Pharmacognostical studies of *Hymenodictyon orixence* (Roxb.) Mabb. leaf

Mallesh Reddy, Alka A. Chaturvedi

*Department of Botany, Rashtrasanth Santh Tukadoji Maharashtra Nagpur University (RTMNU), Nagpur, India*

**ABSTRACT**

*Hymenodictyon orixence* is medicinally important plant found in India, Malaysia and Africa. Due to overexploitation the population of this species has decreased very rapidly. The present study includes pharmacognostical examination of this species. It includes morphological, anatomical, chemical and chromo-fingerprinting characters of *Hymenodictyon orixence* leaf.

**Key words:** Chromo fingerprinting, pharmacognostical characters, Rubiaceae

**INTRODUCTION**

Standardization of natural products is a complex task due to their heterogeneous composition, which is in the form of whole plant, plant part/extracts obtained thereof. To ensure reproducible quality of herbal products, proper identification of starting material is essential.

*Hymenodictyon orixence* is a Rubiaceae member commonly known as ‘Bhorsal’ and is mainly known for its wound healing property. It has been reported to have antimicrobial,[1,2] anticoagulant, antiinflammatory and sun screening activity.[3] The present study was carried out to establish methods to facilitate proper identification of *Hymenodictyon orixence* leaf and its powdered form on the basis of morphological, anatomical, chemical and chromo-fingerprinting characters.

**MATERIALS AND METHODS**

**Plant material**

Leaves of *Hymenodictyon orixence* (Roxb.) Mabb. were collected from Chunala (Manikgad) forest of Chandrapur district (Maharashtra), and properly identified with the help of floras[4-6] at Post Graduate Teaching Department of Botany, Rashtrasanth Santh Tukadoji Maharashatra Nagpur University (RTMNU), Nagpur.

**RESULTS AND DISCUSSION**

The leaves of *Hymenodictyon orixence* are simple, opposite decussate, stipulate and petiolate. The leaf measures about 12–30 cm in length and 8–15 cm in width, elliptic in shape, with an abruptly acute apex. The margin is entire, with the base narrowed into a petiole, which is about 2.5–7 cm long and hairy. Dark green above and pale below, the young leaves are silvery and clustered at the end of branches. The stipule is interpetiolar, triangular or broadly ovate, obtuse recurved and deciduous.

The midrib is elevated on both the surfaces, with the upper being conical and lower semicircular in outline. Inner to the epidermis there is a few layered collenchyma followed by large parenchyma. Vascular bundle shallow is ‘U’ shaped with incurved margins. The xylem strands are few and embedded in phloem [Figure 1].

Upper epidermal cells are larger than the lower ones. Both the
surfaces have multicellular, uniseriate trichomes measuring up to 250–400 μ, stomata are paracytic [Figures 2 and 3] and restricted to the lower side only. Other important characters are given in the table [Table 1].

Behavior of leaf powder with different chemical reagents was studied to detect the presence of phytoconstituents with colour changes under day light and the results were presented in the table [Table 2].

The colour of the plant extract is mainly due to its chemical composition. The same extract may appear different in different wavelength of light. Kokashi et al.[9] studied the behavior of different vegetable drugs under UV radiation and found that different drugs exhibit different colours and those colours were characteristic for the particular drug. In our study we found a specific colour pattern which is characteristic for *Hymenodictyon orixence*, and hence can be used as a fingerprint for crude drug identification [Figure 4].

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**Table 1: Micro and macroscopic characters**

| Character                        | Value            |
|----------------------------------|------------------|
| Shape of epidermal cells         | Highly irregular |
| Size of epidermal cells          |                  |
| Upper surface                    | $2.4 \times 10^3 - 5.8 \times 10^3 \mu$ |
| Lower surface                    | $2.3 \times 10^0 - 3.3 \times 10^3 \mu$ |
| Total number of cells/sq mm      |                  |
| Upper surface                    | 95   |
| Lower surface                    | 145  |
| Stomatal complex length          | 22–27 μ         |
| Stomatal index                   | 25               |
| Vein termination number          | 7                |
| Vein islet number                | 6                |

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**Table 2: Phytochemical tests**

| Reagent            | Colour/precipitate       | Constituent                      |
|--------------------|--------------------------|----------------------------------|
| Conc. H₂SO₄        | Reddish brown            | Steroids/Triterpenoids present   |
| Aq. FeCl₃          | Greenish black           | Tannins, flavonoids present      |
| Ammonia solution   | No change                | Anthracene glycosides absent     |
| Dragendraffs       | Orange precipitate       | Alkaloids present                |
| Mg–HCl             | Red                      | Flavonoids present               |
| Alcohol            | Mucilaginous precipitate | Gums and mucilage present        |
| Lead acetate       | White precipitate        | Tannins present                  |
| Libermann- Burchard | Violet                   | Triterpenoids present            |
| Trim Hill*         | Red                      | Iridoids present                 |

*performed with fresh material

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