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NEW COMBINATIONS IN MADAGASCAN VANGUERIEAE (RUBIACEAE) FOR THE GENERA PSYDRAX, PYROSTRIA, AND RYTIGYNIA

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SUMMARY

Twelve new combinations are proposed for Rubiaceae species from Madagascar: seven for *Psydrax,* three for *Pyrostria*, and two for *Rytigynia*.

Key words*:* Rubiaceae, Vanguerieae, *Canthium*, *Psydrax, Pyrostria, Rytigynia*, Madagascar.

INTRODUCTION

The paucity of taxonomic and nomenclatural works on Madagascan Rubiaceae, particularly compared to mainland Africa, is evident by the large number of epithets for species residing in genera that are either not in current usage or have been circumscribed so as to exclude them. In this contribution we take the opportunity to make 12 new combinations in the tribe Vanguerieae Dumort., for the genera *Psydrax* Gaertn. (7 spp.), *Pyrostria* Comm. ex A. Juss. (3 spp.), and *Rytigynia* Blume (2 spp.).

Vanguerieae is a robust monophyletic group placed within subfamily Ixoroideae (Andreasen & Bremer, 2000; Persson, 2000), which can be characterized by the following morphological features: inflorescence always axillary; flowers with secondary pollen presentation; corolla lobes valvate in bud; pollen presenters distinct (cylindrical, coroniform or mitriform, mostly recessed (hollow) with style attached within, or not recessed and style attached at the base); ovary 2–10(–12)-locular, the ovules solitary and pendulous; fruit with (1–)2–10 pyrenes; pyrenes cartilaginous to strongly woody with apical pre-formed germination slits; seeds with oily endosperm and relatively large embryos; radicle superior (Bridson & Verdcourt, 1998).

This contribution is a precursor (De Block, 2005; Rakotonasolo & Davis, 2006) to a checklist of the Rubiaceae of Madagascar and Comoros (Davis et al., in prep.).

METHODS

Herbarium material was consulted at the Muséum National d'Histoire Naturelle, Paris (P) and the Royal Botanic Gardens, Kew (K). Some species were examined in the field in Madagascar, during eight field trips over a period of nine years (1996–2004) by A. Davis (unpubl. data). Morphological observations were made using a Leica MZ95 stereomicroscope. All specimens cited here have been seen by us.

NEW COMBINATIONS IN PSYDRAX

Psydrax is a genus found throughout the Old World tropics from Africa, throughout southern and SE Asia, to Australia (Bridson, 1985). The circumscription of this genus presents few problems and species are easily assigned to it. A few salient characters allow for easy identification within Vanguerieae, including: leaves usually subcoriaceous to coriaceous (although chartaceous and deciduous in three African species); inflorescences various, basically cymose but also umbellate (by reduction of inflorescence branches), or fasciculate (by reduction of the peduncle), occasionally few-flowered, or rarely solitary; calyx limb consisting of a dentate to repand rim, usually much shorter than the disk; style long and slender, usually long-emergent; pollen presenter cylindrical, always longer than wide, hollow from the base to the middle, apex bifid or rarely deeply cleft; anthers usually reflexed; pyrene cartilaginous to woody, often bullate, with a shallow apical crest; and embryo with cotyledons set parallel to the ventral face of the seed (Verdcourt & Bridson, 1991; Bridson & Verdcourt, 1998). The monophyly of *Psydrax* is supported by molecular evidence (Lantz & Bremer, 2004).

For most of its nomenclatural history *Psydrax* was considered to be a synonym of *Canthium* Lam. Apart from some confusing and erroneous usage of *Psydrax* in Madagascar in the19th century (for details see Bridson, 1985: 688–689), Capuron (1969) was the first to suggest that many species from Africa, Madagascar and Asia should be moved from *Canthium* to *Psydrax*, although he did not propose any combinations. According to Bridson (1985: 689) Capuron's concept of *Psydrax* included the African genus *Keetia* E. Phillips and was wider than the current circumscription.

Cavaco (1966, 1967a, 1967b, 1968, 1969, 1971, 1972) published a series of papers on Madagascan Vanguerieae but did not take up the proposed reinstatement of *Psydrax* by Capuron (1969). Commenting on the last of his series (Cavaco, 1972), which detailed new species of *Canthium* and *Rytigynia*, Bridson (1985: 689) stated that: "It can be assumed from his descriptions and illustrations that species 13–19 [*Canthium*], as numbered in the text, could well be accommodated in *Psydrax* but none of these species has been seen by me". Type specimens of these seven species of *Canthium* (*C. ankotekonense* Cavaco, *C. austro-orientale* Cavaco, *C. bathieanum* Cavaco, *C. esirense* Cavaco, *C. manambyanum* Cavaco, *C. occidentale* Cavaco, *C. sambiranense* Cavaco) have now been examined by us and we are left in no doubt that they belong to *Psydrax*. New combinations for the above seven species are required and are proposed below.

Psydrax ankotekonensis (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium ankotekonense* Cavaco (1972) 236. — Type: *Capuron 24464-SF* (holo P; iso P), Madagascar, Ouest (secteur Nord), massif de l'Ankotekona, au Sud de Mangaoka (Diégo-Suarez), vers 100–150 m, 3 Feb. 1966.

Distribution — N Madagascar.

Psydrax austro-orientalis (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium austro-orientale* Cavaco (1972) 234. — Type: *Capuron 11771-SF* (holo P; iso P), Madagascar, près du Vinay [sic] Be, au SW de Fort-Dauphin, Feb. 1955.

Distribution — SE Madagascar.

Psydrax bathieana (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium bathieanum* Cavaco (1972) 231. — Type: *Perrier de la Bâthie 3796* (holo P; iso P), Madagascar, environs d'Ampasimentera (Boina), Haute Bemarivo, 1907.

Distribution — W Madagascar.

Psydrax esirensis (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium esirense* Cavaco (1972) 231. — Type: *Humbert 6838* (holo P; iso P), Madagascar, bassin supérieur du Mandrare (Sud-Est), mont Amboahangy, près d'Esira, 25 Nov. 1928.

Distribution — SE Madagascar.

Psydrax manambyana (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium manambyanum* Cavaco (1972) 235. — Type: *Capuron 20904-SF* (holo P; iso P), Madagascar, près de Manamby, à l'Est de Mahabo, 19 Jan. 1962.

Distribution — Madagascar.

Psydrax occidentalis (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium occidentale* Cavaco (1972) 233. — Type: *Perrier de la Bâthie 1803* (holo P; iso P), Madagascar, Plateau d'Ankara, Oct. 1904.

Distribution — Madagascar.

Psydrax sambiranensis (Cavaco) A.P. Davis & Bridson, *comb. nov.*

Basionym: *Canthium sambiranense* Cavaco (1972) 234. — Type: *Capuron 23398-SF* (holo P; iso P), Madagascar, Sambirano (confins Ouest-Nord), à la base sud-ouest du mont Ambohipiraka (Ambilobe), 9 Mar. 1964.

Distribution — NW Madagascar.

NEW COMBINATIONS IN PYROSTRIA

Pyrostria is a genus of 37 species ('World Checklist of Rubiaceae': www.rbgkew.org.uk/wcsp/rubiaceae), which is distributed in Africa, the Seychelles, Madagascar, and the Mascarenes (Bridson & Verdcourt, 1998) and probably extends to south and SE Asia (Bridson, 1987; Davis & Ruhsam, 2005). The circumscription is relatively straightforward (Bridson, 1987) and species can be succinctly characterized by the possession of the following characters: inflorescences entirely enclosed in bud by paired connate persistent bracts (with silky hairs inside); inflorescences umbellate or 1-flowered (typical of female flowers); leaves usually with obscure tertiary venation; pollen presenter solid with style attached at the base; corolla throat densely congested with hairs (Bridson & Verdcourt, 1998). Depending on the species the flowers are either hermaphrodite or unisexual and the ovaries 2- or several-locular. The circumscription of *Pyrostria* and its monophyly is supported by molecular data (Lantz & Bremer, 2004). Lantz & Bremer (2004) have suggested that other Madagascan *Canthium*, which lack distinct paired bracts (e.g. see Bridson, 1987 for Groups III–V & *Canthium* subg. *Bullockia*) may

need to be included in *Pyrostria*, although this would disrupt the present morphological circumscription of the genus.

Between 1966 and 1971, Cavaco (1966, 1967a, 1967b, 1968, 1969, 1971) described many new species of *Pyrostria* (usually 2-locular species) and *Pseudopeponidium* (very similar to *Pyrostria*; usually pluri-locular species). According to Bridson (1987: 623) Cavaco's generic concepts became confused in the last paper of his series (Cavaco, 1972), and she notes: "Although no specimens from species block 20–25 [*Canthium*] of his 1972 paper are represented at Kew, the descriptions suggest they could have been placed in *Pyrostria* [as opposed to *Canthium*]". Material of these six species has now been seen by us and we can confirm the placement of three species in *Pyrostria*. These placements conform with the circumscription of the genus after Bridson (1987), including the presence of distinct paired bracts. The other three *Canthium* species in species block 20–25 (Cavaco, 1972) do not have all the salient characters of *Pyrostria* but may well belong in the genus; further study is required.

After this contribution, there are c. 20 species of Madagascan *Canthium* remaining, which are similar to *Pyrostria* (see above) but lack distinct paired bracts. Further work is needed to ascertain whether these taxa (as well as a number of endemic Vanguerieae genera; see Davis & Bridson, 2003a, 2003b) should be included in *Pyrostria* (Lantz, 2003). *Canthium* s.s. does not occur in Madagascar but is restricted to Africa and Asia (Bridson, 1992; Lantz & Bremer, 2004).

Pyrostria inflata (Cavaco) A.P. Davis & Govaerts, *comb. nov.*

Basionym: *Canthium inflatum* Cavaco (1972) 237. — Type: *Humbert 13824* (holo P; iso P), Madagascar, Bassin de la Mananara, affluent du Mandrare pentes occidentales de montagnes, entre l'Andohahela et l'Elakelaka, mont Apiky au-dessous de Mahamavo, 800–900 m, Jan.–Fev. 1934.

Distribution — SE Madagascar.

Pyrostria isomonensis (Cavaco) A.P. Davis & Govaerts, *comb. nov.*

Basionym: *Canthium isomonense* Cavaco (1972) 238. — Type: *Humbert 12818* (holo P; iso P), Madagascar, Vallée de la Manambolo, rive gauche (Bassin du Mandrare) aux environs d'Isomono (confluent de la Sakamalio), monts Kotriha et Isomonobe, 400–600 m, Dec. 1933 – Jan. 1934.

Distribution — SE Madagascar.

Pyrostria italyensis (Cavaco) A.P. Davis & Govaerts, *comb. nov.*

Basionym: *Canthium italyense* Cavaco (1972) 237. — Type: *Capuron 22363-SF* (holo P; iso P), Madagascar, Sud (extrême limite orientale), près d'Italy (baie de Ranofotsy) au Sud-l'est de Fort Dauphin, 10 Jan. 1963.

Distribution — SE Madagascar.

NEW COMBINATIONS IN RYTIGYNIA

Unlike *Psydrax* and *Pyrostria*, *Rytigynia* is heterogeneous and difficult to circumscribe (Bridson & Verdcourt, 1998: 285). Five entries were needed for *Rytigynia* in Bridson's

key to the genera of Vanguerieae in 'Flora Zambesiaca' (Bridson & Verdcourt, 1998), for example. Even though the eastern African species were revised by Verdcourt (1987), the generic concept (after Robyns, 1928) was not seriously challenged. Typically the inflorescence is few-flowered; most species have pluri-locular ovaries, but some are 2-locular; several species have long, and often conspicuous, corolla lobe appendages but other do not. Many species have tufts of hair inside the stipules. A few species have linear calyx lobes and some taxa are spiny. Recent molecular and morphological studies by Lantz (2003) and Lantz & Bremer (2004, 2005) show that the genus is not monophyletic. Most *Rytigynia* species fall within a well-supported monophyletic group that includes *Fadogia* Schweinf., the *Fadogia-Rytigynia* group (Lantz & Bremer, 2005), which as a general rule can be distinguished from closely related taxa (e.g. *Vangueria*) by the presence of domatia and a calyx usually with poorly developed calyx lobes, although this rule is not without exceptions (Lantz & Bremer, 2005). Species of *Rytigynia* from Madagascar (Lantz & Bremer, 2005) fall within the *Fadogia-Rytigynia* group, and have the long corolla lobe appendages, which are characteristic of many *Rytigynia* species. As *Rytigynia* predates the publication of *Fadogia*, possible taxonomic changes would still see these species being placed in *Rytigynia*, rather than *Fadogia*.

Two species of Madagascan Vanguerieae, namely *Canthium erythroxyloides* Baill. and *Pyrostria syringifolia* (Baker) Hochr., possess the characters of the central core of *Rytigynia* and of the *Fadogia-Rytigynia* group (Lantz & Bremer, 2005).

To further bring the nomenclature of Malagasy Vanguerieae in accordance with current usage, we propose two new combinations.

Rytigynia erythroxyloides (Baill.) A.P. Davis & Govaerts, *comb. nov.*

Basionym: *Canthium erythroxyloides* Baill. (1879) 220. — Type: *Boivin s.n.* (holo P; iso P), Madagascar, Île Ste Marie, entre Sasifout [?Sasijout] et la forêt de ravine Tsara, Nov. 1850.

Distribution — Île Sainte Marie, E Madagascar.

Rytigynia syringifolia (Baker) A.P. Davis & Govaerts, *comb. nov.*

Basionym: *Plectronia syringaefolia* Baker (1890) 321. — *Pyrostria syringaefolia* (Baker) Hochr. (1908) 99. — Type: *Baron 5019* (holo K), NW Madagascar, received Sept. 1887.

Distribution — NW Madagascar.

Note — In his identification key for *Rytigynia,* Cavaco (1972) recognised *R. syringifolia*, although his combination is not valid.

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