RESULT: Petroleum ether extract of plant has shown significant cytotoxic potential. Three lignans sesamin (A), kobusin (B), and 4'O demethyl magnolin (C) has been isolated. All lignans showed cytotoxic activities in different ranges. Compound C was the novel bioactive compound from a plant source and found to be most active. In apoptosis study, treatment caused typical apoptotic morphological changes. It enhances the apoptosis at IC50 dose (21.72 micro g/mL) however showing necrotic cell death at higher dose after 24h on MIA-PaCa cell lines.

CONCLUSION: Petroleum ether extract (60-80 degreeC) of Zanthoxylum alatum has cytotoxic potential. The lignans isolated from the petroleum ether extract were responsible for the cytotoxic potential of the extract. 4'O demethyl magnolin was novel compound from Zanthoxylum alatum. Hence the Zanthoxylum alatum can be further explored for the development of anticancer drug. Copyright © 2014 Elsevier Ireland Ltd. All rights reserved.

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Title
Bioactive Lignans from Zanthoxylum alatum Roxb. stem bark with cytotoxic potential.

Source

Abstract
ETHNOPHARMACOLOGICAL RELEVANCE: Zanthoxylum alatum is used in traditional medicinal systems for number of disorders like cholera, diabetes, cough, diarrhea, fever, headache, microbial infections, toothache, inflammation and cancer. The aim of the present study was to evaluate Zanthoxylum alatum stem bark for its cytotoxic potential and to isolate the bioactive constituents.

MATERIAL AND METHODS: Cytotoxicity of the different extracts and isolated compounds was studied on lung carcinoma cell line (A549) and pancreatic carcinoma cell line (MIA-PaCa) using MTT assay. Isolation of compounds from most active extract (petroleum ether) was done on silica gel column. Structure elucidation was done by using various spectrophotometric techniques like UV, IR, (1)H NMR, (13)C NMR and mass spectroscopy. The type of cell death caused by most active compound C was explored by fluorescence microscopy using the acridine orange/ethidium bromide method.

CONCLUSION: Petroleum ether extract (60-80 degreeC) of Zanthoxylum alatum has cytotoxic potential. The lignans isolated from the petroleum ether extract were responsible for the cytotoxic potential of the extract. 4'O demethyl magnolin was novel compound from Zanthoxylum alatum. Hence the Zanthoxylum alatum can be further explored for the development of anticancer drug. Copyright © 2014 Elsevier Ireland Ltd. All rights reserved.

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Title
A ‘toothache tree’ alkylamide inhibits Adelta mechanonociceptors to alleviate mechanical pain.

Source

Abstract
In traditional medicine, the ‘toothache tree’ and other plants of the Zanthoxylum genus have been used to treat inflammatory pain conditions, such as toothache and rheumatoid arthritis. Here we examined the cellular and molecular mechanisms underlying the analgesic properties of hydroxy-alpha-sanshool, the active alkylamide produced by Zanthoxylum plants.
Consistent with its analgesic effects in humans, sanshool treatment in mice caused a selective attenuation of mechanical sensitivity under naïve and inflammatory conditions, with no effect on thermal sensitivity. To elucidate the molecular mechanisms by which sanshool attenuates mechanical pain, we performed single fibre recordings, calcium imaging and whole-cell electrophysiology of cultured sensory neurons. We found that: (1) sanshool potently inhibits Adelta mechanonociceptors that mediate both sharp acute pain and inflammatory pain; (2) sanshool inhibits action potential firing by blocking voltage-gated sodium currents in a subset of somatosensory neurons, which express a unique combination of voltage-gated sodium channels; and (3) heterologously expressed Nav1.7 is most strongly inhibited by sanshool as compared to other sodium channels expressed in sensory neurons. These results suggest that sanshool targets voltage-gated sodium channels on Adelta mechanosensory nociceptors to dampen excitability and thus induce ‘fast pain’ analgesia.

METHODS: After establishing verbal informed consent with participating communities, five field surveys, roughly 20 days in duration, were carried out. In all, 176 schedules were surveyed, and 52 participants were consulted through focus group discussions and informal meetings. Altogether, 24 key informants were surveyed to verify and validate the data. A total of 252 individuals, representing non-timber forest product (NTFP) collectors, cultivators, traders, traditional healers (Baidhya), community members, etc. participated in study. Medicinal plants were free-listed and their vernacular names and folk uses were collected, recorded, and applied to assess agreement among respondents about traditional medicines, markets and management.

RESULTS: Within the study area, medicinal herbs were the main ingredients of traditional therapies, and they were considered a main lifeline and frequently were the first choice. About 55% plants were ethnomedicinal, and about 37% of ethnomedicinal plants possessed the highest informant consensus value (0.86-1.00). Use of Cordyceps sinensis as an aphrodisiac, Berberis asiatica for eye problems, Bergenia ciliata for disintegration of calculi, Sapindus mukorossi for dandruff, and Zanthoxylum armatum for toothache were the most frequently mentioned. These species possess potential for pharmacology.

CONCLUSION: Medicinal plants are inseparable from local livelihoods because they have long been collected, consumed, and managed through local customs and knowledge. Management of traditional therapies is urged, because the therapies are empirically and knowledge based, often culturally inherited and important to pharmacology and local livelihoods. However, traditional therapies are currently being eroded due to changing lifestyles, perceptions, social transformations, and acculturation.
A 'toothache tree' alkylamide inhibits Adelta mechanonociceptors to alleviate mechanical pain.

Source

Abstract
In traditional medicine, the 'toothache tree' and other plants of the Zanthoxylum genus have been used to treat inflammatory pain conditions, such as toothache and rheumatoid arthritis. Here we examined the cellular and molecular mechanisms underlying the analgesic properties of hydroxy-alpha-sanshool, the active alkylamide produced by Zanthoxylum plants. Consistent with its analgesic effects in humans, sanshool treatment in mice caused a selective attenuation of mechanical sensitivity under naive and inflammatory conditions, with no effect on thermal sensitivity. To elucidate the molecular mechanisms by which sanshool attenuates mechanical pain, we performed single fibre recordings, calcium imaging and whole-cell electrophysiology of cultured sensory neurons. We found that: (1) sanshool potently inhibits Adelta mechanonociceptors that mediate both sharp acute pain and inflammatory pain; (2) sanshool inhibits action potential firing by blocking voltage-gated sodium currents in a subset of somatosensory neurons, which express a unique combination of voltage-gated sodium channels; and (3) heterologously expressed Nav1.7 is most strongly inhibited by sanshool as compared to other sodium channels expressed in sensory neurons. These results suggest that sanshool targets voltage-gated sodium channels on Adelta mechanosensory nociceptors to dampen excitability and thus induce 'fast pain' analgesia.

Source

Abstract
AIM OF THE STUDY: Zanthoxylum rhoifolium Lam. (Rutaceae) is locally known as "mamica de cadela", and its bark is popularly used for toothache and earache. The objective of this study was to investigate the antinociceptive effect of the ethanolic extract from this species' stem bark (EtOH), its fractions of partition (hexane-HEX, ethyl acetate-AcOEt, aqueous-AQ) and lupeol (a triterpene obtained from HEX) in models of acute pain.

MATERIALS AND METHODS: Male and female Swiss mice (25-35 g, n=6-12 animals/group) were used to assess acute toxicity and nociception (Animal Ethics Committee/UFPI, No. 09/2008). Acute toxicity was studied up to 2 g/kg p.o. of EtOH. In the formalin test (2%, 20 microL/paw), the licking time of the stimulated paw was quantified during the first 5 min (first phase) and at 15-30 min (second phase), 1h after oral treatment with EtOH, HEX, AcOEt or saline, and 30 min after use of morphine-MOR (5 mg/kg i.p.). The same response evoked by capsaicin (2 microg/20 microL/paw) was quantified during 5 min, after administration of EtOH, HEX, AcOEt, AQ, lupeol, saline or MK801 (0.03 mg/kg, i.p.). Mice were submitted to the rota-rod task and open-field test in order to assess any non-specific muscle-relaxant or sedative effects of EtOH (250 mg/kg p.o.) and HEX (500 mg/kg p.o.).

RESULTS: The animals did not exhibit any acute toxicity to EiOH (up to 2 g/kg p.o.), so it was not possible to calculate the LD50. EtOH, HEX and AcOEt (62.5-250 mg/kg) produced a significant antinociceptive effect in the formalin and capsaicin tests. However, AQ was ineffective. EtOH, HEX, AcOEt and lupeol reduced the glutamate-evoked nociceptive response, but AQ had no effect. EtOH and HEX did not alter the locomotion of animals in the open-field or rota-rod tests, which suggest a lack of a central depressant effect.

CONCLUSION: The results confirm the popular use of Zanthoxylum rhoifolium as an analgesic, and contribute to the pharmacological knowledge of this species because it was shown that EiOH and its less polar partition fractions (HEX, AcOEt) have an antinociceptive effect in models of chemical nociception, and that lupeol appears to be one of the constituents responsible for this effect. Copyright 2010 Elsevier Ireland Ltd. All rights reserved.

Source