Spanish]
Ponce-Macotela M, Navarro-Alegria I, Martinez-Gordillo MN, Alvarez-Chacon R. Laboratorio de Investigacion en Parasitologia, Instituto Nacional de Pediatria SSA. Mexico, D.F.

OBJECTIVE. To investigate antigiardiasic activity in plants used in Mexico as antidiarrheics and/or antiparasitics. MATERIALS AND METHODS. Fourteen species were evaluated. The antigiardiasic activity was measured in vitro in a blinded fashion using trophozoites of Giardia duodenalis incubated with plant extracts. The viability of trophozoites was ascertained using MTT (3-[4,5-dimethylthiazol-2-il]-2, 5-diphenyl tetrazolium bromide) which is reduced to MTT-formazan by the activity of live trophozoites. The reduced MTT was extracted with an acidified alcohol (2-propanol with HCl 0.04 M) and measured in a spectrophotometer at 570 nm. Negative (trophozoites without extract) and positive controls (incubated with tinadazol) were included.

RESULTS. The scientific and trivial names of the plants are given (trivials in Spanish marked by an asterisk). They had the following trophozoite mortality (mean +/- SD in percent): Justicia spicigera (muicle*) = 91 +/- 0.5; Lipia beriandieri (oregano) = 90 +/- 0.6; Psidium guajava (guava) = 87 +/- 1.0; positive control of tinidazol = 79 +/- 1.9; Punica granatus (granado*) = 78 +/- 1.3; Magnifera indica (mango) = 77 +/- 1.0; Plantago major (lante*) = 76 +/- 1.2; Cupressus semperbirens (cipres) = 73 +/- 1.2; Castella tormentosa (chaparro amargoso*) = 70 +/- 0.7; Hematoxilon campechanum (palo de Campeche*) = 67 +/- 1.2. Without or with a low mean activity were Prosopis juliflora (mesquite*) and Rizophora mangle (mangle*) with 0%, Oriza sativa (rice) with 5%, Capsicum annum (pimiento*) with 21% and Persea americana (avocado) with 23%. There were no associations of the antigiardiasic effect with concentration or osmolality of the extracts. CONCLUSIONS. A clear in vitro antigiardiasic effects was seen in nine species. Three of them were superior to tinidazol which is a drug of common use in the treatment of giardiasis.

19. Cardiomyopathy in ostriches (Struthio camelus) due to avocado (Persea americana var. guatemalensis) intoxication.
Burger WP, Naude TW, Van Rensburg IB, Botha CJ, Pienaar AC. Ostrich Research Centre, Oudtshoorn, Republic of South Africa.

Nine out of 120 ostriches died from congestive heart failure within 96 h of ingesting avocado leaves and immature fruit in an avocado orchard containing Hass and Fuerte cultivars. Foliage and immature fruit from both cultivars dosed to ostriches (n = 4) and domestic hens (n = 8) resulted in severe cardiomyopathy in all the ostriches. In the hens, which had received a lower dose, milder lesions occurred. Macroscopically the intoxication in ostriches resulted in a severe anasarca of the neck and ventral body. The cardiomyopathy was characterised by degeneration and necrosis of myocytes, a marked infiltration of heterophils and in one case, early fibroplasia.

20. Evaluation of selected plants for acute toxicosis in budgerigars.

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Pairs of budgerigars were given samples, by gavage, of plants considered potentially toxic to pet birds. Samples were prepared by flash-freezing and powdering fresh plant material in liquid nitrogen and resuspending the material in deionized water for administration. Of the 19 plants tested, only 6 induced clinical signs of illness; these plants included yew, oleander, clematis, avocado, black locust, and Virginia creeper (Taxus media, Nerium oleander, Clematis sp, Persea americana, Robinia pseudoacacia, Parthenocissus quinquefolia).

21. Suspected avocado (Persea americana) poisoning in goats.
Stadler P, van Rensburg IB, Naude TW.
Department of Medicine, Faculty of Veterinary Science, University of Pretoria, Onderstepoort, Republic of South Africa.

A herd of 15 Cameroon goats was suspected of having been poisoned by eating leaves of the Fuerte variety of avocado pear (Persea americana). Two of the affected goats were examined clinically, while necropsies were carried out on 3 of the 4 that had died. The most significant clinical findings were tachycardia, hyperpnoea and evidence of lung oedema. At necropsy severe lung oedema, hydrothorax and hydropericardium were present. Severe myocardial degeneration, necrosis and fibrosis were the major histopathological findings.

22. Cardiomyopathy caused by avocado (Persea americana Mill) leaves.
Grant R, Basson PA, Booker HH, Hofherr JB, Anthonissen M.
Central Veterinary Laboratory, Windhoek, Namibia.

Six of 21 goats feeding on fresh avocado (Persea americana) leaves from pruned trees, showed clinical signs of cardiac distress. Some sheep subsequently dosed experimentally at different dosage rates with the same and other avocado varieties, showed clinical signs of respiratory or cardiac distress and myocardial lesions at autopsy.

23. Avocado (Persea americana) poisoning of horses.
McKenzie RA, Brown OP.
Queensland Department of Primary Industries, Animal Research Institute, Yeerongpilly.

24. Pathological changes in the mammary gland and biochemical changes in milk of the goat following oral dosing with leaf of the avocado (Persea americana).
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Two varieties of avocado leaves (Persea americana var Guatemalan and var Mexican) were administered to lactating goats. The Mexican variety was without effect. The Guatemalan variety in doses exceeding 20 g fresh leaf per kg bodyweight, produced damage to the mammary gland with decreased milk production. The lesions were characterised by oedema and reddening, with clots in the large ducts. Microscopically, there was widespread degeneration and necrosis of the secretory epithelium, the necrotic cells sloughing into the lumen. There was no significant cellular inflammatory response. Concentrations of antitrypsin in the milk, indicating changes in vascular permeability, increased rapidly 15 h after a single high dose, coinciding with palpable oedema. Concentrations of NAGase, indicating cell damage, increased after 24 h. Goats given multiple doses followed a similar pattern but the initial response was delayed. The toxic principle, and its mode of action in selectively damaging mammary secretory cells, remains to be determined.

25. Avocado (Persea americana) intoxication in caged birds.
Avocados of 2 varieties were mashed and administered via feeding cannula to 8 canaries and 8 budgerigars. Two control budgerigars were given water via feeding cannula. Six budgerigars and 1 canary died within 24 to 47 hours after the first administration of avocado. Deaths were associated with administration of both varieties of avocado. Higher dose was associated with greater mortality. The 2 budgerigars given water were normal throughout the observation period. Results indicated that avocados are highly toxic to budgerigars and less toxic to canaries. Postmortem findings observed in some birds included subcutaneous edema in the pectoral area and hydropericardium.


The effects of the chemical composition of fruit juices and fruit on the absorption of iron from a rice (Oryza sativa) meal were measured in 234 parous Indian women, using the erythrocyte utilization of radioactive Fe method. The corrected geometric mean Fe absorptions with different juices varied between 0.040 and 0.129, with the variation correlating closely with the ascorbic acid contents of the juices (rs 0.838, P less than 0.01). Ascorbic acid was not the only organic acid responsible for the promoting effects of citrus fruit juices on Fe absorption. Fe absorption from laboratory 'orange juice' (100 ml water, 33 mg ascorbic acid and 750 mg citric acid) was significantly better than that from 100 ml water and 33 mg ascorbic acid alone (0.097 and 0.059 respectively), while Fe absorption from 100 ml orange juice (28 mg ascorbic acid) was better than that from 100 ml water containing the same amount of ascorbic acid (0.139 and 0.098 respectively). Finally, Fe absorption from laboratory 'lemon juice' (100 ml orange juice and 4 g citric acid) was significantly better than that from 100 ml orange juice (0.226 and 0.166 respectively). The corrected geometric mean Fe absorption from the rice meal was 0.025. Several fruits had little or no effect on Fe absorption from the meal (0.013-0.024). These included grape (Vitis vinifera), peach (Prunus persica), apple (Malus syblestris) and avocado pear (Persea americana). Fruit with a mild to moderate enhancing effect on Fe absorption (0.031-0.088) included strawberry (Fragaria sp.) (uncorrected values), plum (Prunus domestica), rhubarb (Rheum rhapsoticum), banana (Musa cavendishii), mango (Mangifera indica), pear (Pyrus communis), cantaloupe (Cucumis melo) and pineapple (Ananas comosus) (uncorrected values). Guava (Psidium guajava) and pawpaw (Carica papaya) markedly increased Fe absorption (0.126-0.293). There was a close correlation between Fe absorption and the ascorbic acid content of the fruits tested (rs 0.738, P less than 0.0001). There was also a weaker but significant correlation with the citric acid content (rs 0.55, P less than 0.03). Although this may have reflected a direct effect of citric acid on Fe absorption, it should be noted that fruits containing citric acid also contained ascorbic acid (rs 0.70, P less than 0.01).