Contribution to the study of the Selaginellaceae of Madagascar

Sasa STEFANOVIC & France RAKOTONDRAINIBE
École Pratique des Hautes Études,
Laboratoire de Phytomorphologie, Muséum national d'Histoire naturelle,
16 rue Buffon, 75005 Paris, France.
rakotond.@mnhn.fr

KEY WORDS
Selaginella,
Selaginellaceae,
Madagascar.

ABSTRACT
A new species of *Selaginella*, *S. sambiranensis*, from Madagascar is described and illustrated. The taxonomic position and closest relationships are briefly discussed.

MOTS CLÉS
Selaginella,
Selaginellaceae,
Madagascar.

RÉSUMÉ
Une espèce nouvelle de *Selaginella*, *S. sambiranensis*, de Madagascar est décrite et illustrée. La position taxinomique et les relations avec les proches espèces malgaches sont brièvement discutées.

About 700 species have been attributed to the monogeneric family Selaginellaceae. They are widely distributed throughout the world, but the vast majority occur in tropical and subtropical areas. The last complete account of the family in Madagascar and Comoros made by ALSTON (1932) listed 13 species of *Selaginella* occurring in that area. Five additional Malagasy taxa were established, one by TRYON (1955), one by RAUH & HAGEMANN (1991) and three by STEFANOVIC & RAKOTONDRAINIBE (1996). During revision of this family for the Flore de Madagascar et des Comores, necessitaded by the increase in available collections from the last 40 years (specimens have been studied from P, BM), a distinct species was discovered and is described to make the name available for the Flora treatment.

Following the most recent classification of the genus *Selaginella* (JERMY 1986), the new species, *S. sambiranensis*, belongs to the subgenus *Heterostachys* Baker.

The descriptive terms referring to shape, surface and structure of spores follow terminology used by TRYON & LUGARDON (1991).

Selaginella sambiranensis Stefanovic & Rakotondrainibe, **sp. nov.**

Species haec, inter species subgeneris Heterostachys Baker, *habitu ad* S. hildebrandtii A. Braun ex Hieron. *similis, sed apicibus foliorum mediorum acutis (non acuminatis) ab ea differt.*

TYPE.—*Perrier de la Bâthie 8291 bis*, Madagascar, vallée du Marofototra, base du Mt. Bekolosy, massif du Manongarivo, Sambirano, Mar. 1909 (holo-, P; iso-, BM).

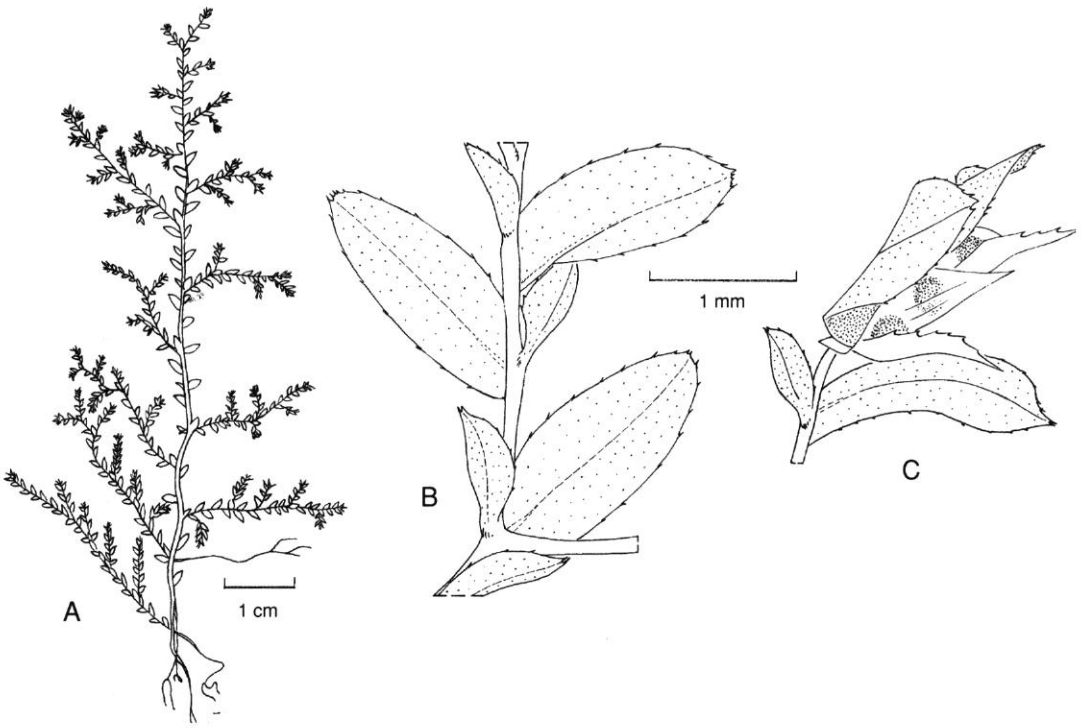

Fig. 1.—***Selaginella sambiranensis*** Stefanovic & Rakotondrainibe: **A**, habit; **B**, enlarged dorsal view showing acute median leaves and denticulate lateral leaves; **C**, strobilus. (*Perrier de la Bâthie 8291 bis*). Drawn by J.-F. DEJOUANET.

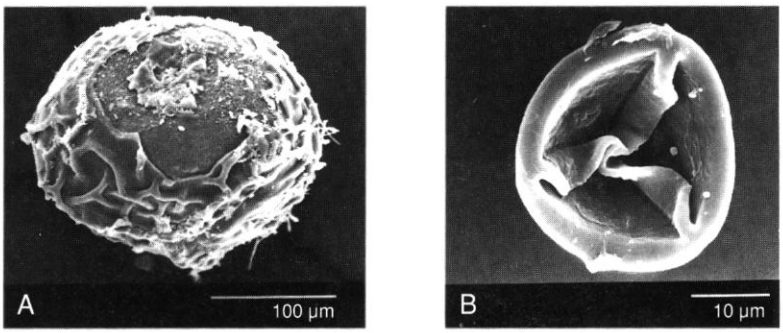

Fig. 2.—Scanning electron (SEM) micrographs of the spores of ***Selaginella sambiranensis***: **A**, megaspore; **B**, microspore. (*Perrier de la Bâthie 8291 bis*).

Plant without rhizome, forming mats. Main steam suberect to erect, 4-10 cm long, outline lanceolate, branched, provided with rhizophores. Branches bifurcated 1-2 times. Rhizophores dorsal, situated in the lower half of the stem, 1-3 cm long and 0.2-0.4 mm in diam., straw yellow to pale green, dichotomizing 2-3 times. Leaves dimorphic, pale green, herbaceous, widely spaced on the main stem, spaced to contiguous toward the extremity of the axes, midrib apparent. Lateral leaves subequal, oblong, 1.2-2.3 × 0.6-1.2 mm, the base unequal and blunt, the apex subblunt to acute, the margin subentire to denticulate all around the leaf. Axilar leaves similar to lateral but equal. Median leaves subequal, ovate-oblong, 0.9-1.3 × 0.4-0.7 mm, the base oblique, the apex acute, non acuminate, the margins denticulate. Strobili solitary, inserted terminally on main stem and branch tips, bilateral, resupinate, 2-4.5 × 1.5-2.5 mm. Sporophylls dimorphic. Dorsal sporophylls oblong-lanceolate, 1-1.5 × 0.4-0.6 mm, keeled, the keel well developed and dentate, the base blunt, the apex subblunt to acute, the margins denticulate. Ventral sporophylls ovate, 0.9-1.1 × 0.4-0.6 mm, slightly or not keeled, the base blunt, apex progressively acuminate, margins dentate-ciliate. Megaspores pale yellow, 180-240 µm in diameter, tetrahedral-globose, trilete, with laesura 3/4 to nearly equal the radius, the surface broken reticulate on both proximal and distal face. Microspores red, 31-32 µm in diameter, tetrahedral-globose, trilete, with laesura equaling the radius, the surface completly laevigate on both proximal and distal face, without any background pattern.—Fig. 1, 2A,B).

PARATYPES.—MADAGASCAR: *Decary 2137*, Maromandia, 9 June 1923 (P); *Guillaumet 2170*, Manongarivo, à 15 km environ de la Maevarano ou 70 km d'Antsohihy sur la route d'Ambanja, 2 Aug. 1968 (P); *Perrier de la Bâthie 8275*, bords du Manongarivo, Sambirano, June 1909 (P, BM); *Rakotondrainibe 1131*, massif du Manongarivo, au S d'Ambalafary, sur un plateau, 150-200 m, 1 Apr. 1991 (P); *Rakotondrainibe 1132*, l.c., 29 Mar. 1991 (P).

DISTRIBUTION AND HABITAT.—All collections are from Domaine Sambirano of northwest Madagascar, Massif de Manongarivo, where this species grows in colonies on rocks in shade, at an elevation of 150-200 m.

Bilateral and resupinated strobili and dimorphic sporophylls place this species, subgenus *Heterostachys* Baker, according to the taxonomic arrangement of the genus *Selaginella* proposed by JERMY (1986).

S. sambiranensis resembles the Comorian species *S. hildebrandtii* A. Braun ex Hieron., which belongs to the same subgenus, in the lanceolate outline of its habit and shape and position of lareral leaves. The two species can be distinguished easily, because the median leaves of the former are acute and denticulate, whereas the latter has acuminate and dentate median leaves. *S. sambiranensis* is characterized by lateral leaves

with both margins subentire to denticulate, while, *S. hildebrandtii* has the acroscopic margin of lateral leaves dentate and the basiscopic margin entire.

The species is named after Domaine Sambirano, the type locality.

Acknowledgments

We are grateful to A. Le Thomas (Laboratoire de Phytomorphologie, École Pratique des Hautes Études) for support and facilities, critical comments on the manuscript and improvement of the Latin diagnosis. The curator of BM graciously loaned specimens and types, as well the curator of P. The senior author was supported by Open Society Institute Supplementary Grant Program FR-134-95/96YU.

REFERENCES

Alston A.H.G. 1932.—Selaginellaceae, in C. Christensen (ed.), The Pteridophyta of Madagascar. *Dansk Bot. Ark.* 7: 193-200.

Jermy A.C. 1986.—Subgeneric names in *Selaginella*. *Fern Gaz.* 13: 117-118.

Rauh W. & Hagemann W. 1991.—*Selaginella moratii*, spec. nova (Selaginellales), a remarkable new species from Central Madagascar. *Pl. Syst. Evol.* 176: 205-219.

Stefanovic S. & Rakotondrainibe F. 1996.—New taxa and a new rank of *Selaginella* (Selaginellaceae) from Madagascar and the Comoros. *Novon* 6: 203-209.

Tryon A.F. & Lugardon B. 1991.—*Spores of the Pteridophyta*. Selaginellaceae: 606-621, Springer-Verlag, New York, etc.

Tryon R.M. 1955.—*Selaginella rupestris* and its allies. *Ann. Missouri Bot. Gard.* 42: 1-99.

Manuscript received 29 August 1996;
revised version accepted November 1996.