Notes on *Distichophyllum armatum* (Daltoniaceae, Bryophyta) in Thailand

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**ABSTRACT**

*Distichophyllum armatum* (E.B. Bartram) B.C. Ho & L. Pokorny, is newly discovered in lower montane forest in southern Thailand. A description and line drawing are provided, and its diagnostic characters and geographical distribution are briefly discussed.

**KEYWORDS:** bryophyte, diversity, moss, Thai-Malay Peninsula, taxonomy

**INTRODUCTION**

The genus *Distichophyllum* Dozy & Molk. is the largest of several genera recently placed in the family Daltoniaceae (Ho *et al.*, 2012). It comprises about 100 accepted species worldwide and is distributed mainly in tropical and subtropical regions (e.g. Frey & Stech, 2009; Ho *et al.*, 2012). The members of the genus are characterized by plants that are sparingly branched and usually complanately foliate, with unicomitate leaves, marginal laminal cells mostly differentiated as a distinct border of elongate cells, and mitriform calyptrae (Frey & Stech, 2009; Ho *et al.*, 2010).

Thailand is one of the countries in Southeast Asia whose moss flora has been intensively studied (e.g. He, 1998; Akiyama, 2006). Recently, nine species and three varieties of *Distichophyllum* have been reported from this area (e.g. He, 1998; Akiyama, 2006; Ho *et al.*, 2010). The discovery of new species and new records of mosses from Thailand (e.g., Ho *et al.*, 2010; Printarakul *et al.*, 2014; Hassama & Chantanaorrapint, 2015; Sukkharak & He, 2015; Juengprayoon *et al.*, 2016), suggests that many bryophyte taxa await discovery in this country.

**MATERIALS AND METHODS**

During botanical surveys to Khao Ramrome Mt., Nakhon Si Thammarat province, in southern Thailand, some interesting collections of the genus *Distichophyllum* were discovered.

Based on the literature and comparisons with herbarium specimens, the unknown collections were identified as *D. armatum* (E.B. Bartram) B.C. Ho & L. Pokorny which is a new record for the country. The distinctive characters of the species were illustrated with the aid of an Olympus drawing tube. The description and illustrations below are based on the recent collections in Thailand.

**TAXONOMIC TREATMENT**

*Distichophyllum armatum* (E.B. Bartram) B.C. Ho & L. Pokorny, Bot. J. Linn. Soc. 170: 172. 2012. (*Fig. 1*)


Plants yellowish green to dark green, turning to brownish green in herbarium specimens, 0.65–1.2 cm long, 0.3–0.4 cm wide with leaves, rarely branched. **Rhizoids** reddish brown to magenta, dense at base of stem, sparse along ventral surface of stem, absent from apex. **Stems** dark green to brown, in cross section 8–12 cells across; epidermal cells in 1–2 layers, slightly thick-walled; cells of the cortex larger in size and thin-walled. **Axillary hairs** filiform, up to 2 per leaf, consisting of 2 cells long; terminal cell inflated, 25–32 µm long; basal and intermediate cells smaller, 12–18 µm long. **Leaves** monomorphic, not complanate, slightly recurved to flexuose when dry, erect-spread, strongly carinate at base when moist; narrowly elliptic to oblanceolate, 2.5–4.3 × 0.7–1.2 mm wide; apex long acuminate to attenuate, acumen 320–400 µm long;
margins entire; border weakly defined, consisting of 1–2 rows of linear cells; costa weakly defined, about 3/5–2/3 of leaf length. Lamina cells somewhat homogeneous, thin-walled, rhomboidal to oblong hexagonal; cells in upper half of leaf 80–97 × 20–25 µm; cells in lower half longer, 102–130 × 23–27 µm.

 Dioecious. Perigonal leaves not seen. Perichaetial leaves yellowish green, narrowly ovate, 0.4–0.45 × 0.1–0.12 mm wide, acute to acuminate, entire. Seta slender, 6.2–7.1 mm long, reddish brown, smooth below, slightly scabrous above. Capsule erect, oblong, 2–2.5 mm long; operculum long rostrate, beak ca. 0.7 mm long; outer peristome teeth yellowish orange, lanceolate, papillose; inner peristome teeth as long as outer peristome, with high basal membrane. Calyptra mitriform, ca. 1 mm long, with fringed hairs at the base. Asexual reproduction by gemmae; gemmae light green, filiform, 320–345 µm long, occurring on adaxial surface of leaf base.


Distribution: Indonesia (Ceram, Sumatra), Malaysia (Pahang, Sabah), The Philippines (Mindanao), and new to Thailand (Nakhon Si Thammarat).

Habitat: In Thailand, Distichophyllum armatum was usually found growing on bamboo nodes in lower montane forest, at altitude 945 m.

Notes: Distichophyllum armatum is easily separated from the other species of Distichophyllum in Thailand by 1) nearly terete plants with monomorphic leaves, 2) long acuminate to attenuate leaf apex, 3) leaf borders and costa weakly defined, 4) rhomboidal to long-hexagonal leaf cells, and 5) axillary hairs consisting of 2 short cells. Distichophyllum armatum might be confused with D. cuspidatum (Dozy & Molk.) Dozy & Molk., a widely distributed species, which also has monomorphic leaves with long-acuminate apices. Distichophyllum cuspidatum, however, differs from D. armatum in having well-developed leaf borders and the long-cuspidate leaf apex. Lamina cells of D. armatum are rhomboidal to long hexagonal, whereas those of D. cuspidatum are uniformly round-hexagonal. Moreover, their axillary hairs also differ in shape and size.

Distichophyllum armatum was first described as Daltonia armata E.B. Bartram, based on a collection from Mindanao, The Philippines (Bartram, 1944). Based on recent molecular data, Ho et al. (2012) transferred it to the genus Distichophyllum. Distichophyllum armatum was previously known from The Philippines (Mindanao), Indonesia (Ceram, Sumatra), and Malaysia (Pahang, Sabah) (Tan & Robinson, 1990; Mohamed & Robinson, 1991; Ho et al., 2010). Akiyama (2006) reported Daltonia armata from Doi Inthanon National Park, northern Thailand, based on his collection, Akiyama Th-187 (HYO). However, after careful re-examination, this collection was determined as Daltonia angustifolia Dozy & Molk. Therefore, this is a significant discovery being a new record for Thailand which also constitutes the northernmost location for Distichophyllum armatum. In Thailand, it is known only from Nakhon Si Thammarat province but it may have a wider distribution and occur in other areas of southern Thailand.

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LITERATURE CITED


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