

## **Nervilia Gassneri Börge Pett. from Africa is Conspecific with the Malagasy N. Lilacea Jum. & H. Perrier**

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## 12. NUSBAUMER, Louis, Phillip CRIBB & Laurent GAUTIER:

### *Nervilia gassneri* Börge Pett. from Africa is conspecific with the Malagasy *N. lilacea* Jum. & H. Perrier

#### Introduction

To increase the knowledge of the Sambirano Domain, floristic and vegetation surveys were conducted in northwestern Madagascar (GAUTIER & al., 2002; NUSBAUMER & al., 2010) and more recently in the Ampasindava Peninsula. Following a preliminary exploration in November 2007, detailed botanical inventories and vegetation studies were carried out during the rainy seasons of two consecutive years from November to February in 2008-2009 and 2009-2010 by a team of botanists from Conservatoire et Jardin botaniques Genève, Missouri Botanical Garden and Université d'Antananarivo.

On 11 November 2008, we discovered 100-150 individuals of a small orchid with a single leaf in the highest forest of the peninsula locally known as “Bongomihiravavy” (referred to as “Ambohimiravahavy” on topographical maps), which reaches an elevation of 730 m. It was growing on a rock in 10-15 cm deep humic soil at the bottom of a 4 m cliff at an elevation of 500 m (Fig. 1). The leaves appeared to have emerged recently and only a few individuals were flowering at this early period of the rainy season (but several were in bud). We collected only two herbarium specimens (one flowering and one plant with a bud) without tubers (Nusbaumer & al. 2797), in order to not deplete the small population. No further material was found during the six months spent exploring forests on the peninsula. The specimens were deposited in herbaria in Antananarivo (TAN) and Geneva (G) respectively.

Using PETERSSON's (1991) key to *Nervilia* Gaudich. to identify our collection, it keyed out as the African *N. gassneri* Börge Pett. Nevertheless, our collection also possesses characteristics of the Malagasy *N. lilacea* Jum. & H. Perrier. The latter species was hitherto only known from the type collection, grown in Perrier de la Bâthie's garden from a tuber collected in 1909 in Manongarivo forest.

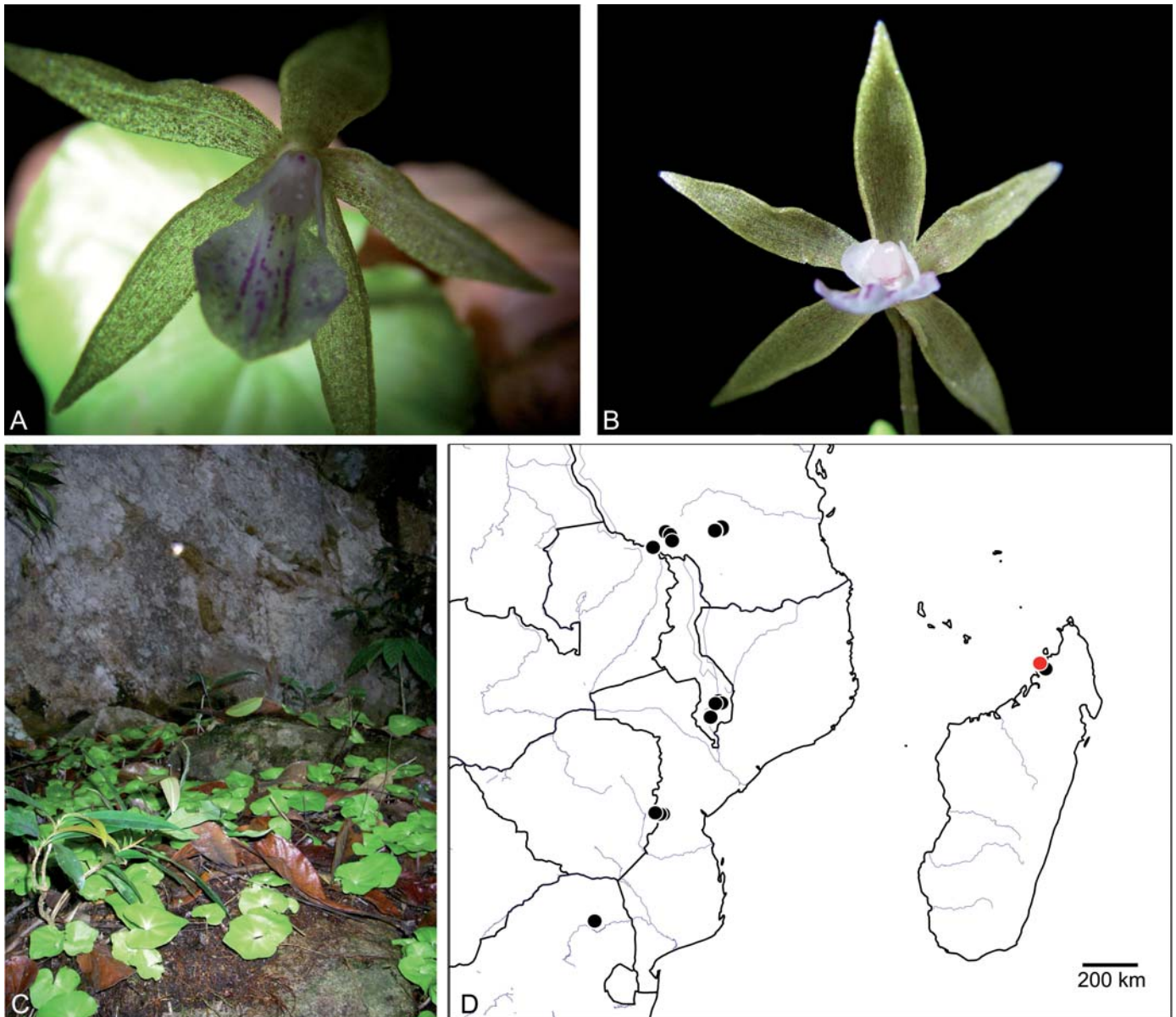
Table 1 presents the main characters used by PETERSSON (1991) to separate the African *N. gassneri* from the Malagasy *N. lilacea* with the corresponding values for these characters for the Ampasindava specimens.

Our collection differs from the African *N. gassneri* because its leaves mature before the plant flowers and because of the absence of cleistogamous flowers, both of which are characteristics of *N. lilacea*. Our collection differs from *N. lilacea* because its lip has obtuse lateral lobes to the hypochile, by the size and venation of its leaves, the length of the petiole and the number of sheathing cataphylls of the spike, characteristics that correspond to *N. gassneri*.

The shape of hypochile lateral lobes is the distinctive character used by PETERSSON (1991) to separate the two species. However, since this character is variable in other *Nervilia* species, we do not consider it to justify the recognition of the two plants as distinct species. The quantitative differences also need to be treated with care because the cultivated type specimen is the only known collection of *N. lilacea* (Perrier de la Bâthie 1873), and we therefore have no idea of the variability of these characters in its natural population. It should also be mentioned that the elevation of our recent collection locality is much lower (500 m) than those of either *N. gassneri* or *N. lilacea* (1150-1900 m and 1000 m elevation respectively), and that this might have an influence on vegetative characters. Further careful examination of both Malagasy and African herbarium collections at K confirmed our conclusion that *N. lilacea* with *N. gassneri* must be considered as conspecific, showing variability in shape of the lateral lobes of the lip (obtuse to acute) and in the sequence in which its leaves and flowers appear. *Nervilia lilacea* is the earliest name and must be retained for this taxon.

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**Fig. 1.** – *Nervilia lilacea* Jum. & H. Perrier. **A.B.** Flowers; **C.** Population growing at the bottom of a 4m cliff at 500 m elevation, in deep humic soil on a rock; **D.** Distribution map of *Nervilia lilacea*, with the new collection Nusbaumer & al. 2797 shown by a red dot [other points re-drawn after PETERSSON, 1990, 1991].

[A-C: Nusbaumer & al. 2797] [Photo: L. Nusbaumer]

**Table 1.** – Diagnostic characters of *Nervilia gassneri* Borge Pett., *Nervilia lilacea* Jum. & H. Perrier according to PETERSON (1991), and our intermediate specimen. The distinctive characters used in the PETERSON's 1991 key are highlighted with a star (\*). Cryptic characters to consider with care, depending on maturity of plants, are highlighted with a cross (†).

Species/specimens (number of known specimens)	Mature leaves	Leaf apparition	† Leaf blade length x width [mm]	Leaf blade veins	† Petiole length [mm]	† Floral bract length [mm]	Inflo. sheathing cataphyl number	* Flowers	* Lip lateral lobes shape	Tooth-like projection on epichile
<i>Nervilia gassneri</i> (> 15)	prostrate or spreading	after flowers	14-55 x 12-45	(5)-7	10-60	1-2.5	(1)-2	cleisto- / chasmogamous	obtuse	absent
<i>Nervilia lilacea</i> (1)	spreading	before flowers	15 x 20	5	30	1	2	chasmogamous	acute	absent
<i>Nusbaumer &amp; al.</i> 2797 (1)	spreading	before flowers	45-50 x 40-50	7	20-45	1	1	chasmogamous	obtuse	absent

*Nervilia lilacea* Jum. & H. Perrier in Ann. Fac. Sci. Marseille 21: 197. 1912.

**Typus: MADAGASCAR:** Centre, massif de Manongarivo, bois humides, 1000 m, fl., *Perrier de la Bâthie* 1873 (holo-: P [P0009 4725]!).

= *Nervilia gassneri* Borge Pett. in Nord. J. Bot. 9: 492. 1990. **Typus: MALAWI:** Southern Prov., Zomba Distr., Zomba Plateau, 1530 m, 15.XII.1984. *Pettersson & Gassner* 359 (holo-: UPS; iso-: BR, K!, LISC, LMU, MAL, NHT, SRGH).

PETERSSON (1991) lists under *N. gassneri* several provisional names that have been applied to African specimens belonging to this species.

**Observations.** – The small light seeds of *Nervilia* species, as with many orchids, permit long-distance dispersal (PETERSSON, 1991). The genus *Nervilia* has 13 species in Africa, six of which are shared with Madagascar, and an additional two species that are endemic to Madagascar. The Jaccard's coefficient of similarity of *Nervilia* between Madagascar and mainland Africa is thus 47%, which is very high compared with 1.8% for *Orchidaceae* and 2.4% for the Angiosperm flora as a whole. Endemism of *Nervilia* in Madagascar is 13.3% which is also very low compared to *Orchidaceae* as a whole (85%) or the entire Angiosperm flora (84%) (CALLMANDER & al., in press). This high similarity and low endemism in Madagascar underlines strong relationships with Africa and suggests the hypothesis of recent multiple dispersal events from continental Africa to Madagascar. Its maximal African diversity is in the Sudano-Zambesian region and its maximal Malagasy diversity occurs in the northern and central western parts of the island, the two regions that are the closest to the Africa mainland. The genus is absent from the extreme southern part of the island.

Recently, new Malagasy records for several taxa from a variety of plant families, previously known only from Africa or Comoros, have been made in the northern part of the island (RAKOTONDRAINIBE & ANDRIAMBOLANTSOA, 2006; FADEN, 2008; TRIGUI, 2010). With our increasing knowledge of Madagascar's flora through ongoing collecting efforts coupled with taxonomic revisionary work, the increase of the level of endemism due to the discovery and description of new endemic species is moderated by a more complete knowledge and better understanding of species distribution in the Malagasy region and the African continent.

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