

## Three New Species of Poaceae from South India

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### Abstract

Three new species of grasses, one of *Chrysopogon* Trin. viz., *C. copei* from Tamil Nadu and two of *Dimeria* R. Br. viz., *D. josephii* and *D. agasthyamalayana* from Kerala are described and illustrated.

### INTRODUCTION

Floristic exploration of Tamil Nadu and Kerala areas of the Western Ghats carried out by the authors, under two separate research projects sponsored by Central Government agencies, have brought specimens of three interesting species of grasses to their attention. Detailed study and subsequent consultation with Dr. Thomas A. Cope of the Royal Botanic Gardens, Kew, confirmed that they are new to Botany. These new taxa are described and illustrated here.

### *Chrysopogon* Trin.

*Chrysopogon* Trin., a genus of tropical and warm temperate regions of the world with about 26 species (Clayton & Renvoize, 1986; Mabberley, 1997) is represented by 18 species in India (Moulik, 1997). 13 species are hitherto recorded from South India (Henry *et al.*, 1989; Pullaiah, 1997; Ravi *et al.*, 2000; Sreekumar & Nair, 1993; Veldkamp & Salunkhe, 2000). The discovery and description of the present new taxon from Tamil Nadu State increases the representative species of the genus to 14 in South India.

*Chrysopogon copei* Mohanan *et* Ravi, *sp. nov.* (Fig. 1).

*C. gryllo* *et* *C. echinulato* affinis, sed ab uterque specie distincta culmis brevioribus plusminusve gracilibus, cum foliis angustis subfiliformibus pulchris cernuis, pedicellisque perglabris longioribus callo brevi pungenti adnatis, cum pilis chocolatinis; a priore differt

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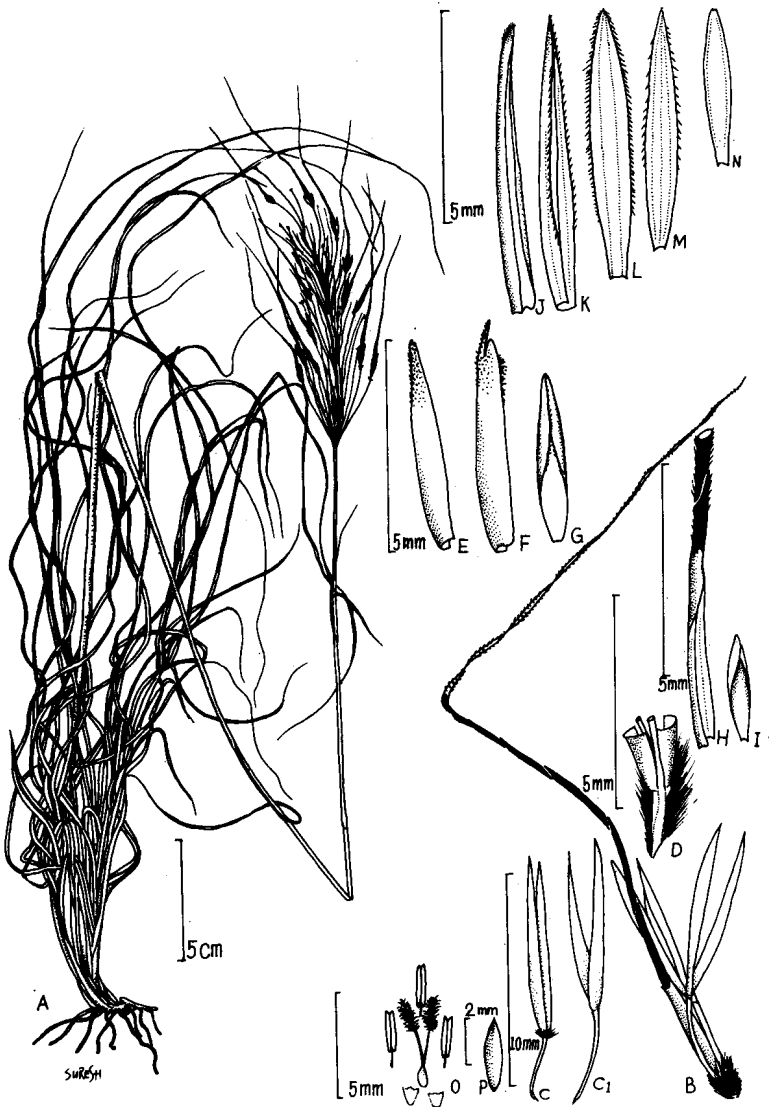


Fig. 1. *Chrysopogon copei* Mohanan et Ravi : A. Habit; B. Spikelets; C. Pedicelled spikelet – bearded at the base of glumes; C1. Pedicelled spikelet – glabrous at base of glumes; D. Callus of sessile spikelet showing adnate part of the pedicel (after removing hairs); E-I, From sessile spikelet : E. Lower glume; F. Upper glume; G. Lower lemma; H. Upper lemma; I. Upper palea; J-N, From pedicelled spikelet: J. Lower glume; K. Upper glume; L. Lower lemma; M. Upper lemma; N. Upper palea; O. Lodicules, stamens and pistil; P. Grain.

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paniculis plusminusve contractis, brevioribus; ab altera differt lemmate superiore spicularum sessilium cum aristatis longioribus usque ad 46 mm longis cum columna longiora usque ad 23 mm longa.

*Types:* India, Tamil Nadu State, Tirunelveli District, Shengelteri, ±700 m, 22 December 2000, Mohanan 45125, (*Holo* - TBGT; *Iso* - CAL, CALI, K, MH).

*Chrysopogon copei* Mohanan et Ravi is allied to *C. gryllus* L. and *C. echinulatus* (Nees) Wats., but distinct from both in having shorter, more or less slender culms with slender, almost filiform, graceful, drooping leaves and perfectly glabrous, longer pedicels adnate to the short, pungent callus with chocolate-brown hairs, and from the former in having more or less contracted, shorter panicle and from the latter in having longer awns up to 46 mm long with a longer column up to 23 mm long for the upper lemma of the sessile spikelet.

Perennials. *Culms* tufted, slender, up to 1 m x 2 mm and glabrous; nodes glabrous. *Leaves* mostly clustered at the base; sheath distichous, continuous with the blade without external differentiation, up to 20 cm long in the upper ones, plicate, flattened and sharply keeled on the back, striate and glabrous; blade linear, almost filiform and gracefully drooping, up to 60 cm or even longer and 2-4 mm wide at the base, shortly keeled on the mid-rib below, sparsely villous on the margins, especially towards the base, with long and weak bulbous-based hairs, ultimately glabrous and scaberulous on the margins towards the linear, filiform apex; ligule a short membrane, c. 0.25 mm long and fimbriate-ciliate at the apex. *Inflorescence* a linear-lanceolate to elliptic, contracted panicle up to 17 x 4 cm; axis many noded (up to 9) with 2-15 filiform ascending branches per node, up to 6 cm long, terminally dialated into an oblique, bearded apex. *Sessile spikelet* linear-elliptic-lanceolate, 6.5-7 mm long including c. 1.5 mm long, pungent callus densely bearded with chocolate-brown hairs. *Lower glume* linear-elliptic-lanceolate in profile, 5-5.5 x 0.8 mm (when folded), cartilaginous-coriaceous, rounded on the back, glossy brown, minutely scaberulous-spinulose towards the truncate-notched apex, 4-nerved with the nerves prominent on the inside. *Upper glume* linear-oblong-elliptic in profile, slightly shorter than the lower glume, 4.75-5 mm long, cartilaginous-coriaceous, rounded on the back, notched at the apex with obtuse lobes, shortly aristate from the notch with the arista barely to over 1 mm long, thickened and rounded on the back and glossy chocolate-brown, thinner and broadly hyaline on the sides, ciliate on the margins above the middle, 3-nerved with the nerves prominent on the inside. *Lower lemma* hyaline, lanceolate, 3.5-4 mm long, shortly truncate at the apex, faintly 3-nerved, infolded along the laterals, sparsely ciliate on the margins from below the middle upwards, epaleate and empty. *Upper lemma* hyaline, linear-lanceolate, 4-5 mm long, 3-nerved, shortly notched at the apex and continuous with the awn; awn up to 46 mm long with a column up to 23 mm long, scaberulous-pubescent on the column and scaberulous upwards, paleate and bisexual. *Upper palea* hyaline, elliptic-lanceolate, c. 2.5 mm long, infolded along the sides in the upper half and truncate and shortly notched at the apex. *Pedicelled spikelet* linear-elliptic-lanceolate, somewhat laterally compressed, 7-9 mm long and glabrous or bearded on the short c. 0.3 mm long obconical callus; pedicel slender and flattened, 3-5 mm long, glabrous. *Lower glume* thinly coriaceous, linear-lanceolate, 7-9 mm long, 5-nerved, rounded on the back in the lower portion, shortly

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keeled on the mid-nerve towards the shortly truncate apex, in-rolled on the margins upwards and bristly hairy on the outside towards the apex, glabrous otherwise. *Upper glume* thinly coriaceous, linear-lanceolate, 7-8 mm long, 5-nerved and rounded on the back in the lower portion, shortly keeled on the mid-nerve towards the subacute apex, in-rolled on the sides, thinly hyaline and ciliate on the margins from below the middle upwards, glabrous to sparsely hairy on the outside towards the apex. *Lower lemma* hyaline, oblong-lanceolate, 5.5-7.5 mm long, 2-nerved, infolded along the nerves, subacute to obtuse at the apex, thinly hyaline on the sides and sparsely ciliate on the margins from below the middle upwards, epaleate and empty. *Upper lemma* hyaline, linear-elliptic-lanceolate, 5.5-7 mm long, 3-nerved, infolded along the lateral nerves, thinly hyaline on the sides and sparsely ciliate on the margins from below the middle upwards, notched or not at the acute apex, paleate or not and bisexual. *Upper palea* when present hyaline, linear-oblong-lanceolate, c. 3.5 mm long and notched at the subacute apex. *Lodicules* 2, c. 0.75 mm long, truncate-lobed at the apex and cuneate at the base. *Stamens* 3; anthers 2-2.75 mm long. *Ovary* c. 1 mm long; styles 2 mm long; stigmas c. 2 mm long. *Grains* oblong-oblong-lanceolate, subcompressed, c. 3 x 1 mm, apiculate at the apex and pale yellow.

*Flowering and Fruiting* : November – January.

*Ecology and distribution* : The specimens of the new taxon were collected from dry scrub vegetation on the eastern slope of the Western Ghats in the district of Tirunelveli of Tamil Nadu State at an altitude  $\pm$  700 m above m.s.l. They were found growing in abundance in association with other bushy grasses like *Chrysopogon hackelii* (Hook. f.) C.E.C. Fisch. *Pennisetum polystachyon* (L.) Schult. and *Themeda triandra* Forssk.

*Etymology*: The specific epithet *copei* is given to the new taxon in honour of the British agrostologist Dr. Thomas A. Cope of the Royal Botanic Gardens, Kew.

**Dimeria R. Br.**

*Dimeria* R.Br., a tropical and subtropical genus of grasses with about 50 species world wide is represented by over 37 species in India and 23 species in Kerala (Mohanan & Ravi, 1996; Ravi, 1996; Ravi & Anil Kumar, 1992; Ravi & Mohanan, 1997; Ravi *et al.*, 1995; Sreekumar & Nair, 1991). Two additions to the genus from Kerala State are described and illustrated here.

***Dimeria josephii* Ravi *et* Mohanan, *sp. nov.* (Fig. 2).**

*D. orissae* Bor affinis, sed differt rhachide angustiore, c. 1 mm lato, spiculis majoribus 5-6 mm longis cum callo longiore usque ad 0.5 mm longo, glumis acuminato-aristatis cum carinis dense ciliatis et carina glumae superioris, gracile alatae in dimidio superiore, aristatis longioribus 13-16 mm longis cum columna longiore, 4-6 mm longa, antheraque longiore, 0.75-1mm longa.

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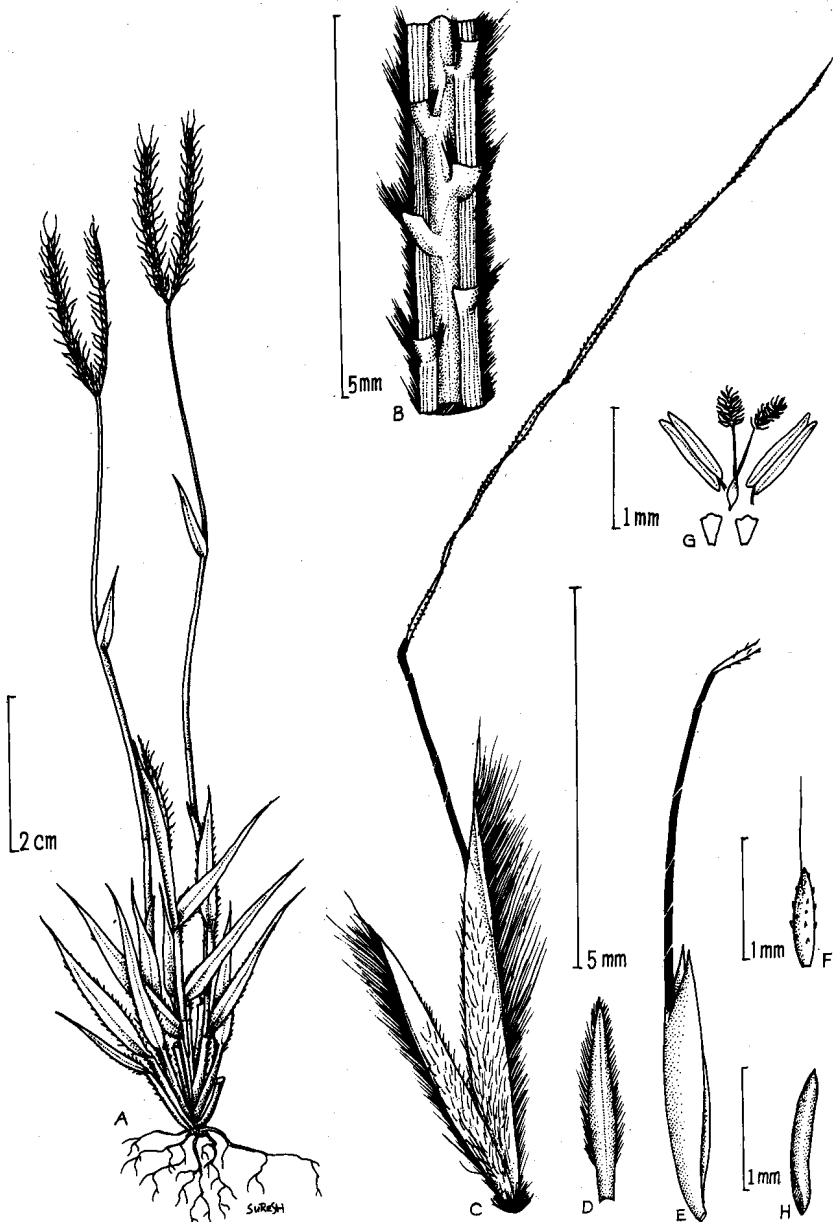


Fig. 2. *Dimeria josephii* Ravi et Mohanan: A. Habit; B. Rhachis - a portion; C. Spikelet; D. Lower lemma; E. Upper lemma; F. Upper palea; G. Lodicules, stamens and pistil; H. Grain.

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*Types:* India, Kerala, Palakkad District, Nenmara,  $\pm$  70 m, 24 November 1998, *Ravi* 39542 (*Holo* – TBGT; *Iso* – CAL, CALI, K, MH).

*D. josephii* Ravi *et* Mohanan is allied to *D. orissae* Bor, but distinct in having narrower, c. 1 mm wide rhachis, larger 5-6 mm long spikelets with a longer up to 0.5 mm long callus, acuminate-aristate glumes densely ciliate on the keel with the keel of the upper glume slenderly winged in the upper half, longer 13-16 mm long awns with longer 4-6 mm long column, and longer 0.75-1 mm long anther.

Annuals. *Culms* densely tufted, filiform, up to 30 cm long; nodes glabrous. *Leaves* mostly confined to the base; sheath up to 8 cm long in the upper ones, keeled on the back all along, less prominently so in the upper ones, beset with bulbous-based hairs, mostly in the upper half, less prominently so in the upper ones; blade linear-lanceolate, up to 5 cm x 4 mm, slightly narrowed into a rounded base, acuminate at the apex and beset with long, bulbous-based hairs on the margins and near the margins on the upper side and sparsely so on the lower side; *ligule* a short membrane c. 0.25 mm long, obtuse-truncate and fimbriate at the apex. *Raceme* 1 or mostly 2, up to 5 cm long; rhachis flattened, c. 1 mm wide with a longitudinal convex ridge along the middle on the face, broadly winged and ciliate on the margins; pedicel short, c. 0.25 mm long, concave at apex, densely ciliate on the outside and sparsely so or not on the inside. *Spikelets* 5-6 mm long including c. 0.5 mm long callus. *Lower glume* linear-oblong in profile, 3-4 mm long, acuminate-aristate at the apex, keeled on the back and densely ciliate on the keel with the hairs considerably longer upwards, up to 1.5 mm long and sparsely hairy on the thinner sides, especially in the lower half and ciliate on the margins except towards the apex. *Upper glume* linear-elliptic in profile, 5-5.5 mm long, acuminate-aristate at the apex, keeled on the back with the keel slightly flattened into a slender wing above the middle, ciliate on the keel with the hairs considerably longer upwards, up to 2 mm long, sparsely hairy on the sides, especially towards the base. *Lower lemma* thinly hyaline, linear, oblong-elliptic, 2-3 mm long, 1-nerved, sparsely ciliate on the margins except towards the base, epaleate and empty. *Upper lemma* hyaline, elliptic in profile, 3-3.5 mm long, bifid at the apex with acute lobes and awned from the sinus; awn 13-16 mm long with a column 4-6 mm long. *Upper palea* hyaline, lanceolate, c. 0.75 mm long, sparsely papillate on the outside, sometimes with 1 or 2 long hairs. *Lodicules* 2, c. 0.5 mm long, obtusely lobed at the truncate apex and cuneate at the base. *Stamens* 2; anthers 0.75-1 mm long. *Ovary* c. 0.25 mm long, stipitate; styles c. 0.5 mm long; stigmas c. 0.3 mm long. *Grains* linear-oblong, c. 2 mm long, subcompressed, apiculate at apex and a little curved.

*Flowering and Fruiting* : November – December.

*Ecology and distribution* : The specimens of the new taxon were collected from a rocky hill in Nenmara of Palakkad District, where they were found growing in the crevices of rocks.

*Etymology* : The specific epithet *josephii* is after the late Dr. J. Joseph, former Joint Director of the Botanical Survey of India (BSI) who had made enormous contributions to Indian Taxonomy.

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***Dimeria agasthyamalayana*** Kiran Raj *et* Ravi, *sp. nov.* (Fig. 3).

*D. conniventii* affinis, sed differt racemis binatis ad trinatis, racemi rhachidi triquetri-complanata scabrida ad scaberula in angulis, gluma inferiore dorso omnino carinata, carina anguste alata supra medium, ala glumae superioris papyracea, et glumis amabus dorso scabrida, aristae undifferentiatæ et columna nulla.

*Types:* India, Kerala, Thiruvananthapuram District, Agasthyamala Hills, Bonaccord, ±800 m, 1 February 2000, *Kiran Raj 41939* (*Holo*-TBGT; *Iso* - CAL, CALI, K, MH).

*D. agasthyamalayana* Kiran Raj *et* Ravi is allied to *D. connivens* Hack., but distinct in having binate to trinate racemes, rhachis of racemes triquetrous-flattened and scabrid to scaberulous on the angles, lower glume keeled all along the back with the keel narrowly winged above the middle, wing of the upper glume papery, both glumes scabrid on the back and awns undifferentiated without a column.

Annuals. *Culms* tufted, slender, up to 40 cm long; nodes glabrous. *Leaves* mostly confined to the base; sheath up to 11 cm in the upper ones, keeled all along the back with the keel less prominent in the upper ones, and almost smooth without hairs; blade linear-lanceolate, up to 18 cm x 5 mm, keeled on the midrib below with the keel continuous with that of the sheath, acuminate at apex, glabrous or beset with a few bulbous-based hairs towards the base; *ligule* membranous, up to 1.25 mm long, obtuse-truncate and fimbriate at apex. *Racemes* 2-3; rhachis triquetrous-flattened, up to 9 cm long and c. 0.75 mm wide, flattened on the back, convexly ridged on the face and longitudinally keeled along the middle and narrowly winged on the sides with the keel and the wings scabrid to scaberulous on the margins; pedicels 0.5-1 mm long, oblong, concave at the apex and glabrous. *Spikelets* oblong to oblong-oblongeolate, 4-5 mm long including a short 0.3-0.4 mm long, moderately bearded callus. *Lower glume* coriaceous, linear-oblong in profile, 3.5-4 mm long, acute at the apex, keeled on the back and keel narrowly winged towards the apex and scabrid on the margins, glabrous otherwise. *Upper glume* coriaceous, oblong-elliptic in profile, 4-4.5 mm long, keeled on the back and the keel broadly winged all along with the wing broad and papery, acute at the apex, scabrid on margins, glabrous or sometimes with a few long hairs on the wing. *Lower lemma* thinly hyaline, oblanceolate, 2.5-3 mm long; 1-nerved, sparsely ciliate on the margins except towards the apex and at 1/3 portion at the base, epaleate and empty. *Upper lemma* hyaline, oblong-oblongeolate in profile, 3-3.5 mm long, bifid at the apex with acute lobes, awned from the sinus; awn simple, 2.5-8 mm long, filiform and scaberulous, without a column. *Upper palea* hyaline, lanceolate, extremely small and sparsely papillate hairy. *Lodicules* 2, small. *Stamens* 2; anthers 1-1.5 mm long. *Ovary* small, c. 0.2 mm long; styles c. 0.5 mm long; stigmas 0.6-1 mm long. *Grains* linear-oblong, 2-2.5 x 0.25 mm, subcompressed, acute-apiculate at the apex and brown.

*Flowering and Fruiting* : January – March.

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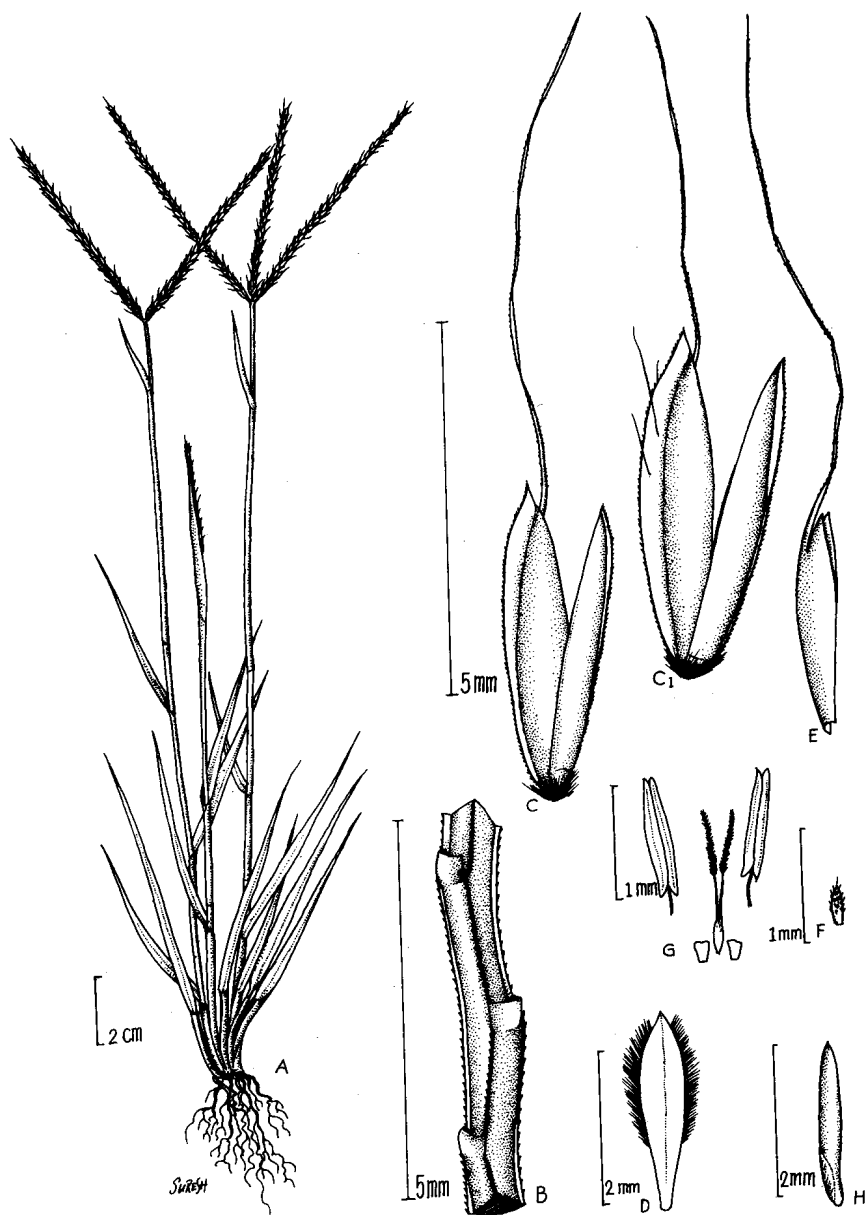


Fig. 3. *Dimeria agasthyamalayana* Kiran Raj et Ravi: A. Habit; B. Rhachis - a portion; C & C1. Spikelets; D. Lower lemma; E. Upper lemma; F. Upper palea; G. Lodicules, stamens and pistil; H. Grain.



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**Ecology and distribution** : Specimens of the taxon were collected from hilly slopes in Bonaccord ( $\pm$  800 m) of the Agasthyamala ranges where they were found growing in rock crevices. Not very common.

**Etymology** : The specific epithet *agasthyamalayana* indicates the name of the locality – the Agasthyamala hills of Western Ghats, one of the hotspots of India – from where the specimens of the species were collected.

#### Acknowledgements

The authors are thankful to the Ministry of Environment and Forests (MoEF), Govt. of India for financial assistance. We are grateful to Dr. Thomas A. Cope of the Royal Botanic Gardens, Kew for confirming the novelty of the species, and Dr. N.C. Majumdar, formerly of the Botanical Survey of India, Calcutta for Latinisation of the diagnosis of the species. Sincere thanks are also due to Dr. G.M. Nair, Director, Tropical Botanic Garden and Research Institute (TBGRI), Palode, Thiruvananthapuram, for providing facilities and Mr. S. Sureshkumar, Artist, TBGRI for India-Ink drawings. We thank Prof. M. Sivadasan, Department of Botany, University of Calicut, for his help and valuable suggestions.

The junior author, M.S. Kiran Raj is indebted to the Council of Scientific and Industrial Research (CSIR), New Delhi, for the award of a Senior Research Fellowship.

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