A new species of fleshy-fruited *Begonia* (Begoniaceae) from the Masoala Peninsula, Madagascar

Mark HUGHES
Royal Botanic Garden Edinburgh,
20a Inverleith Row, Edinburgh, EH3 5LR (United Kingdom)
m.hughes@rbge.ac.uk

Hughes M. 2011. — A new species of fleshy-fruited *Begonia* (Begoniaceae) from the Masoala Peninsula, Madagascar. *Adansonia*, sér. 3, 33 (1) : 81-85. DOI: 10.5252/a2011n1a4.

ABSTRACT
A new species of *Begonia* (*B. masoalaensis* M.Hughes, sp. nov.) is described from the Masoala Peninsula in north-east Madagascar. The species has fleshy fruit, but bears no other similarity to other fleshy fruited *Begonia* from Madagascar, and hence probably represents a secondary acquisition of this character, possibly to facilitate zoochory. *Begonia masoalaensis* possesses an unusual spicate inflorescence architecture, derived from a highly modified monochasial cyme. It is considered to be in the "Vulnerable" IUCN Red List category (VUD2).

KEY WORDS
Begoniaceae,
Begonia,
Madagascar,
fleshy fruit,
new species.

RÉSUMÉ
Une nouvelle espèce de Begonia *à fruits charnus (Begoniaceae) de la péninsule de Masoala, Madagascar.*
Une nouvelle espèce de *Begonia* (*B. masoalaensis* M.Hughes, sp. nov.) de la péninsule de Masoala au nord-est de Madagascar est décrite. Cette espèce possède des fruits charnus, mais ne présente pas d'autre caractère commun avec les autres *Begonia* à fruits charnus de Madagascar, et montre donc probablement une acquisition secondaire de ce caractère, qui facilite potentiellement la zoochorie. *Begonia masoalaensis* possède une architecture d'inflorescence en épi inhabituelle, dérivée d'une cyme monochasiale hautement modifiée. Cette espèce est considérée comme appartenant à la catégorie "Vulnérable" de la Liste Rouge de l'UICN (VUD2).

MOTS CLÉS
Begoniaceae,
Begonia,
Madagascar,
fruit charnu,
espèce nouvelle.

INTRODUCTION

The large genus *Begonia* is currently represented on Madagascar by 48 species (Keraudren-Aymonin 1983) which belong to five sections (*Begonia* sections *Erminea*, *Mezierea*, *Muscibegonia*, *Nerviplacentaria* and *Quadrilobaria*). With one exception (*Begonia oxyloba* Welw. ex Hook.f. from *Begonia* sect. *Mezierea*), these species are endemic to Madagascar and surrounding islands (the Comoros, Réunion and Mauritius) and are the result of a monophyletic radiation, with origins in the mid Miocene *c.* 11 million years ago (Plana *et al.* 2004). The vast majority of these endemic species have papery, three-winged dehiscent fruits, but three of them (*B. salaziensis* Warb., *B. humbertii* Keraudren and *B. comorensis* Warb.) have cylindrical, indehiscent fruits with fleshy walls. In this respect, they resemble the only non-endemic species found in Madagascar, *B. oxyloba* Warb., and are placed with it in *Begonia* sect. *Mezierea*, for which fleshy fruits are a diagnostic character. The new species described here, *B. masoalaensis* M.Hughes, sp. nov. (Fig. 1), also has a wingless fruit with fleshy walls, but differs significantly from members of *Begonia* sect. *Mezierea* in having a tuberous habit and axile (not parietal) placentation within the fruit. These characters would place this new taxon nearer to the other endemic Malagasy sections listed above, and it therefore probably represents a case of secondary acquisition of fruit characters, which are suited for animal dispersal. A similar scenario of multiple origins for fleshy fruit has been described in Asian *Begonia* (Tebbitt *et al.* 2006). It is difficult to assign this new species to any of the existing sections known from Madagascar (Doorenbos *et al.* 1998), given its unusual fruit morphology. Furthermore, the inflorescence structure is also very unusual. Although not perfectly known, it appears to be a spike, derived from a highly modified monochasial cyme. Despite the excellent monograph of Malagasy *Begonia* published in 1983 (Keraudren-Aymonin 1983), this new species highlights that there are still striking discoveries to be made on Madagascar, and hence I hesitate to create a new section to accommodate it until further monographic and phylogenetic work is carried out. *Begonia masoalaensis* is endemic to the Masoala Peninsula in the north-east of Madagascar (Fig. 2). The other three species currently known from the Masoala region (*Begonia lyallii* A.DC., *B. tsimihety* Humbert and *B. antongilensis* Humbert) differ in having winged fruit.

SYSTEMATICS

Begonia masoalaensis M.Hughes, sp. nov.
(Fig. 1)

Begonia masoalaensis sp. nov. *tuberis praesentia et foliis maculatis marginibus sinuosis a ceteris speciebus madagascariensibus et insulis affinibus cum fructu carnoso (*B. comorensis*,* B. humbertii*,* B. oxyloba *et* B. salaziensis*) differt*.

TYPUS. — **Madagascar**. Antsiranana, Masoala Peninsula, forest surrounding research station at Anronabe on west coast, 15°39'30"S, 49°57'30"E, 0-600 m, 19.II.1992, *Zjhra & Hutcheon 175* (holo-, MO; iso-, E).

DESCRIPTION

Tuberous repent herb to 10-20 cm high. Tuber *c.* 2 × 0.8 cm when dry, elliptic, narrowing at the ends, circular in cross section. Stem to *c.* 8 cm long, with many adventitious roots, hairy, more so towards the apex, hairs simple, *c.* 1.5 mm long. Stipules persistent, *c.* 6 mm long with hairs on the keel. Leaves 2-3 in number; petiole 1-5 cm long, densely covered in 1.5 mm long simple hairs; lamina green with an even covering of tiny white or red dots, 8-22 × 5-11 cm in total, 7-16 cm long from point of petiole attachment to tip, ovate, markedly asymmetric, cordate at base, venation palmate-pinnate; margin sinuate, denticulate with a fringe of hairs *c.* 0.25 mm long. Inflorescence terminal, spicate, bisexual, usually with two main axes, each terminating in a female flower, primary peduncle *c.* 3 cm long; bracts persistent, 2-3 mm long, glabrous; male flowers with 4 white tepals, outer sub orbicular, *c.* 5 mm in diameter, inner linear-elliptic to *c.* 5 mm long; stamens *c.* 15, filaments 1.5 mm long, free, anthers just over 1 mm long, elliptic-oblong, not hooded, dehiscing through slits running the entire length of the anther; female flowers with 4 white tepals, similar in shape and

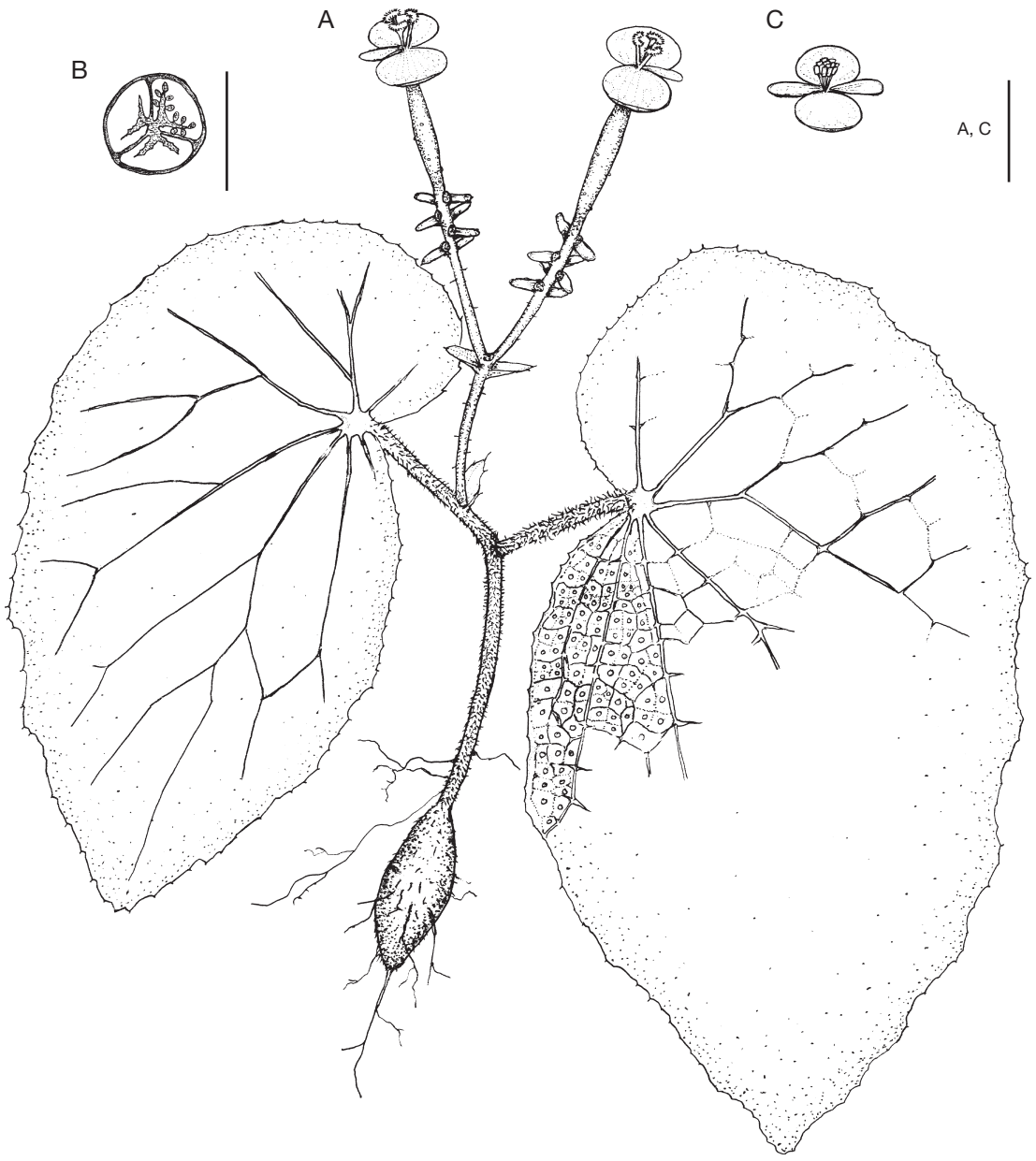

FIG. 1. — **A,** *Begonia masoalaensis* M. Hughes, sp. nov., bearing two female flowers with the scars of the shed male portion of the inflorescence below: **B**, cross section of ovary; **C**, male flower. Scale bars: A, C, 1 cm; B, 5 mm.

dimensions to those in the male flowers, ovary cigar-shaped, *c*. 1 cm long on flowering, stigmas 3, stigmatic surface in a simple U-shaped band. Fruit fleshy, cigar-shaped, *c*. 3 cm long, 3 mm wide when dried, glabrous, indehiscent; placentation axile, placentae bifid. Seeds barrel-shaped, size at maturity not known, collar cells less than ⅓ the length of the seed.

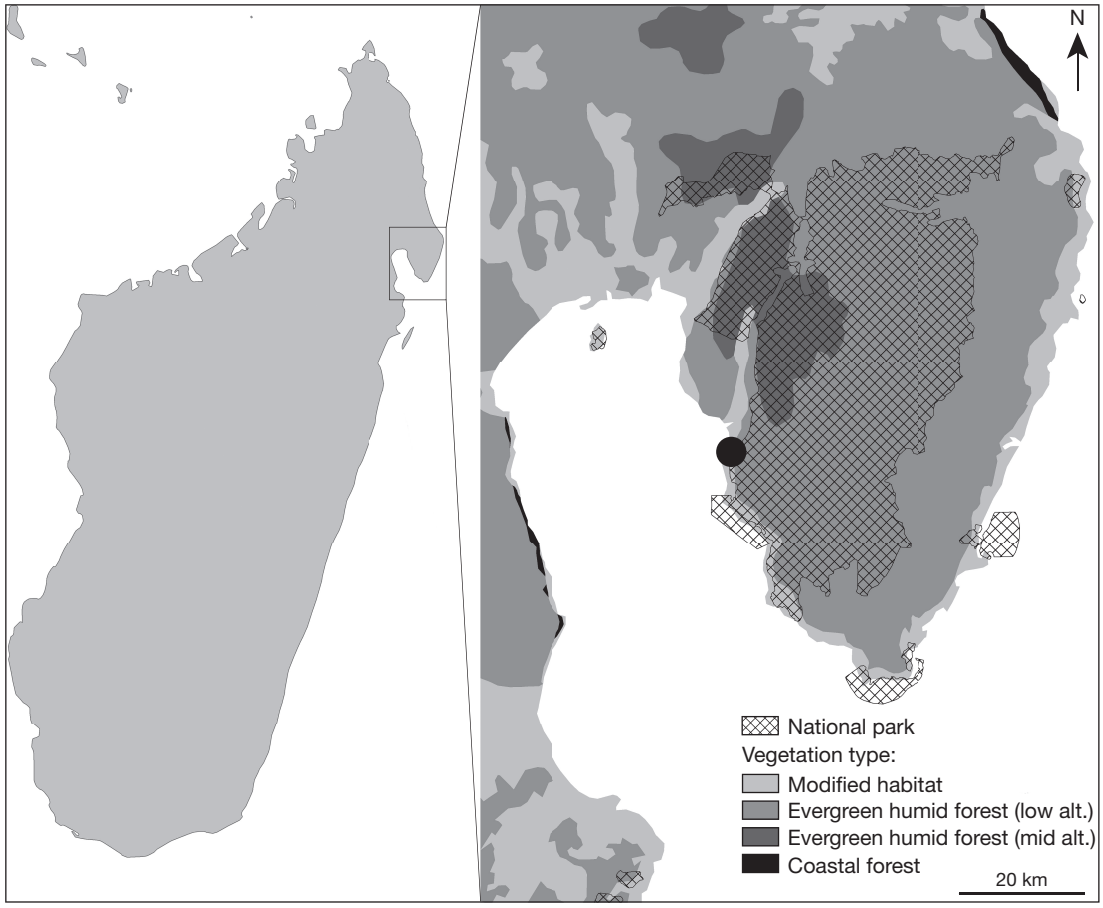

FIG. 2. — Map of the Masoala Peninsula in Madagascar, showing the National park and the location of *Begonia masoalensis* M. Hughes, sp. nov. (●). Vegetation data derived from Du Puy & Moat (1997).

DIAGNOSTIC CHARACTERS

Begonia masoalaensis differs from other Malagasy and neighbouring islands species with fleshy fruit (*B. comorensis*, *B. humbertii*, *B. oxyloba* and *B. salaziensis*) in having a tuber and spotted leaves with sinuate edges.

CONSERVATION ASSESSMENT

The Masoala National park is currently well protected (C. Kremen pers. com.). However, this species is currently known only from the type locality, which is at a low altitude just within the border of the reserve, and hence is considered to be Vulnerable (VUD2) (Standards and Petitions Working Group 2006).

Acknowledgements

The author thanks the curators of E, MO & P for allowing access to specimens, Robert Mill for the translating the diagnosis into Latin, and two reviewers for helpful comments. The support of the M.L. MacIntyre *Begonia* Trust, The Sibbald Trust and SYNTHESYS (grant FR-TAF 1416) is gratefully acknowledged. This research was carried out at the Royal Botanic Garden Edinburgh, supported by

the Rural and Environment Research and Analysis Directorate of the Scottish Government.

REFERENCES

DOORENBOS J., SOSEF M. S. M. & DE WILDE J. J. F. E. 1998. — The sections of *Begonia*, including descriptions, key and species lists (Studies in Begoniaceae VI). *Wageningen Agricultural University Papers* 98 (2): 1-266.

DU PUY D. J. & MOAT J. 1997. — *Madagascar Remaining Primary Vegetation Classified by the Underlying Geology.* Royal Botanic Gardens, Kew, UK, http://www.kew.org/gis/projects/madagascar/download.html.

KERAUDREN-AYMONIN M. 1983. — Bégoniacées, *in* LEROY J.-F. (ed.), *Flore de Madagascar et des Comores*, fam. 144. Muséum national d'Histoire naturelle, Paris: 7-108.

TEBBITT M. C., FORREST L. L., SANTORIELLO A., CLEMENT W. L. & SWENSEN S. M. 2006. — Phylogenetic relationships of Asian *Begonia*, with an emphasis on the evolution of rain-ballist and animal dispersal mechanisms in sections *Platycentrum*, *Sphenanthera* and *Leprosae*. *Systematic Botany* 31 (2): 327-336.

PLANA V., GASCOIGNE A., FORREST L. L., HARRIS D. & PENNINGTON R. T. 2004. — Pleistocene and pre-Pleistocene *Begonia* speciation in Africa. *Molecular Phylogenetics and Evolution* 31 (2): 449-461.

STANDARDS AND PETITIONS WORKING GROUP 2006. — *Guidelines for Using the IUCN Red List Categories and Criteria.* Version 6.1. Prepared by the Standards and Petitions Working Group of the IUCN SSC Biodiversity Assessments Sub-Committee, 60 p.

Submitted on 30 September 2010;
accepted on 29 January 2011.