

1

A PROVISIONAL SYNOPSIS OF DALECHAMPIA (EUPHORBIACEAE)

Dalechampia, a genus of about 100 ~~spex~~ tropical species of a mainly twining habit, is unique in the Euphorbiaceae because of its bilabiate pseudanthia of a ~~complex~~ 3-flowered pistillate cyme coupled with a several-flowered staminate pleiochasium (Webster & Webster, 1972). This unusual reproductive structure may be understood as an adaptation for pollination by ~~xxxx~~ female bees gathering resin for nest-building or (more rarely) by male bees gathering aromatic compounds (Armbruster & Webster, 1979). <sup>Within</sup> /The genus ~~xxxxxxxx~~ there is a great diversity of pseudanthial configuration reflecting adaptation to a variety of apoidean pollinators, primarily Megachilidae and Euglossini (Armbruster & Webster 1979, 1982).

The systematic position of Dalechampia is reasonably clear on the basis of comparative studies with related taxa in subfam. Acalyphoideae; the characteristic stinging hairs suggest a relationship to Tragia in tribe Plukenetieae subtribe Tragiinae. <sup>(Webster & Webster, 1972)</sup> Dalechampia was placed in a separate tribe Dalechampieae by Mueller Argoviensis (1864, 1866), a disposition accepted by Pax and Hoffmann (1931), Hutchinson (1969), and Webster (1975). However, Baillon (1858) had indicated an affinity of Dalechampia with Plukenetia, and Bentham (1880) included Dalechampia in his subtribe Plukenetiinae. Bentham's perceptive grasp of relationships appears to be supported by more recent studies, and it now seems preferable to place Dalechampia in a monogeneric subtribe, Dalechampiinae, within the Plukenetieae.

Although the phylogenetic placement of Dalechampia within the Euphorbiaceae now appears rather noncontroversial, the placement of species within the genus presents a very different picture. Mueller (~~1864~~ 1866, 1874) recognized 2 sections, one of which contained only the enigmatic D. houlettiana Baill. from Brazil. It seems probable

that the character used to Baillon to distinguish his sect. Champadelia is fictitious, as a disk does not occur in the pistillate flowers of any genera of tribe Plukenetieae. Pax and Hoffmann (1919) accepted 13 sections, mostly newly created although based on the unnamed subsectional divisions of ~~Dalmeida~~ Mueller (1866). These sections were regrettably based almost entirely on vegetative characters of the stem and leaves, probably because Pax and Hoffmann had little knowledge of the pseudanthial structure in the living condition (possibly only a single species, D. spathulata!). Even a brief acquaintance with the genus clearly indicates that ~~the~~ most of these sections are artificial and evolutionarily meaningless. Since it appears that the genus will be receiving increasing attention from both botanists and ecologists in tropical regions, a better-grounded classification seems needed in order to carry out researches that will properly exploit the evolutionary implications of the unique pseudanthial resin-rewarding syndrome in Dalechampia.

As one might suppose, the <sup>characters with the</sup> ~~most~~ <sup>critical</sup> ~~powerful~~ / resolving power are found in the pseudanthia, especially in the structure of the staminate ~~in~~ sub-inflorescence. In contrast to the pistillate cymule, in which there is regularly a cymule of 3 flowers subtended by 2 or 3 bracts, the staminate pleiochasium may have <sup>4</sup> ~~5~~ to 15 flowers (although the prevailing number is 8 to 10) subtended by bracts that may be wholly free <sup>to</sup> ~~or~~ very markedly connate. The significance of the variation in staminate bract structure has escaped the attention of earlier investigators, probably because it is difficult to understand the morphology from dried herbarium specimens.

The only detailed comparative study of the Dalechampia pseudanthium published so far is that of Michaelis (1924), who however had for study only 7 species, only one of which (D. spathulata) was available in the living state. Michaelis's interpretation of the ~~inflorance~~ pseudan

pseudanthial structure is basically sound as far as it goes, since he correctly regarded the resiniferous laminae as modified bractlets of the staminate floescence of ~~of~~ and ~~xx~~ indicated that D. scandens is at the end of a reduction series that begins with less highly modified staminate cymules in other species such as D. pentaphylla. However, Michaelis overlooked the significance of the degree of fusion of the staminate involucellar bracts and the concomitant ~~x~~ level of specialization of the bractlets for production of resin or aromatic compounds. His choice of D. tamifolia as the most primitive type is therefore suspect, since it clearly has <sup>a symbracteate</sup> ~~xxxxxx~~ staminate involucl..