

Pharmacognostical and Phytochemical study on the leaves of *Paederia foetida* linn.

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Abstract: This paper gives the information about the *Paederia foetida* linn. Pharmacognostical and Phytochemical studies on the leaves of *Paederia foetida* linn were performed. Less study are available on microscopical and phytochemical studies, hence, the present study was undertaken to investigate the same. All the parameters were studied under the WHO and pharmacopocial guidelines. The leaf simple, petiolale, stipulate, glabrous and mostly ovate margin entire, taste is indistinct. Epidermis, trichomes, parenchyma, collenchyma, vascular bundle, cell content were appearing on microscopical study on the leaf. Phytochemical standardization parameter such as moisture content, total ash, water soluble and acid insoluble ash, alcohol soluble and water soluble extractives were determined. Primary identification of phytoconstituents was performed.

Keywords: *Paederia*, *Rubiaceae*, Pharmacognostical, Phytochemical

Introduction

Herbal medicine is a triumph of popular therapeutic diversity. Almost in all the traditional medicine, the medicinal plants play a major role and constitute the backbone for the same. In order to make sure the safe use of these medicines, a necessary first step is the establishment of standards of quality, safety and efficacy. Keeping this fact in the consideration, the attempts were made to establish physiochemical standards of the plant *Paederia foetida* linn syn. *Paederia scandan*. (Hindi – *Ghandhali*, Assameese – *Bedolilata*) belonging to family Rubiaceae¹⁻³. In India, *Paederia foetida* linn is of medicinal value. It is usually found in Himalayas from Dehradun eastwards upto an altitude of 1800m and also in Assam, Bihar, Orissa, and Bengal. It contains bitter taste with having foul smell. It is also reported to be used in gout, vesical calculi, diarrhoea, dysentery, piles, inflammation of the liver and emetic³⁻⁴. It also enters in to the preparation of Dasmularishta. The major classes of chemical constituent present in this plant are iridoid glycosides, sitosterol, stigmaterol, alkaloids, carbohydrates, protein, amino acid and volatile oil³⁻⁶. In the present study some of the Pharmacognostical and phytochemical parameters such as macroscopic,

microscopic, ash value, extractive value, moisture content and preliminary screening of the leaves.

Material and methods

The leaves of *Paederia foetida* linn were collected from the Botanical garden (Department Of Life Sciences) Dibrugarh University. The leaves were dried under normal environmental condition and authenticated from Botanical Survey of India, Shillong (Ref. No.DU/PSc/HRB-2/08). For macroscopical studies on the leaves give the knowledge of external feature. For microscopical studies, free hand section of leaf were cut, cleared and stained with safranin according to the prescribed method^{7,8}. Physiochemical studies such as moisture content, ash value, extractive values were performed according to official procedure^{7,8}. Dried leaves were used for qualitative photochemical analysis. All the five extract were used for primary phytochemical screening. The chromatographic development was performed using mixture of some chemical such as n-hexane, ethyl acetate, chloroform, dichloromethane, glacial acetic acid, methanol, carbon tetrachloride, petroleum ether for all extract as mobile phase under the following conditions; chamber saturation time, 30 min

and temperature, 20°C. After development, the TLC plates were dried completely at room temperature.

Result and Discussion

Macroscopically, the fresh leaf of *Paederia foetida* Linn is 10 to 15 cm long, 5 to 6 mm width and petiole 1.2 to 6 cm, surface is glabrous and mostly ovate, green in colour having a characteristic odour indistinct bitter taste.

The leaf is distinctly dorsi-ventral with prominent midrib and lamina. Epidermal trichomes are sparsely seen both on the upper and lower epidermis. Mesophyll composed of single layered palisade cells and 3-4 layered spongy tissue; in margin of the leaf mesophyll replaced by thick-walled cells (Fig. 1,2). Trichomes are present on both surfaces elongate to produce uniseriate trichomes (Fig. 3). Midribs composed of single layered epidermis covered with cuticle; ground tissue consisting of 2-5 layered of collenchyma towards upper and lower side and rest parenchyma; a large median crescent-shaped vascular bundle consisting usual elements with xylem towards upper side and phloem towards lower side (Fig. 4).

The result of physico-chemical analysis and extractive value are given in Table 1. preliminary qualitative

chemical tests were performed which show that plant is credited with carbohydrates, proteins, amino acids, tannins, phenolics, flavonoids, steroids, mucilage and saponins. The value of other physical contents like moisture content, ash values and extractive value can be used for further investigations.

Conclusion

Standardization of herbal drugs is a topic of great concern. They are subject to variability as derived from heterogeneous sources. This variability can have both advantage and disadvantages effect. The main disadvantages are that the activity of the material may vary and that inferior material may be produced. *Bedolilata* is an Ayurvedic herb known for its antiarthritic, antihelminthic, hepatoprotective, antispasmodic activity and various medicinal properties. So the efforts were made to provide the scientific data to standardize the plant material for further studies. Microscopic, macroscopic and other physical values and parameters will help to identify the correct species of the plant since no such scientific data is available for the same.

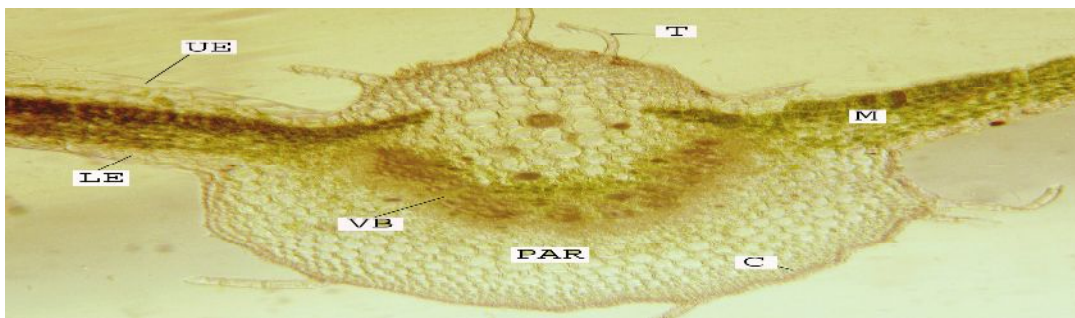


Figure no. 1

T S of *Paederia foetida* (Linn.) leaf

[T – Trichomes; M – Mesophyll; C – Collenchyma; PAR – Parenchyma; VB – Vascular Bundle; LE – Lower Epidermis; UE – Upper Epidermis]

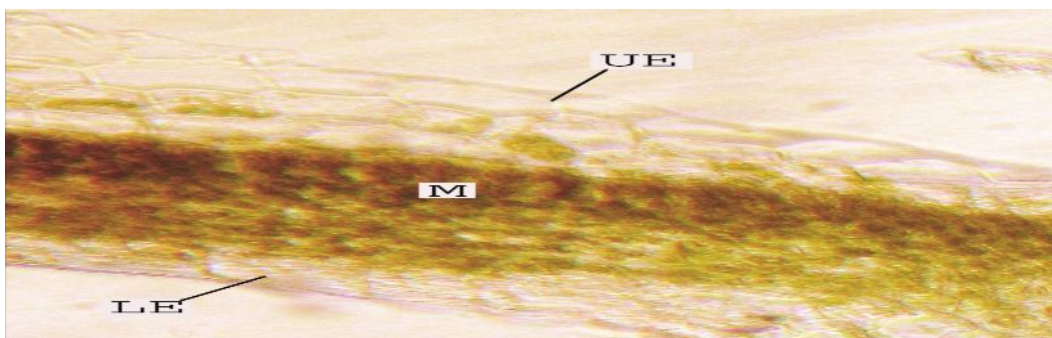


Figure no. 2

Lamina [M – Mesophyll; LE – Lower Epidermis; UE – Upper Epidermis]

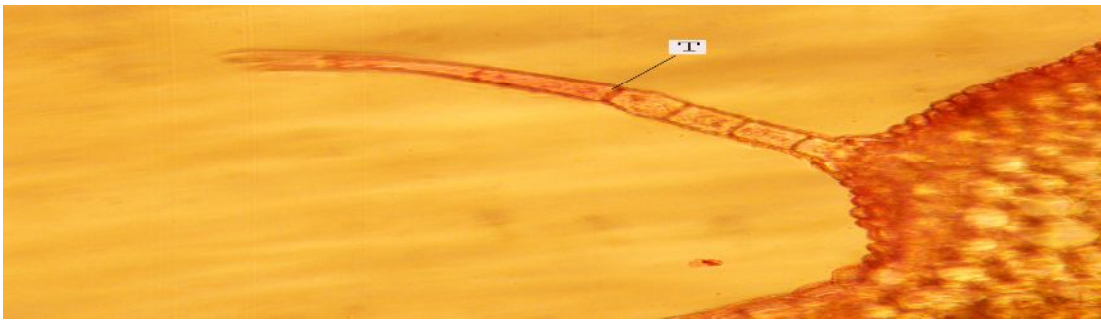


Figure no. 3
Trichomes

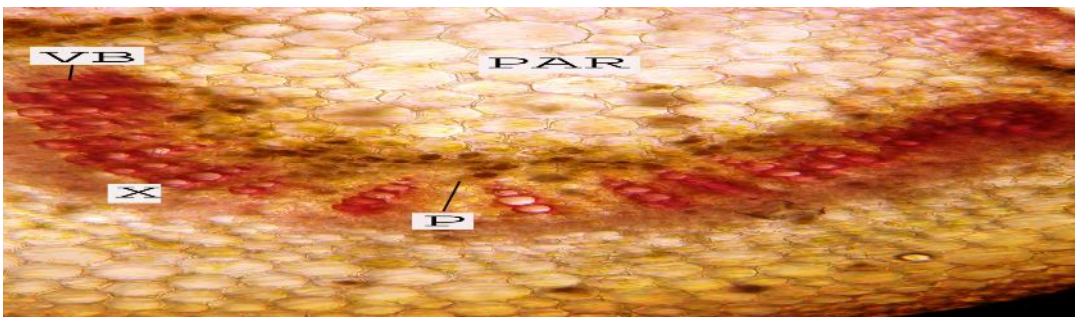


Figure no. 4
Midribs [VB – Vascular Bundle; PAR – Parenchyma; P – Phloem; X – Xylem]

Physical contents	
Moisture (%)	11.5
Ash (%)	10
Acid insoluble (%)	1.5
Extractive value	
Alcohol (%)	16.80
Water (%)	21.717

References

- 1) *The Ayurvedic Pharmacopeia of India* (1999). Ministry of Health and Family Welfare Department and Indian System of Medicine and Homeopathy, New Delhi. Part I, Vol – II: 137 – 140.
- 2) *The wealth of India* (1962), A dictionary of Indian raw materials and industrial product, raw material, vol. 7 CSIR, New Delhi
- 3) Blatter E, Caius JF, et. al. (1981), *Indian Medicinal Plants*. Vol. II 1297-1299.
- 4) *Indian Materia Medica* (2002). (Nandkoni KM ed). Bombay Popular Prakashan, Mumbai. 892.
- 5) Steinmetz EF (1961) □*Paederia foetida* □ pharmaceutical biology 1:4, 133 – 144.
- 6) Khare CP (2007). CP Khare, CCRAS. Indian medicinal plants 2007, 459.
- 7) Kokate, C.K., 1994, Practical Pharmacognosy, Vallabh Prakashan, 4, 29.
- 8) Kokate, C.K., Khandelwal, K.R., Pawar, A.P., Gokhale, S.B., 1995, *Practical Pharmacognosy*, Nirali Prakashan, 1, 11 – 19.
