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Research Article

Seedling Morphology of some selected members of Commelinaceae and its bearing in taxonomic studies

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Abstract

Seedling morphology of eight species from four genera of the family Commelinaceae viz. *Commelina appendiculata* C.B. Clarke, *C. benghalensis* L., *C. caroliniana* Walter, *C. paludosa* Blume, *Cyanotis axillaris* (L.) D. Don ex Sweet, *C. cristata* (L.) D. Don, *Murdannia nudiflora* (L.) Brenan and *Tradescantia spathacea* Sw. are investigated using both light and scanning electron microscopy. The seedling morphological features explored include germination pattern, seed shape, surface and hilum, root system, cotyledon type, cotyledonary hyperphyll (apocole), cotyledonary hypophyll (cotyledonary sheath), hypocotyl, first leaf and subsequent leaves. All taxa studied had hypogeal and remote tubular cotyledons. However, differences in cotyledon structure (apocole, cotyledonary sheath), seed, hypocotyl, internodes, first leaf and subsequent leaves were observed. Variations of those characters were used to prepare an identification key for the investigated taxa. *Commelina* spp. and *Murdannia nudiflora* of the tribe Commelineae were found to differ from *Cyanotis* spp. and *Tradescantia spathacea* of tribe Tradescantieae in the petiolate first leaf with papillate margins on upper surface with 6-celled stomata and the glabrous epicotyl. The presence of an elongated cotyledonary sheath, long apocole and extended periblast region appear to be synapomorphies for *Commelina* spp. and *T. spathacea*. The affinity of the investigated taxa as revealed through multivariate analysis supports some of the relationships inferred by pollen morphology, floral morphology and DNA (rbc-L, 5S NTS, trnL-trnF) data stated by previous authors.

Keywords: Seedling morphology; Commelinaceae; Artificial key; Identification; Phylogeny.

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Introduction

The family Commelinaceae is small in comparison to other larger monocotyledonous families, like Orchidaceae and Poaceae (1). The family includes annual or perennial, erect, creeping or rarely climbing herbs and comprises 41 genera and 650

species distributed throughout the warmer parts of the world (2). The family has been extensively studied in the light of different botanical disciplines for a better understanding of the interrelationships and phylogeny of various taxa within the family. As such, Evans et al. (3,4) conducted a cladistic