Studies on Seed Morphometry of Epiphytic Orchids from Western Ghats of Karnataka

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ABSTRACT: Seed morphometry and Scanning Electron Microscopic studies on 10 species of epiphytic orchids from Western ghats of Karnataka are presented. All the presently investigated taxa are different in their seed surface characters including size, shape, visibility of embryo, testa cells and structure, curvature and ridges. Seed colours range from pale yellow to yellow, brown and white. Variation between maximum and minimum in the length/width ratio of seed is discussed. Data on the seed volume show that higher seed volume is the result of both greater length and width. Maximum width of testa cell and seed volume are found in Cymbidium bicolor. Variations in seed and embryo volume and percent air space could exist among the different taxa of orchids. The volume of the embryo changes during its developments from zygote to seedling. Increase in the percentage of air space is due to increase in the cell length of the testa. Seeds with higher percentage of air space get dispersed over wide geographical areas.

KEY WORDS: Air space, Cymbidium bicolor, Scanning Electron Microscope, Orchids, Seed Morphometry.

INTRODUCTION

The taxonomic importance of the seed characteristics was first pointed out by Clifford and Smith (1969). Dressler (1981) has proposed several classificatory schemes for orchids based on conventional micro morphological characteristics. Seed morphology serves as a source of systematic character to circumscribe sub-generic groups or hypothetical relationships among species within a genus (Mathews and Levins, 1986; Ness, 1989; Vij et al., 1992; Larry, 1995; Augustine et al., 2001). The morphological characteristics of the seeds not only serve as taxonomical markings but also serve in deducing phylogenetic relationships (Barthlott, 1976). The morphometric characters of seeds are ever challenging to the taxonomic and phylogenetic issues that would be a great help both in academic as well as in applied ventures (Rani et al., 1993; Augustine et al., 2001).

As the seeds of orchids are the smallest among the seeds produced by flowering plants, it is difficult to study their structural details with an ordinary optical microscope (Arditti et al., 1980). The seeds of orchids vary in size, morphology, structures, colour, and finer details. The seed size varies from 150 to 6000 μm and in majority of taxa the range is from 300-800 μm (Molvray and Kores, 1995). Molvray and Kores (1995) have also brought to light that the seeds vary in shape from filiform to fusiform, clavate to ellipsoidal and sometimes...