

ON THE RELATION OF *CHLORANTHUS KIANGSIENSIS* TO THE  
GENUS *CHLORANTHUS*

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When *Chloranthus glaber* (Thunb.) Makino and *C. hainanensis* P'ei are segregated from the other species of the genus, and treated as species of the recently resurrected genus *Sarcandra* Gardner (Swamy and Bailey, 1950), the genus *Chloranthus* (Swartz, 1787) attains homogeneity and compactness. A critical examination of extensive herbarium specimens of all of the nearly 30 species of *Chloranthus* proposed to-date has revealed that approximately half of this number deserve to be reduced to synonymy, thereby finally recognizing 15 or 16 distinct species. The only species that does not fit into the range of variability of the genus is *Chloranthus kiangsiensis* Metcalf (Metcalf, 1942). Arguments to exclude this species from the genus and family are presented in this paper.

The isotype specimen of *Chloranthus kiangsiensis*, S. K. Lau, 4193 (Fig. 1) belonging to the Arnold Arboretum, Harvard University, U.S.A., consists of (1) mounted vegetative part represented by a slender stem with four leaves borne towards the apex, and (2) loose, badly mutilated parts of inflorescence axes and immature fruits preserved in an envelope.

The four leaves, at first sight, appear to be arranged in a whorl, but a careful examination reveals that the phyllotaxy is decussate although the internode between the two pairs of leaves has failed to undergo elongation. The exstipulate leaves are more or less obovate with subacuminate apex, ciliolate-dentate margin, and cuneate base. The petiole is directly attached on to the stem in contrast to the invariable situation in the genus *Chloranthus* (as well as in the other genera of the family) where the petiolar bases fuse to form a vaginate structure sheathing the node and denticular stipules arise from the rim of the vagina. Numerous 'etherial oil cells' are present in the leaves and flowers of *Chloranthus* and of other genera of the family, but *Chloranthus kiangsiensis* typically lacks them. The younger parts of the stem and under-side of the leaves along the veins of the latter species are covered with a dense coating of minute papillae, which, upon microscopic examination, prove to be two-celled epidermal cyst-like outgrowths, their cavities being filled with dark brown contents (Fig. 5). Such a feature is not seen in the Chloranthaceae.

The flowers of *Chloranthus* are bisexual and totally lack a perianth. A somewhat clasping deltoid concave bract directly subtends a styleless pistil with a capitate stigma. The tripartite or trilobed stamen is attached about the middle height of the pistil on its abaxial side. The ovoid fruit is a drupe. The corresponding structures in *Chloranthus kiangsiensis* present a totally different picture:

(1) Although the flowers of this species appear to be hermaphroditic as in the other species of *Chloranthus*, the plan of construction of the flower is at variance. The flower has a conspicuous pedicel arising from the axil of an awl-shaped, membranous bract. The outermost whorl of floral structures consists of five lanceolate appendages with ciliolate margins that are slightly fused at the point of insertion (Figs., 2, 3). This structure has been interpreted by Metcalf as a five-lobed bract.

However, an examination of vascular anatomy of the specimens reveal that apart from the five strands that vascularize the members of the outermost whorl, there are two successive sets of five strands each departing between the outermost whorl and the base of the gynoecium. The outer set of strands exhibit evidences of trifurcation at their tips while those of the inner set appear to undergo no change. These second and third sets of strands then obviously represent vasculature for corolla and androecium respectively, both kinds of appendages now fallen off. The wall of the gynoecium is traversed by five strands. This indicates that the flower is constructed on a typically pentamerous plan with a centrally situated gynoecium surrounded successively by stamen and corolla whorls, and that the outermost whorl should be taken to represent the calyx.

(2) The pistil (in post-fertilization stages) is ovoid with a slender elongate and persistent style that shows a characteristic knob-like swelling slightly above the attachment to the ovary (Fig. 2).

The mature fruit of *Chloranthus kiangsiensis* is ovoid and relatively much smaller than those of the genus *Chloranthus* and shows minute broken striations aligned somewhat longitudinally on the exterior surface (Fig. 4).

The primary xylem of the stem of *Chloranthus*, as also of other genera of the family, is made up of tracheary cells that are unusually long with extensively sloping and overlapping ends with uniseriate scalariform intervascular pitting, and are typically tracheid-like. The corresponding tracheary cells of *Chloranthus kiangsiensis* exhibit a relatively high degree of phylogenetic specialization. This has resulted in the development of short truncate vessel members with transverse-porous ends and multiseriate alternate intervascular pitting.

A critical examination of new and adequate material—particularly of young flowers and fruits—is very essential for an understanding of the affinities of this plant. However, even as it stands, such differences as those narrated above are highly significant for excluding *Chloranthus kiangsiensis* Metcalf not only from the genus, but also from the family Chloranthaceae.

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#### ABSTRACT

The data obtained through a critical examination of taxonomic and morphological characters of *Chloranthus kiangsiensis* Metcalf warrants the exclusion of this species not only from the genus, but also from the family Chloranthaceae.

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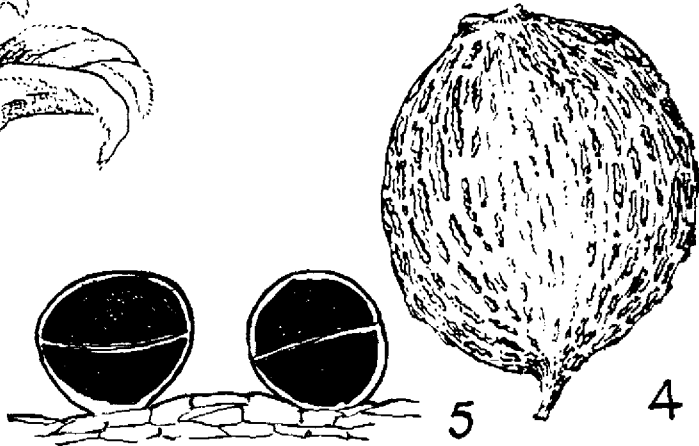
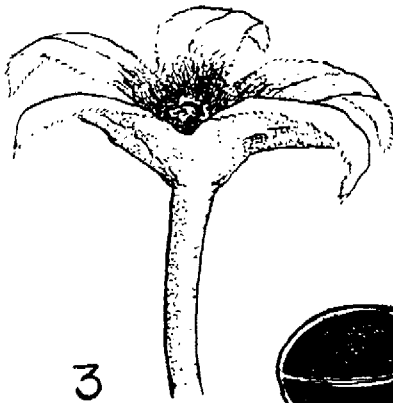
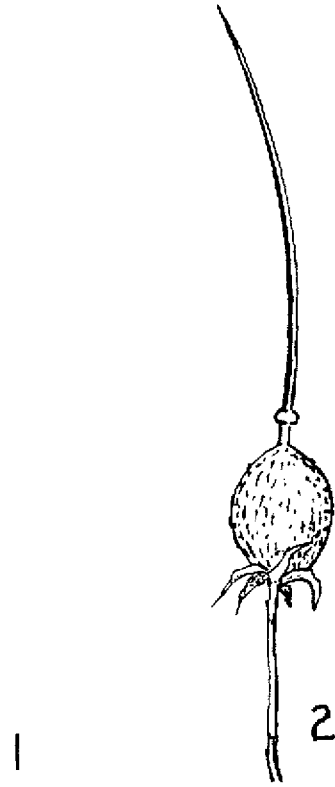


FIG. 1. Photograph of the isotype specimen of *Chloranthus kiengsiensis* Metcalf (Arnold Arboretum, Harvard University, U.S.A.). FIG. 2. A young developing fruit with persistent calyx. FIG. 3. Calyx whorl, enlarged. FIG. 4. Fairly mature fruit. FIG. 5. Cyst-like outgrowths from the epidermis,  $\times 80$ .