

## SYNOPSIS OF SUBGENUS **CYCLANTHERA**

Subgenus **CYCLANTHERA** G. L. Webster, subgen. nov.: herbae vel suffrutices, ramificatione more sectionis *Phyllanthi*; flores axillares, solitarii vel paucis, sepalis 5 vel 6, imbricatis, integris; segmentis disci ♂ purpureis; stamina 2 vel 3, filamentis coalitis; antherae horizontaliter dehiscentiubs; pollinis grana globosa, exinium fasciatum vel clypeatum; discus ♀ dissectus vel lobatus; ovarium triloculare; stylis emaraginatibus vel bifidis; fructus capsularis; semina verruculosa.

TYPE: *Phyllanthus lindenianus* Baillon.

Monoecious (rarely dioecious) annual or perennial herbs; branching phyllanthoid, branchlets pinnatifid but sometimes with an iterative lateral axis; leaves thin, < 2 cm long, often purplish; flowers axillary, solitary, often purplish-flecked; staminate flowers proximal or distal to the pistillatae; staminate sepals 5 (6), free; disk segments isomerous; stamens 2 or 3, filaments and sometimes anthers connate; anthers dehiscing horizontally; pollen grains spheroidal, pantoporate, clypeate, the exine shields elongated or circular; pistillate sepals usually 6, free; disk lobed or segmented, often purplish; ovary 3-locular, smooth or scabridulous; styles free or connate, bifid to emarginate; fruits capsular; seeds verruculose.

This small but very distinctive West Indian section of 5 species is well characterized by its unique pollen types. Although the two sections of subg. *Cyclanthera* were originally included in subg. *Phyllanthus* (Webster, 1957), they appear much more similar to one another than to any of the sections in that subgenus. In addition to the distinctive pollen (Webster & Carpenter, 2002), plants in subg. *Cyclanthera* stand out by their purplish floral pigments, segmented pistillate disk, and (in sect. *Cyclanthera*) the curious iterative branchlet axes and the remarkable extreme modification of the anthers (synandrium).

“ The relationships of subg. *Cyclanthera* remain unclarified. Within subg. *Phyllanthus*, verruculose seeds occur in sect. *Pentandra* and sect. *Phyllanthus* subsect. *Niruri*; but both those groups show little other significant resemblance. The pollen of subg. *Cyclanthera* is utterly different from the pollen of any group within subg. *Phyllanthus*, and is closest to that in subg. *Xylophylla*, but there are no other linking characters. Earlier (Webster, 1957), it was noted that the “basal” species in subg. *Cyclanthera*, *P. carnosulus*, was classified by Müller (1866) among the species now put in sects. *Loxopodium* and *Macraea* (subg. *Isocladus*). There is a suggestive (although not extremely close) resemblance between the the

clypeate pollen of the Old World section *Macraea* and that of subg. *Cyclanthera*. However, postulating a phylogenetic connection would require a hypothesis of independent origin of phyllanthoid branching in subg. *Cyclanthera* (as was tentatively suggested by Webster, 1957).

Sect. 1. **Callitrichoides** G. L. Webster, Contr. Gray Herb. 176: 47; 1955; J. Arnold Arb. 38: 171. 1957.

TYPE: *Phyllanthus carnosulus* Müll. Arg.

Perennial diminutive herb; leaves and branchlets slightly succulent; leaf margins obscurely crenulate; branchlets unramified, sometimes rooting at the nodes; flowers solitary, the pistillate distal; staminate sepals 5; disk segments 5, purplish; stamens 2, filaments connate; anthers discrete; pollen grains spheroidal, exine with band-shaped shields; pistillate sepals 6; disk segments 6, purplish; ovary densely scabridulous; styles free, bifid or emarginate; seeds verruculose.

Monotypic; the type species *Phyllanthus carnosulus* is a rare species of rain forests in eastern Cuba. Its resemblance to species of sect. *Loxopodium* (e.g., *P. compressus* Kunth) is striking enough to suggest a possible phylogenetic connection. Its similarities with *P. tenuicaulis* in sect. *Cyclanthera* are sufficient to give it the status of sister group to that section.

Sect. 2. **Cyclanthera** G. L. Webster, Contr. Gray Herb. 176: 47. 1955; J. Arnold Arb. 38: 177. 1957.

TYPE: *Phyllanthus lindenianus* Baillon.

Annual or perennial herbs or subshrubs; branchlets often with a smaller iterative axis from the first node, never rooting at the nodes; main and iterative branchlet axes both floriferous; staminate flowers either proximal or distal to the pistillate; staminate sepals 5 or 6; disk segments 5 or 6, purplish; stamens 3, filaments connate; anthers completely connate into a disciform circumscissile synandrium; pollen grains spheroidal, pantoporate, exine clypeate, shields roundish with a single central pila; pistillate sepals 6; disk of 3—8 lobes, mostly purplish; ovary smooth or scabridulous; styles free or united, bifid; seeds verruculose.

Four species (one with several subspecies) endemic to the Greater Antilles. Despite considerable differences, it seems most closely related to sect. *Callitrichoides*. The remarkable synandrial structure of

the androecium is not unique, being duplicated in an unrelated West Indian species, *Phyllanthus dimorphus* Britton & P. Wilson, and in several species from Madagascar.

SPECIES INCLUDED: WEST INDIES (Cuba & Hispaniola): *Phyllanthus abditus* G. L. Webster, *P. berterianus* Müll. Arg., *P. lindenianus* Baillon, *P. tenuicaulis* Müll. Arg.