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RESEARCH ARTICLE

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A new species of *Odontosoria* (*Lindsaeaceae*) from New Guinea

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Key words

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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 laminas, short sori and monolete spores in contrast to tripinnate laminar division, continuous sori and trilete 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 *Sphenomeris 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 uninerval sori and monolete spores in contrast to the continuous sori and trilete spores in *O. retusa*. This apparently undescribed taxa 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

Frondes quadripinnatae. Pinnulae ultimae cum basi anguste cuneatae, surrhombeae cum incisuris non profundis. Sori uninervii, sporae monoletae. — Typus: *Harrison-Gagné BHG 2141* (holo BISH), Papua New Guinea, Louisiade Archipelago, Misima Island, Mt Oiatau, epiphytic on log, 795 m, 26 March 1979.

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, quadripinnate-pinnatifid, dark green above, much lighter green below. Major pinnae at least 6 to 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, subrhombic with shallow incisions, c. 7–10 by 2–4 mm, about twice as long as wide, sterile pinnules more rounded than fertile ones. Veins elevated, usually 2–3 times forked, 0.5–1 mm apart. *Sori* 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* monolete, 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. Monolete spores are rare among the *Odontosoria* species. Besides *O. quadripinnata*, monolete 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 uninerval, 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 monolete spores are closely related.

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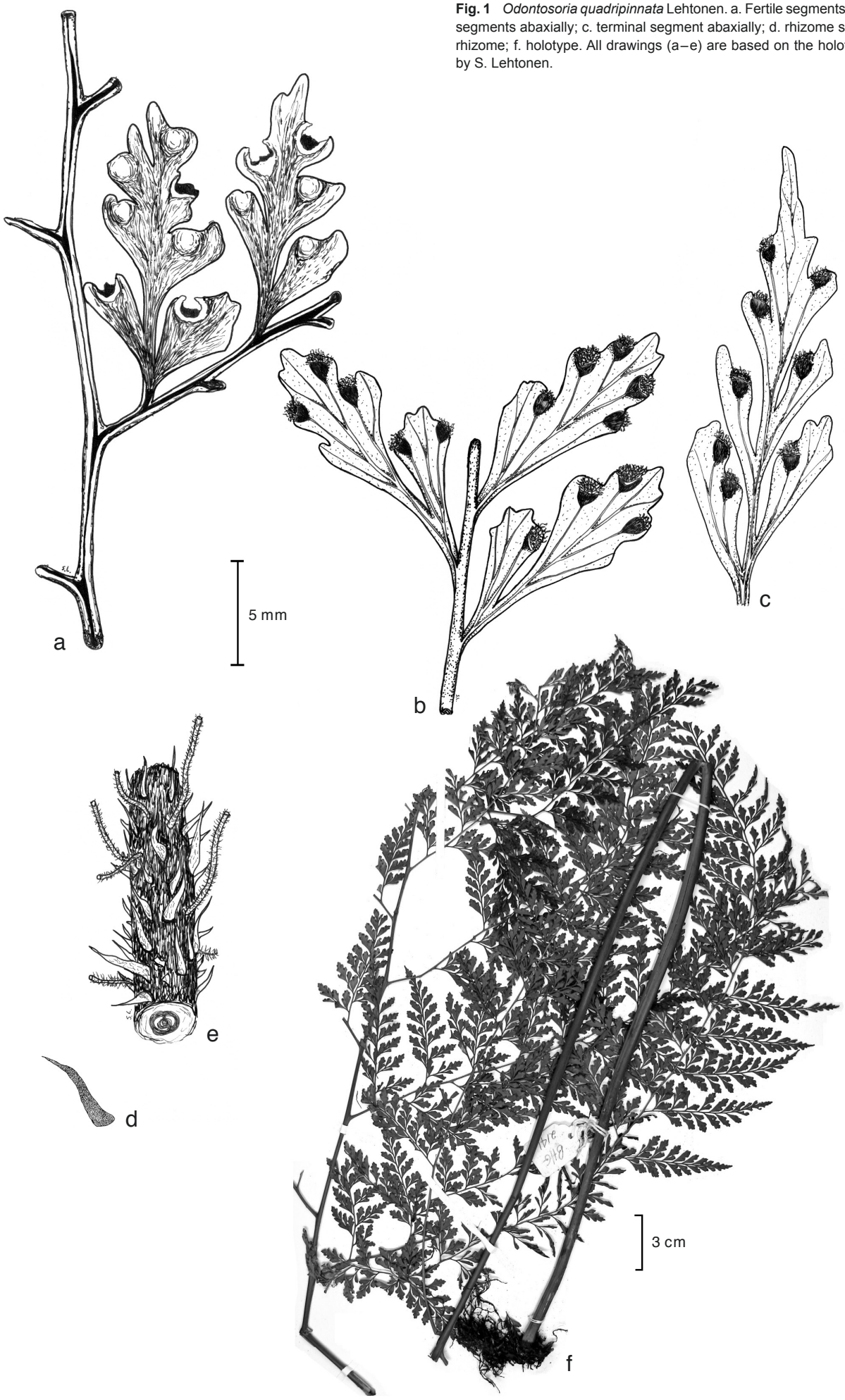

Fig. 1 *Odontosoria quadripinnata* Lehtonen. a. Fertile segments adaxially; b. fertile segments abaxially; c. terminal segment abaxially; d. rhizome scale; e. part of the rhizome; f. holotype. All drawings (a–e) are based on the holotype (f). — Drawn by S. Lehtonen.