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Additional new combinations in *Sesamum* L. (Pedaliaceae: Sesameae)

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Background: Ongoing systematic studies in the African flora necessitate periodic nomenclatural adjustments and corrections.

Objectives: To effect requisite nomenclatural changes.

Method: Relevant literature was surveyed and requisite nomenclatural transfers provided.

Results: The new combination *Sesamum byngianum* Christenh. proposed for *Josephinia africana* Vatke is superfluous as an available synonym exists.

Conclusions: The new combination *Sesamum rosaceum* (Engl.) J.C. Manning & Magee is also provided for *Josephinia africana* Vatke. Three new sectional combinations are provided to accommodate the species previously placed in *Ceratotheca* Endl., *Josephinia* Vent. and *Dicerocaryum* Bojer in the current infrageneric classification of *Sesamum*.

Introduction

Pedaliaceae are a family of 60–70 species from the Old World tropics and subtropics, mainly in sub-Saharan Africa, with 13 genera traditionally recognised (Christenhusz, Fay & Chase 2017a; Ihlenfeldt 1988). Recent molecular phylogenetic analyses of the family confirm that the tribes Pedalieae Dumort., Sesameae (Endl.) Meisn. and Sesamothamneae Ihlenf. are monophyletic, but that the genus *Sesamum* L. is not (Gormley, Bedigian & Olmstead 2015).

Tribe Sesameae is recognised by its axillary flowers with obliquely campanulate, pink to purple corolla; anthers with parallel, oblong thecae; and the development of false-septa dividing the ovary and fruit locules (Ihlenfeldt 1988). It has traditionally been treated as comprising the four genera *Ceratotheca* Endl. (2 spp.), *Dicerocaryum* Bojer (4 spp.), *Josephinia* Vent. (6 spp.) and *Sesamum* (21 spp.), essentially separated, like many of the genera in the family, by characters of the fruit. Thus, both *Dicerocaryum* and *Josephinia* are characterised by indehiscent fruits with the locules completely divided by false-septa, whereas *Ceratotheca* and *Sesamum* share dehiscent capsules with incompletely divided locules (Bruce 1953; Ihlenfeldt 1988). The development and position of spines on the fruits serve to separate the genera within these two groups: *Dicerocaryum* has flattened, discoid fruits bearing paired horns on a central disc; *Josephinia* has ovoid or subglobose fruits densely covered with small spines; *Ceratotheca* has obtuse or truncate capsules usually with a pair of horns on the distal angles; and *Sesamum* has acute, beaked capsules. These carpological developments are associated with modes of seed dispersal, with the indehiscent fruits adapted for zoochory and the capsular fruits adapted for anemochory.

Phylogenetic analyses of plastid (*ndhF* and *trnLF*) and nuclear (*ETS*) sequence data by Gormley et al. (2015) show convincingly that *Sesamum* is paraphyletic with respect to the remaining genera in the tribe, which fall within a clade including members of *S.* sect. *Aptera* and possibly also sect. *Sesamum*. This finding is borne out by both plastid and nuclear analyses, although sampling in the latter is not as comprehensive as in the former. Morphological support for this relationship is evident in the simple leaves of *Ceratotheca*, *Dicerocaryum* and *Josephonia*, a condition shared with *S.* sect. *Aptera* (some of the other sections have palmate leaves) and in the seeds of *Ceratotheca* (the only one of the three genera with dehiscent fruits), which are consistent with those of *S.* sect. *Aptera* in lacking wings but with a well-developed double fringe on the margins and with rugose-reticulate testal sculpturing. The molecular topology reproduced in Gormley et al. (2015) suggests an increasing shift in this clade from anemochory towards zoochory through the development of lateral horns, accompanied by shortening (or depression) of the capsule and loss of dehiscence.

On the basis of these findings, *Sesamum* can be rendered monophyletic only by splitting it into smaller segregates or by enlarging its circumscription to include the remaining three genera and

12 species in the tribe. The former option has no historical precedent, and Christenhusz, Fay and Byng (2017b) adopted and partially implemented the second option. Unfortunately, the new name *Sesamum byngianum* Christenh. that was proposed for *Josephinia africana* Vatke to avoid a later homonym for *S. africanum* Tod. (1866) is superfluous as an earlier available synonym exists and should have been used (McNeil et al. 2012: Art. 11.4). We provide the relevant combination here. We also provide three additional combinations at sectional level in order to integrate these taxa into the infrageneric classification of *Sesamum*, which currently includes the four sections *Aptera* Seidenst., *Chamaesesamum* Benth., *Sesamopteris* Endl. and *Sesamum* (Ihlenfeldt 1988).

Materials and methods

We examined the relevant literature and implemented the necessary nomenclatural changes following McNeil at al. (2012).

Results

Sesamum L., Sp. Pl.: 634 (1753).

Existing sections (see Ihlenfeldt 1988)*:* sect. ***Aptera*** Seidenst., sect. ***Chamaesesamum*** Benth., sect. ***Sesamopteris*** Endl. and sect. ***Sesamum***.

New sections:

Sect. ***Ceratotheca*** (Endl.) J.C. Manning & Magee, *comb. et stat. nov. Ceratotheca* Endl. in Linnaea 7: 5, tt. 1, 2 (1832). Type: *C. sesamoides* Endl. = *S. sesamoides* Byng & Christenh.

Sect. ***Josephinia*** (Vent.) J.C. Manning & Magee, *comb. et stat. nov. Josephinia* Vent., Jard. Malm. 2: 67, t. 67 (1804). Type: *J. africana* Vatke = *S. rosaceum* (Engl.) J.C. Manning & Magee.

Sesamum rosaceum (Endl.) J.C. Manning & Magee, *comb. nov. Pretreothamnus rosaceus* Endl. in Bot. Jahrb. 36: 228 (1905). Type: Kenya, 'Northern Frontier Province, Jeroko', *Ellenbeck 2199* (B, holo.†).

Josephinia africana Vatke in Linnaea 43: 541 (1882). *Sesamum byngianum* Christenh. in GLOVAP Nomenclature 1, 4: 145 (2017b), as nom. nov. [non *S. africanum* Tod. (1866)]. Type: Kenya, 'Teita District, Tsavo River', *Hildebrandt 2586* (B, holo.†).

Sect. ***Dicerocaryum*** (Boj.) J.C. Manning & Magee, *comb. et stat. nov. Dicerocaryum* Bojer in Ann. Sci. Nat., sér. 2, 4: 268 (1835). Type: *D. sinuatum* Bojer = *S. zanguebarium* (Lour.) J.C. Manning & Magee

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

J.C.M. and A.R.M. both contributed to all aspects of the research.

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