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Author: Al-Shehbaz, Ihsan Ali

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IHSAN ALI AL-SHEHBAZ[1]

Morettia kilianii (*Brassicaceae*, *Anastaticeae*), a new species from Yemen

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Abstract: *Morettia kilianii* is described from Yemen, and its relationships to the other three species of the genus is discussed. It is readily distinguished from them by the subshrubby habit, lack of valve partitions between the seeds, connivent stigmas, and petals 0.3–0.5 mm wide. A key to the species of *Morettia* is presented.

Key words: *Anastaticeae*, *Brassicaceae*, *Cruciferae*, *Diceratella*, key to species, *Morettia*, new species, Yemen

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Introduction

As currently recognized (see BrassiBase 2018+), *Morettia* DC. consists of three species (*M. canescens* Boiss., *M. parviflora* Boiss. and *M. philaeana* (Delile) DC.) distributed from Mauritania and Morocco in NW Africa eastward into Mali, Niger, Chad and Sudan, north into Egypt, Israel and Jordan, and south into the Arabian Peninsula to Yemen and Oman (Stork & Wüest 1980; Miller 1996). All three species grow in Egypt (Boulos 1999), Israel (Zohary 1966), Jordan (Al-Eisawi 2016) and Saudi Arabia (Miller 1996). Of these, *M. canescens* is the most widespread, and its reduction to synonymy of *M. philaeana* by Jafri (1977) was erroneous (see the key below).

Morettia is morphologically similar to *Diceratella* Boiss. (nine species), and they share several features, including trichome morphology, well-developed stigma lobes opposite the replum, four tooth-like lateral nectar glands, and fruit valves usually strongly partitioned between the seeds. The last feature is not developed in the novelty described below, and in *D. elliptica* (DC.) Jonsell and *D. inermis* Jonsell the valvular partitions are rather poorly developed (Jonsell 1979). The last two species, along with *D. psilotrichoides* Chiov. and *D. revoilii* (Franch.) Jonsell, do not have the apical fruit horns characteristic of the remaining five species of *Diceratella*, including the generic type *D. floccosa* (Boiss.) Boiss. It is interesting to note that Stork & Wüest (1980) recognized *D. revoilii* as *M. revoilii* Franch., but Jonsell (1993) transferred it to *Diceratella* strictly because it falls within the range of this genus, not on morphological grounds.

Molecular phylogenetic studies (Warwick & al. 2007; Khosravi & al. 2009) sampled all three species of *Morettia* and *Diceratella inermis* and showed that the latter species is sister to *M. philaeana.* Obviously, sampling the remaining species of *Diceratella* is needed to resolve the problem of their overlapping boundaries within the tribe *Anastaticeae*, to understand the phylogenetic trends within each, or to merge *Diceratella* under the earlier-published *Morettia*.

1 Missouri Botanical Garden, 4344 Shaw Boulevard, St. Louis, Missouri 63110, U.S.A.; e-mail: ihsan.al-shehbaz@mobot.org

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During recent work on the undetermined collections of the *Brassicaceae* (*Cruciferae*) in the Missouri Botanical Garden, two specimens of a new species from Yemen were discovered. They were collected in 2002 by Nobert Kilian (B) and colleagues during their fieldwork on the biota of that country. The novelty is placed in *Morettia* because it lacks the fruit horns and the valve partitions between seeds, both of which characters are typical of *Diceratella*.

Morettia kilianii Al-Shehbaz, **sp. nov.** – Fig. 1.
Holotype: Yemen, gov. Abyan, Jabal Urays, middle Wadi Lobob, W facing slope, into the wadi of 13°27'29.5"N, 45°45'57.3"E, 300–500 m, 19 Mar 2002, *N. Kilian & C. Oberprieler YP* [Yemen project number] *2010* (MO [barcode MO-3110673, accession no. 6757854, https://tropicos.org/specimen/101123982]; isotype: B [barcode B 10 0451327, http://herbarium.bgbm.org/object/B100451327]). – Paratypes: Yemen, gov. Abyan, plateau area of the Jabal Urays massive N of Theibe, from Gerf Am-Auda (13°31'03.8"N, 45°52'57.9"E, 1340 m) southwards to 13°30'11.2"N, 45°54'03.2"E, 1550 m, 15 Mar 2002, *N. Kilian, P. Hein, C. Oberprieler, S. Kipka, A. N. Al-Gifri & M. H. Omar YP1694* (B [barcode B 10 0451472, http://herbarium.bgbm.org/object/B100451472], MO [barcode MO-3110674, accession no. 6757855, https://tropicos.org/specimen/101123986]).

Diagnosis — Morettia kilianii differs from the other species of *Morettia* by being woody subshrubs with connivent stigmas and petals 0.3–0.5 mm wide and by lacking the valve partitions between the seeds.

Description — Plants subshrubs, canescent throughout. *Trichomes* minutely stalked, stellate 0.15–0.31 mm long, primary 3 or 4 rays 2–4-branched, coarser trichomes subdendritic. *Stems* 15–35 cm tall, 0.8–1 cm in diam. near base, woody throughout except current-year growth. *Leaves* lanceolate to narrowly elliptic, 5–11 × 1.5–3 mm, attenuate to a petiole-like base 1–3 mm long, canescent, margin entire, apex acute. *Raceme* ebracteate throughout except lowermost 1 or 2 flowers, 10–25-flowered, corymbose in flower, elongated considerably in fruit; rachis straight; fruiting pedicels erect to suberect, subappressed to rachis, canescent, slender at base, wider towards apex, 2–3 mm long, as wide as or slightly narrower than mature fruit. *Sepals* oblong-ovate, 2.2–2.7 mm long, canescent except membranous narrow margin, erect, not saccate at base. *Petals* white, narrowly linear-oblanceolate, 4–5 × 0.3–0.5 mm; claw 2–3 mm long. *Stamens* white, erect, slightly tetradynamous; filaments 1.5–2 mm long; anthers oblong, 0.9–1.1 mm long. *Nectar glands* lateral, tooth-like, 1 on each side of lateral stamens; median glands absent. *Ovary* densely pubescent; ovules 8–12. *Fruit* linear silique, densely pubescent, 6–11 × 1–1.2 mm, erect at base, strongly arcuate-recurved; valves papery, strongly torulose, without internal partitions between seeds, with somewhat distinct midvein; septum opaque, complete; style 0.2–0.5 mm long, sparsely pubescent; stigma strongly 2-lobed, narrowly conical, 0.3–0.5 mm long, lobes connivent, opposite replum, not decurrent. *Seeds* uniseriate, brown, ovate, wingless, minutely reticulate, 0.75–0.92 × 0.50–0.57 mm; cotyledons accumbent.

Phenology — Flowering and fruiting in March.

Discussion — Morettia kilianii is readily distinguished from the other three species of the genus by being a subshrub (vs annual or short-lived perennial herbs) with distinctly woody (vs exclusively herbaceous) stems, by its lack (vs presence) of the valve partitions between adjacent seeds and by having connivent (vs divergent) stigma lobes and petals 0.3–0.5 (vs 1–5) mm wide. It most closely resembles *M. parviflora*, which also grows in Yemen, in having entire leaves, small flowers and strongly curved fruit, but can be further distinguished by having lanceolate to narrowly elliptic (vs ovate to broadly elliptic) leaves 1.5–3 (vs (2–)4–10) mm wide and petiole-like base 1–3 (vs 3–14) mm long.

The holotype consists of primarily current-year growth with many fruiting and flowering racemes and rather few older woody branches of previous years. By contrast, the paratype at MO has rather few flowers and fruit but with a thick-woody base to 1 cm in diam. and distinct bark.

The trichomes of *Morettia kilianii* are stellate for having the principal three or four rays attached at one point, though the coarser trichomes appear subdendritic because branches of these rays do not fall into one plane as in the smaller, typical, stellate trichomes that form the understory on leaf surfaces.

Eponymy — Morettia kilianii is named in honour of Nobert Kilian (B) for leading the team that collected the species.

Key to the species of *Morettia*

1. Subshrubs with woody stems; fruit valves not partitioned between seeds; stigma lobes connivent; petals 0.3–0.5 mm wide . . . . . ***M. kilianii***
– Annual or short-lived perennial herbs with a short caudex and herbaceous stems; fruit valves strongly partitioned between seeds; stigma lobes divergent; petals 1–5 mm wide **2**
2. Sepals (5–)6–8 mm long, persistent well after fruit maturity; petals 12–14 mm long, claw 6–8 mm long; fruit 2.2–3.2 wide at base; seeds 1.5–1.7 × 1–1.4 mm; plants scabrid, with stellate and larger, brittle, forked and dendritic trichomes to 2.5 mm long; ovules 8–16 per ovary . . . . . ***M. philaeana***

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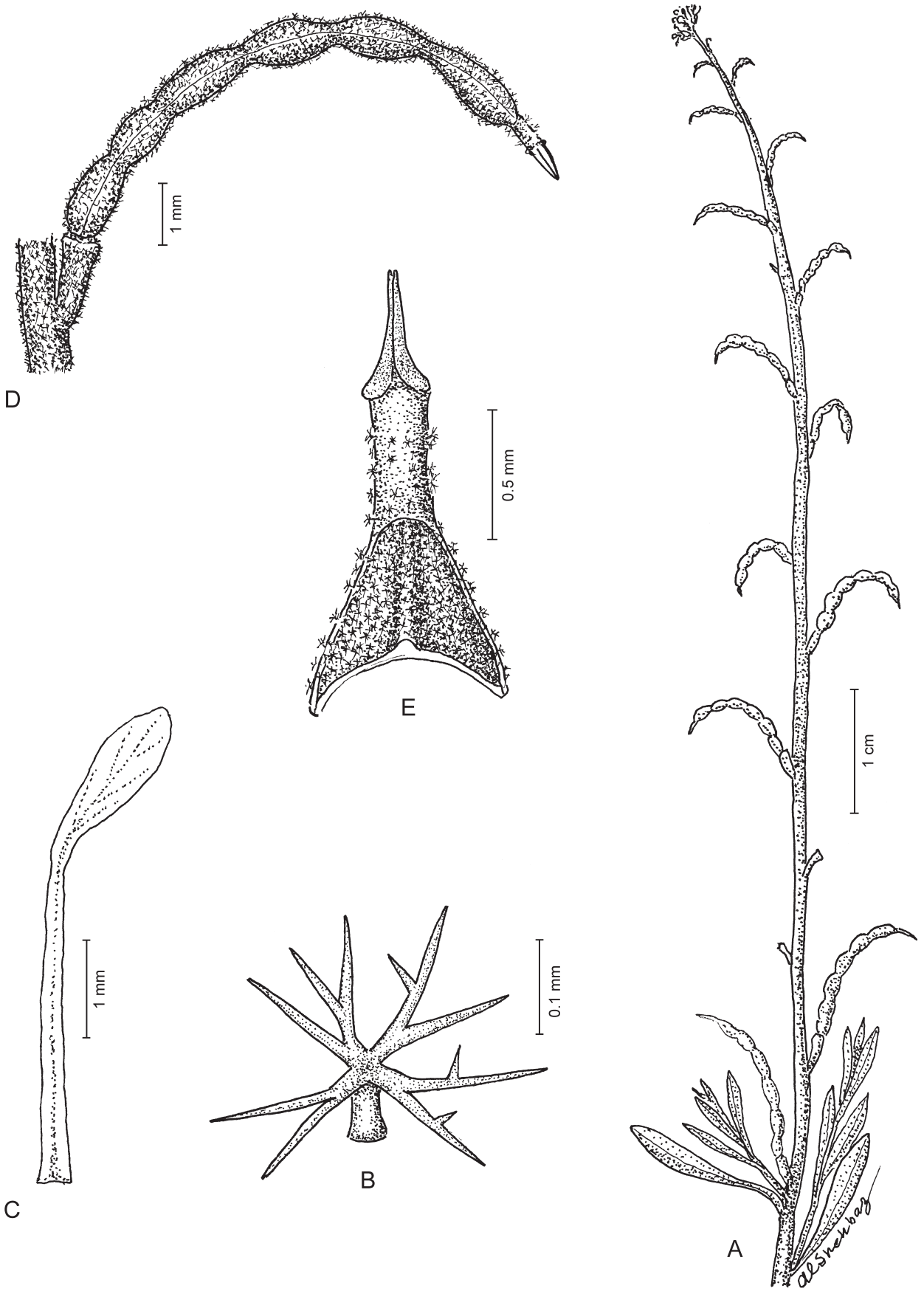


Fig. 1. *Morettia kilianii* – A: portion of fruiting branch; B: trichome; C: petal; D: fruit and fruiting pedicel with part of stem; E: distal part of fruit showing style and stigma. – Drawn from the holotype, *Kilian & Oberprieler YP2010* (MO), by I. Al-Shehbaz.

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– Sepals 2–4 mm long, soon caducous; petals 4–8 mm long, claw 2–5 mm long; fruit 1–2 mm wide at base; seeds 0.8–1.2 × 0.5–0.9 mm; plants usually not scabrid, with primarily stellate and some subdendritic trichomes to 0.7 mm long; ovules 12–26 per ovary **3**

3. Fruit appressed to rachis, straight or rarely slightly curved distally; valves 3-veined; at least some leaves dentate, petiole obsolete or 1–2(–4) mm long . . . . . ***M. canescens***

– Fruit not appressed to rachis, strongly curved; valves 1-veined; leaves entire, petiole 3–14 mm long . . . . . ***M. parviflora***

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