

A new native and critically endangered fern for Mauritius: *Elaphoglossum coursii* Tardieu (Dryopteridaceae)

Kersley PYNEE

Mauritius Herbarium, Mauritius Sugarcane Industry Research Institute (MSIRI),
Mauritius Cane Industry Authority (MCIA), Réduit (Mauritius)
kersley.pynee@msiri.mu

Edmond GRANGAUD

21, les Cytises, Terre-Sainte, F-97410 Saint-Pierre, La Réunion (France)
edmond.grangaud@orange.fr

Germinal ROUHAN

Muséum national d'Histoire naturelle, UMR CNRS 7205
Origine, Structure et Évolution de la Biodiversité,
case postale 39, 57 rue Cuvier, F-75231 Paris cedex 5 (France)
rouhan@mnhn.fr

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ABSTRACT

In the Mascarene Islands, *Elaphoglossum coursii* Tardieu (Dryopteridaceae) was only known in La Réunion. This species is also known to grow in Madagascar, the Comoro Islands and Zambia. In November 2007, this species was observed and collected for the first time in Mauritius. Based on these observations, a brief discussion is provided concerning the ecology and conservation status of this species in Mauritius.

RÉSUMÉ

Une fougère indigène nouvelle en danger critique d'extinction sur l'île Maurice: Elaphoglossum coursii Tardieu (Dryopteridaceae).

Dans les Mascareignes, *Elaphoglossum coursii* Tardieu (Dryopteridaceae) était connue uniquement à La Réunion. Cette espèce croît aussi à Madagascar, aux Comores et en Zambie. En novembre 2007, elle a été observée et récoltée pour la première fois sur l'île Maurice. En se fondant sur ces observations, nous discutons brièvement de l'écologie et du statut de conservation de cette espèce sur l'île Maurice.

KEY WORDS

Dryopteridaceae,
Elaphoglossum,
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ferns,
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conservation.

MOTS CLÉS

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INTRODUCTION

Elaphoglossum Schott ex J.Sm. (Dryopteridaceae) is a pantropical genus comprising about 600 species with most of them occurring in the Neotropics. These ferns are mostly epiphytic, lithophytic and sometimes terrestrial in rainforest vegetation types (Fig. 1A, C). In the Mascarenes, the genus is absent from Rodrigues but 17 species and one variety are known from La Réunion and Mauritius. Out of the 17 species and one variety, eight are known from Mauritius, of which three are endemic (Lorence & Rouhan 2004, 2008; Grangaud 2010); in addition, two species previously and rarely collected seem to be now extinct and four endemic nothospecies (five in the Mascarenes), were described in Mauritius (Lorence 1984).

The species *Elaphoglossum coursii* Tardieu was first described and illustrated from Madagascar by Tardieu-Blot (1959; 1960: 41, fig. 12, 3-7) being recognized also from the Comoro Islands, Zambia, Réunion Island but no record was ever made elsewhere in the Mascarenes (Lorence & Rouhan 2004, 2008).

During a field trip in 2007 in the eastern region of Mauritius, our attention was drawn to unusual simple-bladed ferns. Here, we report our observations and further investigations about the ecology of the species should be assigned to *Elaphoglossum coursii*, a new native record for that island.

MATERIAL AND METHODS

The species was found at Gaulettes Serrées (20°12'29"S, 57°38'42"E; 310-350 m altitude), which is a fenced area of c. 633 ha owned by the Flacq United Estates Ltd (FUEL) Sugar Estate for deer (*Cervus timorensis*) and wild pig (*Sus scrofa*) ranching. After the first collection of the species, six random transects of 25 × 2 m (50 m²) were set along a rivulet to determine the species preferences.

Further surveys in other forest sites were undertaken to determine the species distribution

in Mauritius. Material was identified using collections housed at MAU and P.

RESULTS & DISCUSSION

SPECIES IDENTITY

The new recorded fern is distinct from all other genera growing in Mauritius except the genus *Elaphoglossum* to which it is assigned unambiguously, thanks to fertile individuals displaying the distinctive dimorphism between fertile and sterile fronds and the acrostichoid sori (Fig. 1B).

Our unidentified specimens belonging to *Elaphoglossum* have phyllopodia and nearly glabrous fronds that characterize section *Elaphoglossum* of the genus. According to the most recent taxonomic treatment of the genus for the Mascarenes (Lorence & Rouhan 2004, 2008), only three *Elaphoglossum* species belonging to section *Elaphoglossum* have been described as growing in Mauritius: *E. macropodium* (Fée) T. Moore (extremely rare), *E. lepervanchei* (Bory ex Fée) T. Moore, and *E. sieberi* (Hook. & Grev.) T. Moore. Morphological characters of the new *Elaphoglossum* species do not match those of any of these species. In particular, the unusual species shows scales of the rhizomes with the following combination of characters: outline ovate to ovate-elliptic; 1.0-1.5 × 0.4-0.7 mm, dark brown to black, paler at base and margins, opaque; rigid; bases auriculate with overlapping lobes; apices acute; margins with some bulbous-tipped cilia especially basally; cells square to fusiform. Based on these morphological characters and examining all species of section *Elaphoglossum* known in the Indian Ocean area, we assigned the new discovered species to *Elaphoglossum coursii*. First described from Madagascar, *E. coursii* was also known from the Comoro Islands, Zambia, and La Réunion, and constitutes thus a new native species for Mauritius.

Elaphoglossum coursii belongs to a morphological complex with three other species of the Malagasy region (*E. acrostichooides* (Hook. & Grev.) Schelpe, *E. coriaceum* Bonap., and *E. martinicense* (Desv.) T. Moore var. *obtusum* C. Chr.; see Grangaud



FIG. 1. — *Elaphoglossum coursii* Tardieu at Gaulettes Serrées, in Mauritius: **A**, individuals growing as epiphytic; **B**, fertile frond; **C**, individuals growing as saxicolous.

2010 for descriptions of these taxa), but none occurring in Mauritius: thus, identification of *E. coursii* is unambiguous in Mauritius.

SPECIES ECOLOGY

In Mauritius, *E. coursii* was observed growing in low vegetation comprising mainly a mixture of rainforest vegetation types, similar to Perrier Nature Reserve and Mare Longue Plateau in the southwest of Mauritius. The dominant native species of the area were *Sideroxylon cinereum* Lam. and *S. puberulum* A. DC. (Sapotaceae), *Securinega durissima* J. Gmelin (Phyllanthaceae), *Warneckea trinervis* (DC.) Jacq. Fel. (Melastomataceae), and *Pandanus eydouxia* Balf.f. (Pandanaceae). The dominant invasive alien species were *Ravenala madagascariensis* Sonn. (Strelitziaceae), *Ardisia elliptica* Thunb. (Primulaceae), and *Psidium cattleianum* Sabine (Myrtaceae). *Elaphoglossum coursii* was found growing mostly as epiphytic on tree trunks of *Securinega durissima* or *Ravenala madagascariensis*, whereas it was rarely observed as saxicolous (Fig. 1C) on rocks in association with other ferns (*Hymenophyllum inaequale* (Poir.) Desv., *Davallia repens* (Bory) Desv.), with Angiosperms (*Clidemia hirta* (L.) D. Don., *Psidium cattleianum*) and with some bryophytes. Moreover, the much localized population of *E. coursii* consisting of 28 dispersed clumps representing *c.* 90 individuals was observed in an area of one hectare.

When growing on native plants, the species occurs at higher height (29.6 ± 16.3 cm), and also on larger trees (3.7 ± 2.4 cm diameter at breast height [DBH]). On invasive alien species, *E. coursii* are found at a lower level (17.4 ± 15.4 cm high), and even on smaller diameter (3.1 ± 2.8 cm DBH). However, the small population size does not allow concluding on significant differences between specimens growing on native or alien plants.

The three following herbarium specimens of *E. coursii* have been collected and deposited at the Mauritius Herbarium (MAU): Mauritius, Gaulettes Serrées (Munjawa), next to Camp Thorel, $20^{\circ}12'11''\text{S}$, $57^{\circ}38'42''\text{E}$, 316 m, Pynee K. & Grangaud E. *s.n.* in MAU 24678 (MAU) collected on 15.XI.2007; *s. loc.* Pynee K. *s.n.* in

MAU 24679 (MAU) collected on 22.IV.2008; *s. loc.* Pynee K. *s.n.* in MAU 24813 (MAU) collected on 26.I.2010.

CONSERVATION STATUS IN MAURITIUS

In Mauritius, despite important historical collecting efforts, this species is known from only one locality. Thus, the tentative conservation status according to the IUCN criteria (2001) for the species locally is Critically Endangered. *Elaphoglossum coursii* is vulnerable to damage by deers and wild pigs, herbicide spreading, soil erosion and clearing for hunting. For these reasons, *ex situ* conservation and perhaps propagation should probably be encouraged. A management plan for the species should be considered and planned in collaboration with the landowner. Further surveys on the other regions of Mauritius should be envisaged.

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