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New Records of Seagrass Flora in Air Bangis West Sumatera

Eni Kamal[1*)], Japar Sidik Bujang[2)], dan Muta Hara Zakaria[2)]

[1)]Faculty of Fisheries, Universitas Bung Hatta Padang West Sumatra,
[2)]Department of Biology, Faculty of Science and Environmental Studies, Universitas Putra Malyasia, 43400 UPM Serdang, Selangor, Malaysia

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ABSTRACT

Seagrasses in the Air Bangis Archipelago, west coast of Sumatra were found growing in sandy muddy substrates of the shallo coastal waters at depth of 0.3-2.5 m, dominated by degraded coral reefs around the off-shore islands. Two species; *Enhalus acoroides* (L.f) Royle and *Thalassia hemprichii* (Ehrenb) Aschers were observed at Pulau Unggas, Pulau Pasir Panjang and Teluk Tapang. *Halodule uninervis* (Forssk) Aschers was observed in two locations; Pasir Panjang and Teluk Tapang. The occurrence of this species is unknown previously and therefore it is a new flora record for Sumatra. With this new record, Sumatra has six species of seagrasses, contributing to half of total number of seagrasses occurring in Indonesia. According to leaf width measurements, two morphological variants (narrow and wide leaved) can be distinguished for *Halodule uninervis*. In addition, descriptions of the species and their habitat characteristic are provided.

Keywords: Air Bangis, *Enhalus acoroides, Halodule uninervis,* Seagrasses, species, *Thalassia hemprichii*

INTRODUCTION

Past records based on various collections from 1919 to 1936 indicated that five seagrass species were found in east coast of Sumatra (den Hartog, 1957; 1970). The five species were *Enhalus acoroides* (L.f) Royle, *Thalassia hemprichii* (Ehrenb) Aschers, *Halophila ovalis* (R.Br) Hook. F, *H. minor* (Zoll) den Hartog, *H. spinulosa* (R.Br) Aschers and *Cymodocea rotundata* Ehrenb & ex Aschers. Presently, the occurrence of seagrasses e.g. *Enhalus acoroides, Thalassia* sp. and *Halophila* sp. was also noted in east coast of Sumatra by various authors; Soeharmoko (1985), Kusdiarti *et al.*, (1989) and Erlambang and Siregar (1995). To date there are no available information on seagrasses from the west coast of Sumatra.

During an extensive survey in December 2009 we have collected specimens of seagrasses from the waters of Air Bangis Archipelago (Figure 1); Pulau Panjang (0° 11' 22.7" N, 99° 18' 51.7" E), Pulau Unggas (0° 13' 20.2" N, 99° 18' 05.9" E), P. Taming (0° 11' 12.3" N, 99° 18' 30.8" E) and Teluk Tapang (0° 13' 13.6" N, 99° 16' 03.4" E). This paper reports species from the west coast of Sumatra. Ecology and habitat information are also provided.

*Telp: +6281363389898
Email: ekamal898@yahoo.com

MATERIALS AND METHODS

Field surveys were undertaken in the waters of Air Bangis Archipelago intertidally. Specimens were collected with hand and a shovel, stored in plastic bags and preserved in 4% formalin and processed into herbarium following the method of Menez *et al.*, (1983). After identification based on den Hartog (1970), specimens were lodges at the Herbarium of Department of Biology, Faculty of Science and Environmental Studies, Universiti Putra Malaysia (UPM) at Selangor, Malaysia and the Faculty of Fisheries, Universitas Bung Hatta (UBH), West Sumatra. Observation was made of habitat type and environmental condition (salinity, depth or tidal height, sediment type) were observed.

RESULTS AND DISCUSSION

Historical and Present Records. Five seagrass species have been reported and almost all were records from the Riau Archipelago, Eastern Sumatra (den Hartog, 1970). Specimens of seagrasses were placed at various herbaria around the world at: British Museum (Natural History), London, England (BM); Herbarium Bogoriense, Bogor, Indonesia (BO); Herbarium of the Royal Botanic Gardens, Kew, Richmond, England (K); Rjiksherbarium, Leyden, the Netherlands (L); Herbarium of the National University of Singapore (before

Herbarium of the Botanic Gardens, SING) and Botanical Museum and Herbarium, Utrecht, the Netherlands (U). The records are given as follows:

Family HYDROCHARITACEAE. *Enhalus acoroides* (L.f.) Royle. Riau Archipelago: Pulau Bintan-Tanjung Pinang, 1-7-1919, Bunnemeyer 6521 (L); Bangka, Blinju, undated, J.E. Teysmann (L).; Enggano, south coast, south of Boea, 4-6-1936, W.J. Lutjeharns 5331 (L, K); Enggano, beach near Kaja apoe, 3-7-1936, W. J. Lutjeharms 5311 (L, K).

Halophila ovalis (R. Br.) Hook. f. Riau Archipelago: Pulau Bintan-Tanjung Pinang, 1-7-1921, Bunnemeyer 6524 (L, BO); Pulau Penyengat, 8-11-1930, Md Nur 24602 (SING).

Halophila spinulosa (R. Br.) Aschers. Riau Archipelago: Pulau Penyengat, shallow water in mud, 8-11-1930, Md Nur 24100 (BO, SING).

Thalassia hemprichii (Ehrenb.) Aschers. Riau Archipelago: Tanjung Pinang, date and collector unknown (BO).

Family CYMODOCEACEAE. *Cymodocea rotundata* Ehrenb. & ex Aschers. Riau Archipelago: Tanjung Pinang, undated, Teysmann (BO).

At present, there have been reports on the occurrence of seagrasses; *Enhalus acoroides, Thalassia* and *Halophila* species inhabiting the intertidal and muddy areas of Bintan Island, Riau Archipelago (Soeharmoko, 1985; Kusdiarti *et al.*, 1989; Erlambang & Siregar, 1995).

Additional records from Air Bangis Archipelago, Western Sumatra obtained from our study are as follows:

Family HYDROCHARITACEAE

***1. Enhalus acoroides* (L.f.) Royle, Figure 2.**

Synonym: *Stratiotes acoroides* L.f.
Vallisneria sphaerocarpa Blanco

Common name: Tropical eelgrass

Distribution and Ecology. Pulau Panjang-Moderate population growing together with *Halodule uninervis* (narrow leaved variant) and *Thalassia hemprichii* in the lower inter-tidal zone (depth 0.8-1.5m) on sand covered coral rubbles and dens pure population in the upper sub-tidal zone (depth 1.5-2.0 m) on sandy-muddy substrates. Male and female flowering specimens were collected in this area.

Pulau Unggas-A sparse and isolated patches were found growing on muddy sand and occasional plants were observed growing on sand covered dead corals. No flowering specimen was found.

Teluk Tapang-Moderate population covering large areas growing together with *Thalassia hemprichii* on sandy substrate (depth 1.0-1.2 m) directly in front of the mangrove. Further away from the mangrove, *Enhalus* population formed patches or only as occasional plant with *Thalassia hemprichii* and *Halodule uninervis* (wide leaved variant). In shallow water (depth 0.3-1.0 m), *Enhalus* and the associates grew on sand covered coral rubbles and dead coral. No flowering specimen was found.

Pulau Taming-Sparse population and occasional plants was observed growing with *Thalassia hemprichii* on sand covered dead corals. No flowering specimen was found.

Description. Plants large, dioeciously; rhizomes 13-25 mm thick with long, black fibrous bristles; usually embedded in the substratum numerous anabranches root varies 125 to 330 mm in length and without root hairs. Shoot produced at the nodes with 1-5 leaves. Leaf blades, dark green, flat and linear, 230-530 mm long and 13-17 mm wide with many parallel veins; midrib conspicuous; leaf tip rounded or obtuse; leaf margins entire. Male inflorescence on a short peduncle reaching 30 mm long; spathal leaves ovate-lanceolate, obtuse keeled measured 45 mm long and 16 mm wide. Rough

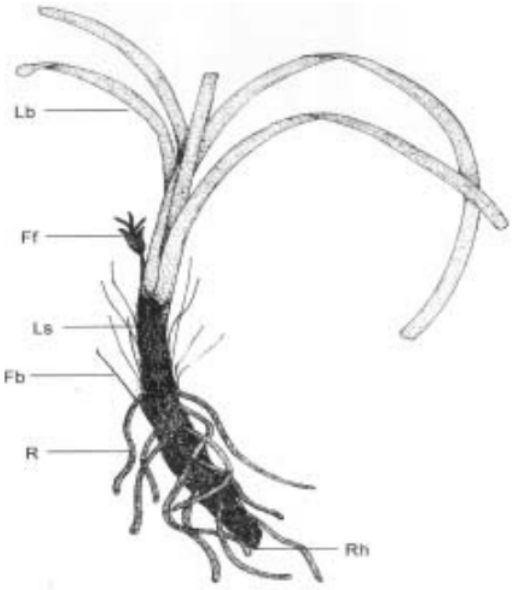

Figure 2. Enhalus acoroides (L.f) Royle, habit, Fb-fibrous bristle, Ff-female flower, Lb-leaf blade, Ls-leaf sheath, R-root, Rh- rhizome.

hairs covered along the keels and nerves. Young female inflorescence on a peduncle reaching 25 mm; spathal leaves oblong-lanceolate, obtuse and strongly keeled measured 38-41 mm long and 9-10 mm wide; petals oblong with length 14-21 mm and 1-2 mm in width.

***2. Thalassia hemprichii* (Ehrenb.) Aschers., (Figure 3)**

Synonym: *Schizotheca hemprichii* Ehrenb

Zostera marina sensu Gaudichaud, non L.

Common name: Dugong grass

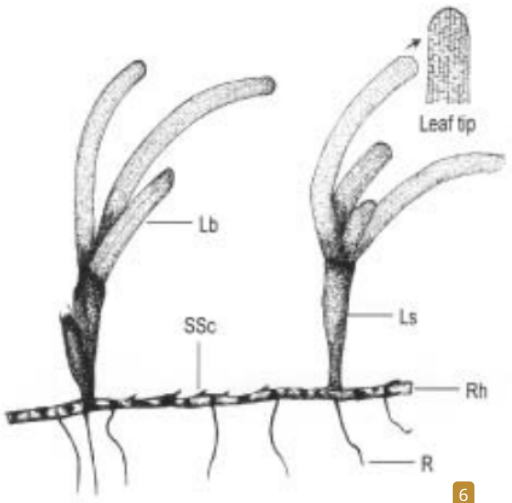

Figure 3. Thalassia hemprichhii (Ehrenb.) Ascher, habit. Lb-leaf blade, Ls-leaf sheath, R- root, Rh- rhizome and SSc-shoot scar.

Distribution and Ecology. The species was observed to occur along coastlines (Figure 1) of Pulau Panjang, Pulau Unggas, Teluk Tapang and Pulau Taming. Usually growing as mixed meadows together with *Enhalus acoroides* and *Halodule uninervis*. *Thalassia hemprichii* relatively buried deep under sand covered coral rubbles and corals. The local distribution in the 4 islands are as described in the *Enhalus* section.

Description. Plants moderate in size; rhizomes are robust reaching to 1.5-2.0 mm in diameter; conspicuous shoot scars present between the successive erect shoots; internodes, 20-55 mm long; 1-2 roots per node; roots possessing dense fine root hairs. Erect shoots, 5-12 mm long bearing 3-4 leaves which is distichously arranged on short lateral branches arising from the rhizomes. Leaf blade linear, falcate, 43-87 mm long and 4-8 mm wide; dark green colour; leaf tip is rounded and sometimes slightly serrated; midrib conspicuous; leaf margin entire. The basal leaf sheath is 25-40 mm, remnants of sheath often forming a dense clump surrounding the base of erect shoot.

Family CYMODOCEACEAE. *Halodule uninervis* (Forssk.) Aschers., (Figure 4)

Synonym: *Zostera uninervis* Forssk.

Halodule australis Miq.

Diplanthera uninervis (Forssk.) Aschers.

Common name: Fiber-strand grass

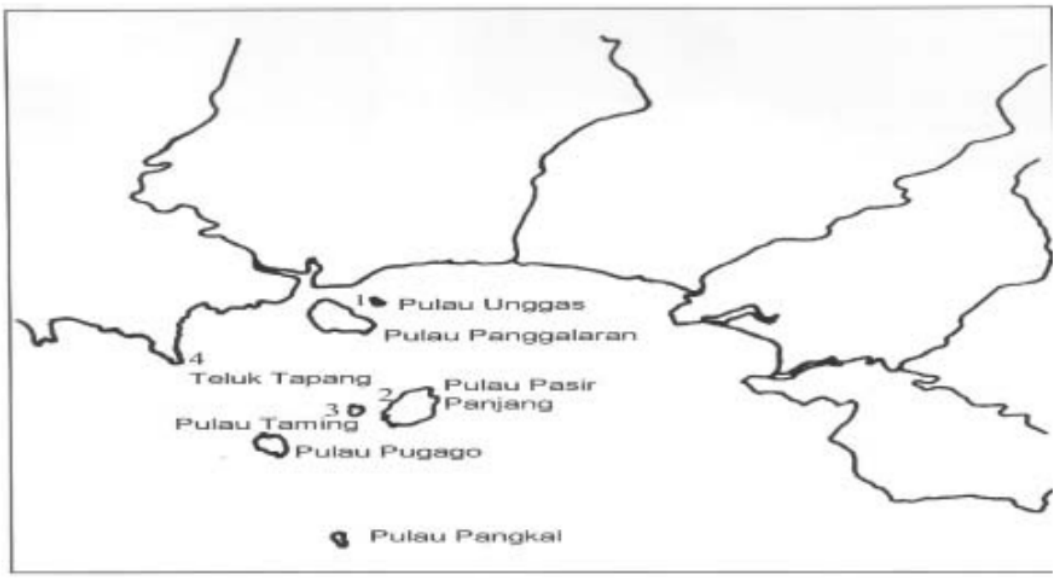

Figure 1. Map of Air Bangis archipelago showing the location of seagrasses. 1-north-western and southern coasts of Pulau Unggas, 2-north-eastern coast of Pulau Panjang, 3-western coast of Pulau Taming and 4- eastrn coast of Teluk Tapang.

Distribution and Ecology. Observed to occur along coastline (Figure 1) of Pulau Panjang and Teluk Tapang. Usually growing as mixed meadows together with *Enhalus acoroides* and *Thalassia hemprichii* on the sand covered coral rubbles and dead corals. The local distribution in the 2 islands are as described in the *Enhalus* section. The narrow leaved variant is observed in Pasir Panjang while the wide leaved variant is from Teluk Tapang.

Description. Based on measurement of leaf width, *Halodule uninervis* can be categorized as narrow (~1 mm) and wide leaved (2-4 mm) variants.

Narrow leaved variant. Plant small; rhizomes, 1.0 mm in diameter; internodes, 9-20 mm long; 1-5 roots with fine lateral hairs emanate from each node. Erect shoot possessing 1-3 flat, linear leaf blades,44-85 mm long and 1.0-1.1 mm wide; leaf green to dark green in colour; leaf tip tridentate which ends in three distinct points of teeth; midrib conspicuous. The lateral teeth are well-developed and acuminate while the median tooth is blunt. Leaf sheath, 15-27 mm long.

Wide leaved variant. Plant with rhizomes, 1.0-1.5 mm in diameter, internodes, 4-17 mm long; 2-6 roots with fine lateral hairs emanate from each node. Erect shoot possessing 1-3 flat, linear leaf blades, 30-140 mm long and 2.0-3.5 mm wide; leaf green to dark green in colour; leaf trip tridentate which ends in three distinct points of teeth; midrib conspicuous. The lateral teeth are well-developed and acuminate while the median tooth is blunt. Leaf sheath, 17-23 mm long.

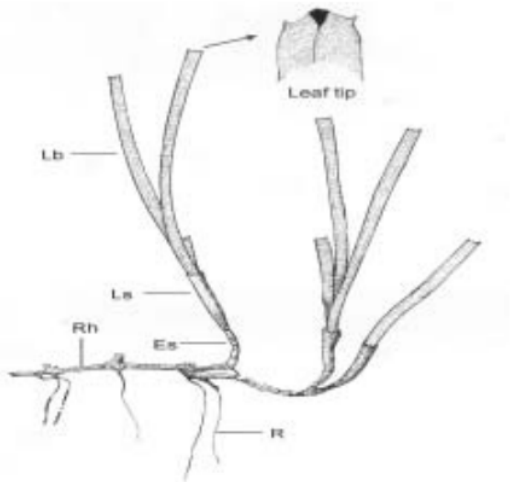

Figure 4. *Holodule uninervis* (Forssk) Asher, - widw leaved variant, habit.Es-erect shoot, Lb-leaf blade, Ls-leaf sheath, R- root, Rh- rhizome

Studies on seagrass species diversity and geographical distribution have been conducted in Indonesia particularly for Flores Sea (Nienhuis *et al.*, 1989), Sunda Strait (Kiswara, 1991), Banten Bay (Kiswara, 1992a), Jakarta Bay (Kiswara, 1992b), and, Kuta Bay and Gerupuk Bay in Lombok (Kiswara, 1996). Based on these findings, Indonesia has 12 species of seagrasses; *Enhalus acoroides, Thalassia hemprichii, Halophila decipiens, H. minor, H. ovalis, H. spinulosa, Cymodocea rotundata, C. serrulata, Halodule pinifolia, H. uninervis, Syringodium isoetifolium* and *Thalassandendron ciliatum*. For Sumatra, in particular the east coast, seagrass records include five species viz., *Enhalus acoroides, Thalassia hemprichii, Halophila ovalis, H. spinulosa* and *Cymodocea rotundata*.

Few works on seagrass flora have been conducted along the west coast of Sumatra. Seagrass in the west coast of Sumatra were found growing in sandy to sand muddy substrates of the shallow coastal waters at depth of 0.3-2.5 m, area dominated by degraded coral reefs around the off-shore island. In the present investigation, two species; *Enhalus acoroides* and *Thalassia hemprichii* were observed in all locations. *Halodule uninervis* was observed in two localities; Pasir Panjang and Teluk Tapang. The occurrence of this species has not been noted by den Hartog (1957; 1970), Soeharmoko (1985), Kusdiarti *et al.*, (1989) and Erlambang and Siregar (1995) in the east coasts and therefore it is a new flora record for Sumatra. With this new record, Sumatra has 6 species of seagrasses, contributing to half the total number of seagrasses occurring in Indonesia.

With increasing intensities of survey and covering a wider area along the coastlines of the mainland Sumatra and its off-shore islands, it is anticipated that more species and their habitats will be known in the future.

CONCOLUSION

Seagrasses in the Air Bangis Archipelago, west coast of Sumatra were found growing in sandy muddy substrates of the shallow coastal waters at depth of 0.3-2.5 m, dominated by degraded coral reefs around the off-shore islands. Two species; *Enhalus acoroides* (L.f) Royle and *Thalassia hemprichii* (Ehrenb) in all locations. Aschers were observed at Pulau Unggas, Pulau Panjang and Teluk Tapang. Pulau Taming-Sparse

population and occasional plants was observed growing with *Thalassia hemprichii* on sand covered dead corals.

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