Fruit as diagnostic characteristic to recognize Brazilian species of Zornia (Leguminosae, Papilionoideae)

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Abstract

Articles of the lomentaceous fruits encountered in the thirty-six species of Brazilian Zornia species are described, illustrated and compared using scanning electron microscopy and stereomicroscopy. Macro-and micro-morphological characters of the fruit articles provide excellent diagnostic taxonomic characters (including fruit shape, fruit article surface, presence/absence of glands, presence/absence of bristles, and presence/absence of hairs) to distinguish among the Brazilian taxa. Results generally support the species recognised for Brazil although the micro-morphological characters have limited taxonomic value within some species complexes, in which taxa can be better differentiated using other morphological characteristics. The results of macro-morphological analyses show that the morphology of fruit articles is related to the geographical distribution pattern of each species and is a good source of morphological character to distinguish the species of Zornia. We present here an inedit identification key, based on the lomentum morphology, to distinguish the Brazilian species of Zornia.

Key words: Dalbergieae, Fabaceae, Faboideae, lomentum, morphology, Scanning Electron Microscopy (SEM)

Introduction

Zornia Gmelin (1791: 1076) comprises 80 species, mainly distributed in tropical and subtropical regions of the world (Klitgaard & Lavin 2005). In Brazil, the genus is represented by 36 species (Fortuna-Perez & Tozzi 2011). Zornia belongs to the informal Adesmia clade of the Dalbergioid legumes (Lavin et al. 2001) and includes herbs and shrubs, with flowers arranged in spiciform inflorescences, paired peltate bracteoles protecting each flower, and stipules that resemble the bracteoles (Fortuna-Perez 2009). The most recent systematic treatment of the genus was published by Mohlenbrock (1961), who recognized two subgenera: Zornia subg. Myriadena (Desvaux 1813: 121) Mohlenbrock (1961: 16) and Z. subg. Zornia (differentiated by inflorescence morphology), and three sections (Z. sect. Zornia, Z. sect. Isophylla Mohlenbrock (1961: 49) and Z. sect. Anisophylla Mohlenbrock (1961: 78) within Z. subg. Zornia. Zornia sect. Zornia possesses leaves with four leaflets, while the other two sections have species with two leaflets per leaf. Zornia sect. Isophylla and sect. Anisophylla are separated from each other by leaflet shape. In Z. sect. Isophylla leaflets are all of the same shape within any one plant. By contrast, in all species of Z. sect. Anisophylla in any one plant the leaflets of the lower leaves are always different in form from those of the upper leaves.

Mohlenbrock (1961) reestablished several species previously considered to be infra-specific taxa, and used the morphological characteristics of fruits, calyces and bracteoles to diagnose each species. For some species, however, Mohlenbrock (loc. cit.) did not comprehensively analyse the amplitude of intra-specific variation and some of his species circumscriptions lack detail, resulting in poorly defined and overlapping putative diagnostic characters (Fortuna-Perez 2005).

Studies of micromorphological characters have proved useful in taxonomy at different hierarchical levels, as