NOTE

Sonneratia ovata (Sonneratiaceae) – A New Distributional Record for India from Andaman and Nicobar Islands

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ABSTRACT: *Sonneratia ovata* Backer was found from Havelock, Andaman and Nicobar Islands, representing a new addition to the mangrove flora of India. This species lacks petals and is characterized by the finely warty calyx, the lobes of which are red on the inner side and by the adpressed calyx lobes in fruit. Since *S. ovata* is considered rare as a whole, conservation measures are imperative for managing the mangrove diversity of the Islands with special reference to this species.

KEY WORDS: Andaman and Nicobar Islands, floristic affinities, India, mangrove, new record, *Sonneratia.*

INTRODUCTION

Sonneratiaceae is a small tropical family consisting of two small genera *Sonneratia,* ranging from East Africa through Indo-Malaya to tropical Australia and into Micronesia and Melanesia (Tomlinson, 1986) and *Duabanga,* which is confined to Southeastern Asia (Shi et al., 2000). *Sonneratia* is a typical mangrove genus (Backer et al., 1954) comprising of nine species (Wang and Chen, 2002) and the inland genus *Duabanga* is an evergreen component of the rainforest belt (Backer et al., 1954) comprising of two species and has a more restricted range (Tomlinson, 1986). In India, including Andaman and Nicobar Islands, four species of *Sonneratia viz., Sonneratia alba* Smith, *S. caseolaris* (L). Engler, *S. griffithi* Kurz. and *S. apetala* Buch. Ham. have been recorded so far (Parkinson, 1923; Dagar et al., 1991; FAO, 2005; Kathiresan and Rajendran, 2005; Mandal and Naskar, 2008). Recent floristic expeditions revealed the presence of *Sonneratia ovata* from Havelock Island, South Andaman which is being reported herein as a new distributional record for India.

TAXONOMIC TREATMENT

Key to the species of *Sonneratia* in India

1a. Leaves narrowly elliptic to lanceolate, gradually tapering towards apex, narrowed to short petiole at base, calyx lobes 4(–6), up to twice as long as the tube; ovary 5–8 celled; stigma peltate and umbrella shaped, 1.5–2 cm; petals absent; stamens white ……..... ……..… ***S. apetala***

1b. Leaves, elliptic to broadly ovate, oblong, obovate, or suborbicular; usually 5 cm wide or wider, abruptly narrowed to the rounded or even emarginated apex; calyx usually 6–8 lobed; ovary 14–21 celled; stigma capitate; petals present or absent; stamens red, white, or red and white ……..…… 2

2a. Calyx flat, extended horizontally, not enclosing the ripe fruit, obscurely ribbed ……..…… 3

2b. Calyx cupular, enclosing the base of the ripe fruit, prominently ribbed ……...…… 4

3a. Twigs not pendulous; leaves obovate to sub-orbicular; base rounded, petiole scarcely developed, midrib green throughout; veins conspicuous, prominent on the upper blade surface; petals absent; stamens white ……..... ***S. griffithi***

3b. Twigs pendulous, slender; leaves broadly elliptic or oblong with minute, recurved tip; petiole short with reddish pink base, midrib often red at base; veins inconspicuous, not prominent, petals usually present; stamens red; sepals adaxially green or sometimes red-streaked ……..... ***S. caseolaris***

4a. Leaves ovate to oblong-ovate with short thick petiole; apex of fruit not depressed at base of style; tube of the fruiting calyx smooth, lobes usually reflexed, may also be flattened into a plane; petals present; stamens white, sometimes pink at base …..…….. ***S. alba***

4b. Leaves broadly ovate, as broad as long with a distinct narrow petiole, mucro absent, apex of fruit depressed at base of style; tube of the fruiting calyx finely verruculose, lobes ascending, petals mostly absent, rarely vestigial, white; stamens white ..…. ***S. ovata***

Sonneratia ovata Backer, C.A. Backer, *Bulletin du Jardin Botanique* Jardin Botanique De Buitenzorg Sér. III, 2: 329. 1920; C.A. Backer & C.G.G.J. van Steenis, Sonneratiaceae. *Flora Malesiana* Sér. I, 4: 286–289. 1951; N.C. Duke & B.R. Jackes, A systematic revision of the mangrove genus *Sonneratia* (Sonneratiaceae) in Australasia. *Blumea*

32, 277–302. 1987. Fig. 7. 大葉海桑 Fig. 1

Columnar tree *c.* 7.2 m high with quadrangular branches when young (Fig. 1A); trunk base not buttressed; bark slightly flaky (Fig. 1B), pale brown to grey; pneumatophores thin, pointed, *c.* 37 cm high (Fig. 1C). Leaves simple, opposite, broadly ovate, 5.3–9.0 cm × 4.1–8.6 cm, rounded or subcordate at the base, leaf apex obtuse, mucro absent, upper surface glossy, lower surface satiny (Fig. 1D), mid-vein not reddened; petiole 5.7–6.9 mm long; terete, reddened (Fig. 1G). Inflorescence-with 1–3 buds (Fig. 1E), mature flower bud-with obtuse apex, broadly oval and covered with small warts (Fig. 1F). Flower bisexual, solitary or occur in groups of three at the tops of stems. Calyx lobes usually 6, rarely 5 (Fig. 1I), 2.6–4.6 cm long, obtuse apex, inner surface strongly tinged with red at base (Fig. 1J); remain attached to the fruit enveloping the berry. Petals absent. Stamens white and numerous which fall off quickly within hours of anthesis. Anthers yellow, dorsifixed, (Fig. 1H). Ovary multilocular (Fig. 1L). Berry globose, 4–6 cm by 3.5–4.5 cm wide (Fig. 1K); pericarp leathery; apex of fruit depressed at base of style. Seeds numerous; rounded and irregular.

Specimen examined: INDIA, South Andaman, Havelock Island, Radha Nagar Beach (11°59'04.7"N 92°57'18.7"E) 13/05/2009 M. Kaliyamoorthy and M.P. Goutham Bharathi (s n 25536 PBL). Four trees were observed in the muddy soil, along the tidal creek on the landward margin of mangroves.

DISCUSSION

Though *Sonneratia* trees are relatively uniform in their vegetative features (Tomlinson, 1986), *S. ovata* can be distinguished by several attributes including the presence of a finely warted texture on the calyx surface forming a cup enclosing the base of the fruit, fruit apex that is depressed at the base of the style (Tomlinson, 1986; Duke and Jackes, 1987; Jayatissa et al., 2002), leaf shape and texture, absence of a leaf mucronate apex and habitat (Jayatissa et al., 2002). A unique character of *Sonneratia ovata* is its occurrence only near the terrestrial fringe (Duke and Jackes, 1987) and never on hard substrata like coral reefs (Geisen et al., 2007). The salient characteristic features of the all the reported species of *Sonneratia* in India are tabulated in Table 1.

Sonneratia ovata is an uncommon species and not yet observed in great detail (Duke and Jackes, 1987) and is considered rather rare as a whole in Asia (FAO, 2005). Among the 30 countries that have mangrove vegetation in the Indian Ocean region, *Sonneratia ovata* has been reported only from four *viz.,* Indonesia, Malaysia, Thailand and Singapore so far (Kathiresan and Rajendran, 2005). The present record of *Sonneratia ovata* from Andaman and Nicobar Islands represents not only a new addition to the mangrove flora of India but also presents compelling evidence of its floristic affinities towards Southeast Asian countries. Further, it highlights the need for extensive floristic expeditions and calls for focussed efforts for conservation such as regular updating of information on the extent and status of mangroves. Since the rural population in Asia have traditionally used mangroves as a source of wood and non-wood forest products (FAO, 2005), they should be sensitized on rare species for conservation of mangrove diversity in the Islands.

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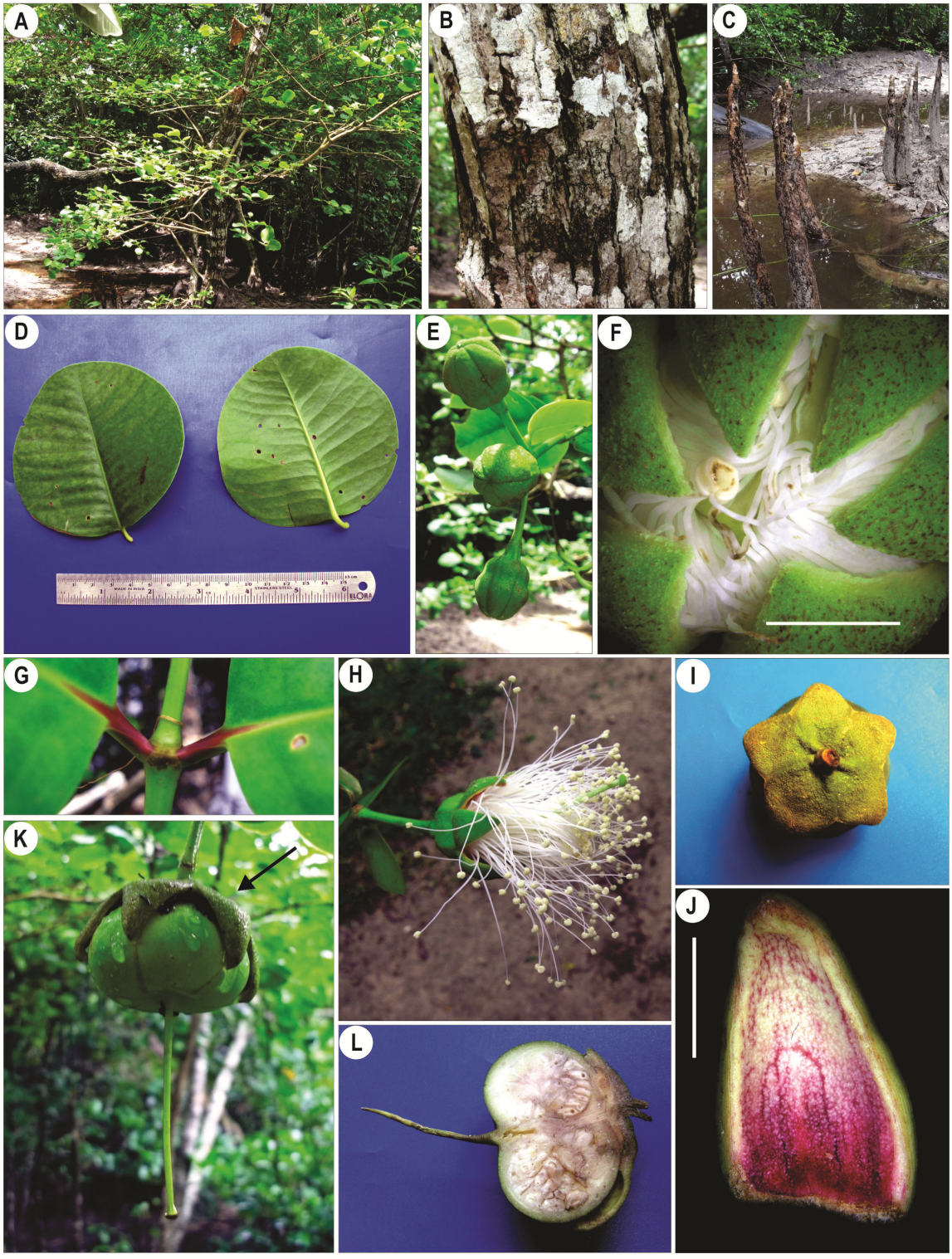

Fig. 1. The new record of *Sonneratia ovata* Backer for India with its vegetative and floral characters. A: habit. B: slightly flaky bark. C: pointed pneumatophores. D: ovate leaves. E: Inflorescence with 3 buds. F: partially opened bud with finely warted calyx, end view. G: reddened petiole. H: flower. I: calyx with 5 lobes. J: inner surface of the calyx lobe tinged with red. K: berry with enveloping sepals. L: cross section of berry showing multilocular ovary. Scale bar: 5 mm.

Table 1. Salient characteristic features of *Sonneratia* species in India

Characters	*S. alba*	*S. apetala*	*S. caseolaris*	*S. griffithi*	*S. ovata*
Bark	cream-coloured to brown; smooth longitudinal fissures.	thin, light brown, irregularly fissured.	pale brown, smooth; furrows at maturity.	deep or pale brown, smooth when young; fissures at maturity.	pale brown to grey; slightly flaky
Leaves	elliptic to ovate or obovate	narrowly elliptic to lanceolate, gradually tapering towards an obtuse apex; nerves and veins indistinct	ovate-elliptic or broadly oblong, apex rounded with minute, recurved tip, veins conspicuous	obovate or suborbicular, apex rounded, veins conspicuous	broadly ovate to suborbicular, apex obtuse, mucro absent
Leaf base	rounded	attenuate	rounded	cuneate	reniform
Petals	white	absent	red; linear	absent	absent
Staminal filaments	white	white	red; sometimes white distally	white	white
Seeds	falcate	falcate	irregularly angular	angular	rounded irregular
Inflorescence	terminal cyme occur either solitarily or in groups of three	terminal cyme from branch axis	solitary cyme or few flowers on outer pendulous wing	solitary cyme on terminal and lateral branches	terminal cyme occur either solitarily or in groups of three

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來自印度安達曼－尼科巴群島的新紀錄分佈－大葉海桑（海桑科）

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摘要：本文報導在印度安達曼－尼科巴群島發現的大葉海桑新紀錄分佈，此種缺少花瓣，且花萼表面長有細瘤，萼片內面為紅色並緊貼果實。由於此種族群稀少，因此迫切需要對群島上的紅樹林進行保育評估。

關鍵詞：印度安達曼－尼科巴群島、植物區系、印度紅樹林、新紀錄分佈、海桑屬。