Pharmacognostic Studies of Thuja Occidentalis Linn. – A Good remedy for warts & tumours, used in Homoeopathy.

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ABSTRACT: Thuja occidentalis Linn. (Family cupressaceae), commonly known as American Arbor Vitae, is an evergreen tree and native of North America. Leaves & twigs, which contains essential oil, condylomatous growth, spongy tumours, warts, ill effects of vaccination etc. Twigs fan-shaped; leaves ovate, obtuse, having resin ducts & parenchymatous mesophyll; stem shows resin ducts in parenchymatous cortex and alternate bands of phloem parenchyma & phloem fibres. TLC of alcoholic extract in chloroform: Methanol (9:1) shows 8 spots under UV light, and UV absorbance shows peak at 260nm.

INTRODUCTION

Thuja occidentalis Linn. of the family cupressaceae, commonly known as American arbor vitae, is a native of North America from Quebec South wards to North California, grows along the banks of streams, rivers and in moist places. It is introduced in India from North America. Thuja is an evergreen tree up to 20 m tall has a rather ragged conical crown of branches bearing more or less 4-sides twigs that are completely covered by scale like and closely overlapping leaves.

The leaves & twigs on steam distillation yield 0.6 to 1.0% camphor like essential oil called oil of thuja or white cedar leaf oil, sp.gr. 0.925, boiling point 190-206c, easily soluble in alcohol. The main constituent of the oil is d-thujone which is poisonous (W.I., 1976). It acts on the muscles of the uterus, Americans drink a tea of the inner bark to promote menstruation. Thuja also contain volatile oil, sugar, gelatinous matter, wax, resin and thujin. Volatile oil can be distilled from leaves and used as vermifuge (Grieve, 1971). Externally, a wash of herb is considered beneficial for such skin infections as impetigo and also for warts. Homoeopats recommended it for body odour, morning headache and warts and is also used in Homoeopathic system for condylomatous growth, ill effect of vaccination, gonorrhoea, syctic pains, tearing in muscles & joints, very painful and sensitive genitals (Clark, 1975). The decoction has been used in intermittent fever, rheumatism, dropsy, coughs, scurvey and as an emmenagogue. The leaves made in to an ointment with fat are helpful for local application in rheumatism. An injection of the tincture into venereal warts is said to cause them to disappear (Greive, 1971).

MATERIAL AND METHODS:

Plant material procured from different places of USA. Conventional method of hand section cutting was taken up for anatomical studies; chemical analysis were
done following Johansen (1940), Youngken (1951), Cormwell (1956), Trease & Evans (1972) and for determining physical characters IP (1970) was followed. Leaves and twigs were extracted with ethanol at room temperature in soxhlet apparatus for 24 hours. TLC of extract of leaves & twigs was carried out on silica gel ‘G’ coated plates using chloroform: Methanol (9:1) as solvent system. UV absorption spectroscopy was carried out on Bekman M26 instrument.

OBSERVATION:

1. **Macroscopic studies**

Twigs fan-shaped, flattened dark-green on top and significantly lighter in colour on the under sides bearing paired, decussate scale like leaves (Fig.1A). Leaves closely imbricate, ovate, acute, 2-4 mm long, obuse, glandular, bearing gland on back, bright green above and yellowish green beneath, changing in winter usually to dull brownish green. Odour aromatic, rubbed between the fingers the fresh leaves produce a powerful balsamic odour; taste camphoraceous, turpentine & bitter.

2. **Microscopic studies:**

Leaves: Isobilateral, single layered epidermis; stomata anomocytic, broadly elliptical, large & sunken. Mesophyll thinwalled, parenchymatous containing one resin duct on both sides of the stele; small, circular stele surrounded by single layer of endodermis; pericycle indistinct; xylem surrounded by phloem, centre parts of the stele is very small & parenchymatous (Fig.1).

Young Twig: Transection shows angiospermic leaf like structure, having two lateral lamina like projections; epidermis single layered with thin cuticle and anomocytic stomata; a discontinous layer of sclerenchymatous hypodermis in the centre part only ground tissue parenchymatous; stele small containing single layer of endodermis; pericycle indistinct, xylem surrounded by phloem; pith scanty, parenchymatous. Two lateral lamina like projections containing parenchyma & vascular strands at the place constrictions (Fig 2).

Stem: Transection shows 6-8 layers of cork cells with brown contents; hypodermis two layered & sclerenchymatous; cortex thinwalled parenchymatous containing resin ducts and isolated scattered fibres; phloem consists alternate layers of phloem fibres & phoem parenchyma; wood large, lack of vessels, early & late wood distinct; medullary rays 1 to 2 seriate; pith small parenchymatous (Fig.3).

1. **Chemical analysis:**

a) A preliminary chemical analysis reveals presence of volatile & essential oils, flavone, tannin, resin, sterol, sugar; absence of alkaloid, oxalate, glycoside, anthraquinone & saponin.

b) Thin layer chromatographic study of alcoholic extract was carried out using chloroform: methanol (9 : 1 v/v) as mobile phase. Under UV light eight spots appear at Rf.0.05, 0.12 to 0.22 (all red), 0.37 (blue), 0.47,0.54,0.68,0.84 & 0.93 (all red) and after spraying antimony trichloride regent five spots were developed (Rf. 0.15 (violet), 0.85 (violet), 0.87 (brown) and 0.96 (green)).

c) Alcoholic extract scanned for UV absorbance gave strong peak at 260 nm.

2. **Physical Characters:**
a) Extractive values:
   Alcohol soluble extractive – 18.9%
   Water (pH7) soluble extractive – 8.6%

b) pH of alcoholic extract = 5.6

c) Sp. gravity – 0.830

d) Ash values:
   Ash value of powdered drug = 8%
   Acid soluble ash = 2%

DISCUSSION

Thuja orientalis Linn. native of china, is very common in Indian gardens and used as an adulterant. It can be distinguished by narrow needle like leaves; anatomically stem can be characterized by single, discontinuous layer of hypodermis, presence of starch grains in parenchyma of cortex & medullary rays.

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EXPLANATION OF FIGURES:

Fig.1 A. A twig
Fig 1. Transection of Twig
Fig 2. Transection of Stem
Fig 3. Transection of Leaf.

Abbreviation Used:

Co-cork; COR-Cortex; EPI – Endodermis; END – Endodermis; Ew-Early wood; F-Fibres; Hyp-Hypodermis; LW-Late wood; Mr-Mercury rays; Ms-Mesophyll; P-Pith; PH-Phloem; PHF-Phloem fibres; PHP-Phloem parenchyma; RD-Resin duct; ST-Stomata; VS-Vascular Strand; XY-Xylem.

FIGURES TO BE INSERTED.
