EXPERIMENTAL TAXONOMIC STUDY OF MEDICINAL PLANT : AMMANIA BACCIFERA LINN.

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ABSTRACT

Ammania baccifera L. Is annual erect herb. It is known as Bharjambhul in Marathi and Blistering Ammania in English. It belong to family Lythraceae. Stem is herbaceous. Leaves are sessile, linear. It is medicinal plant and used in the treatment of cough, vata, pitta, used in rheumatic pain, fever. It is used in skin diseases. It is also used as appetizer. As it is being sold in market there is need of standardization and correct botanical identification. Detail pharmacognostic studies have been carried out in this paper. The study include macroscopic, microscopic, anatomy, histochemistry, phytochemistry including ash analysis. The detail pharmacognostic account of Ammania baccifera L. which include macroscopic and microscopic characters will be helpful for the correct botanical identification of the medicinal plant. The percentage of extractive and ash analysis, phytochemical data will be helpful for standardization.

Key Words : Pharmacognostic, Standardization, Blistering etc.

Introduction ;

Large no of medicinal plants known from Marathwada (MH) India. Some time medicinal plant researcher depends on collected drug supplied by vaidhy. It is necessary to deposit specimen in laboratory herbarium on which research work is carried out. The identification must be followed systematically in medicinal plants. India has long tradition of using medicinal plants hence there must be proper documentation. The standard taxonomic procedure follow to identify specimen. The pharmacognosy tools are impotent. Themacroscopic and microscopic events plays important role in identification of medicinal plants.

Ammania baccifera L is a annual erect herb. In Marathwada (MH) India. It is found to be growing as
weed in rice field. Wet soil along the stream bank. *Ammannia baccifera* L. has been used in the treatment of ring worm. It is rich in vitamin-C.

**Material and Method:**

Fresh plant material was collected from various districts of Marathwada (MH) India in large quantities. Efforts were made to collect the plant in flowering and fruiting condition for the correct botanical identification. The plant material was identified by using Flora of the Presidency of Bombay (Cooke 1901 to 1908) Flora of Maharashtra state (Singh *et al*.) Flora of Marathwada (Naik *et al* 1998) Flora of British India (Hooker 1972). For microscopic studies uniform, thin free hand section were taken from the fresh and preserved root, stem and leaves. Double stained and finally mounted on Canada balsum by following the microscopic technique method of Johanson (1989). Macroscopic and microscopic studies were carried out according to Wallis and Deware (1933). Histochemical tests were carried out as per Krishnamurthy (1989). For phytochemical investigation healthy plant parts like root, stem and leaves were separated and dried in shade so as to prevent decomposition of chemical components. Powder is analysed qualitatively and quantitatively for different chemical parameters. Extractive percentage and ash analysis content were studied as per Indian pharmacopoeia (Anonymous 1994).

**Observation:**

**Macroscopic characters:**

*Ammania baccifera* L. is an annual erect herb. Leaves are linear, sessile, acute, pinnate, Venation pattern is campyloclastous. Trichomes are unicellular and bicellular. Stomata are ranunculous type. Stomatal index is 25.00. Stem is herbaceous. Flowers are pedicellate, hemispheric. Seeds are yellowish brown.

**Microscopic characters:**

**Transverse Section of Root:**

It is circular in C.S. Epidermis is unilayered followed by 6-8 layered Parenchymatous outer cortex, Inner cortex is with large lacune. Endodermis and pericycle distinct. Secondary tissue consists of outer secondary phloem and inner secondary xylem with vessels arranged in rows. Pith small with large parenchymatous cells.

**Transverse Section of Stem:**
Epidermis is outermost layer composed of barrel shaped cells. Epidermis is followed by collenchymatous hypodermis. The cortex is 3-5 layered parenchymatous with intercellular spaces and some crystals of oxalate of lime. Endodermis is conspicuous with casparian thickening. Pericycle is distinct containing isolated strands of fibers. Secondary tissue shows outer secondary phloem and inner secondary xylem. Xylem elements are transversed by narrow medulary rays. Vessels arrange in rows. Inter xylary phloem is observed. Pith is with scleroied cells and crystals oxalate and starch observed in pith region.

Transverse section of leaf :

' Leaves are dorsiventral. Epidermis is unilayered on both the sides covered by cuticle. Epidermal cells containing mucilaginous cells. It is covered by unicellular or bi cellular elongated hairs. The mesophyll tissue is of two types, upper is occupied by 1-2 layered palisad tissue made up of elongated columnar cells, 2-3 layered spongy chlorenchyma on the lower side. Crystals of oxalate of lime are found in mesophyll. In the mid-rib region single vascular bundle is present. Vascular bundle covered by bundle sheath.

Ammannia baccifera  L.

Stomata :

The leaves are hypostomatic or may be amphistomatic and are more in number on lower surface. The stomatas are usually ranunculous type. The stomatal index is 25.00. The average size of stomata is 28x11.9µm.

Trichome : The trichomes are unicellular or bicellular elongated. The average length of trichome is 11x17.9µm.

Leaf Architecture::

Type of venation is pinnate, camptodromous, exmedial ramified, reticulate venation and laking areole.

Vessels :

The shape of vessel element is cylindrical and linear. Simple pitted thickening were common, pits alternate. Vessel with short pointed, long pointed were observed. In the vessel only simple perforation plate were present. More commonly vessel have oval in shape. All the fibers are pointed at both ends. The shape of tracheid is spindle shaped.

Histchemistry ;

Table: Histochemical test in fresh section of root, stem and leaf of

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It is observed from Table ------- that Alkaloid, starch, protein, fat, lignin calcium except Tannin and Silicon are present in Root, Stem and Leaf. Their localization is as per table

Extractive Percentage:

Table: Determination of Extractive percentage of Ammannia baccifera L.

<table>
<thead>
<tr>
<th>Plant part</th>
<th>Solvent (Mg. g-1) dry weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water soluble extractive (%)</td>
</tr>
<tr>
<td>Stem</td>
<td>73.40</td>
</tr>
<tr>
<td>Leaf</td>
<td>69.06</td>
</tr>
</tbody>
</table>

Stem sample exhibit higher level of water soluble extractive as compare to alcohol and ether soluble extractive. Stem sample exhibit higher level of alcohol soluble extractive as compare to ether soluble extractive.

Ash Value:

Table: Determination of Ash value in Ammannia baccifera L.

<table>
<thead>
<tr>
<th>Plant part</th>
<th>(Mg. g-1) dry weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Ash (%)</td>
</tr>
<tr>
<td>Stem</td>
<td>9.31</td>
</tr>
<tr>
<td>Leaf</td>
<td>8.56</td>
</tr>
</tbody>
</table>
The total ash % of stem is higher than the total ash % of stem.

The water-soluble % of stem is higher than water soluble ash % of leaf.

The acid insoluble ash% of leaf is higher than the acid insoluble ash % of stem.

Discussion:

The present research work deals with the experimental taxonomic studies of Ammannia baccifera L. The leaves of this plant are used to improve the appetite. It is also given to remove cough, vata etc. It is commonly found in muddy places along stream, ponds etc. It is collected from Nanded, Basar, Dhanora. It is morphotaxonomically studied in detail including gross anatomy of root, stem and leaves.

Stem T.S. is circular in outline externally covered by cuticle. The cortex is 3-5 layered and shows lacunae. In cortex crystals of oxalate of lime were observed. Pericycle containing isolated strands of fibers. The secondary vascular bundle shows phloem to outer and xylem to inner side. Xylem elements are transverse by narrow medullary rays. Vessels were arranged in row. Pith cells were full of crystals of oxalate, scleroid cells and starch.

In the leaf t.s. epidermis few cells shows bladder like mucilaginous cells. The epidermis is covered with unicellular hairs. The mesophyll consist of two layered palisad and 2-3 layered spongy chlorenchymatous tissue. In mid rib region is single vascular bundle consisting of xylem elements towards adaxial side and phloem towards abaxial side. In mid rib region sclerenchymatous hypodermis and crystals of oxalate of lime were observed. Rananculaceous type of stomata were observed. Trichomes were unicellular.

Histochemical test shows that out of nine chemical tests carried out seven chemicals were found in root, stem and leaf except tannin and silicon.

Stem shows higher water extractive content and ether soluble extractive content, while leaves shows higher alcohol soluble extractive content.

Total ash content and water soluble content in general is higher in stem as compared to root and leaves. Acid insoluble ash is higher in leaves.

Conclusion:

Ammannia baccifera L. The leaves of this plant are used to improve the appetite. It is also given to remove cough, vata etc. It is commonly found in muddy places along stream, ponds etc. Stem T.S. is circular. In cortex crystals of oxalate of lime were observed. Pericycle containing isolated strands of fibers. Xylem elements are transverse by narrow medullary rays. Vessels were arranged in row. Pith cells were full of crystals of oxalate, scleroid cells and starch. In the leaf t.s. epidermis few cells shows bladder like mucilaginous cells. The
epidermis is covered with unicellular hairs. In mid rib region sclerenchymatous hypodermis and crystals of oxalate of lime were observed. Ranunculaceous type of stomata were observed. Trichomes were unicellular. Nine chemical tests carried out seven chemicals were found in root, stem and leaf except tannin and silicon. Stem shows higher water extractive content and ether soluble extractive content, while leaves shows higher alcohol soluble extractive content. Total ash content and water soluble content in general is higher in stem as compared to root and leaves. Acid insoluble ash is higher in leaves.

(A) Vessels of Ammania baccifera L., (B) T.S. Stem of Ammania baccifera L

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