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Phylogenetic Study on The Genus *Ficus* L. (Moraceae) in Kerala Using ITS Sequences as Molecular Marker

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Abstract

A preliminary molecular phylogenetic study on Ficus species from Kerala is done using Internal Transcriber Spacer (ITS) sequences. 29 species of Ficus were studied here to establish their phylogenetic relationship. Sequences of the ITS 2 region were retrieved from NCBI, with reference to accession numbers from authentic specimens. The sequences were alligned and Neighbour Joining tree was prepared by MEGA 10 software. The dendrogram obtained well separated the Ficus species into two major groups. Most of the morphologically similar species showed a common lineage and were closely related. *F. caulocarpa* and *F. superba* were the closest species. *F. carica*, the type species of the genus stands distinct from other species in the dendrogram.

Key Words: Ficus, Figs, Phylogeny, ITS sequences, Kerala.

Introduction

With a global distribution of around 750 species (Noor *et al*., 2007; Chaudhary, 2012), Ficus L. (Moraceae), commonly referred as figs, is one among the most abundant and diverse group of angiosperm plants. They remain as a highly complex taxonomic group with respect to the morphological complexities and floral characters. Figs have the specific hypanthodium inflorescence, pollinated by Agaonidae wasps exhibiting mutualism and co evolution (Priyadharsan 2000; Li *et al.,* 2012 a). Figs exhibit diversified habitat pattern including independent trees, hemi epiphytes, epiphytes and rarely some woody climbers. They fruit throughout the year, ensuring rich nutritional supply to many animals and birds feeding on the fig trees (Harrison, 2005). Thus, figs help to maintain an ecological balance in the ecosystem and act as a keystone species. According to the current status, 32 species of Ficus is reported from Kerala, belonging to 5 subgenera (Sasidharan, 2004).

DNA barcoding techniques aims to reveal the identity of plants that are morphologically indistinguishable. Various molecular markers are used to identify the specimens. Internal Transcribed Spacer (ITS) sequences are such molecular markers used in plant identification. ITS shows the most variable sites, greater intra- and inter-specific divergences and high species discrimination rate in the genus Ficus (Li *et al*., 2012 b). Hence, ITS is the most suitable single locus DNA barcode in Ficus. The present study aims to provide a preliminary knowledge on the phylogeny of fig species in Kerala using ITS sequences.

Materials and Methods

Selection of species and sequences