

**STENOCHLAENA RIAUENSIS (BLECHNACEAE), A NEW FERN SPECIES
FROM RIAU, INDONESIA**

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Abstract

Stenochlaena riauensis, a new fern species from Riau, Indonesia is described and illustrated. This species can be distinguished from its most closely related species *S. palustris* by the position of fertile and sterile pinnae. In the new species, both fertile and sterile pinnae are located on the same frond, the lower part of lamina consisted of sterile pinnae that gradually narrower towards apex forming linear fertile pinnae.

Introduction

Stenochlaena J. Smith belonging to the family Blechnaceae is a small genus consisting of only six species, and widely distributed in tropical and sub-tropical regions (Holtum, 1971; Chamber, 2013; Wang *et al.*, 2013). Most of the species of the genus have both sterile and fertile pinnae. Chamber (2013) reported that this genus is strongly dimorphic, in which fertile and sterile pinnae are located at the different fronds, with imparipinnate pinnae. Furthermore, *Stenochlaena* is characterized by possessing radially symmetrical rhizome (Chamber, 2013); purplish-red to red fronds when young; sterile pinnae entire (Piggot, 1996); lanceolate to oblong-lanceolate, lateral veins arising from a closely parallel series of areolae; acrotisoid sori, that densely covering the dorsal surface or the lower surface of the fertile pinnae and not arranged in discrete lines or dots; spores with a very thin and closely appressed perispore (Chamber, 2013).

During our expedition in Riau Province (Sumatera Island, Indonesia) from 2012 to 2014, we discovered that *S. palustris* (Burm.f.) Bedd (1876) is the the most widely distributed and abundant fern species in this province (Fig. 1). Local people consume the juvenile leaves of this species as vegetables. Surprisingly, some specimens collected from conservation forest (Taman Hutan Raya Sultan Syarif Hasyim, Siak) and Pekanbaru, Riau showed a different type of fronds. Both fertile and sterile pinnae are located in one frond, the lower part of lamina are consisted of sterile pinnae that gradually narrower forming fertile pinnae on the tip of leaves. The other morphological characters are similar to *S. palustris*. Our detail observation of morphological characters of these specimens, brings us to a conclusion to a new *Stenochlaena* species, *Stenochlaena riauensis* sp. nov.

***Stenochlaena riauensis* Sofiyanti, Iriani, Fitmawati & Roza, sp. nov. (Fig. 2).**

Diagnosis: *Stenochlaena riauensis* morphologically differs from its closest related species *S. palustris* (Burm. F.) Bedd by being monomorphic, and having both fertile and sterile pinnae located on one frond, the lower part of lamina consisted of sterile pinnae that gradually narrower

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towards apex, forming fertile pinnae on the tip, and the acrotischoid sori with monolete and reniform (bean-shaped) spores.

Types: Indonesia. Riau Province: Taman Hutan Raya Sultan Syarif Hasyim, 11 June 2012, *N. Sofiyanti, Fitmawati & A.A. Roza*, STR2 (*Holotype:* ANDA); Pekanbaru, 3 December 2014, *N. Sofiyanti & Fitmawati*, STRPKU1 (*Paratype:* ANDA).

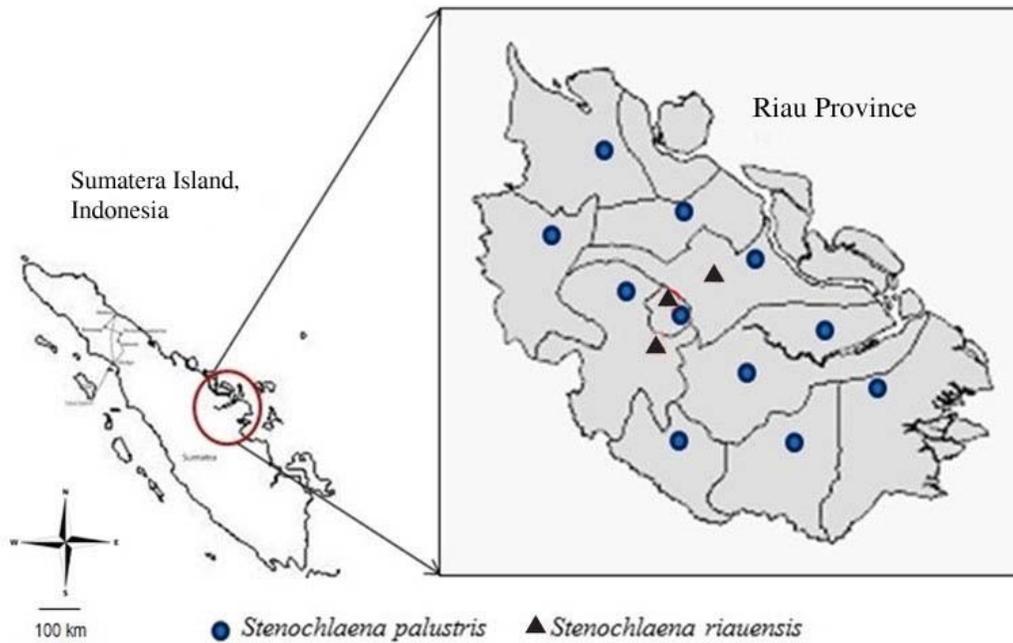


Fig. 1. Distribution map of *Stenochlaena* species in Riau, Indonesia.

Terrestrial, scrambling. Rhizome creeping or climbing, stout, 5–8 mm in diameter, light brown, covered by brown scales, especially towards the apex. Frond up to 90 cm long, pinnate. Stypes up to 20 cm long, glabrous, greenish brown at the base, green towards laminae. Rachis glabrous, dark green, c. 4 mm in diameter, having groove along the rachis. Laminae purplish red when young, dark green at maturity, c. 60–70 cm long, 1-pinnate, consisted of 17 pinnae. Pinnae sterile at the base of laminae, gradually narrower towards the apex and form fertile pinnae. Sterile pinnae 8 per frond, lanceolate to oblong-lanceolate, mostly cuneate, papery, glabrous on both surfaces, c. 11 cm long, 3 cm wide, rounded at the base, shortly stalked, blackish green, stalk c. 3 mm long, tip acute, serrate margin, veins anastomosing and forming single row of areoles along each side of costa. Fertile pinnae 9 per frond, started from the middle of laminae toward the apex, pinnae gradually reduce towards the apex of lamina, shortly stalked, form elongated fertile pinnae on the tip, usually asymmetric at the base, the reduced sterile pinnae glabrous on both surfaces, c. 7 cm long, 1.5 cm wide, blackish green stalk c. 2.0–2.5 mm long, margin serrate, veins anastomosing and forming single row of areoles along each side of costa, at the fertile parts become yellowish green and narrower, linear, the top pinnae is the longest (c. 8 cm long, 2 mm wide), margin curve forming a linear groove at ventral surface. Sori cover the dorsal surface forming acrotischoid sori, brownish yellow. Spores monolete, reniform or bean-shaped.

Etymology: The specific epithet refers to the type locality, Riau Province of Indonesia.



Fig. 2. *Stenochlaena riauensis* Sofiyanti, Iriani, Fitmawati & Roza, **sp. nov.** A. Mature frond; B. Alternate pinnae arrangement; C. Sterile pinna; D. Fertile Pinna; E. Dorsal surface of fertile pinnae; F. Ventral surface of fertile pinna; G. Leaf base of fertile pinnae showing symmetric pinna; H. Leaf base of sterile pinnae, showing asymmetric pinna; I. Serrate leaf margin; J. Spore (scale bar = 10 μ m).

Distribution: *Stenochlaena riauensis* was first found between 75 m and 150 m in conservation forest, Taman Hutan Raya Sultan Syarif Hasyim, Riau Province, Sumatera Island, Indonesia. This forest is a low land tropical forest that dominated by Dipterocarpaceae species, such as *Shorea acuminata* Dyer (Meranti Rambai), *Shorea leprosula* Miq. (Meranti pirang), *Shorea parvifolia*

Dyer (Meranti Bunga), *Parashorea aptera* Slooten (Meranti Batu), and *Dipterocarpus* sp. (Kruing). This species is also recorded from Pekanbaru District, Riau.

Habitat: This species commonly grows in open area or partly shaded area and mostly in streetside, at Riau Province, Indonesia.

Note: In Riau Province, *S. riauensis* shares the same distribution area with *S. palustris* (Fig. 1). However, *S. palustris* is more abundant than the new species, and sometime is found as epiphyte on the oil palm tree (Sofiyanti, 2013) or other woody species, as well as in the open space area or partly shaded area (Sofiyanti *et al.*, 2014). Morphologically, these two species have close similarity, especially when young. Both species have purplish red fronds when young, usually covered by scales, 1-pinnate lamina, short stalked pinnae, with broadly rounded base of fertile pinnae, usually cuneate, serrate margin of sterile pinnae, with acuminate tip. The veins of sterile pinnae are anastomosing and forming single row of areoles along each side of costa. The sori type and spore characteristic are also the same. A comparative account of *S. riauensis* sp. nov. with its closely related species, *S. palustris*, is presented in Table 1.

Table 1. Comparison of diagnostic morphological characters of *Stenochlaena riauensis* sp. nov. with *S. palustris*.

Characters	<i>S. riauensis</i>	<i>S. palustris</i>
Type of frond	Monomorphic	Dimorphic
Position of sterile pinnae	At the base of laminae	At the sterile frond
Number of sterile pinnae	8	17–29
Position of fertile pinnae	At the upper part of laminae	At the fertile frond
Number of fertile pinnae	9	16–28
Lower part of fertile pinnae	Broader at the base, green	Linear, brown
Upper part of fertile pinnae	Gradually narrower toward the apex forming linear structure	Linear

Most of *Stenochlaena* species usually have acrosticoid sori and lack true indusium (Chamber, 2013) with monolete spores (Holttum, 1932; Chamber, 2013). The spore investigation of six *Stenochlaena* species conducted by Chamber (2013), presented the similar spore shape and ornamentation. Their spores are monolete spores with a single line indicating the splitting axis of mother spore with thin perispore, as observed in other Blechnaceae genus, i.e. *Blechnum* L. (Mendoza-Ruiz and Perez-Garcia, 2009). These characteristics are also found in newly described *S. riauensis*. The genus *Stenochlaena* was previously reported as strongly dimorphic fern, with distant fronds (Holttum, 1932, 1971; Chamber, 2013; Wang *et al.*, 2013). Usually, the sterile pinnae are shorter and wider than fertile pinnae. However, *S. riauensis* is not dimorphic fern, because the sterile and fertile pinnae are located in the same frond. Sterile pinnae are located at the base of laminae, and gradually narrower and reduced toward apex. The narrow tips are elongated forming fertile pinnae. The reduced sterile pinnae is located at the base of pinna, usually with asymmetric base. This is the strong characteristic of *S. riauensis* to be treated as a distinct *Stenochlaena* species.

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References

- Chamber, T.C. 2013. A review of the genus *Stenochlaena* (Blechnaceae, subfamily Stenochlaenoideae). *Telopea* **15**: 13–36.
- Holtum, R.E. 1932. Further notes on the *Stenochlaena*, *Lomariopsis* and *Tetophyllum*. *Gard. Bull. Str. Sett.* **9**: 139–144.
- Holtum, R.E. 1971. The genus *Stenochlaena* J. Smith with the description of new taxa. *Amer. Fern J.* **61**: 119–123.
- Mendoza-Ruiz, A. and Perez-Garcia, B. 2009. Morphogenesis of the gametophytes of eight Mexican species of *Blechnum* (Blechnaceae). *Acta Bot. Mex.* **88**: 59–72.
- Piggot, A.G. 1996. Fern of Malaysia in Colour. Tropical Press SDN. BH. Kuala Lumpur, 486 pp.
- Sofiyanti, N. 2013. The diversity of epiphytic fern on the oil palm tree (*Elaeis guineensis* Jacq.) in Pekanbaru, Riau. *Jurnal Biologi* **XVII** (2): 51–55.
- Sofiyanti, N., Iriani, D. and Roza, A.A. 2014. Morfologi Tumbuhan Paku di Taman Hutan Raya Sultan Syarif Hasyim, Riau. UNRI Press. Pekanbaru, Riau, 96 pp. (in Indonesian).
- Wang, F.G., Xing, F.W., Dong, S.Y. and Kato, M. 2013. Blechnaceae. *In*: Wu, Z.Y., Raven, P.H. and Hong, D.Y. (Eds), *Flora of China*, Vols. **2 & 3** (Pteridophytes). Science Press, Beijing; Missouri Botanical Garden Press, St. Louis, pp. 411–417.

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