

Paullinia pinnata (Sapindaceae)

Engl.: Sweet gum Span.:Bejuco de Costillo, bejuco di Palma

French: Paullinie German: Paullinie

African vernacular names:

Konde: Kasisi Lunda: Chifui Moshi: Mdala Shambala: Singo-lingo

Zigua: lugoto

The plant

In the plant family Sapindaceae the genus Paullinia is very important. It contains the species *P. cupana* of which Guarana, a caffeine rich (4-8 %) paste is prepared from the seeds. It is cultivated in Brazil, therefore.

Paullinia pinnata, is growing naturally in South Africa and Madagascar, in Brazil, Jamaica, and Domingo. It is used as an arrow and fish venom.

P. pinnata is a climbing shrub, the leaves are compound with winged rhachis, inflorescences stand axillary on long stalks, and bearing paired collected tendrils with white flowers. In Zimbabwe and Zambia *P. pinnata* is growing in evergreen and mixed forests up to an altitude of 1200m.

Plant parts used

The whole plant, the leaves, the stem, the root

Constituents

Though the plant is growing worldwide only few investigations have been done about its chemical compounds, with the exception of caffeine. There are no informations about other alkaloids.

Methanolic **leave** and **root extracts** are rich of phenolic compounds (6).

Phytochemical investigation of the **air dried leaves** resulted in the isolation of two new flavone glycosides

- 1) Diosmetin -7-O-(2''-O-β-D-apiofuranosyl-6''-acetyl-β-D-glucopyranoside), pale yellow amorphous powder, melting point 221-223 °C,
- 2) Tricetin-4'-O-methyl-7-O-(2''-O-β-D-apiofuranosyl-6''-acetyl-β-D-glucopyranosid), also a pale yellow powder, melting point 230-232 °C

Furthermore triterpene saponines and cardiotoxic catechol tannins are present (1).

Traditional uses

In the Homoeopathy *P. pinnata* is used as a remedy against different forms of pains and as a natural cure.

In East Africa leaves are used against snake bites, rabies, mental problems, blindness and eye troubles, together with the roots, against gonorrhoea, paralysis, wounds, threatened abortion, malaria, ancylostomiasis, and to expel the placenta. Roots are applied against eczema, as a tonic and as a styptic medicine. The whole plant is applied for bad skin conditions, for wounds and microbial infections. The root decoction is drunk in the case of nausea and vomiting (4).

Results of experimental studies

Antimicrobial activity

Leaves, stems or roots, prepared following the traditional method of preparation, have shown antibacterial activity against Gram positive *Bacillus subtilis* (NCTC 10073), *Staphylococcus aureus* (NCTC 4163), *Micrococcus flavus* (NCTC 7743), *Streptococcus faecalis* (NCTC 775) and Gram negative *Pseudomonas aeruginosa* (MCIMB 1042). *Clostridium tetani* was susceptible, also. The aqueous decoction of leave, stem and root of *P. pinnata* showed activity against both Gram positive and Gram negative bacteria with the highest activity against *Staphylococcus aureus* and *Bacillus subtilis* (MIC 16.1 µg/ml). The minimum bacteriostatic concentration (MBC) ranged from 62.5 µg/ml to 250 µg/ml. The highest activity was recorded from the root (2).

Molluscicidal activity

In Puerto Rico extracts from 173 tropical plants were tested on *Biomphalaria glabra*, the intermediate host of *Schistosoma mansoni*. Six of them were effective at 50 ppm. *P. pinnata* extracts killed 50 % of the snails after 24 h of exposure and a day for recovery (5).

Pharmacological effects

According to an older information from 1962 tannins obtained from the stem of *P. pinnata* cause cardiotoxic effects for the isolated frog heart (3).

Methanolic leave and root extracts of *P. pinnata* elicited the relaxation of phenylephrine-precontracted isolated rat aortic rings in a dose-dependent manner. Nitro-L-arginine methyl ester significantly attenuated the capacity of both extracts to induce arterial relaxation. This could indicate that this arterial relaxation was mediated by the endothelial nitric oxide release. Therefore it can be argued, that both extracts have the capacity to inhibit nitric oxide oxidation through their antioxidant properties. Furthermore both extracts induced a slight transcriptional activity of peroxisome proliferator activated receptor- α . In bovine aortic endothelial cells they increased and decreased endothelial nitric oxide synthase, too (6).

Results of clinical studies

No results were available

Evaluation

Triterpene saponines and phenolic catechol tannins are the main active compounds of *Paullinia pinnata*. Therefore their good effects for the antimicrobial action can be explained. The cardiotoxic effects on the frog heart can be explained by the relaxative effect of the leave and root extracts. If these are real one must be very cautious in internal applications of extracts from *P. pinnata* for men.

In such cases there must be argued against.

Paullinia pinnata

for the treatment of skin lesions	**
against snails	***
for internal treatment of men	- - -

References *Paullinia*

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