

THE DISTRIBUTION OF THREE GRASSES IN INDIA

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ABSTRACT

The distribution of *Acrachne henrardiana*, *Chloris wightiana* and *Holcolemma canaliculatum* is discussed. *A. henrardiana* and *C. wightiana* are endemic to Tamil Nadu whereas *H. canaliculatum* occurs in Ceylon also. It is observed that *H. canaliculatum* is rare while the other two are not.

INTRODUCTION

For an inventory of the angiosperms of the Gulf of Mannar Biosphere Reserve located in southeast Tamil Nadu which includes 19 existing islands and the mainland coast from Rameswaram to Kanyakumari through Tuticorin intensive explorations were conducted. For certain species that were found interesting, from a distribution viewpoint material from the adjoining regions in Tamil Nadu was also studied. Observations presented here pertain to the distribution of three grasses, viz., *Acrachne henrardiana*, *Chloris wightiana* and *Holcolemma canaliculatum*. The first two species are endemic to Tamil Nadu whereas the third one is distributed in the neighbouring Ceylon as well.

Each species is provided with an up-to-date citation, description, data on phenology, habitat and uses and illustrations. The known distribution is mapped (Fig. 1). Under the subtitle 'Notes' a discussion is provided on distribution which inter alia includes a comparison with the observations of earlier authors. The status of each species is also discussed. Specimens examined are all at MH unless an acronym is provided.

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***Acrachne henrardiana* (Bor) Phillips** in Kew Bull. 37 : 158. 1982 ; V.J. Nair in A.N. Henry *et al.* Fl. Tamil Nadu 3:87. 1989 ; Karth. *et al.*, Fl. Ind. Enum. Monocot. : 178. 1989 ; Balasubramaniam & Ramachandran in J. Econ. Tax. Bot. 14 : 495. 1990. - Type : Tamil Nadu, Ramnad, Pamban, opp. railway station, 29.1.1945, D. Daniel (Sundararaj) & S.R. Raju 20089 (K, holotype, photo !). *Dactyloctenium henrardianum* Bor in Blumea 3(Suppl.) : 44. 1946 & Grass. Burma Ceylon India Pakistan : 489. 1960. *Acrachne eleusinoides* Wight & Arn. [in Wight, Cat. Indian Pl. : 104. No. 1760. 1834, *nom. nud.*]. *Eleusine verticillata* sensu Hook.f., Fl., Brit. India 7 : 295. 1896 *non* Roxb. 1820, quoad syn. *Acrachne elusinoides* Wight & Arn. *Eragrostis cynosuroides sensu* Stapf in Hook.f., Fl. Brit. India 7:324. 1896 *non* (Retz.) P. Beauv. 1812, quoad syn. *Dactylis interrupta* Herb. Rottl. *Arthrochloa henrardiana* (Bor) Lorch in J. Indian Bot. Soc. 39 : 490. 1960; Sebastine in Bull. Bot. Surv. India 4: 220. 1962; Sebastine & Ramam. in Bull. Bot. Surv. India 8:80. 1966. *Normanboria henrardiana* (Bor) Butzin in Taxon 27:301.

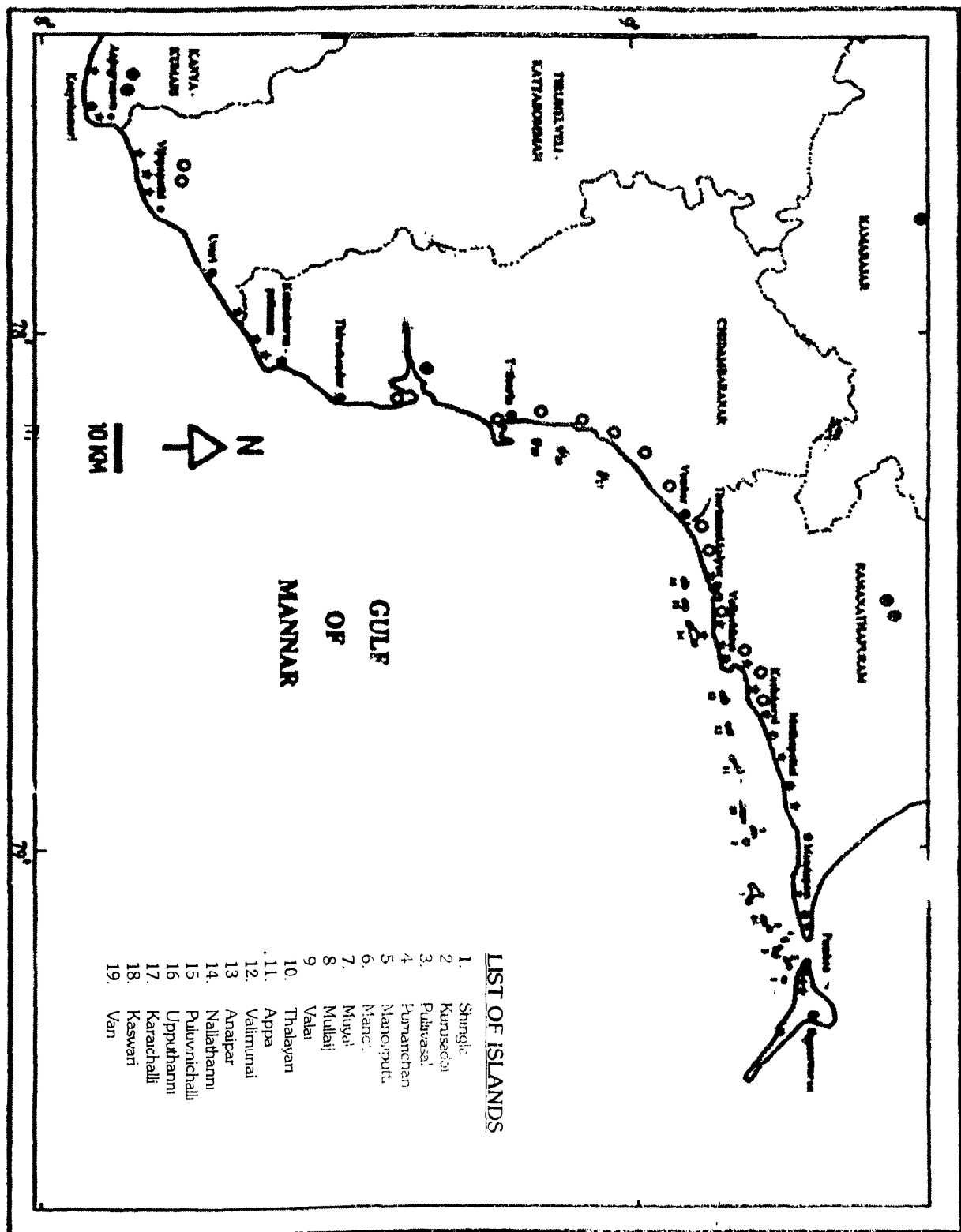


Fig. 1. : Known distribution of *Acrostichum henwardiana* (★), *Chloris wightiana* (○) and *Holcolemma canaliculatum* (⊙) in the Gulf of Mannar.

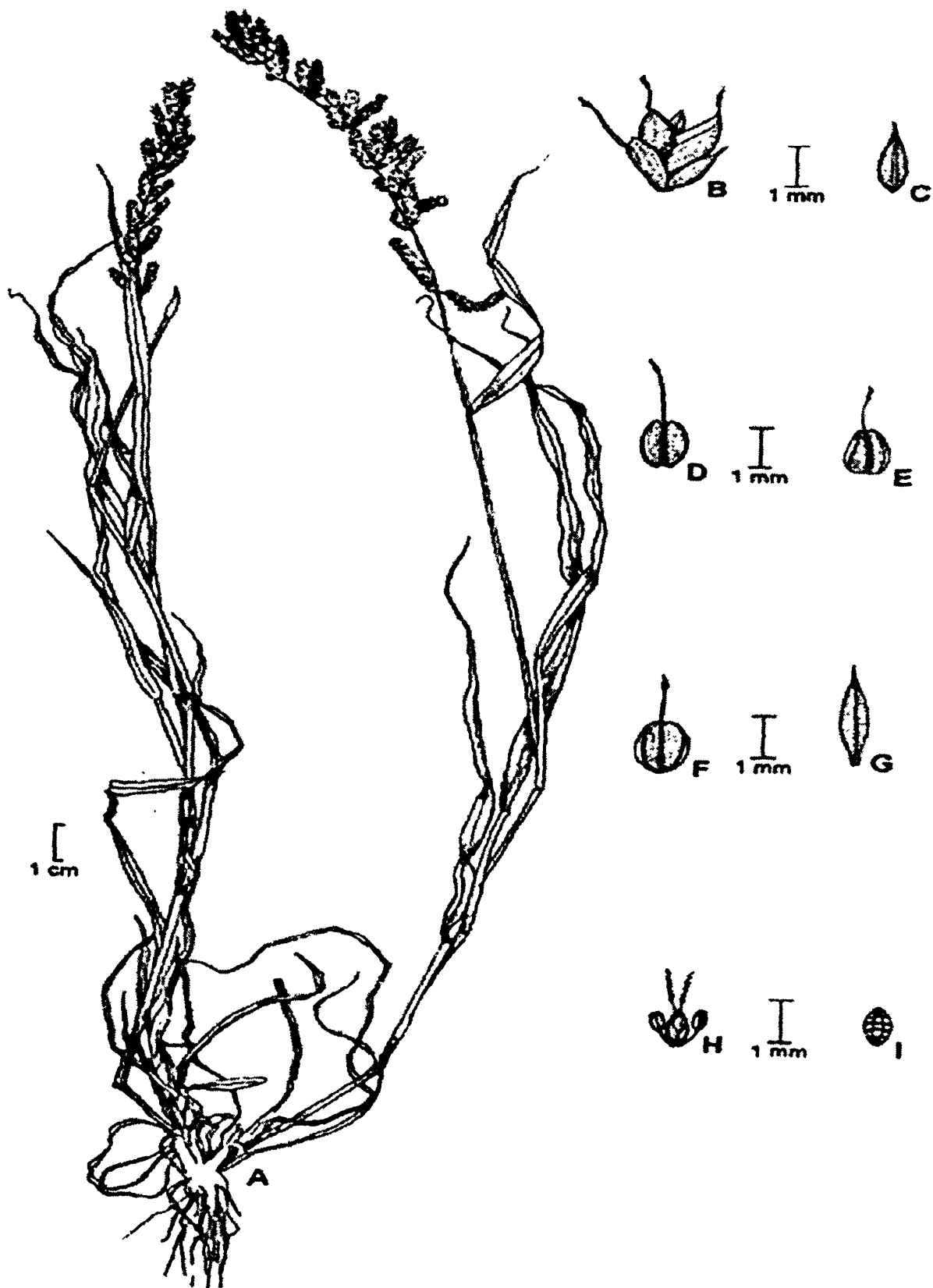


Fig. 2 (A-I) : *Acrachne henrardiana* (Bor) Phillips (*P. Daniel* 101622). A. Habit ; B. Spikelet ; C. Lower glume ; D. Upper glume ; E. Lower lemma ; F. Upper lemma ; G. Palea ; H. Pistil & Stamens ; I. Grain.

1978; Karth. in Jain & R.R. Rao, Assess. Threat. Pl. India : 249. 1983; Jain in Bull. Bot. Surv. India 28:239. 1986; Ahmedullah & Nayar, Endem. Pl. Indian Region 1:229. 1987. (Fig.2).

Annual; culms caespitose, terete, erect, up to 60 cm, glabrous; lower nodes dark purplish; internodes 3-15 cm long. Leaves linear-lanceolate, 3-15 × 0.2 - 0.5 cm, minutely spinulose along margins, pilose for half the length above; ligule membranous; sheaths shorter than internodes, pilose above for half the length, purplish. Spikes racemose, in whorls of 2-4, 1.5-2 cm long. Spikelets ovate, *ca* 2.5 × 2 mm, 2-4 flowered, stramineous green; lower glume ovate, acute, 1.2-1.5 × 0.4-0.6 mm, 1-nerved; upper glume oblong-elliptic, 2.1-2.4 × 0.6-0.7 mm, 1-nerved, awned; awn 1.1-1.4 mm long; lemmas 2, persistent; lower lemma ovate, 1.8-2 × 0.8-1 mm, awned; awn 0.8-1 mm long, 3-nerved; upper lemma ovate *ca* 2 × 1 mm, awned; awn *ca* 0.9 mm long, geniculate; paleas lanceolate, acute, keeled, 1.8-2 × 0.3-0.4 mm. Stamens 3; filaments slender; anthers linear, *ca* 0.5 mm long. Ovary oblong. 0.5-0.6 mm long; styles 2; stigmas 2, *ca* 1 mm long, plumose. Grains oblong, *ca* 0.8 mm long, transversely zonate, grooved in middle, yellowish brown.

Fl. & Fr. : Almost throughout the year.

Habitat : Coconut groves along sea shores, and under shades of *Acacia planifrons* and *Borassus flabellifer* trees in coastal scrub jungles. Usually associated with *Hedyotis graminifolia*, *Phyllanthus maderaspatensis* and sometimes with *Aerva lanata* and *Gloriosa superba*.

Use : Good fodder grass.

Distrib. : INDIA ; Tamil Nadu coast. Endemic. (Fig.1).

Notes : Originally this species was

described under the genus *Dactyloctenium* as *D. henrardianum* by Bor (1946) based on Daniel & Raju 20089. Later on it was shifted to two different genera (*vide* nomenclatural citations). It was justifiably assigned to the genus *ACRACHNE* by Phillips (1982) where it is retained by later authors. Incidentally, material that had been collected earlier by Rottler and Wight (K) had escaped the attention of Bor (1946). From the absence of material in Indian herbaria after the type, Karthikeyan (1983) concluded that its status was indeterminate. Later on Jain (1986) categorized this as a rare one. Balasubramaniam and Ramachandran (1990) who collected material of this species on the Sethukarai coast, not far away from the type locality, reported it as a rare species as there was none at MH.

Material of this species was collected on the Nallathanni Island close to Mundal near Valinokkam on the mainland coast of Ramanathapuram district for the first time when the present explorations were begun. It was later collected in a number of places on the mainland coast from Pamban to Kanyakumari. Once we got the type and other authentic specimens from Kew to confirm the identity it was known that the type had been collected in a coconut tope (grove) opposite Pamban railway station. Though field notes on the type sheet says 'not very common' at Pamban and Sethukarai near Keelakarai it was found to be quite common in well-protected and unweeded coconut groves adjoining the seashore. In unprotected and weeded groves, on the contrary, it was absent. Goats relish this grass. Its absence from open and unprotected areas and consequent rarity may be attributed to voracious goats. In Kanyakumari too it was found to occur only in coconut groves. However, in localities where coconut groves adjoining the seashore are not common, it was found to occur in shades of

trees of *Acacia planifrons* and *Borassus flabellifer*, both almost ubiquitous throughout the mainland coast off the Gulf of Mannar. Particularly interesting is its association with *Hedyotis graminifolia* which is also a common plant especially on the islands opposite the mainland coast of Valinokkam. The present observations may show that it is a common grass and occurs almost throughout the mainland coast of the Gulf of Mannar. No collections were made along the Tuticorin-Thiruchendur Industrial belt. This may be attributed to the giant industries that have come up here and whatever land is mercifully left mostly getting converted into salt pans. A recent collection (Jeyajothi 45) shows that it occurs on the West Coast of Kanyakumari district too. Cattle other than goats particularly sheep may also feed on this grass and disperse the seeds making it common throughout. However, it is rare on the islands, collected only on the Nallathanni Island on two occasions from two patches of a few individuals. The plants here too were found to occur in the shade of an *Acacia planifrons* tree. This is the only island in the Gulf of Mannar, as the name indicates in Tamil, that has potable water. Fresh water appears to be one of the requirements for its existence. However, it is not known what insular factors prevented it from spreading further and becoming common on this island. As it occurred a little interior on this island it is likely to have been brought by birds from the mainland coast. It might have also landed through human agency as villagers from the mainland coast opposite frequently visit the temple on the island. A chance drifting of a detached dry infructescence may also not be ruled out. But the factors that enable its existence on an island need further investigations.

There are collections by Rottler and Wight from Peninsular India as indicated earlier. No precise localities are mentioned on the sheets.

As both of them collected on other coastal areas in present Tamil Nadu as well these may or may not be from the Gulf of Mannar.

Specimens examined : PENINSULAR INDIA, Rottler s.n. (K. photo !); Peninsular India, Wight 3314 (K !). Tamil Nadu, Chidambaranar distr., Kanyakumari-Thiruchendur highway, between Karaichuttu and Padukkapathu diversion, 26.1.96, P. Daniel & P. Umamaheshwari 107236; Kanyakumari, and Vivekanandhapuram 20.12.94, K. Sampath Kumar 102828; Vivekanandhapuram, 24.1.96, P. Daniel & P. Umamaheshwari 106960; Pallam, 27.7.96, J. Jeyajothi 45; Ramanathapuram distr., Sethukarai, 5.5.87, V. Balasubramaniam 1318; 23.12.86, V. Balasubramaniam 1161; Pambam, Thoppukadu, 12.11.89, V. Balasubramaniam 2155; Nallathanni Island, 1.2.94, P. Daniel 101622; 2.12.94, K. Sampath Kumar 102361; Tankachimadam near Pambam, 25.2.95, K. Sampath Kumar 103324; Sethukarai, 15.12.95, P. Daniel & P. Umamaheshwari 106560; Pambam, coconut groves opp. railway station, 15.1.96, P. Daniel & P. Umamaheshwari 106946; near Mundal, ca 5 km from Valinokkam, 19.1.96, P. Daniel & P. Umamaheshwari 106953; Tirunelveli Kattabomman distr., Thillaivanamthoppu village near Vijayapathi, 26.1.96, P. Daniel & P. Umamaheshwari 107206.

Chloris wightiana Nees [in Wight, Cat. Indian Pl. : 104. No. 1766. 1834, *nom. nud.*] ex Steudel, Syn Pl. Glumac. 1:206. 1854; Hook.f., Fl. Brit. India 7:293. 1896; C. Fischer in Gamble, Fl. Madras : 1838. 1934; Bor, Grass. Burma, Ceylon, India, Pakistan : 468. 1960; Karth. in Jain & R.R. Rao, Assess. Threat. Pl. India : 245. 1983; V.J. Nair in A.N. Henry *et al.* Fl. Tamil Nadu 3:100. 1989; Karth. *et al.* Fl. Ind. Enum. Monocot. : 197. 1989; Ramachandran & Balasubramaniam in J.

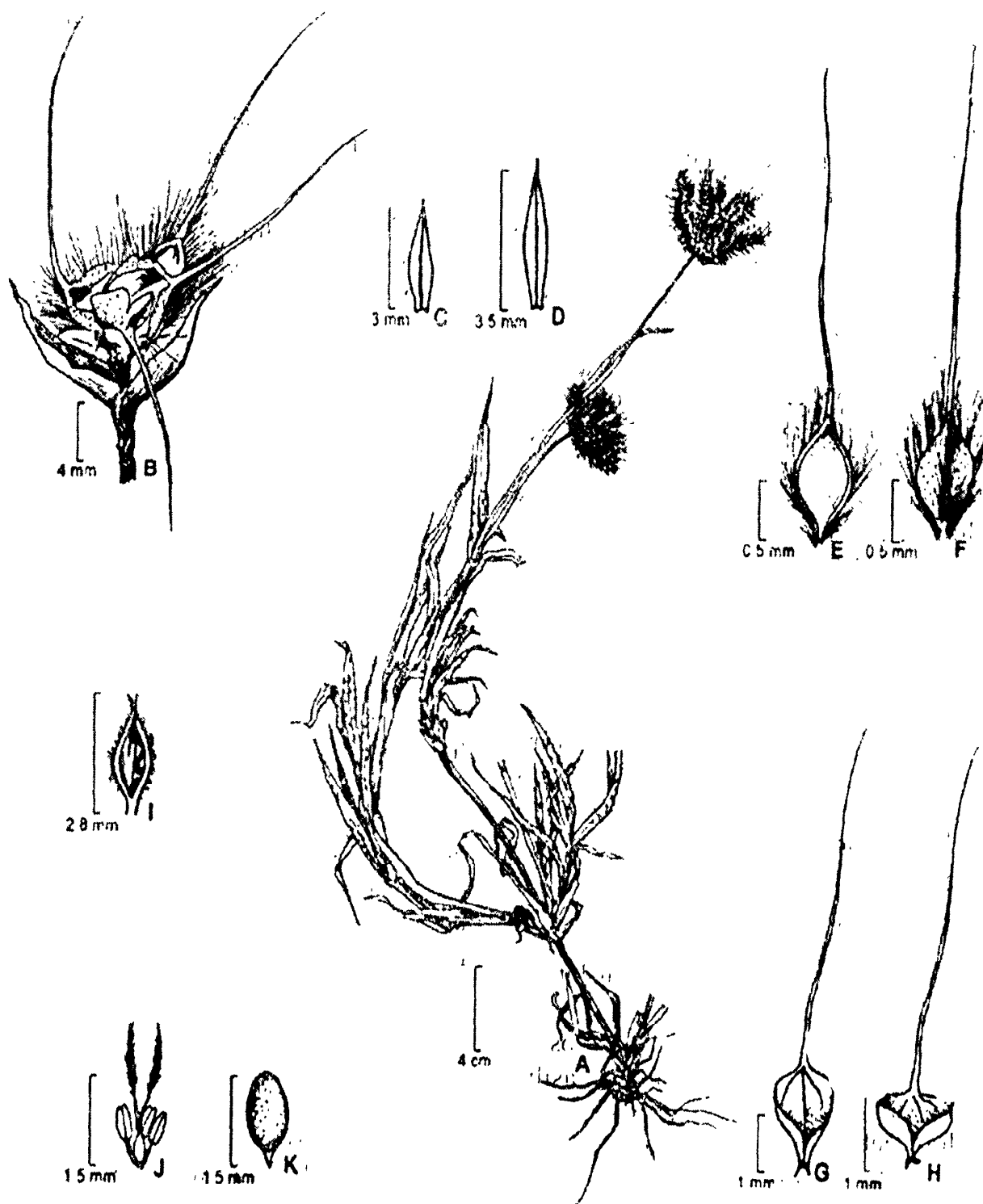


Fig. 3 (A-K). : *Chloris wightiana* Nees ex Steudel (A, P. Daniel 106550, B-K, K. Sampathkumar 103421) A. Habit ; B. Spikelet ; C. Lower glume ; D. Upper glume ; E. & F. Lemma dorsal & ventral view ; G. & H. Sterile lemmas ; I. Palea ; J. Pistil & Stamens ; K. Grain.

Econ. Tax. Bot. 14:131. 1990.- *Type* : Wall., Numer. List No. 3809 (Peninsula Indiae Orientalis, Herb. Wight. prop. 1766 & 1337 16K, CAL, photo !). Fig.3.

Annual or ? perennial; culms erect, *ca* 30 cm. Leaves linear, acuminate, $3-7 \times 0.2-0.4$ cm, densely villous; sheaths 3-5 cm long, densely pubescent. Spikes 3-5, digitate, 1.5-5 cm long, puberulous below spikes, Spikelets ovate, $3-3.5 \times 2-2.2$ mm; lower glume ovate, acuminate, *ca* 3×1 mm, 1-nerved; upper glume ovate, acuminate or shortly mucronate, *ca* 3.2×1.2 mm, 1-nerved; lemmas 4; 1 lemma fertile, other 3 sterile; 1 lemma broadly ovate, *ca* 3×1 mm, long-hairy on keel, awned; awn *ca* 9 mm long; 2 lemma ovate, imarginate, *ca* 2×1.7 mm, hairy beneath, awned; awn *ca* 8 mm long; 3 lemma obovate or cordate, imarginate, *ca* 1.5×2 mm, 3-nerved, awned; *ca* 7 mm long; 4 lemma obcordate, emarginate 1×1.5 mm, awned; awn *ca* 5 mm long; palea shortly stalked, ovate, cleft at apex, *ca* 3×1.2 mm, scarbrid on keel. Stamens 3; filaments short; anthers linear, *ca* 1 mm long. Ovary oblong, *ca* 0.7×0.2 mm; styles 2, free, *ca* 0.8 mm long; stigmas 2, *ca* 1.5 mm long, plumose, reddish brown. Grains oblong, *ca* 1.5×0.9 mm, creamy pale-yellowish.

Fl. & Fr. : Almost throughout the year.

Habitat : Occurs in a variety of habitats, bunds of salt pans, sandy seashores and along road sides, on clayey or gravelly soil mostly with *Chloris barbata*. But it can be easily differentiated from the said associated species by its short pubescent culms, villous leaves, stout and shorter spikes.

Distrib. : INDIA : Tamil Nadu. Endemic. (Fig.4).

Use : Good fodder grass.

Notes : *Chloris wightiana* was described by Steudel (1854) based on Wall., Numer. List

No. 3809, collected by Wight in Peninsular India. Hooker (1896) and Fischer (1934) who gave the distribution as southern India did not see any more material. While enumerating the endemic grasses of India Karthikeyan (1983) refrained from indicating its status. And it was apparently overlooked by Jain (1986) and later by Ahmedullah and Nayar (1987).

Ramachandran and Balasubramaniam (1990) "rediscovered" it as there was no later collection at MH. This material was collected at Pullanthai near seacoast in Ramanathapuram district. However, it had been earlier collected by Sundararaj in the Tambraparani river delta in Tirunelveli district, now in the adjoining Chidambaranar district which was inadvertently overlooked by these authors. The information from Kew that there are no recent collections at Kew appears to have prompted Ramachandran and Balasubramaniam (1990) to draw indirect conclusion to the effect that it is rare.

Initially it was collected at Therkumkkaiyur, a coastal village in Ramanathapuram district. Later on it was collected near Veppalodai and Chippikulam, about 25 km from Tuticorin, the headquarters of Chidambaranar district. In subsequent trips it was gathered near Valinokkam also in Ramanathapuram district and later near the Tuticorin port. More recently it was collected at the Nambiyar Reservoir Project site near Vallioor in Tirunelveli-Kattabomman district which is a little away from the seashore. It appears to be an annual as the plants were found to be completely dry in most places. In all these places plants were plenty so much so it is hard to categorise the species as rare.

Specimens examined : TAMIL NADU, Chidambaranar distr., Tambraparani river delta, D.D. Sundararaj s.n. (Acc. No. 94090); as "*P. canaliculatum* Nees (in litt. et Wight herb.)" did

Veppalodai, ca 25 km Tuticorin towards Rameswaram, 30.7.95, *P. Daniel & P. Umamaheshwari* 103570 ; Chippikulam, ca 4 km from Veppalodai, 31.7.95, *P. Daniel & P. Umamaheshwari* 104606 ; Veppalodai, 29.1.96, *P. Daniel & P. Umamaheshwari* 107316; Tuticorin port, 30.1.96, *P. Daniel & P. Umamaheshwari* 107350 ; Ramanathapuram distr., Pullanthai, 25.12.89, *V. Balasubramaniam* 2311 ; Therkumukkaiyur, 29.3.95, *K. Sampath Kumar* 163421 ; near Valinokkam, 16.12.95, *P. Daniel & P. Umamaheshwari* 106550 ; Tirunelveli-Kattabomman Distr., Nambiyar Reservoir Project site near Kottaikarungulam, ca 25 km from Vallioor, 16.3.96, *P. Daniel* 107688.

***Holcolemma canaliculatum* (Nees ex Steudel)**

Stapf & C. Hubb. in Bull. Misc. Inform. 1929 : 246. 1929; C. Fischer in Gamble, Fl. Madras : 1779. 1934; Senar, Grass. Ceylon : 123. 1956; Bor, Grass. Burma Ceylon India Pakistan : 313. 1960; Clayton in Kew Bull. 32 : 773. 1978; Nair & Srinivasan in Bull. Bot. Surv. India 24:241. 1982; V.J. Nair in A.N. Henry *et al.*, Fl. Tamil Nadu 3:121. 1989; Karth. *et al.*, Fl. Ind. Enum. Monocot. : 227. 1989; Balasubramaniam & Ramachandran in J. Econ. Tax. Bot. 14:495. 1990; Gould in Dassan., Rev. Handb. Fl. Ceylon 8:254. 1994. Type : Peninsular India, Wight, Cat. No. 1624. *vide* Gould (*l.c.*). *Panicum canaliculatum* Nees [in Wight, Cat. Indian Pl. : 95. No. 1624. 1834, *nom. nud.*] ex Steudel, Syn. Pl. Glumac. 1:155. 1854; Hook.f., fl. Brit. India 7:43. 1896 & Trimen. Handb. Fl. Ceylon 5:144. 1990. *P. stenostachyum* Thwaites, Enum. Pl. Zeyl. : 436. 1864; Trimen, Cat. Pl. Ceylon: 105. 1885. *Hemigymnia canaliculata* (Nees ex Steudel) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.) : 324. 1931. (Fig.4).

Annual ; culms tufted, slender decumbent, arising from bulb-like light brownish rootstocks, ca 45 cm high, glabrous, rooting at lower nodes. Leaves linear, acuminate, 4-15 × 0.3-0.5 cm, glabrous, ligule conial, ca 3 mm wide, membranous with a fringe of hairs; sheaths shorter than internodes, to 7 cm long. Panicles to 12 cm long; rachis glabrous; spikes 0.5-1 cm long. Spikelets 7-12, lanceolate, 2.5-3 × 1.2-1.5 mm; lower glume ovate, acute, ca 1.1 × 1 mm, 3-nerved, pale greenish ; upper glume ovate or elliptic, acute, ca 1.5 × 1 mm; nerves 5, prominent, greenish. Lower floret staminate ; lemma ovate, acute, ca 2.7 × 1.5 mm 7-nerved ; palea oblong or elliptic, acute, ca 1.8 × 1 mm, folded along margins, 2-nerved. Lodicules 2, ca 0.3 mm long. Stamens 3 ; filaments ca 0.6 mm long ; anthers ca 1.4 mm long, yellowish. Upper floret pistillate, ovate, ca 2.5 × 0.8 mm; lemma ovate, mucronate, ca 2.5 × 0.8 mm, transversely rugose; palea ovate, acute ca 2.2 × 0.7 mm. Ovary oblong, ca 0.5 mm long; styles 2 ca 0.3 mm long; stigmas 2, ca 0.7 mm long, plumose, purplish-pink. Grains oblong, ca 1.2 × 0.5 mm, cream-coloured.

Fl. & Fr. : Aug. - Oct.

Habitat : Rice fields near seacoast, and in shade on wet clayey/sandy soil, usually with other grasses like *Brachiaria eruciformis* and *Dactyloctenium aegyptium* and *Digera muricata*.

Distrib. : S. India (Tamil Nadu) (Fig.4) and Ceylon. Though many authors included Kenya as well under distribution, Clayton (1978) and Gould (1994) excluded it.

Use : Good fodder grass.

Notes : This species was originally described by Steudel (1854) as *Panicum canaliculatum*. Gould (1994) cited Wight, Cat. No. 1624 as the type. Though Steudel (1854) who validly published the name attributed it to

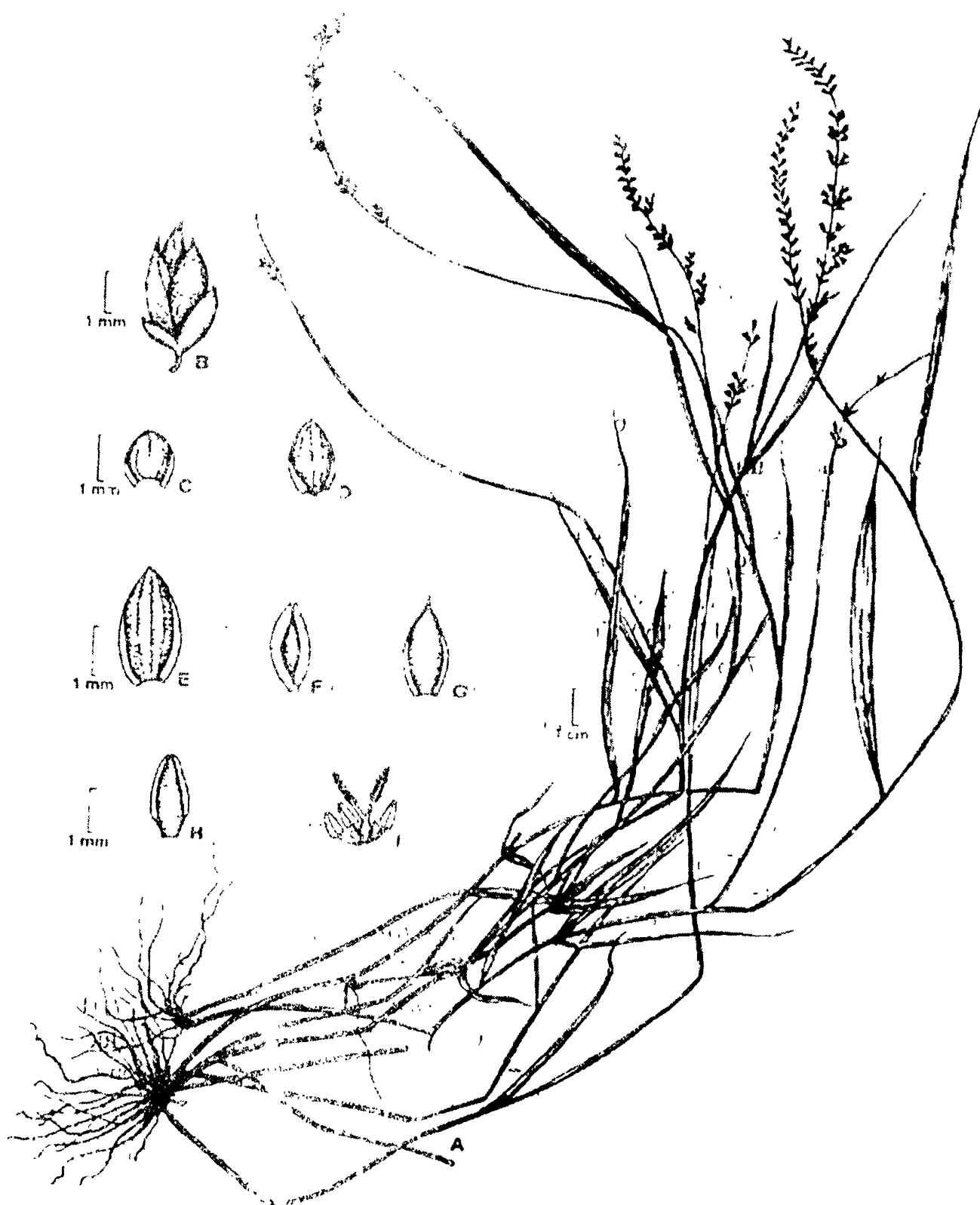


Fig. 4. (A-I) : *Holcölemma canaliculatum* (Nees ex Steudel) Stapf & C. Hubb. (S.A. Muthukumar, 104695). A. Habit
 B. Spikelet; C. Lower glume; D. Upper glume; E. Lemma of lower floret; F. Palea of lower floret;
 G. Lemma of upper floret; H. Palea of upper floret; I. Pistil & Stamens.

not refer to Wight's Catalogue. Besides he also cited two herbarium names as synonyms. "*P. Myurum* Wight hrbr. *Aira interrupta*. *Rottl. Klein*. Hrbr. Ind. Or." Hence, all these are original material.

Stapf and Hubbard (1929) transferred it to their new genus *Holcolemma*. There was no material in any Indian herbarium and it seems to have been collected by Srinivasan in 1980 in the vicinity of the foothills of the Western Ghats near Srivilliputhur, Ramanathapuram district, now in Kamraj district, Tamil Nadu. Thereafter it was collected by Balasubramaniam twice in the vicinity of Paramakudi, plains of Ramanathapuram district and a little away from seacoast. This time around it was collected at Mukkani near the estuary of the Tambraparani river in Chidambaranar district. Not many plants were seen on the spot where it was collected. It was recently collected at Nagarcoil, the headquarters of Kanyakumari district, which is a little away from seacoast. It occurred in a well-protected campus of a government office. Its existence may be due to the protection from grazing animals. From its distribution, particularly in the neighbouring Ceylon (Gould, 1994 : 254), it looks that it is a coastal species. However, it may also occur a little interior as indicated by some of the recent collections made in the plains of Tamil Nadu. But no collector has ever stated that it is a common grass. Present observations also corroborate that it is a rare species. It is suggested that the plant be studied in the field with particular reference to

its ecology and reproductive biology. That might reveal the factors behind its rarity. Being a good fodder grass it deserves the suggested serious study.

Specimens examined : TAMIL NADU, Chidambaranar distr., *Mukkani*, 15.11.95, S.A. *Muthukumar* 104695; Kanyakumari distr., Nagarcoil, Vadassery, 9.6.96, J. *Jeyajothi* 40; 30.6.96, P. *Daniel* 107535; Ramanathapuram distr., way to *Mamsapuram*, Srivilliputhur R.F., 10.3.80, S.R. *Srinivasan* 63643; Kattuparamakudi, 19.9.88, V. *Balasubramaniam* 1854; Thelisanallur near Paramakudi, 16.11.89, V. *Balasubramaniam* 2252.

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