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### INTRODUCTION

*Brucea mollis* Wallich *ex* Kurz belonging to the dicotyledonous family Simaroubaceae is a bitter shade loving deciduous shrub growing on gentle hill slopes as forest undergrowth. The family Simaroubaceae comprises of about 30 genera and 200 species distributed in tropical America, tropical West Africa, North Japan and Korea, China, New Caledonia, Fiji, Polynesia and Borneo (Nootebom, 1962; Clayton, 2008). The genus *Brucea* J. F. Mill. was named after Scottish scholar and explorer James Bruce and the type species of the genus *B. antidysenterica* was collected by him from Africa (Wight, 1839). The genus *Brucea* comprises of 10 species viz., *B. javanica*, *B. mollis*, *B. antidysenterica*, *B. bruceadelpha*, *B. erythraeae*, *B. guinensis*, *B. macrocarpa*, *B. trichotoma*, *B. stenophylla* and *B. tenuifolia* (Bharati and Singh, 2012) and distributed in old world tropics (Mabberley, 2005; [www.theplantlist.org](http://www.theplantlist.org)).

Members of the genus *Brucea* are either monoecious or dioecious shrubs or small trees growing on hill slopes of tropical forests. Leaves exstipulate, imparipinnate with petiolar base. Flowers are minute uni- or bi-sexual, polygamous. Inflorescence cyme, forming axillary raceme. Sepals 4, connate at the base, imbricate, ovate, triangular and small. Petals 4, free, imbricate, ovate and small. Disk four lobed. Stamens 4, filaments short, inserted between the lobes of the disk. Ovaries 4, free, ovate, ovule 1, anatropous, pendent, attached above the middle at the adaxial side. Styles free or coherent at the base. Fruit drupaceous, hardly fleshy.

Mature dried nuts ovoid. Seeds ovoid, with thin testa and a thin to very thin endosperm.

In India the genus is represented by two species viz., *Brucea javanica* (L.) Merr. and *B. mollis* Wall. ex Kurz (Gupta *et al.*, 2004; Santapau and Henery, 1973). It is an endemic medicinal plant restricted to northeast India except Mizoram and Tripura. In Assam the plant grows in different parts of Karbi Anglong District only. The species is also listed as endangered plant in Arunachal Pradesh and Assam in the CAMP workshop held during March 2003 at Guwahati to assess the threat status of prioritized Medicinal plants of northeast India. *B. mollis* has been listed as NT (Near Threatened) plant species of Meghalaya by IUCN (Anonymous, 2003). The percentage of its global presence is estimated to be 5-10 (Anonymous, 2003). It is also reported from Bhutan, Cambodia, China, Laos, Malaysia, Myanmar, Nepal, Philippine, Thailand, Vietnam (Pullaiah, 2006) and northern Australia. In Myanmar *B. mollis* is distributed in Chin, Kachin, Magway, Mandalay, Taninthay (<http://botany.si.edu/myanmar/checklistNames.cfm>).

*Brucea mollis* was first established by Kurz based on a material collected by Wallich in 1847 (Wall. 8483 B) from Burma (Myanmar) (Kurz, 1873). Later on the species was dealt with by other workers also (Kurz, 1977; Merrill, 1906, 1908, 1911, 1915 and 1917; Hua and Thomas, 2008). The description of the species so far based on male plant only and as such remained incomprehensive. Bennette (1875) provided a brief description of the leaf, inflorescence and the fruit of the plant. Merrill (1915) provided a morphological description of branch, leaf and inflorescence of the species only. Subsequently, a description of stem, leaf and inflorescence of the plant was also provided by Li (1943). Nootebom (1962) gave a brief description of the stem, leaf, inflorescence along with distribution and ecology

of the species. Moreover, the species exhibit wide diversity in its morphology not only between male and female plants but also among the plants of same sex and for which the species was described under different names by different workers *viz.*, *B. luzoniensis* by Vidal (1883), *B. membranacea*, *B. macrobotrys* and *B. stenophylla* by Merrill (1906, 1915, 1917) and *B. acuminata* by Li (1943).

*Bruceamollis* possesses notable medicinal importance. Decoction of either root or fruit has long been used by the local people for the treatment of fever (Barthakur, 1976). The species has also been used for treatment of malaria and cancer in traditional medicine in China (Liu *et al.*, 2009). In recent years, researches have established the medicinal properties of the plant (Ouyang *et al.*, 1994; Bharati and Singh, 2012; Prakash *et al.* 2012; Tung *et al.* 2012; Chen *et al.* 2013).

### **1.1 Rationale of the present study:**

In spite of its medicinal potentialities details about the plant is yet to be worked out. Scrutiny of literature reveals that only brief morphological description of the plant is available. The plant is so far known only from the fragmentary description based on the external morphological features of the male plants only. Although the description provided of Hua and Thomas (2008) includes certain features of female plants yet it is also incomplete. As such no comprehensive taxonomic assessment has been worked out with detail morphology, anatomy, floral biology and seed germination. The traditional use of the plant is also still not documented properly.

Loss of habitats due to extension of arable land, urbanization and other anthropological factors the population of the species is declining very fast. It is for this reason the species has been enlisted as endangered and near threatened.

Therefore, critical study of the species including the detail biological features is very crucial from conservation point of view.

Conventional taxonomic study includes only the study of gross morphological features (Ogura, 1964; Holttum, 1968; Hicky and Wolfe, 1975; Cronquist, 1975). However, in recent years features of organism derived from other branches of botany are being increasingly used as synthetic approach to Taxonomy (Anonymous, 1974). Importance and significance of the features other gross morphological characters in taxonomy has been emphasized by many workers (Stace, 1965; Dilcher, 1974; Barthlott, 1981; Carlquist, 1961; Dehgan, 1980; Dickinson, 1975; Ficher and French, 1977; Metcalfe, 1961; Paliwal and Anand, 1978; Payne, 1979; Rajagopal and Ramayya, 1977).

Therefore, in the present work studies on micro morphological and anatomical features of both vegetative and reproductive plant parts, floral biology, pollination mechanism, seed germination study along with the ethnobotanical use in addition to gross morphology features of *B. mollis* were taken up for proper taxonomic judgment and understanding of the species and its biology.

## **1.2 Aim and objectives:**

The aim of the present study is to prepare a comprehensive taxonomic account of *Brucea mollis* Wall. ex Kurz occurring in Assam. The objectives of the study are:

1. To work out the taxonomy and distribution of the species covering floral morphology and macro- and micro- morphological features of vegetative parts.
2. To work out the floral biology.

3. To work out the detail anatomical studies of root, stem and leaves.
4. To study the germination behavior of seeds and seed variability test.
5. To work out the traditional and other uses.