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# Generic Transfers in Malagasy Boraginales

James S. Miller & Marc Gottschling

## Abstract

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Recent molecular data have demonstrated convincingly that the Old World genus *Hilsenbergia* Tausch ex Meisn. (*Ebretiaceae*) is nested within the New World genus *Bourreria* P. Browne. Thus, 13 new combinations are required to accommodate the endemic Malagasy species in *Bourreria*. Additional studies have demonstrated that *Heliotropium* sect. *Orthostachys* R. Br. (*Heliotropiaceae*) is not closely related to the rest of the genus and should be segregated as *Euploca* Nutt. Three species that occur in Madagascar fall into this group, including one endemic that requires a new combination.

## Résumé

MILLER, J.S. & M. GOTTSCHLING (2017). Transferts de genre dans les Boraginales malgaches. *Candollea* 72: 329-332. En anglais, résumé anglais et français. DOI: <http://dx.doi.org/10.15553/c2017v722a9>

Des études moléculaires récentes ont démontré de façon convaincante que le genre *Hilsenbergia* Tausch ex Meisn. (*Ebretiaceae*) de l'Ancien Monde est inclus dans le genre *Bourreria* P. Browne du Nouveau Monde. En conséquence, 13 nouvelles combinaisons sont nécessaires pour y transférer les espèces malgaches. D'autres travaux ont démontré que la sect. *Orthostachys* R. Br. du genre *Heliotropium* (*Heliotropiaceae*) n'est pas étroitement apparentée au reste du genre et devrait être séparée au niveau générique en tant que *Euploca* Nutt. Trois espèces malgaches font partie de ce groupe, dont une endémique qui nécessite une nouvelle combinaison.

## Keywords

BORAGINALES – *Ebretiaceae* – *Heliotropiaceae* – *Bourreria* – *Euploca* – *Heliotropium* – *Hilsenbergia* – New combination – Madagascar

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## Introduction

THULIN (1987) recognized five species from eastern Africa and the Mascarenes as differing from other African species of *Ehretia* P. Browne (*Ehretiaceae*) in having valvate calyx lobes and pyrenes (i.e., fruit parts) with overlapping lamellae, features shared with the circum-Caribbean genus *Bourreria* P. Browne. He described one of the five species as new to science and created new nomenclatural combinations for the other four in *Bourreria*. MILLER (2003) described an additional 13 species of Ehretiaceae, all endemic to Madagascar, and resurrected the genus *Hilsenbergia* Tausch. ex Meisen. to accommodate them, based on their much smaller urceolate corollas (New World *Bourreria* species have rotate to salveriform corollas), their distinct geographic distribution, and ITS sequence data for a very limited subset of the species (GOTTSCHLING & HILGER, 2001).

More recent studies of sequence data from both nuclear and chloroplast genes and based on a much larger sample of species (GOTTSCHLING et al., 2014) indicate that *Hilsenbergia* species are nested within *Bourreria* rather than being its sister group. This confirms the assumption of close relationship proposed by THULIN (1987) but is in conflict with their segregation from the New World species. *Bourreria*, also in this broader and morphologically more heterogeneous circumscription, remains distinct – the combination of the valvate calyx aestivation, the extensive disc in the flower and an additional sterile chamber in each pyrene is not found in any other member of the *Ehretiaceae* (GOTTSCHLING, 2004). In preparing a treatment of Boraginales (in the sense of LUEBERT et al., 2016) for the *Flore de Madagascar et des Comores*, it is necessary to make new nomenclatural combinations for the endemic species.

Recent studies of members of the *Heliotropiaceae* (HILGER & DIANE, 2003) show that one of the major clades of *Heliotropium* is not related to the core group of species and is sister group to two other genera of the family. The authors conclude that it should be recognized as a distinct genus, *Euploca*. Three species found in Madagascar fall within the clade, including one endemic species which requires a new nomenclatural combination.

## Transfers to Bourreria

***Bourreria angustifolia*** (J.S. Mill.) J.S. Mill. & Gottschling, **comb. nov.**

= *Hilsenbergia angustifolia* J.S. Mill. in *Adansonia* ser 3, 25: 158. 2003.

**Typus :** MADAGASCAR. **Prov. Toliara :** près d'Andrenialamahitsy, au N du Lac Ihotry, [21°50'S 43°40'E], 27.V.1965, *Service Forestier 24122* (holo- : P [P00417673]!; iso- : G, K, MO-5582595!, P [P00417674]!, TEF [TEF000088]!).

***Bourreria apetala*** (J.S. Mill.) J.S. Mill. & Gottschling, **comb. nov.**

= *Hilsenbergia apetala* J.S. Mill. in *Adansonia* ser 3, 25: 160. 2003.

**Typus :** MADAGASCAR. **Prov. Mahajanga :** Ambongo, au S d'Antsakomanera, baie de Marambitsy, 16°30'S 44°40'E, 20.XI.1965, *Service Forestier 24232* (holo- : P [P00417675]!; iso- : G, GH, K, MO-5582603!, P [P00298699]!, TEF [TEF000089]!, WAG [WAG0248972] image seen).

***Bourreria bosseri*** (J.S. Mill.) J.S. Mill. & Gottschling, **comb. nov.**

= *Hilsenbergia bosseri* J.S. Mill. in *Adansonia* ser 3, 25: 162. 2003.

**Typus :** MADAGASCAR. **Prov. Toliara :** 95 km W of Fort Dauphin, on RN 13, at Andalitany, 200 m, 25°08'S 46°12'E, 29.III.1991, *Miller & Randrianasolo 6182* (holo- : MO-3801522!; iso- : G [G00341684] image seen, K, MO-3801523!, P, TAN [TAN000457]!, WAG [WAG0304635] image seen).

***Bourreria capuronii*** (J.S. Mill.) J.S. Mill. & Gottschling, **comb. nov.**

= *Hilsenbergia capuronii* J.S. Mill. in *Adansonia* ser 3, 25: 164. 2003.

**Typus :** MADAGASCAR. **Prov. Toliara :** forêt d'Analalava, c. 14 km N of RN 7, W of Isalo NP, E of the Malio River, 670 m, 22°35'26"S 45°08'16"E, 27.I.2003, *Miller et al. 10737* (holo- : MO-04876342!; iso- : CAS [CAS1164451] image seen, G [G00386540] image seen, K [001081859] image seen, P, TAN).

***Bourreria comorensis*** (J.S. Mill.) J.S. Mill. & Gottschling, **comb. nov.**

= *Hilsenbergia comorensis* J.S. Mill. in *Adansonia* 25: 167. 2003.

**Typus :** COMORES. **Mayotte :** Hachiroungour, 450 m, 16.IV.1996, *Pascal 504* (holo- : P [P00144492]!; iso- : K).

***Bourreria croatii* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nova.**

= *Hilsenbergia croatii* J.S. Mill. in *Adansonia* ser 3, 25: 168. 2003.

**Typus : MADAGASCAR. Prov. Toliara :** Tsivonoakely, 20-30 km N of Tuléar on the road to Morombe, 5-10 m, 23°12'S 43°37'E, 11.XI.1989, *Miller & Keating 4514* (holo- : MO-3765989)!; iso- : G [G00341685] image seen, P, TAN).

***Bourreria darcyana* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia darcyana* J.S. Mill. in *Adansonia* ser 3, 25: 170. 2003.

**Typus : MADAGASCAR. Prov. Toliara :** env. d'Ampandrandava, entre Bekily et Tsivory, 1000-1100 m, [24°05'S 45°42'E], s.d., *Seyrig 5404* (holo- : P [P00298612]!; iso- : MO-5582605!).

***Bourreria labatii* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia labatii* J.S. Mill. in *Adansonia* ser 3, 25: 173. 2003.

**Typus : MADAGASCAR. Prov. Antsiranana :** collines et plateau calcaires de l'Ankarana, 300 m, [12°54'S 49°08'E], XII.1937-I.1938, *Humbert 18924* (holo- : P [P00853280]!; iso- : G [G00341681], K, MO-5613311!, P [P00417677]!, TEF, WAG [WAG0248971] image seen).

***Bourreria leslieae* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia leslieae* J.S. Mill. in *Adansonia* ser. 3, 25: 174. 2003.

**Typus : MADAGASCAR. Prov. Toliara :** 14 km SE of Tuléar on the road to Sakaraha, 100 m, 23°21'S 43°42'E, 26.XII.1988, *Miller & Miller 3787* (holo- : MO-3667627!; iso- : K, MO-3667628!, P [P00417678]!; TAN [TAN000458] image seen, WAG [WAG0247494] image seen).

***Bourreria lowryana* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia lowryana* J.S. Mill. in *Adansonia* ser 3, 25: 177. 2003.

**Typus : MADAGASCAR. Prov. Fianarantsoa :** dans la vallée de la Manarahaka, à l'E d'Ihosal, [22°19'S 46°16'E], 19.XII.1968, *Service Forestier 28492* (holo- : P [P00417679]!; iso- : G [G00014853] image seen, K [K000418833] image seen, MO-5613318!, P [P00417680]!, TEF).

***Bourreria moratiana* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia moratiana* J.S. Mill. in *Adansonia* ser 3, 25: 182. 2003.

**Typus : MADAGASCAR. Prov. Antsiranana :** forêt d'Orangéa, à l'E de Diégo-Suarez, [12°15'S 49°24'E], 25.I.1966, *Service Forestier 24435* (holo- : P [P00446404]!; iso- : MO-5613322]!, P [P00417681]!, TEF [TEF000087]).

***Bourreria randrianasoloana* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia randrianasoloana* J.S. Mill. in *Adansonia* ser 3, 25: 184. 2003.

**Typus : MADAGASCAR. Prov. Toliara :** Morondava, forêt d'Antanambao, [20°17'S 44°17'E], 8.II.1956, *Service Forestier 15554* (holo- : P [P00298610]!; iso- : K [K000975969], MO-6513325!, P [P00298611]!, TEF [TEF000179] image seen).

***Bourreria schatziana* (J.S. Mill.) J.S. Mill. & Gottschling, comb. nov.**

= *Hilsenbergia schatziana* J.S. Mill. in *Adansonia* ser 3, 25: 185. 2003.

**Typus : Madagascar. Prov. Antsiranana :** massif de la Montagne d'Ambre, bassin de la rivière des Makis, 600 m, [12°37'S 49°09'E], 13.X.1954, *Service Forestier 11302* (holo- : P [P00298609]!; iso- : MO-5613330!; P [P00446405]!, TEF).

## Transfer to *Euploca*

*Euploca perrieri* (J.S. Mill.) J.S. Mill., **comb. nov.**

= *Heliotropium perrieri* J.S. Mill. in *Adansonia* ser. 3, 25 : 116. 2003.

**Typus :** MADAGASCAR. **Prov. Mahajanga :** plaine de Marovoay, I.1910, *Perrier de la Bathie 4420* (holo- : P [P00608272]!; iso- : MO-5727638!, P [P00608273]!).

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