

## RESEARCH PAPER

# Taxonomic treatment of some Indian *Magnolia* L. in respect to Seedling Morphology

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Seedling morphology of five species of *Magnolia* from different districts of West Bengal (India) were studied. The germination is epigeal, phanerocotylar type. The seedlings are distinguishable on the basis of features like hypocotyl; shape, apex, and venation of paracotyledons; first two leaves and subsequent leaves have been considered also as key characters for the easy identification of the plants at juvenile stage. Similarities in seedling morphology rightly support the placement of *Michelia* under the genus *Magnolia* as treated recently. These taxa are facing various degrees of threats, mainly due to exploitation for their commercial potential as timber-yielding plants, horticultural and medicinal plants. Consequently, conservation programmes of these plants can be planned through their identification at juvenile stages in natural sites.

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## 1 Introduction

The genera *Magnolia* L. and *Michelia* L. of the family Magnoliaceae are represented in India by 15 and 14 species respectively (Kundu, 2009). The two genera *Magnolia* with terminal flower, sessile carpels and *Michelia* with axillary flower, stipitate carpels were considered under two different tribes Magnolieae and Michelieae of the subfamily Magnolioideae for long time (Law, 1984; Nootboom, 1985). In a taxonomic treatment by Figlar & Nootboom (2004) based on similarities of other morphological and molecular data, it was proposed that the Magnolioideae is treated as monotypic subfamily with the single genus *Magnolia* and most of the species of *Michelia* are transferred to the genus *Magnolia*. The members of these genera have been studied in respect of morphology (e.g. Howard, 1948; Li & Conran, 2003; Xu, 2003), anatomy (e.g. Xu, and Rudall, 2006), floral biology (e.g. Thien, 1974), palynology (e.g. Xu & Kirchoff, 2008; Agababian, 1972) and

molecular aspects (e.g. Kim et al. 2001; Azuma et al. 1999) to achieve a better understanding of the phylogenetic relationship of the concerned taxa. Some of these investigations in different disciplines support the taxonomic transfer of *Michelia* to *Magnolia*. However, the data on seedling morphology which may provide significant taxonomic clues for the members are still lacking.

A seedling, as defined by Jackson (1928) is a plant produced from seed, in distinction to a plant propagated artificially. Seedling stage is the crucial phase in the life cycle of a plant (Farnsworth, 2008) as it faces unpredictable environmental stresses and includes low levels of morphological and physiological defenses. Morphological characters of seedlings have been studied by an array of workers for delimiting groups at various taxonomic levels (Vogel, 1980; Ladiges et al. 1981; Sampathkumar, 1982; Das & Paria, 1999; Paria, 2014) and for interpretation of phylogenetic relationships (Rodrigues & Tozzi, 2008). Seedlings are also important in conservation programmes of plants through their identification at juvenile stages, i.e. much before flowering and fruiting. According to Kundu (2009) the Indian *Magnoliaceae* have been facing various degrees of threats, mainly

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