A new species of Odontosoria (Lindsaeaceae) from New Guinea

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Key words
Lindsaeaceae  
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Abstract  
A new fern species, Odontosoria quadripinnata, is described from New Guinea. The new species resembles O. retusa, but has quadripinnate laminae, short sorus and monoleote spores in contrast to trippinate laminar division, continuous sorus and trilette spores in O. retusa.

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INTRODUCTION

Recent studies on Lindsaeaceae systematics (Lehtonen et al. 2010) revealed two collections of a morphologically unusual Odontosoria from New Guinea. These specimens probably represent the ‘quadripinnate form’ of Sphenomoreras retusa (Cav.) Maxon (1913: 144) [now Odontosoria retusa (Cav.) J.Sm. (1857: 430)], mentioned by Kramer (1971) without a specific citation of any specimen. However, the specimens in question differ from O. retusa not only by laminar dissection, but they also have univalve sorus and monoleote spores in contrast to the continuous sori and trilette spores in O. retusa. This apparently undescribed taxon was not included in the family-level phylogenetic analysis (Lehtonen et al. 2010) because the DNA isolation from the available herbarium material failed, but is described here as a new species.

Odontosoria quadripinnata Lehtonen, sp. nov. — Fig. 1


Etymology: The species has a distinctive quadripinnate laminar dissection, hence the name.

Herb. Rhizome probably short creeping, solenostelic, stout, c. 1 cm diam. Rhizome scales medium to pale brown, triangular, to 5 mm long, c. 20 seriate at the base. Petioles dull brown, c. 6 mm diam at the base, c. 60 cm long, all axes abaxially rounded, adaxially grooved. Lamina oblong to triangular, at least to 60 cm long, 50 cm wide, chartaceous to subcoriaceous, quadripinnatitatefis, dark green above, much lighter green below. Major pinnules at least to 6 ft a side, alternate, the lower ones with a stalk up to 3 cm long, the upper ones gradually subsessile, elongate-triangular, to 35 by 20 cm, equal sided. Larger secondary pinnae triangular, shortly petiolulate, acuminate, up to 15 cm long, 7 cm wide, pinnate to bipinnate, 5–12 free pinnae or pinnules to a side, upper pinnules cuneate, confluent. Ultimate pinnules cuneate, subhombic with shallow incisions, c. 7–10 by 2–4 mm, about twice as long as wide, sterile pinnae more rounded than fertile ones. Veins elevated, usually 2–3 times forked, 0.5–1 mm apart. Sorus occupying just a single vein. Indusium entire, pouch-shaped, c. 0.7 mm wide, 1 mm long, reaching the margin. Sporangia c. 200 by 150 µm, annulus with 15–20 indurated cells. Spores monoleot, bean-shaped, pale, smooth, c. 50 by 30 µm.

Distribution & Ecology — New Guinea, wet tropical montane forests at elevations between c. 800–2000 m. Terrestrial or epiphytic on fallen trunks.

Additional specimen. NEW GUINEA, Morobe Province, Kuper Range, along unpaved track to Biaru, wet montane forest; on muddy banks of gently flowing stream, 2021 m, 7°31'S 146°48'E, 29 Sept. 1988, Takeuchi 4081 (BISH).

Note — Kramer (1971) mentioned that several collections of a quadripinnate form of O. retusa exists from New Guinea and Manus, but that their taxonomical status is uncertain. He believed that at least some of them represented hybrids, possibly between O. retusa and O. chinensis (L.) J.Sm. (1857: 430). Hybrid origin was assumed because of abortive spores. However, the specimens examined here have fully developed spores and are unlikely hybrids. Monoleote spores are rare among Odontosoria species. Besides O. quadripinnata, monoleote spores are present in O. chinensis, O. biflora (Kaulf.) C.Chr. (1906: 464), and O. veitchii (Baker) Parris (1992: 151). These species also share a short, typically univalve, sori. Odontosoria chinensis and O. biflora were resolved as sister species pair in the cladistic analysis, but the phylogenetic relationships of O. quadripinnata and O. veitchii remain uncertain, due to the lack of molecular data (Lehtonen et al. 2010). However, it is probable that all Odontosoria species with monoleote spores are closely related.

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Fig. 1 Odontosoria quadripinnata Lehtonen. a. Fertile segments adaxially; b. fertile segments abaxially; c. terminal segment abaxially; d. rhizome scale; e. part of the rhizome; f. holotype. All drawings (a–e) are based on the holotype (f). — Drawn by S. Lehtonen.