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OBSERVATIONS ON THE DISTRIBUTION OF THE RARE *SURIANA MARITIMA* L. (SURIANACEAE) IN THE GULF OF MANNAR BIOSPHERE RESERVE, SOUTHERN INDIA

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ABSTRACT

Suriana maritima earlier found to occur only on the Kurusadai and Shingle Islands in exceedingly small numbers in the Gulf of Mannar, now seen occurring on the Pumarichan and Pullivasal Islands too in reasonably good numbers. A detailed description of this species is provided with an illustration. It is rare in the Gulf of Mannar Biosphere Reserve. The probable casual factors for its rarity are discussed and the need for further investigations is stressed.

INTRODUCTION

Suriana maritima is reportedly a pantropical species (Nooteboom, 1962). Among the earlier works related to the Indian flora that of Wight and Arnott (1834) seems to be the first to enumerate *S. maritima* mentioning *inter alia* as a sea-side shrub, but no locality. Bennett (1875) in the Flora of British India gave the distribution as "throughout the tropical shores of India", but again cited no specimens. From the present Indian territory it appears that it was Prain (1892) who reported this species from the Laccadives citing exact localities and collectors' names. Though Parkinson (1923) enumerated it in his forest flora of the Andaman Islands he stated that it was said to be a native of these islands but he had seen no Andaman specimens. Rao (1986) too did not see any specimen. Iyengar (1927) who incidentally studied the angiosperms of the Kurusadai Island while seriously studying the algae seems to be the first to collect and record *S. maritima* for peninsular India. Fischer (1936) enumerated it in the Addenda of Gamble's flora of the Presidency of Madras based on that of Iyengar (1927). Later a few workers collected (almost all of them from the same patch on the Kurusadai Island) and/ or reported this species (Chacko *et al.*, 1953; Rao, 1963; Ramachandran & Balasubramaniam, 1991; also *vide* specimens examined). In his revision Basak (1980) gave the distribution of this species in India as "small islands along the coast such as Rameswaram, Kurusadi,

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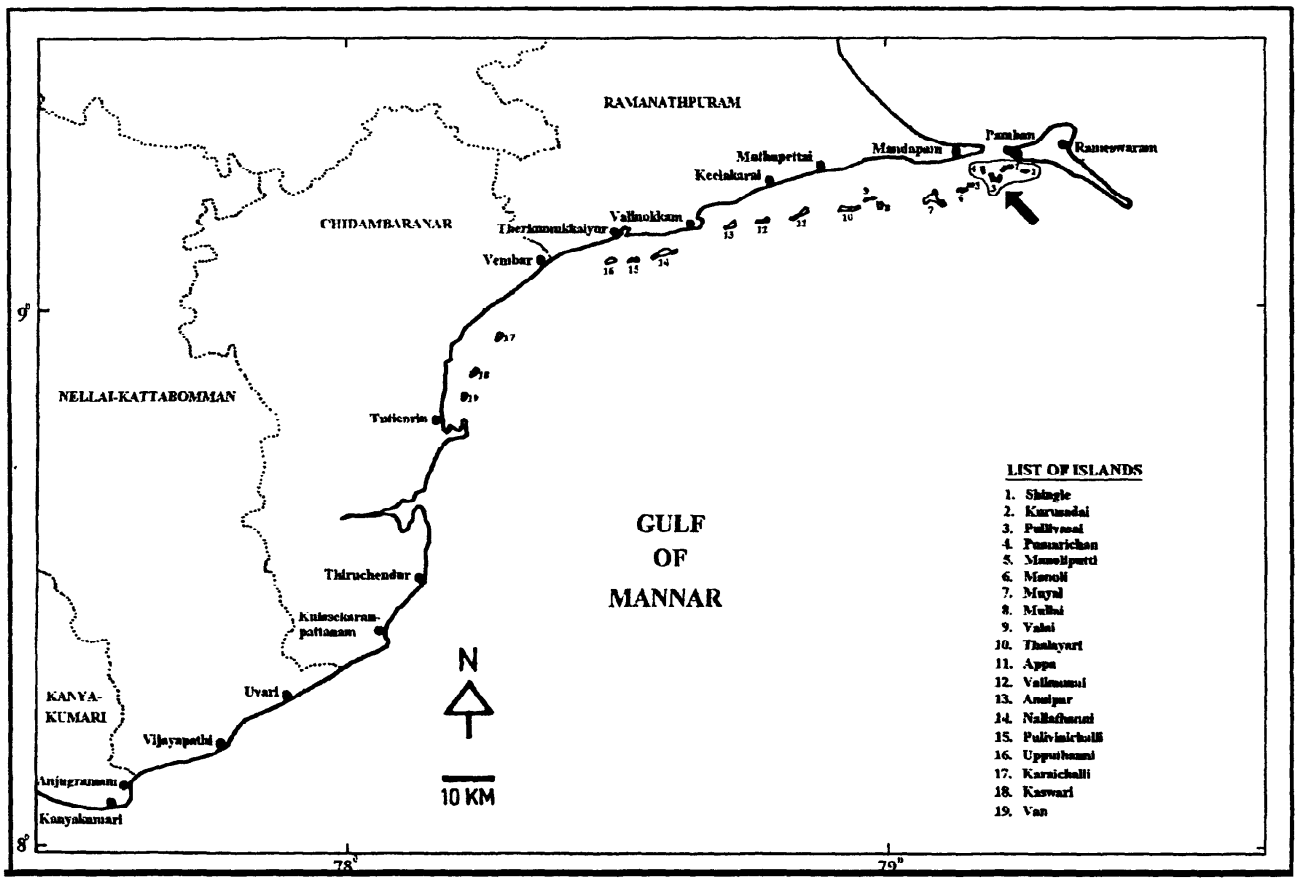


Fig 1. Distribution of *Suriana maritima* L.

Shingle (Tamil Nadu), Andaman and Nicobar Islands and Kavarathy, Agathi, Betra Par and Maldiv in the Minicoy and Lakshadweep group of islands." However, it has never been collected at Rameswaram at any time.

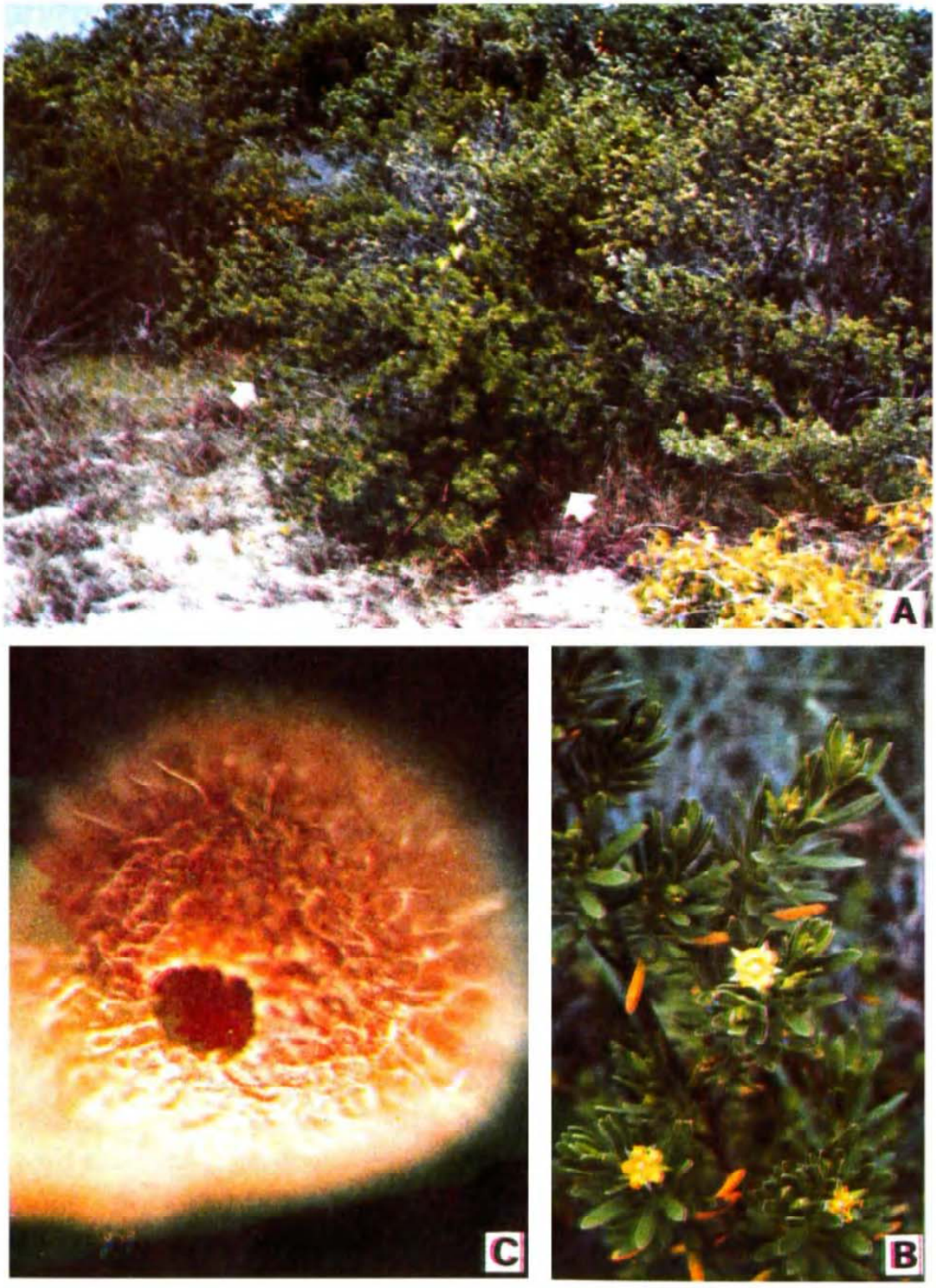
The islands of the Gulf of Mannar Biosphere Reserve were intensively explored for an inventory of the flora therof. As *S. maritima* was earlier known to occur only in this part of peninsular India earnest efforts were made to study the populations in the entire bisophere reserve. Based on the material collected a detailed description is provided with an illustration. It is found to be a rare species. Based on our observations as well as a comparison with that of earlier workers elsewhere some critical comments are presented.

Suriana maritima L., Sp. Pl.: 284. 1753; A.W. Bennett in Hook.f., Fl. Brit. India 1:522. 1875; Prain in J. Bombay Nat. Hist. Soc. 7:464. 1892; Trimen, Handb. Fl. Ceylon 1:231. 1893; C. Parkinson, Forest Fl. Andaman Isl.: 112. 1923; Iyengar in Bull. Madras Govt. Mus. 1:186. 1927 (as "*maratima*"); C. Fischer in Gamble, Fl. Madras, Addenda: 1872. 1936; Chacko *et al.* in Contrib. Mar. Biol. Stat., Kurusadai Isl. 3: 13. 1953; Nooteboom in Steenis, Fl. Males. I, 6: 196. 1962; T.A. Rao *et al.* in Bull. Bot. Surv. India 2:146. 1963; Basak in Fasc. Fl. India 4: 17. 1980; S.R. Sriniv. in Nair & A.N.Henry, Fl. Tamil Nadu 1: 63. 1983 (Figs. 3A-J).

Shrub, up to 2 m high; young shoots sericeous; older ones glabrous; bark blackish grey, fissured; leaf scars prominent. Leaves clustered at the ends of branchlets, sessile, linear-spathulate, 1-3 × 0.2-0.5 cm, attenuate at base, entire along margins, acute at apex, densely sericeous rendering the nerves inconspicuous. Flowers bisexual, 5-merous, solitary or 2-5 in axillary or terminal cymes; bracts linear, *ca.* 3 mm long, densely pubescent; pedicels to 1 cm long, Sepals 5, imbricate, unequal, shortly connate at base, ovate-lanceolate, acute, 8-10 × 3-4 mm, coriaceous, hirsute, persistent. Petals 5, imbricate, caducous, obovate, obtuse, *ca.* 5 × 3 mm, bright yellow, falling off at the slightest disturbance. Stamens 10; fertile stamens usually 5, rarely 6; filaments subulate, *ca.* 2mm long, pilose at base; anthers subglobose, emarginate, 4-lobed, versatile, *ca.* 1 mm, yellowish; staminodes (4-) 5, opposite petals, subulate, *ca.* 1 mm long, sericeous. Carpels (4-) 5 (6-), distinct; ovary obovoid, *ca.* 1 mm long, hirsute; styles basal, persistent, *ca.* 4 mm long, hairy at base; stigma subcapitate. Fruits obovoid, with (2-) 5 (6-) carpels and persistent calyx, each *ca.* 4 × 3 mm, hirsute, 1-seeded; seeds oblong, *ca.* 2 mm long; embryo curved.

Fl. & Fr. : Almost throughtout the year.

Note : Nooteboom (9162), and Basak (1980) described *S. maritima* as a shurb or small tree, 3-8 m high. In the Gulf of Mannar Biosphere Reserve this plant is a shurb and the mostly crooked branches which arise from the base seldom attain a height of more than 2 m. Following Record and Hess (1943) who praised the virtues of the wood of the New World plants the wood is reportedly suitable for turnery (Basak, 1980; Anon., 1976; Anon., 1994). With the largest trunk not more than a few inches thick, the wood of the plants here may not be suitable for turnery. Flowers may



Figs.2. (A-C). *Suriana maritima* L.
A. A few shrubs on the Pumarichan Island (at arrows).
B. Flowering branches. C. Insect-bored × 25

be hidden in herbarium specimens as mentioned by certain authors. But in the field the unhidden bright yellow flowers can be easily spotted. (Fig. 2B)

Earlier it was collected and/or reported only from the Kurusadai Island, and the Shingle Island which is just 1.5 km away from the former in the east. During the present explorations apart from these islands plants were collected on the Pullivasal and Pumarichan Islands which are 0.5 km and 1 km respectively away from the Kurusadai Island in the southwest. Iyengar (1927) stated that in 1922 he saw one plant on the southern side of Kurusadai Island and 3 or 4 plants on the Shingle Island. Now there are about 10 plants on the same southern side (shores) of the Kurusadai Island, 400-500 plants from the middle to the eastern shores on the Shingle Island, about 50 plants on the southern shores of the Pullivasal Island and about 200 plants in atches on the eastern shores of the Pumarichan Island (Fig. 2 at arrow; Fig. 3A). Rao *et al.* (1963) who studied the vegetation of the Pumarichan and Pullivasal Islands did not mention the occurrence of *S. maritima* there. On all these islands the plants occur on loose sandy soil except Shingle where the rocky substratum is covered by a thin mantle of sand. Likewise, almost on all islands it is *Pemphis acidula* which occurs in their vicinity. At times *Acacia planifrons, Cyperus pachyrrhizus, Gloriosa superba, Indigofera oblongifolia, Lumnitzera racemosa, Salvadora persica, Sporobolus maderaspatanus, Thespesia populnea* etc. may be found but not *Scaevola* and others as in Malaysia (Nooteboom, 1962). Not only in the herbarium as pointed out by Nooteboom, (1962) but in the field as well *S. maritima* is likely to be confused with or missed for *Pemphis acidula.* However, the latter can be distinguished in the presence of a large campanulate calyx tube and the 6 larger crumpled, white petals and long and slender branches.

Granting that the observations made by Iyengar in 1922 were accurate and that the plants got established on the Shingle and Kurusadai Islands in the Gulf of Mannar sometime at the turn of the century, how do we explain the rarity of this species to the present?

Guppy's assumption (cited in Nooteboom,1962) that the plants would have been destroyed in spots as firewood by wandering islanders is unlikely was agreed to by Nooteboom (1962). The situation in the Gulf of Mannar, nevertheless, points to something contrary to this. The most-sought-after firewood by fishermen, who stay on most of the islands now and then and those stranded, is *Pemphis acidula.* It is said that once the fire is made the twigs and wood of this plant would burn very easily. *S. maritima* which usually grows in its vicinity is likely to be destroyed as firewood along with that. The Kurusadai is the most disturbed island whereas the Shingle appears to be the least disturbed. Shingle Island where Iyengar (1927) saw 3 or 4 plants in 1922 has 400-500 plants now whereas the one plant he saw on the Kurusadai Island has only 10. Of the 10 some of them had been cut down and dried. This may show that anthropogenic interference is one of the causal factors for its rarity. The manifold increase in the number of plants forming thickets on the Shingle Island over the years from the near-absence of human interference may indicate that this

insular species can best be conserved *in situ*.

Though known to exist on the Kurusadai and Shingle Islands since 1922, this species has not spread wide even on the Mandapam group of islands. There is almost profuse flowering and fruiting in the plants, and the nearby islands have almost similar soil factors (Rao *et al.*, 1963). Chances for the fruits to be dispersed by birds appear rather remote as they niether possess any special mechanisms nor do they occur in the vicinity of mud to get stuck fortuitously to the feet of birds. As pointed out by Nooteboom (1962) the fruits are likely to be dispersed by sea-water. However, how far floating logs and pumice particularly the latter could also carry them in the Gulf of Mannar is not clear. The fruits of *S. maritima* with an unfilled space in their cavity can retain the floating power up to at least 5 months (Schimper & Guppy, cited in Nooteboom, 1962). In spite of this the fruits have managed to travel not more than 1 km from the existing nearest island (the distance between the Kurusadai and the Pumarichan Island) so far. And despite the presence of near-similar situations the plants have not been able to establish on the Manoli and Manoliputti Islands which are 7-8 km away from the Kurusadai Island. May be the ocean currents were never good and kind enough to the plants to spread far notwithstanding the cyclones and storms now and then. But then, how did the plant come to get established in the Gulf of Mannar in the first instance even from the nearest point of Sri Lanka which is not less than 35 km away?

A number of dried fruits of *S. maritima* kept in the laboratory for future studies were found to have been bored by some unknown insect and the seeds eaten up (Fig. 3C). Evidently there are seed predators. The presence of such predators on the islands and large scale predation and loss of seeds as a consequence as a cause for their restricted distribution may not be ruled out.

By and large, the restricted distribution of *S. maritima* in the Gulf of Mannar Biosphere Reserve seems to be governed by intricate factors which can be unravelled only by intensive field studies exclusively meant for this purpose. With no known uses of any great significance of this species at present, from a utilitarian standpoint such a proposition might be discouraging. Nonetheless, in the current renewed frenetic quest for environment-and health-friendly plant sources for various uses it is hard to predict which one would suddenly emerge as a dark horse of a plant species as a result of researches as did *Wedelia biflora* (Miles *et al.*, 1993), another littoral species with greater similarities in its distribution and dispersal. Hence, earnest efforts might be worthwhile.

Specimens examined: SOUTH INDIA: (Tamil Nadu), Kurusadai Island, Sept., 1922, *M.O.P. Iyengar* 6019 (K, MH photo!); Kurusadai Island, 25.9.1944, *S.V. Parthasarathy & D.D. Sundararaj* 88159; Kurusadai Island, 30.1.1945, *D.D. Sundararaj & S.R. Raju* 88195; Kurusadai Island, 26.1.1946, *J. Gopal Rao* 93055 (MH); Shingle Island, 14.5.1962, *T.A. Rao* 1549 (CAL); Kurusadai Island, 30.12.1987, *V. Balasubramaniam* 1450; Shingle Island, middle of the island, 3.11.1993, *P. Daniel* 100352; Kurusadai Island, southern shores, 22.1.1994, *P. Daniel*

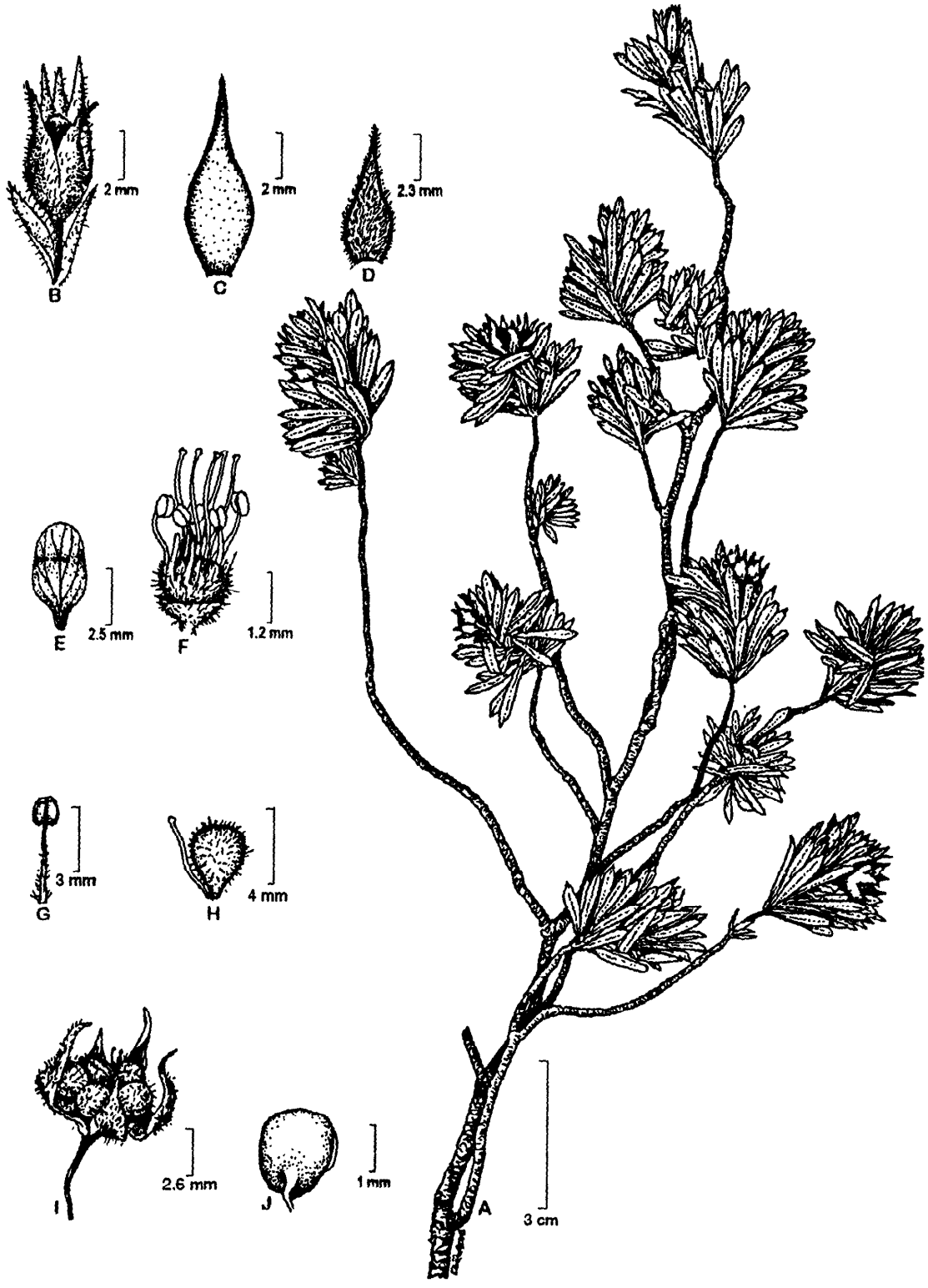


Fig. 3 (A-J). *Suriana maritima* L.
A. Habit; B. Flower; C & D. Sepals; E. Petal; F. Androecium & Gynoecium;
G. Stamen; H. Carpel; I. Fruit; J. Seed;

100618; Pumarichan Island, eastern shores, 23.8.1994, *K.S. Kumar* 101682; Kurusadai Island, southern shores, 29.11.1994, *K.S. Kumar* 102309; Pumarichan Island, eastern shores, 30.11.1994, *K.S. Kumar* 102337; Pullivasal Island, southern shores, 26.2.1995, *K.S. Kumar* 103346; Pumarichan Island, eastern shores, 11.1.1996, *P. Daniel* 106822; Shingle Island, middle to eastern shores, 12.1.1996, *P. Daniel* 106873; Kurusadai Island, southern shores, 13.1.1996, *P. Daniel* 106894 (MH).

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