

# On *Euphorbia milii* (Euphorbiaceae) and its varieties

Jean-Philippe Castillon & Jean-Bernard Castillon

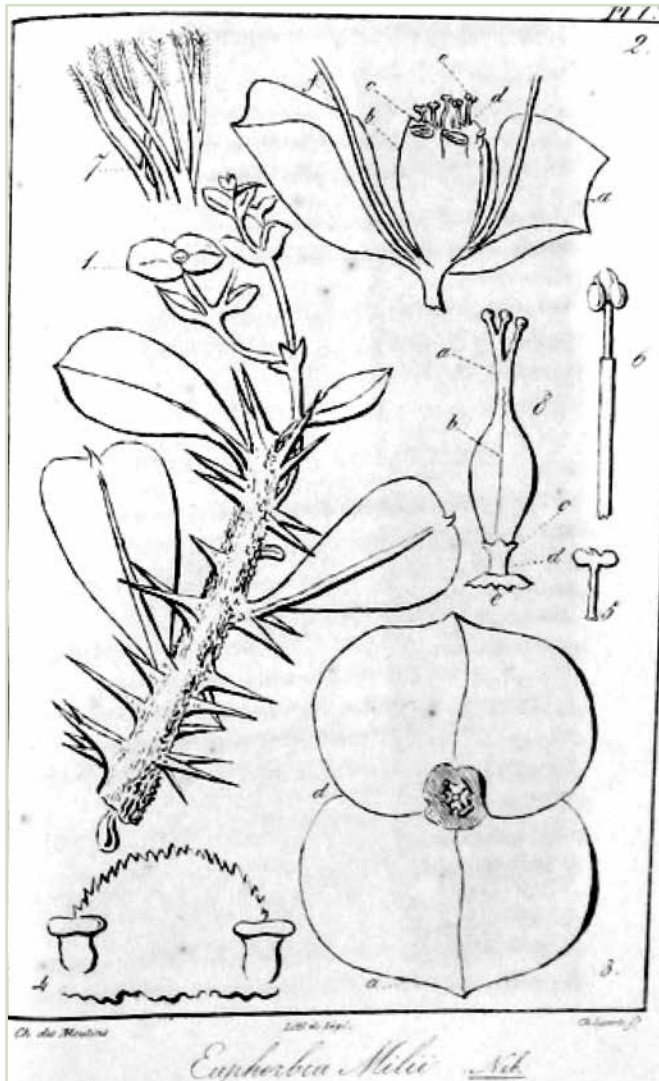


Fig. 1: Drawing of *Euphorbia milii* taken from the original description (Des Moulins, 1826)



Fig. 2: Drawing of *Euphorbia bojeri*, being the type of the species that is a synonym of *Euphorbia milii* (taken from W.J. Hooker, 1836, *Curtis's Botanical Magazine*, Vol. 63: t. 3527, reproduced with permission © the Board of Trustees of the Royal Botanic Gardens, Kew)

*Euphorbia milii* Des Moulins is at this time the best known of the Madagascan spurges – the one that is called “crown of thorns” (“la couronne d’épines” in French), grown in a large number of botanical gardens and by succulent amateurs – and one of the most poorly defined from a taxonomical point of view. It was described by Charles Des Moulins (1826) from living plants brought back to Paris by Baron Milius in 1821, but without type material or type locality. The publication of Des Moulins was subsequently completely ignored or forgotten. Therefore many names were cre-

ated for thorny spurges with large red cyathophylls from Madagascar (*E. splendens* Bojer ex Hook., *E. bojeri* Hook., *E. hislopii* N.E.Br., *E. breonii* Nois.), that nowadays are considered as synonyms or varieties of *E. milii*. Even after the rediscovery of Des Moulins’ publication and the rehabilitation of the name *E. milii* the true plant to which this name was applied remained unknown. As a consequence many authors preferred to create varieties of *E. milii* rather than establish new species for plants resembling the enigmatic *E. milii*, even though they might differ significantly from Des Moulins’ descrip-



tion and drawings (e.g. *E. milii* var. *tulearensis* Ursch & Leandri, *E. milii* var. *roseana* Marn.-Lap. ex Demoly, *E. milii* var. *tenuispina* Rauh & Razaf., ...)

Attempts to bring order to this confusing taxonomy are unsatisfactory up to this time, as there is still uncertainty about the identity of the true *E. milii*. Leandri (1946, 1952) created many varieties of *E. splendens*, which were then transferred into varieties of *E. milii* in Ursch & Leandri 1954 (some of them being invalid for lack of a Latin diagnosis), based only on morphological properties and on plants in culture at the Botanical Garden Tsimbazaza. Haevermans et al. (2009) were only interested in the formal validity of taxa, not their “botanical” validity, nor in the exact determination of the plants corresponding to each taxon.

Our personal approach will consist in combining historical arguments, the study of morphological characteristics of species and varieties already described, and field research of different populations of *E. milii*. The latter will give us an idea of the variability of plants in their natural habitats and is in our opinion essential because similar plants that flower at the same time in a given locality and can therefore interchange their genes must belong to a single taxon, although some specimens may appear morphologically different from the others. These three points of view will allow, we think, clarification of taxonomy of *E. milii*, its varieties and closely related species. Our aim

in this paper will therefore be to give a legitimate name to each of the populations of plants in the *E. milii* group that are still found in the wild in Madagascar, and to specify the characteristics of each taxon.

### The identity of *Euphorbia milii*

The complex *E. milii* group can be defined as spiny branched Madagascan euphorbias, with inflorescences comprising a sticky, erect peduncle, terminated by cymes of 2-64 cyathia with broad cyathophylls, rounded and generally red (more rarely yellow). This definition being very vague, we will only discuss taxa already described as varieties of *E. milii* or of *E. splendens*, without including other taxa which may correspond to the previous synoptic description.

In the last taxonomic study on this group of euphorbias, it is simply stated: “The original wild locality in Madagascar remains unknown” (Haevermans et al., 2009, p. 288). There is no type material, so any genetic study is impossible. But let’s see if we can specify the type locality with other arguments.

### The search for the probable type locality of *Euphorbia milii*

In his description of *E. milii*, Des Moulins (1826, p. 261) tells us: “This beautiful and very rare species, native to Madagascar, appears to have been brought



Fig. 3: Plants found in the region of Fort-Dauphin match the original description of *Euphorbia milii*, both text and drawing



to France for the first time in 1821, by Baron Milius, then governor and administrator for the King to the island of Bourbon”. A little research on Milius tells us that he was indeed governor of Bourbon (now Réunion Island) from 13 September 1818 to 14 February 1821 (Wikipedia, 2020). During his governorship, he organised shipments from Réunion to the French comptoirs of Madagascar, and we learn (Ministry of the Navy and the Colonies, 1836) that his explorations concerned the comptoirs of Sainte-Marie, Tintingue (currently Pointe à Larrée), Sainte-Luce (currently Manafiafy, near Fort-Dauphin) and Fort-Dauphin (August 1819). The highlands of Madagascar were in those times hostile to the French (Reign of Radama I, allied to the English). It is therefore highly unlikely that Milius’ expedition reached the highlands – it was by no means his goal. *E. milii* could therefore have been collected during one of the stops by Milius’ ship.

However, there is no variety of *E. milii*, nor any closely related species, in Sainte-Marie or in Tintingue; on the other hand there is one near Fort-Dauphin.

### Comparison between the form of *Euphorbia milii* from Fort-Dauphin and the description of Des Moulins

Fortunately, Des Moulins’ description is very precise (unlike other descriptions of the 19<sup>th</sup> and early 20<sup>th</sup>

century!), 3 full pages of text and a plate of drawings. It perfectly matches the specimens of *E. milii* that we found in the region of Fort-Dauphin (on rocky hills near the airport and on the hills of Lokaro). Among the characters noted and drawn by Des Moulins, present in the samples from Fort-Dauphin, verified in situ by us, and different from the other varieties of *E. milii*, we can cite:

- the size of the stem,
- the stem leaves,
- the thorns: “They are born two by two, placed only and constantly to the right and left of each leaf. At their base, we sometimes see a much smaller one.” (Des Moulins, 1826, page 262),
- the scars left by the leaves,
- the size and shape of the leaves: spatulate, always mucronate, the largest very obtuse ... The upper leaves ... smaller, rather obovate than spatulate (page 263),
- the peduncles: “one inch long” (page 262),
- the incyathescences formed of 2-4 cyathia,
- the yellow cyathial glands ...

We couldn’t describe *E. milii* better than Des Moulins did; we will therefore content ourselves with presenting photos of the Fort-Dauphin plant, which is undoubtedly the typical form of *E. milii*. *Euphorbia bojeri* Hook. and *Euphorbia breonii* Nois. have drawings as holotypes that correspond perfectly



Fig. 4: Flowering and fruiting branch of *Euphorbia milii* from the Fort-Dauphin region



Fig. 5: *Incyathescence of Euphorbia milii from the Fort-Dauphin region*

to the one of *E. milii*. We therefore confirm these synonymies.

***Euphorbia milii* Des Moul. var. *milii***

Bulletin d’Histoire Naturelle de la Société Linnéenne de Bordeaux 1: 27-30, pl. 1 (1826)

**Typus:** Des Moulins, Bulletin d’Histoire Naturelle de la Société Linnéenne de Bordeaux 1: 27, Pl. 1 (1826) (holo-,!)

= *Euphorbia bojeri* Hook. Curtis’s Botanical Magazine 63: t. 3527 (1836). Type: Curtis’s Botanical Magazine 63: t. 3527 (1836) (holo-,!)

= *Euphorbia breonii* Nois. Annales de Flore et de Pomone 1 (11): 189 (1833).

Other specimens: Fort-Dauphin, route de Ste Luce, 6 November 1994, M. Teissier 190, (P) [P00078929]; Fort-Dauphin, Cap Evatra, 5 October 1932, R. Decary 10874, (P) [P00217866] (<https://science.mnhn.fr/institution/mnhn/collection/p/item/p00217866>); Fort-Dauphin, G.F. Scott-Elliot 2958, (P) [P00217898] (<https://science.mnhn.fr/institution/mnhn/collection/p/item/p00217898>).

**Note:** On the large inselbergs around Kianjavato (Vatovavy, Mananjary road) there is a similar spurge which we relate to *E. milii*, despite a slightly larger size (1 m stems).

**The varieties of the south-east**

There are two forms very close to *E. milii*, both morphologically and geographically, that in our opinion deserve their status as varieties of *E. milii*:

***E. milii* var. *bevilaniensis* (Croizat) Ursch & Leandri**

This variety grows about 50 km west of Fort-Dauphin, but on the western slope of the Andohahelo range, and therefore in a much warmer and much more arid region. It can be recognized by its smaller (25-30 x 18-20 mm) more spatulate leaves, sometimes truncate or even obcordate, its thinner stems (3-4 mm instead of 8-10mm), much less armed with thorns. *E. melanacantha* Drake originating in exactly the same locality thus becomes synonymous not with *E. splendens*, but with *E. milii* var. *bevilaniensis*.

***E. milii* var. *bevilaniensis* (Croizat) Ursch & Leandri**

Mémoires de l’Institut scientifique de Madagascar, série B, Biologie végétale, 5: 150 (1954).

**Typus:** Bevilany, limit of Anosy and Androy, Foret gneissique, 14 November 1932, Decary 10956 (holo-, P! [P00077911], <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00077911>).





Fig. 6: *Euphorbia milii* var. *bevilaniensis*

≡ *Euphorbia bevilaniensis* Croizat, National Horticultural Magazine 1934 (Jan.): 96 (1934). – *Euphorbia splendens* Bojer ex Hook. var. *bevilaniensis* (Croizat) Leandri, Notulae Systematicae 12: 159 (1946).

= *Euphorbia melanacantha* Drake, Bulletin du Muséum d'Histoire Naturelle 9: 45 (1903). – Type: Tsilamaha, October 1901, Grandidier s.n. (holo-, P! [P00577112], <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00577112>), syn nov.

**Note:** If this plant was ever to be elevated to species status, the name *E. melanacantha* Drake would be given priority.

*E. milii* var. *imperatae* (Leandri) Ursch & Leandri, nom. inval.

This variety from the Manantenina region, about 100 km north of Fort-Dauphin, has smaller, round or obcordate succulent leaves without mucronate tip, and yellow or red cyathophylls. This variety is currently invalid, because its description was not accompanied by the Latin diagnosis compulsory in 1954, the date of publication. This omission is rectified here.



Fig. 7: Leaves of *Euphorbia milii* var. *bevilaniensis* differ in shape



Fig. 8: *Incycathescence* of *Euphorbia milii* var. *bevilaniensis*





Fig. 9: *Euphorbia milii* var. *imperatae* in habitat

***Euphorbia milii* Des Moul. var. *imperatae* Leandri ex J.-P.Castillon & J.-B.Castillon, var. nov.**

**Typus:** Manantenina, clefts of gneissic rocks, 10 June 1925, Decary 3863 (holo-, P! [P00221940], <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00221940>).

≡ *Euphorbia splendens* Bojer ex Hook. var. *imperatae* Leandri, Notulae Systematicae 12: 159 (1946) nom. inval.

≡ *Euphorbia milii* Des Moul. var. *imperatae* (Leandri) Ursch & Leandri, Mémoires de l'Institut scientifique de Madagascar, série B, Biologie végétale, 5: 150 (1954) nom. inval.

**Diagnosis:** Planta dumos est, 50 cm – Caulibus spinas remotas, 1 cm longas, basi dilatatas gerentibus – Foliis 1-2 cm, duris, orbiculatis emarginatisque. – Racemis minimis (2-3 cm) cum 2-4 cyathiis; cyathiorum foliis rubidis vel flavis.



Fig. 10: *Euphorbia milii* var. *imperatae* in leaf and flower

## The varieties of the southwest

These varieties, described later, with more precise indications of location, preserved types and photos, do not present any particular problem of identification. Their status as varieties should however be corrected in view of the significant morphological differences with the type species of *E. milii* var. *milii*, the geographic distance between the type localities, and also the genetic differences noted by Aubriot (2012) making the species *E. milii*, such as currently circumscribed, a paraphyletic taxon. Two old varieties of *E. milii* have already been transformed into species (*E. milii* var. *bosseri* Rauh which became *E. neobosseri* Rauh, and

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