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Pharmacognostic and Phytochemical Evaluation of *Tridax procumbens* Linn.

Ganju Kuldeep^{1*}, Pathak A.K²

1. Principal, Bhabha Polytechnic Pharmacy, Bhopal, India.
[E-mail: kuldeepganju@yahoo.com]
2. Head, Dept. of Pharmacy, B.U., Bhopal, India.

Tridax procumbens Linn. is a procumbent herb found throughout India. The plant has many pharmacological applications as in the case of wound healing and hair growth. Quantitative microscopical and histological study is done for correct identification of the plant. The characteristics identification parameters are studied and reported. Phytochemical analysis of the whole plant is done and the presence of quercetin is confirmed using HPTLC and HPLC techniques

Keyword: *Tridax procumbens*, Glandular Trichomes, Anomocytic Stomata, Latex Cells.

1. Introduction

Tridax procumbens Linn. belongs to the family Compositae. It is commonly known as 'Common button' or 'Coat button' and it is a weed found throughout India. A hispid, procumbent herb with woody base sometime rooting at the node, upto 60 cm high. Leaves are ovate-lanceolate 2 to 7 cm and lamina pinnatisect, sometimes three lobed; flowers in small, long peduncled heads; achenes 1.5 - 2.5 mm long x 0.5 - 1 mm in diameter and densely ascending pubescent; persistent; bristles of disc achenes alternately longer and shorter, 3.5 - 6 mm in length^[1]. Isolation of methyl 14-oxoacagaecunoate, methyl 14-oxonacosanoate, 3-methyl-non adecylbenzene, heptacosanyl cyclohexane carboxylate, 1-(2,2, dimethyl-3-hydroxypropyl) isobutyl phthalate, 12-hydroxytetracos-15-one, 32-methyl-30-ozotetraatriacont-31-en-1-ol along with β -amyryn, β -amyryne, fucosterol and sitosterol, arachidic, behenic, lauric, linoic, linolenic, myristic,

palmitic and stearic acids have been isolated^[2]. The leaves are reported to be employed in bronchial catarrh, dysentery or diarrhea and for restoring hair. The leaf gel possesses antiseptic, insecticidal and parasiticidal properties. It is used to check haemorrhage from the cuts, bruises and wounds. An aqueous extract of plant produces reflex tachycardia and showed a transient hypotensive effect on the normal blood pressure^[1]. It is employed as an indigenous medicine for a variety of ailments including jaundice. The plant also has hepatoprotective activity and it is used in Ayurveda in various liver disorders^[3].

It is commonly used in Indian traditional medicine as anticoagulant, antifungal and insect repellent, in bronchial catarrh, diarrhea and dysentery^[4]. Moreover it possesses wound healing activity and promotes hair growth^[5].

2. Material and Methods

Transverse section studies of leaf along the midrib, stem and roots were done. The coarsely powdered plant material was subjected to extraction by solvents with increasing polarity and the dried extracts were subjected to phytochemical studies using standard test procedures.

Table 1: Preliminary Phytochemical Screening of Various Extracts of the Whole Plant of *Tridax procumbens* Linn

Constituents	Pet. Ether	Chloroform	Ethanol	Aqueous
Alkaloids	-	-	-	-
Anthroquinone glycosides	-	-	-	-
Flavonoids	-	-	+	-
Phenolic groups	-	+	+	+
Saponins	-	-	+	+
Tannins	-	-	+	+
Steroids	+	+	+	+
Carbohydrates	-	-	+	+

+ indicates presence - indicates absence

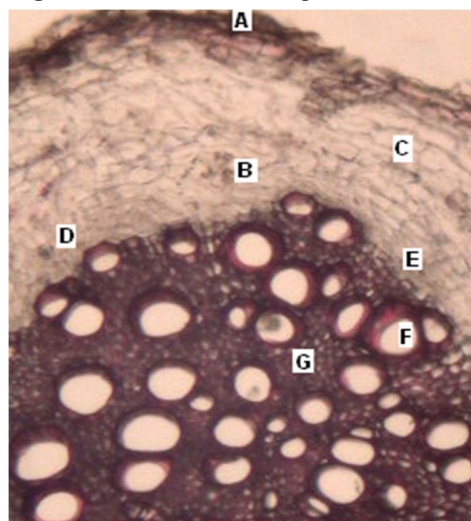
2.1 Histological studies of *Tridax procumbens*



Fig 1: TS of Leaf of *Tridax procumbens* X40

A : upper epidermis, B : palisade cells, C : mesophyll, D : lower epidermis, E : vascular bundles

Fig 2: TS of Root of *Tridax procumbens* X40



A : exodermis, B&C : phelloderm, D : pericycle, E : phloem, F : xylem, G : medullary rays

Fig 3: TS of Stem of *Tridax procumbens* X40



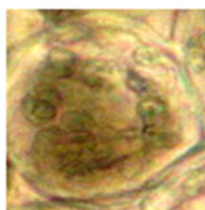
covering trichome, B : cuticle, C : epidermis, D : cortex, E : primary phloem, F : cambium, G : primary xylem, H : pith

A :

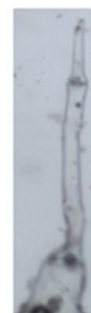
Fig 4: Powder & Cellular Microscopic Study of *Tridax procumbens* X400



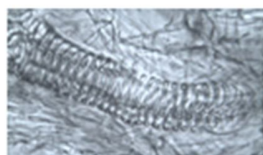
Stem Glandular Trichome



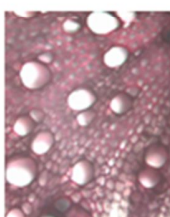
Stem Latex Cells



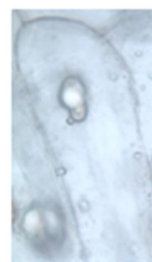
Covering Trichome



Leaf Vessels



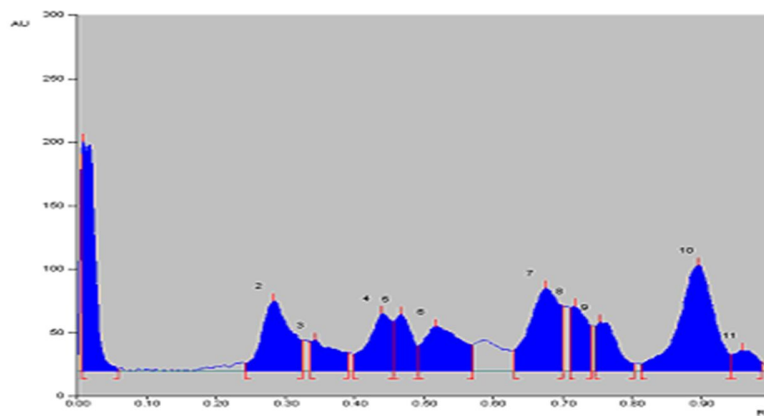
Root Mri



Palisade Cells

2.2 HPTLC studies of ethanolic extract of whole plant of *Tridax procumbens* Linn.

Solvent system : Acetic acid : HCl : Water (30:03:01)



HPTLC studies of Quercetin

Fig 5: HPTLC Profile of Ethanolic Extract of Whole Plant of *Tridax procumbens* Linn.

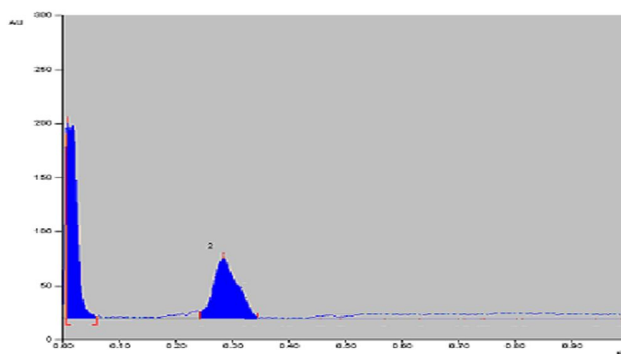


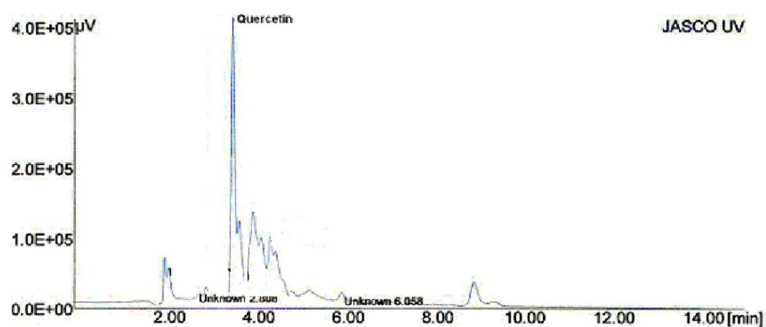
Fig 6: HPTLC Profile of Standard Quercetin

2.3 HPTLC studies of ethanolic extract of whole plant of *Tridax procumbens* Linn.

The alcoholic extracts of the whole plants was run for HPLC studies. HPLC, Jasco, RP C-18 column was used and samples were administered at 1ml/min flow rate using HPLC grade methanol as the mobile phase.

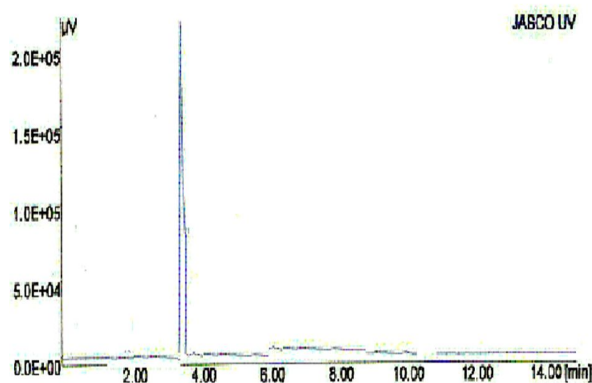
2.4 HPLC studies of ethanolic extract of whole plant of *Tridax procumbens*

Fig. No. 7: HPLC Profile Ethanolic Extract of Whole Plant of *Tridax procumbens*



2.5 HPLC studies of Quercetin

Fig. No. 8: HPLC Profile of Quercetin



3. Result and Discussion:

Transverse sections of the whole plant of *Tridax procumbens* were studied. The section of leaf shows single layered upper epidermis consisting of polygonal tabular cells about 40-70 μm by 15 to 30 μm with a single layer of cylindrical palisade cells about 18 to 30 μm wide and 60 to 70 μm long, spongy parenchyma 2-4 layered, cells polyhedral or isodiametric in shape (Fig. No.1). The section of root shows composed of thin walled tangentially elongated cells. Cortex composed of oval to polygonal parenchymatous cell. Simple pitted vessels are present. The stele is surrounded by a single layer of pericycle and has xylem and phloem arranged in a circle, alternating in position so that each lies on a different radius (Fig. No.2). The section of stem shows cortex consisting of 1-2 layers of collenchyma and 6-7 layers of parenchyma. Endodermis is indistinct (Fig. No.3). Powder microscopy of the plant showed fibres of 175 μm length, and collenchyma cells of 70-115 μm diameter, glandular trichomes of stem are present, latex cells are seen in the stem, root cortex cells of diameter 80-120 μm are present, spiral vessels are present in the leaf, unicellular covering trichomes of length 200 μm are present on the leaf surface, glandular trichomes of length 200-250 μm are present on the stem, latex cells of approx. 100 μm diameter are found in the stem. Anomocytic stomata are found on both the surfaces of the leaf (Fig. No.4). The presence of flavonoid quercetin is confirmed in the plant since the HPLC and HPTLC studies of the ethanolic extract of the whole plant and that of standard quercetin match each other.

4. References:

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