

Monographia Indicorum *Fimbristylium* Praecursores - Novelties in *Fimbristylis* Vahl - II

E. Govindarajalu*

Centre of Advanced Studies in Botany, University of Madras,
Guindy Campus, Madras - 600 025, India

Abstract

Six new species of *Fimbristylis*, viz., *F. benthamiana*, *F. humerosa*, *F. ultragluma*, *F. dimorphonucifera*, *F. mycosa* and *F. pandurata* are described and illustrated.

INTRODUCTION

During the course of monographic project work on the genus *Fimbristylis* Vahl, six more new species have been discovered. Earlier three new species viz., *F. bispicula* Govind., *F. breviculma* Govind. and *F. stigmatotecta* Govind. had been published (Govindarajalu, 1996).

***Fimbristylis benthamiana* Govind., sp. nov.** (Fig. 1)

Affinis *Fimbristylis hookeriana* Boeck. sed differt culmis ad basem squamis corneis et vaginis frondosis, carinae scalarum et laterum vaginarum tomentosa membranacea, squamis et foliis distichis, foliis angustioribus laevigatis culmis brevioribus, inflorescentia aperta, bracteis scabridis marginatis, spiculis vel ellipticis ovatis solitaribus brevioribus pedicellatis cum ad numerum maioribus floribus, glumis late ovatis multum brevioribus latioribus cum carina glandibus rubris punctata et glumis basorum, mucrone brevioris sine glumis sterilibus basalibus et stylo glabro brevioris.

Type: Bagoola, Nadia Dt. R.E.P. 29/27 (Herbarium of the Industrial Section, Indian Museum, Botanical Survey of India, Calcutta) (Holotypus - CAL).

Annuals. Roots few, rather thick, brown. Culms few, tufted, rigid, leafy at base, 3-gonous or obscurely 3-quetrous, striate, glabrous, 20 cm x 0.9 mm, surrounded at base by scales and open leaf sheaths. Scales more or less horny, ovate lanceolate, sparsely hairy on the keel, abruptly acute, distichous, smooth throughout, eligulate, many-nerved, shorter than

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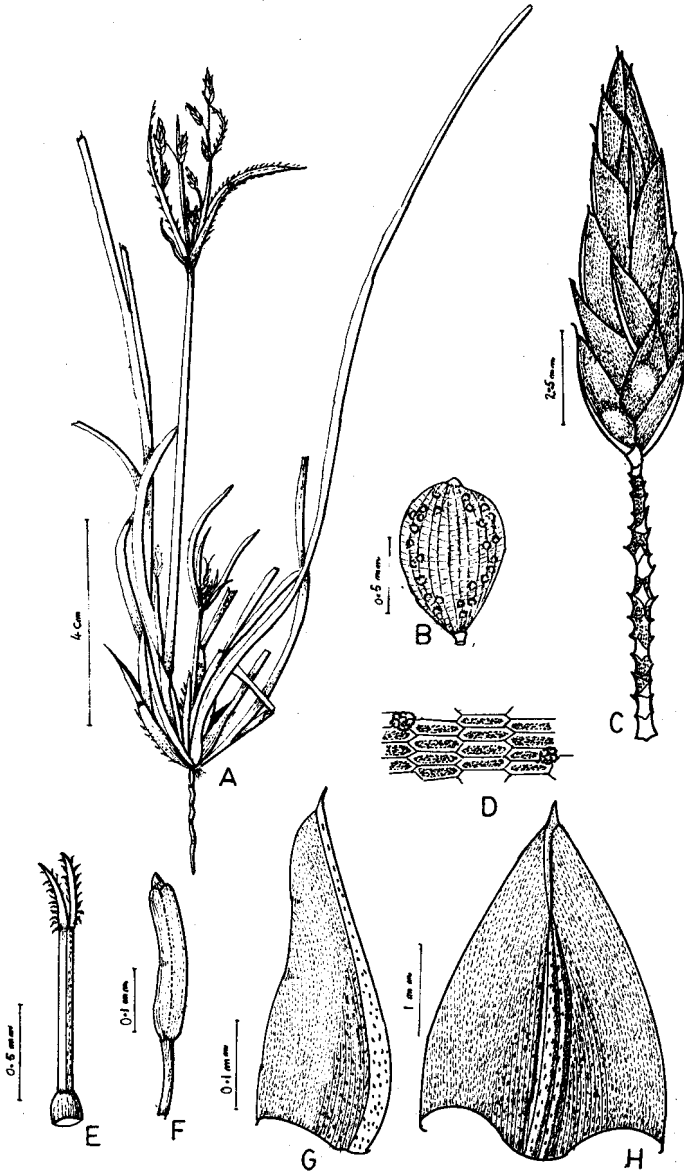


Fig. 1. *Fimbristylis benthamiana* Govind.: A. Habit; B. Nut; C. Spikelet; D. Epicarpic cells - diagrammatic; E. Style and stigma; F. Anther; G & H. Glume folded and spread out (based on R.E.P 29127 - holotypus).

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culm, c. 1-1.2 (-1.5) mm broad; leaf sheaths brown, prominent, obliquely mouthed with broad hairy membranous sides. Inflorescence open, erect, compound, narrow containing 1-2 sessile or subsessile central spikelets, 4-6 cm broad. Bracts leaf like, 2-3, as long as inflorescence, erect and recurved with scabrid margin, 2.5-3 cm long. Primary rays 2-4, obliquely patent, smooth, 3-4 cm long. Spikelets solitary, ovate or elliptic ovate, flat or subterete, acute, many-flowered, mostly peduncled, greenish brown, corymbiform, 5 x 2 mm, lengthening up to 10 mm; rhachilla raggedly winged. Glumes ovate, acute, spiral, membranous, translucent, mucronulate, distinctly keeled without hyaline margin and lateral nerves, 2-2.2 (incl. mucro) x 1.5 - 1.6 mm; mucro 0.25 mm long; keel 3-nerved, apparently 1-nerved; keel and basal half of glumes on either sides tannin dotted. Stamens 2 with short filaments; anther linear, purplish brown, apiculate, c. 0.5 mm long. Style slender with slightly dilated base, glabrous, as long as nut, c. 1 mm long; stigma 2, sparsely fimbriate, shorter than style, c. 0.5 mm long. Nut planoconvex (biconvex), tubercled, obovoid, stipitate, umbonulate covered by pluricellular outgrowths at margin, brown or dark brown, 1-1.2 (incl. stipe) x 0.5-0.7 mm; stipe 0.1 mm long; epicarpic cells minute, hexagonal, transversely elongated, occurring in 10 -15 regular longitudinal rows.

***Fimbristylis humerosa* Govind., sp. nov.** (Fig. 2)

Affinis *Fimbristylis monticola* Steud. sed differt habitu annuale, culmis cum lamina una tetragonis ad basim ligneis, foliis ad numerum multum redactis planis acutis cum margine laevigato, inflorescentia corybiforme, radiis planis primariis, spiculis oblongis ovatis aliquantum angularibus parvioribus, glumis non hyalinis marginatis parvioribus, carina sigmoidea, antheribus brevioribus, stylo et stigmatate glabri, stylo breviora, nucibus anguste obovoidis cum apice depresso et humeris acutis elevatis et seriebus ad numerum cellulorum minoribus in superficiem utramque.

Type: Kerala State, Peringalkuthu Division, on the way to Orukomban, *Govindarajalu 6012 A* (Holotypus - CAL; isotypus - MH).

Slender noncaespitose annuals. Culms filiform, few, tufted, flexuous, tetragonous, smooth, glabrous, each with single reduced blade restricted to base, without thickening and non woody at base, 10-20 cm x 0.2-0.3 mm. Leaves solitary to each culm, much reduced, basal, flat, acute, brown, glabrous, smooth margined, eligulate, 7-9-nerved, 1-1.2 cm long, less than 1 mm broad; sheaths brown or blackish brown, transversely truncate with glabrous margin, 1.5-2 cm long. Inflorescence simple, corymbiform, lax bearing 2-6 spikelets, 1-2 x 1.5- 2.5 cm. Bracts 2-3, setaceous, shorter than inflorescence, stiff, erect, glabrous, scabrid margined, 2-8 mm long. Primary rays 1-4, usually erect, filiform, smooth, flat, each bearing 1-2 spikelets, 3-15 mm long. Spikelets solitary, oblong ovoid, more or less angular acute or subacute, ferruginous brown, up to 10-flowered, pedicellate, 3-5 x 1-1.2 mm. Glumes deltoid ovate, imbricate with translucent sides, ferruginous brown, mucronulate, membranous without hyaline margin, eglandular, dull with nerveless sides, glabrous, 1.5 x 1.2-1.4 mm;

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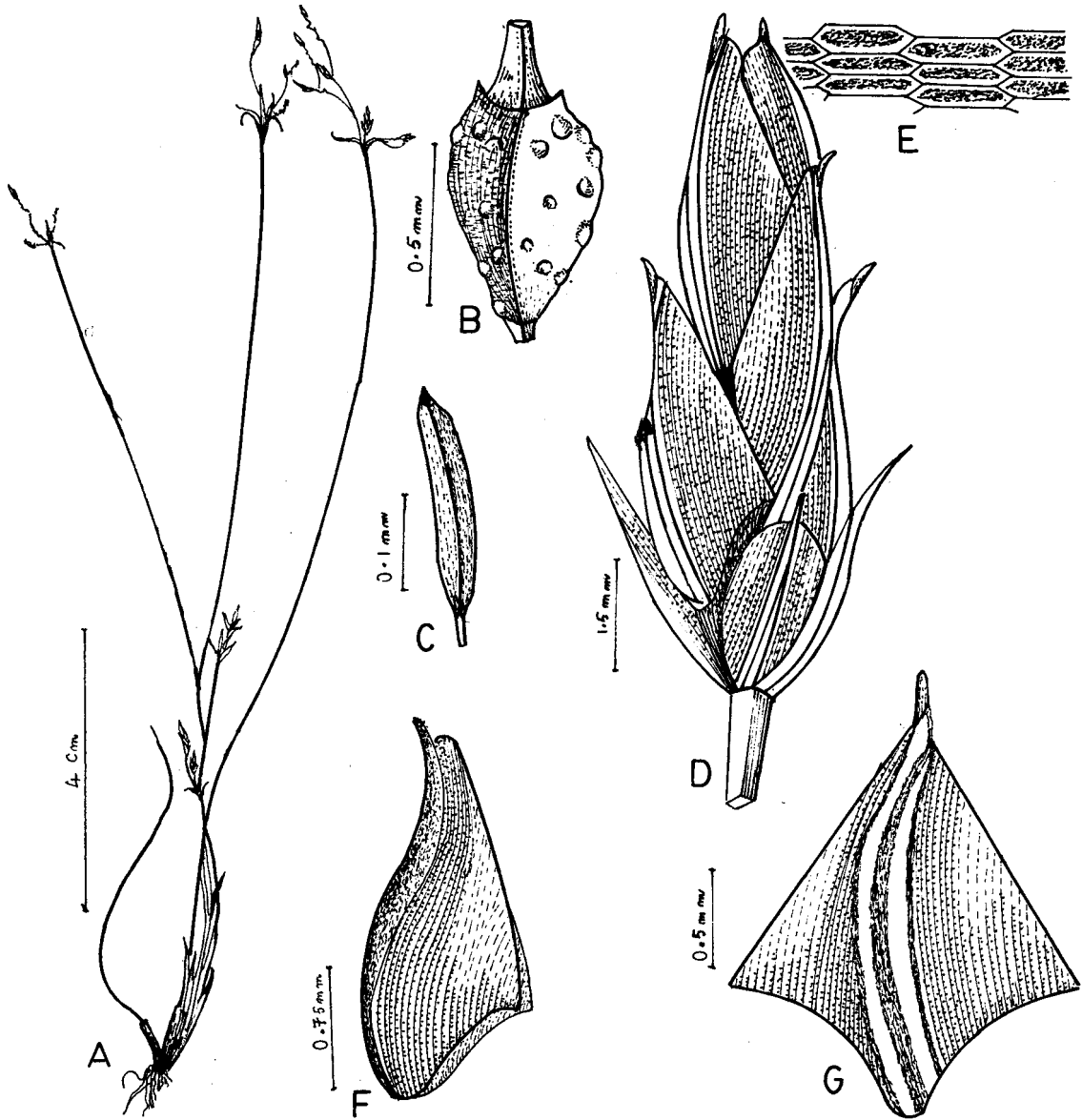


Fig.2. *Fimbristylis humerosa* Govind.: A. Habit; B. Nut; C. Anther; D. Spikelet; E. Epicarpic cells - diagrammatic; F. & G. Glume folded and spread out (based on Govindarajalu 6012 A - holotypus).

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keel 3-nerved (apparently 1-nerved), rather stout, sigmoid excurrent into erect or curved mucro; rhachilla winged, excavated; basal glumes 2, awn like, empty. Stamens 3; anther linear oblong, c. 0.5 mm long. Style pyramidal at base, 3-quetrous, glabrous, 0.5-0.6 mm long; stigma 3, glabrous, longer than style, c. 1 mm long. Nut narrowly obovoid, trigonous with convex sides, depressed at apex with pointed shoulders, shortly stipitate, brown, distinctly tuberculate, 1 x 0.5-0.6 mm; epicarpic cells transversely elongated hexagonal occurring in 4-6 longitudinal rows on each face.

***Fimbristylis ultragluma* Govind., sp. nov.** (Fig. 3)

Affinis *Fimbristylis microcarya* F.v.M. sed differt culmis solitaris latioribus, foliis ad marginem laevigatis acutatis vel acuminatis cum ad nemerum nervis minoribus, vaginis ad orem glabris, radiis laevigatis primariis, anthela cum spiculis paucioribus, bracteis cum nervis paucioribus, spiculis longioribus cum floribus ad numerum maioribus, glumis oblongis vel ellipticis ovatis sordidis longioribus sine marginibus scariosis, stylo cum base abrupte dilato latiore pyramidale, stigmatate trifido, nucibus flavidus opacis dense tuberculatis cum tuberculis serialibus.

Type: Maharashtra State, Rajkot, Pradumna Park, *H. Santapau* 13672 (Holotypus - BLAT).

Annuals. Roots black, slender. Culms solitary, flattened, dipterous, ribbed, rigid, erect, smooth throughout, leafy at base, glabrous, 30 cm x 1 mm. Leaves flat, smooth margined, gradually acute or acuminate, with thickened margin, glabrous, erect, up to 7-nerved, ligulate, shorter than culms, 2 mm broad; sheaths all laminiferous, non horny, obliquely truncate with glabrous mouth. Anthela compound to decomposed, erect, consisting of lesser number of spikelets up to 25, 3-4 cm long. Bracts leaf like, as long as inflorescence, stiff, erect, up to 7-nerved, scabridulously margined, non asperous, up to 4 cm long. Primary rays 4-5, erect, filiform, smooth, 1.5-2 cm long. Spikelets ovoid, acute, rusty or cinnamomeous brown, angular, 12-15-flowered, solitary, erect, 3.5-4 x 1.5-1.6 mm; basal glumes usually fertile. Glumes oblong or elliptic ovate, obtuse, mucronate, membranous, spiral without scarious margin, glabrous, nerveless in each half, non shining, cymbiform, inflated by nuts, strongly keeled, subpatulous, 1.5-1.6 (incl. mucro) x 0.9-1.0 mm; keel 3-nerved, pale yellow, apparently 1-nerved; mucro 0.25 mm long, erect or excurved; cells minute, narrow, vertically oblong, curving towards margin. Rhachilla winged, excavated. Stamens 1-2; anther linear oblong, obtuse at both ends, 0.2-0.4 mm long. Style 3-quetrous, glabrous, with abruptly dilated broad pyramidal base, c. 0.5 mm long; stigma trifid, glabrous, shorter than style, 0.25 mm long. Nut globosely obovoid, yellowish brown, rounded at apex, minutely stipitate, opaque, 3-gonous, 3-costulate with concave sides, densely tubercled with tubercles arranged in 4-5 vertical rows, 0.6-0.7 (incl. stipe) x 0.5 mm; stipe 0.25 mm long; epicarpic cells in upper half distinct, transversely elongated to hexagonal occurring in 4-6 rows.

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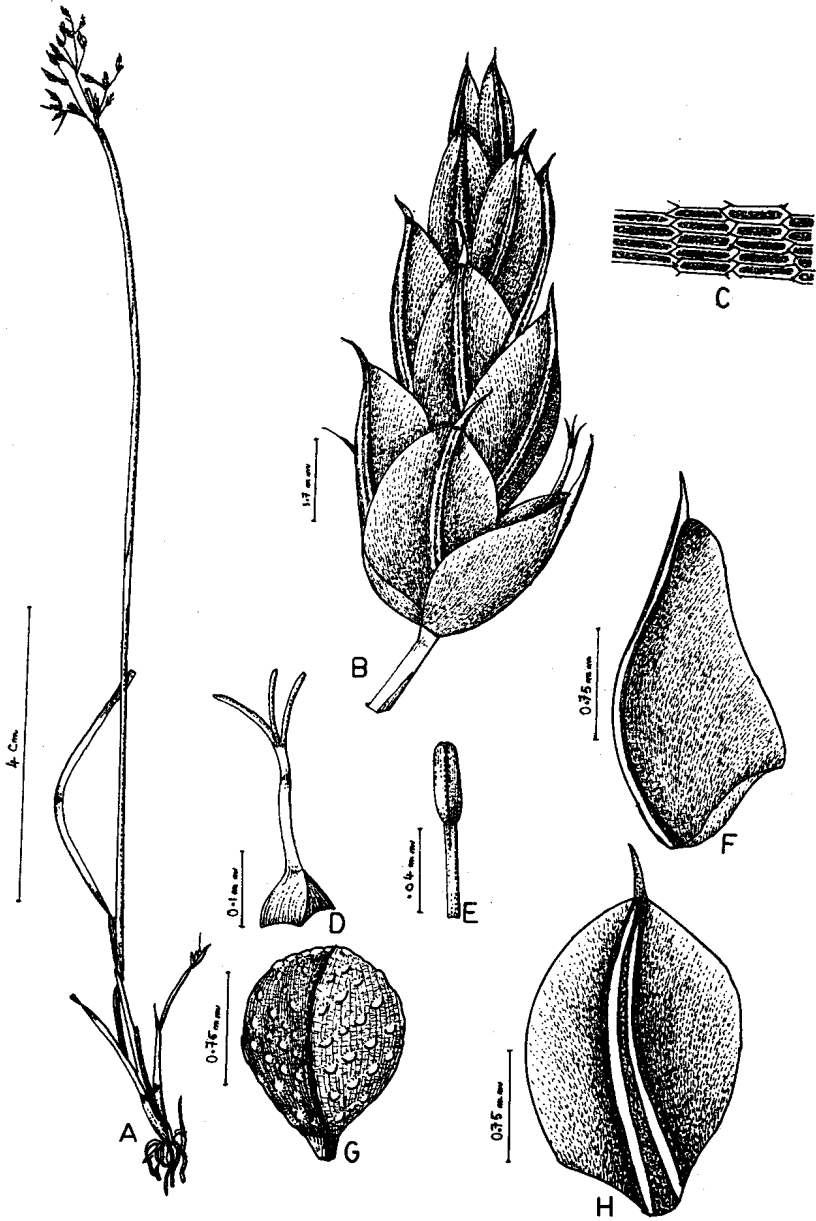


Fig. 3. *Fimbristylis ultragluma* Govind.: A. Habit; B. Spikelet; C. Epicarpic cells - diagrammatic; D. Style and stigma; E. Anther; F. Glume folded; G. Nut; H. glume spread out (based on Santapau 13672 - holotypus).

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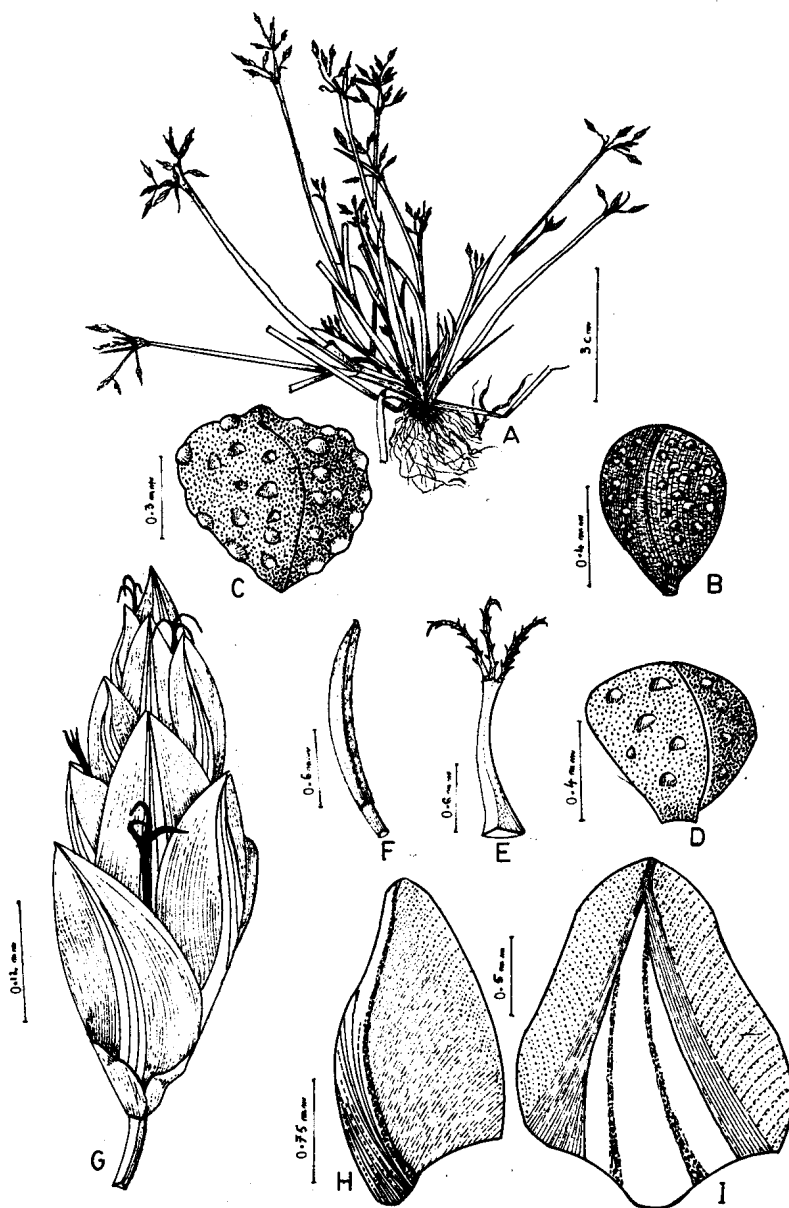


Fig.4. *Fimbristylis dimorphonucifera* Govind.: A. Habit; B. Nut - one form; C & D. Nuts - another form; E. Style and stigma; F. Anther; G. Spikelet; H & I. Glume folded and spread out (based on Govindarajalu 8860 G - holotypus).

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Fimbristylis dimorphonucifera Govind., *sp. nov.* (Fig. 4)

Affinis *Fimbristylis pustulosae* Govind. sed differt habitu annuale, culmis brevioribus caespitosis trigonis, scalis laevigatis carinatis sine lateribus purpureis punctatis, foliis et vaginis brevioribus caulinis, foliis surculorum sterilium erectis ad marginem laevigatis, radiis laevigatis, glumis ad marginem sinuatis parvioribus muticis cum lateribus late translucens eglandulatis nervis ad carinam evanescentibus et apice rotundato, antheribus longioribus, stigmatibus sparsim pubescentibus, stylo brevioribus, nucibus dimorphis dense tubercularibus - una forma pyriformi nigra asymmetrica obscure trigona sessili maiori cum cellulis obscuris epicarpis, alteri anguste obovoida triquetra lutea symmetrica minute stipitata parviori cum cellulis transverse elongatis epicarpis.

Type: S. Kanara, Kannadekatta, *Govindarajalu 8860 G* (Holotypus - CAL).

Annuals. Roots many, fibrous, blackish brown. Culms many, tufted, 3-gonous, brown, stiff, erect, glabrous, smooth throughout, 8-12 cm x 1 mm; culm bases covered with 2-3 ovate-lanceolate distichously arranged many-nerved subhorny keeled scales; scales without purple dotted membranous margin; keel smooth; culms usually up to 3-noded bearing tubular non keeled sheaths with or without reduced blade; lowermost sheaths aristate, oblique or transversely truncate mouthed; uppermost sheaths 1.5-2 cm long; cauline leaves when present 1.5-2.5 (-3.5) cm long. Leaves of sterile shoots shorter than culms, flat, erect, somewhat keeled, smooth-margined throughout, 1.5-2.5 mm broad; ligule densely fringed with brown hairs; sheaths with rounded back. Inflorescence simple, sometimes 1-2 rays added, loose, consisting of (3-) 5-8 (-10) spikelets, 1-2.5 cm long and broad. Involucral bracts 3-4, erect, usually narrowly leaf like (setaceous), acute-acuminate with smooth surface and scabridulous margin, usually shorter than inflorescence without scarious margin, (0.5-) 1-1.8 mm long. Rays usually 0, when present erect, angular, smooth, c. 1 cm long. Spikelets solitary, ellipsoid or elliptic ovoid, angular, pedicellate, acute, 10-20-flowered, ferruginous brown, 4.5-5 x 1.5-2 mm. Rhachilla excavated, winged. Glumes ovate, sinuous margined, broadly rounded at apex, non mucronate, spiral with 3-nerved keel and broad translucent eglandular sides, 1.5-2.2 x 0.75 mm; keel nerves evanescent behind apex. Stamens usually 3; anther linear oblong, obtuse, yellow or yellowish brown, 1.2-1.3 mm long. Style 3-quetrous with narrow pyramidal base, glabrous, upto 1.2 mm long; stigma 3, slender, sparsely hairy, shorter than style, 0.7-0.8 mm long. Nuts densely tubercled, dimorphic; 1-2 basal nuts larger, black, asymmetric, pyriform, sessile, obscurely trigonous, minutely umbonulate or non umbonulate, 0.75-1 mm long and broad with obscure epicarpic cells; the remainder small, stramineous, symmetric, narrowly obovoid, shortly stipitate, non umbonulate, 3-quetrous with convex sides and narrowly linear transversely elongated epicarpic cells, 0.75 x 0.5 mm.

Notes: Grows in marshy soil and wet habitats.

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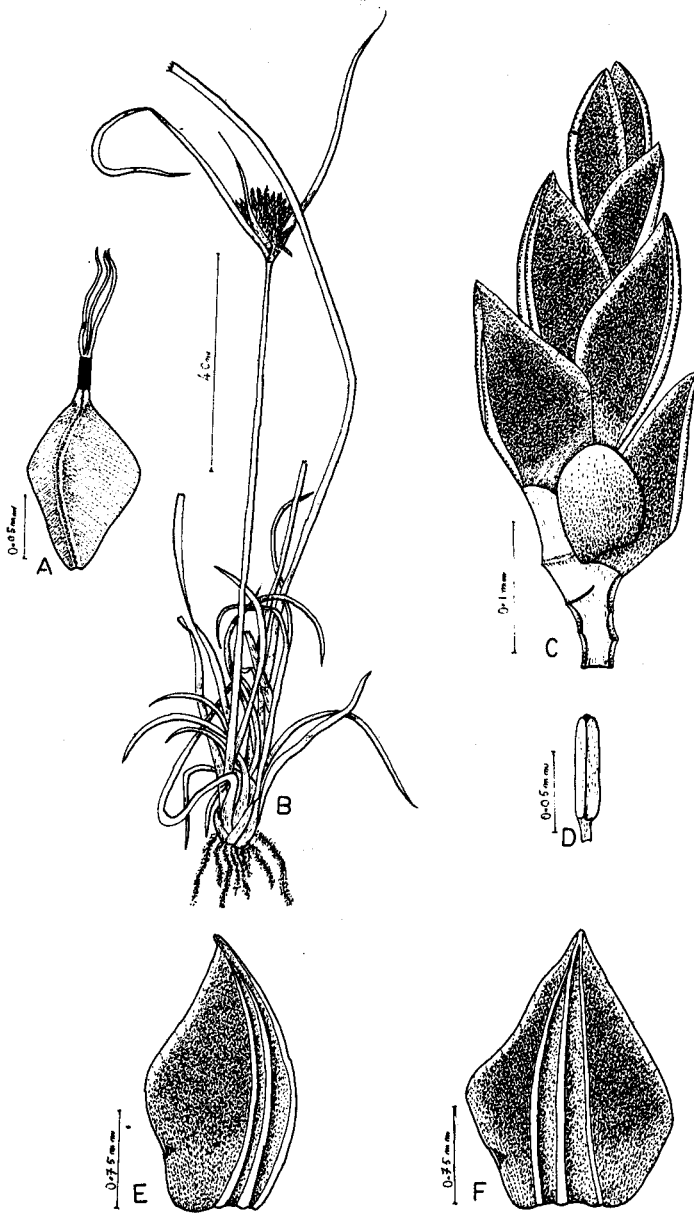


Fig. 5. *Fimbristylis mycosa* Govind.: A. Nut; B. Habit; C. Spikelet; D. Anther; E. & F. Glume folded and spread out (based on Govindarajalu 39 - holotypus).

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***Fimbristylis mycosa* Govind., sp. nov. (Fig. 5)**

Affinis *Fimbristylis cymosae* R. Br. sed differt culmis ad basem tumidis, foliis ad numerum minoribus non caespitosis flexuosis varie curvatis gradatim acuminatis sparsim ad apicem solum scabrescentibus, vagina integra tubulari ad axem membrana spadiceis punctis notata clausa cum ore ad formam 'V' simili, scalis integris ovatis lanceolatis corneis basilaribus, inflorescentia distincte capitata globosa vel subglobosa, bracteis inflorescentia longioribus, spiculis congestis sessilibus acutis, rhachilla parum alata, glumis plerumque acutis castaneis fuscis ad marginem solum anguste hyalinis, nervis carinae ad apicem extensis, stylo articulado sine base dilata, nucibus rhomboideis sessilibus triquetris rostratis juvenibus.

Type: Tamilnadu State, Madurai Dt., High Ways Mts., Nursery Valley, *Govindarajalu 39* (Holotypus - CAL).

Perennials. Rhizome obscure. Roots few, rather thick, woolly appearing white. Culms few, rigid, trigonous towards top and subterete towards base, smooth, few leaved, tumid due to covering by sheaths and scales, 8-20 cm x 1 mm. Leaves few, coriaceous, shorter than culms, flexuous, variously curved, flat, canaliculate or inrolled, gradually acuminate, smooth margined except sparsely scabrescent apex, eligulate, 0.5-1.5 mm broad; leaf sheaths entire, tubular, adaxially tannin dotted, membranous with 'V' shaped mouth; lowermost scales 2-3, ovate lanceolate, horny, prominently nerved, entire. Inflorescence distinctly capitate, globose or subglobose with many spikelets, 1 cm long and broad. Involucral bracts 3-5, leaf like, subequal, obliquely erect, longer than inflorescence, the longest up to 5 cm long. Rays absent. Spikelets congested, sessile, usually elliptic ovoid, subtumid, acute, 10-16-flowered, 4-5 x 1-1.5 mm. Rhachilla excavated, slightly winged. Glumes broadly ovate, distichous in lower half, imbricate in upper half, chartaceous, usually acute, rarely apiculate, castaneous brown, obtusely keeled with nerveless sides and narrow hyaline margin, 2 x 0.6-0.7 mm; keel 3-5-nerved with nerves extending up to apex, green. Stamens 1-3; anther oblong, rounded at apex and base, 0.5-0.6 mm long. Style flat, glabrous, articulated, without dilated base, brown, c. 0.2 mm long; stigmas 3, longer than style, glabrous, c. 0.4 mm long. Immature nuts rhomboidal, triquetrous, smooth, beaked, yellowish, sessile, 0.5-0.6 x 0.3-0.4 mm; epicarpic cells not obvious.

***Fimbristylis pandurata* Govind., sp. nov. (Fig. 6)**

Affinis *Fimbristylis consanguinae* Kunth sed differt habitu annuale nano, culmis multum brevioribus tetragonis laevigatis, foliis subacutis vel obtusis angustioribus rigidis laevigatis, ligula penicillata setifera, inflorescentia simplici minori 2-3 spiculorum consistenta, bracteis aristatis multum brevioribus glabris laevigatis panduratis, spiculis ellipticis ovoidis vel late obrullatis minoribus solitaribus cum numero minoribus floribus, glumis ovatis lanceolatis minoribus luteis cum lateribus enerviis et margine anguste hyalino, rhachilla carenti ala, stamina 2, stylo et stigmate brevioribus.

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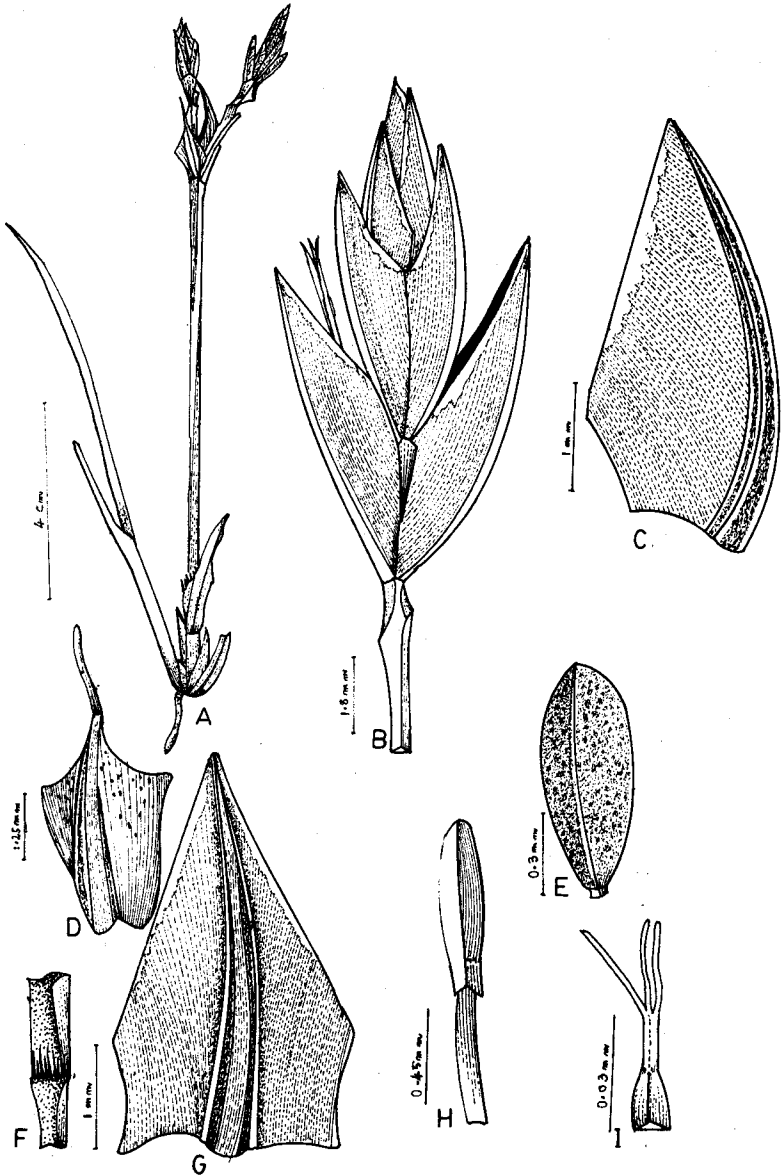


Fig. 6. *Fimbristylis pandurata* Govind.: A. Habit; B. Spikelet; C. Glume folded D. Bract; E. Nut; F. Sheath and leaf *p. p.* showing ligule - diagrammatic; G. Glume spread out; H. Anther; I. Style and stigma (based on Govindarajulu 14295 A - holotypus).

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Type: Tamilnadu, Madurai Dt., High Wayys Mts., Thangaikalmottai, *Govindarajalu 14295 A* (Holotypus - CAL).

Dwarf annuals. Roots very few, thick, pale yellow. Culms solitary, erect, rigid, 4-gonous, smooth, 2-2.5 cm x c. 0.5 mm. Leaves 1-2, rigid, flat or involute with thickened margin, excurved, smooth, subacute - obtuse, usually as long as culms, 0.75 mm broad; cauline leaves 1-2 reduced to short blades; sheaths with obliquely truncate mouth and sparsely hairy membranous margin (upper); ligule with penicillate white bristles. Inflorescence simple consisting of 3 spikelets (the central one missing or undeveloped), 5 x 3-4 mm. Involucral bracts 2-3, pandurate, awned, glabrous, smooth, slightly oblique, much shorter than inflorescence, keeled with keel nerves extending into awn, 2.5 (incl. awn) x 1 mm; awn 1.2 mm long. Spikelets solitary, elliptic ovoid or broadly obtrullate, subterete, acute, up to 10-flowered, brown, 3.5-4 x 1-1.2 mm; peduncle ancipitus, glabrous, 1.5-2.5 mm long. Rachilla excavated, wingless. Glumes ovate lanceolate, translucent, acute, spiral-subdistichous, non mucronate with glabrous margin throughout, obtusely keeled, 2-2.2 x 1 mm; keel 3-nerved with nerves extending up to apex and the median one rather prominent; margins narrowly hyaline; lateral sides nerveless. Stamens 2 with broad filaments, c. 2 mm long; anther yellow, linear oblong with reddish apex, c. 1 mm long; stigma 3, glabrous, as long as style. Nut (young), greyish white with more or less rough surface, narrowly obovoid or elliptic ovoid, rounded at apex, non umbonulate, sessile, 3-quetrous, c. 1 x 0.3 mm; epicarpic cells not obvious.

Acknowledgements

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Literature cited

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