

Morpho-anatomical characters and secondary metabolites from *Psittacanthus calyculatus* (Loranthaceae)

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Abstract. *Psittacanthus calyculatus* is a parasitic plant. The presence of alkaloids, saponins and terpenes indicates its potential medicinal values, and antimicrobial activities.

Key words: *Psittacanthus calyculatus*, morphology, anatomy, secondary metabolites.

Psittacanthus calyculatus is a regular parasite on many trees such as pear. In Mexico the common name is hiedra-injerto. The preliminary phytochemical study showed the presence of the principal secondary metabolites (1). The morphoanatomy studies were made.

MATERIALS & METHODS

Plant material and extract preparation. Plant material was collected from plants growing abundantly as parasitas on the branches of the trees in Cholula, Puebla (México). Shade dried, powdered plant material (100 g) was successively extracted (maceration) with ethanol 96 % for 3 days. The sample material was further extracted once with ethanol 96 %. Crude extracts were obtained by removing the solvents in vacuum (30°C).

Phytochemical analysis. We analyzed the presence of some metabolites of high medicinal value (alkaloids, anthroquinone, steroids,

leucoantocyanin, saponins, triterpens) using the methods of Webb and Kiang & Douglas, and Cain (2) appropriate for different chemical constituents.

Antimicrobial assays. The antibacterial activity of the extract was evaluated by applying the extract on the bacterial culture medium and then measuring the inhibition of growth compared to the control, positive or negative. The organisms used were the bacteria *Staphylococcus aureus* (ATCC 4012), *Bacillus subtilis* (ATCC 465), *Pseudomonas aeruginosa* (ATCC 260), *Escherichia coli* (ATCC 128), the positive control was Ciprofloxacin (5 mg/disc) and negative control was distilled sterile water. The culture medium utilized was Müller Hinton prepared in petri dishes 24 h before the test and placed within a bacteriological incubator at 37°C.

The extract is obtained by macerating the plant sample in ethanol at room temperature, then 5% solution in solvents was prepared for the test. Filter paper disks were sterilized, then 10 µl of the extract was applied, after the evaporation of solvent, the disks were put on petri dishes with agar inoculated, incubation was for 24 h at 37°C.

RESULTS & DISCUSSION

Psittacanthus calyculatus (Loranthaceae) is a parasitic plant growing in abundance on the branches of trees including pear reducing drastically fruit production (3). After maturity the seeds fall on the branch and secrete some sort of mucilage which helps the growth of haustorial root. These penetrate deeply and ramify in the bark and wood thereby softening the wood and drawing nutrients for the luxuriant growth of the parasite (4-5). Leaves are thick with thick cuticle to reduce the loss by transpiration. This plant is used in traditional medicine to treat skin infections with *Streptococcus* called erysipelas and other skin diseases (6,7) in the state of Puebla. The diagnostic anatomical characters of the species are the presence of abundant stomatas of parasitic type and glands on the stem surface and long truncate vessels with elongated pits and long thin walled fiber cells. Leaf surface also contains parasitic type of semi-abundant stomatas, mostly sunken to reduce transpiration loss and also glands. (Detailed data were stored in database).

Phytochemistry. A preliminary analysis on the phytochemistry of leaves, stem and flowers showed the presence of alkaloids, saponins, and terpenes. Further study by Chromatography and nuclear magnetic resonance at a later study will confirm the presence of these compounds and phenolic xyloside derivatives that were isolated from *Psittacanthus cucullaris* by A. Sinha et al. (8).

Antimicrobial assays. The effect of ethanolic extract on antibacterial activity of *Staphylococcus aureus* (ATCC 4012), *Bacillus subtilis* (ATCC 465), *Pseudomonas aeruginosa* (ATCC 260), *Escherichia coli* (ATCC 128), reveals that none of extracts showed activity in the antimicrobial assays, but these findings are stimulating for further assays with other bacteria.

Anatomical characters (10 x):

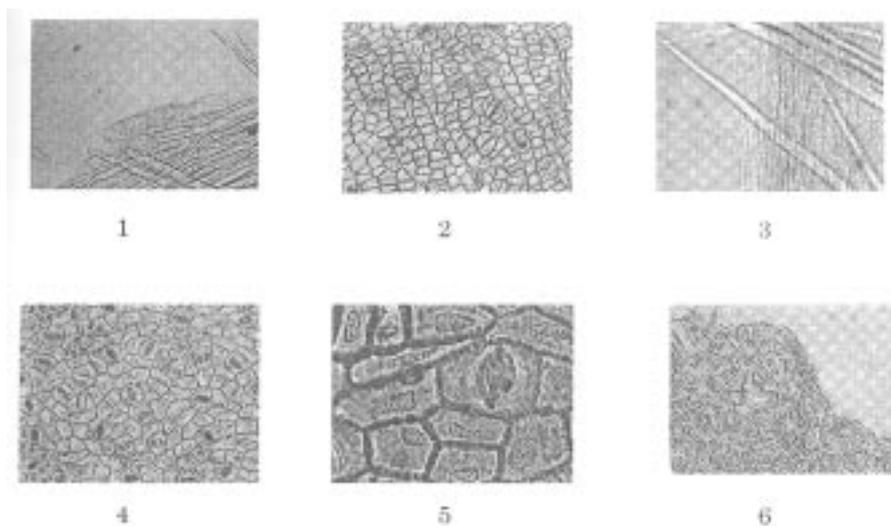


Fig.1-6.- Anatomical characters (10 x): Stem 1, xylem vessels. 2, Stomata on stem surface. 3, Thin walled fiber cells. Leaf 4, Stomata 10x. 5, Stomata 40x. 6, Flower-gland.

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