

CYPERACEAE OF TAMIL NADU



भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

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2023



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**BOTANICAL SURVEY OF INDIA
SOUTHERN REGIONAL CENTRE**

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

2023



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Date of Publication : August, 2023

Published by

Botanical Survey of India

CGO Complex, 3rd MSO Building,

Block-F, 5th & 6th Floor

DF-Block, Sector I, Salt Lake City

Kolkata 700 064

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Cover photo (front) : *Schoenoplectiella mucronata*

ISBN : 978-81-962640-7-9

E-Publication

ए.ए. माओ
निदेशक
A.A. Mao
Director



भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारतीय वनस्पति संवर्क्षण
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST
& CLIMATE CHANGE
BOTANICAL SURVEY OF INDIA



FOREWORD

India is one of the 17 megabiodiversity countries of the World and home to more than 22000 flowering plant species. It is important to understand the diversity and potential utility of all these species for harnessing their potential to the optimum and to frame effective policy for their sustainable utilization. India is party to many international agreements which have been instituted for conservation and sustainable use of bioresources globally. Botanical Survey of India has been documenting the floristic wealth of our country in the form of national, state and district floras. The institute also brings out publications on important group of plants which have high diversity, special features and more significance than the other plant groups. In this sequence, this book on "Cyperaceae of Tamil Nadu" is being published by BSI.

Tamil Nadu presents maximum floristic diversity and high degree of endemism amongst the Indian states. The 'Sedges' or family Cyperaceae alone represents 219 taxa under 20 genera. These species are documented with morphological features, photographs, identification keys, phenology, habitat and distribution. The study had been undertaken during 2015–2020 under the Annual Research Programme of BSI. I believe, this e-book will definitely bridge the knowledge gap on this important group of plants and will be referred by the students, researchers, amateurs, nature lovers and policy makers while dealing with these plants.

I congratulate the authors in bringing out the work in its present form.



ACKNOWLEDGEMENTS

We express our deep sense of gratitude to Dr. A.A. Mao, Director and Dr. Paramjit Singh, former Director, Botanical Survey of India, Kolkata, for facilities and encouragement.

We heartfully thank Dr. M. Sanjappa, former Director, Dr. D.K. Singh, Scientist "G" (Retd.), and Er. A.K. Pathak, Scientist "G" (Retd.), Botanical Survey of India, for their incessant encouragement and support.

We wish to express our sincere gratitude to Dr. M.U. Sharief, Scientist "E" & Head of Office, BSI, SRC, for facilities and constant support.

We express our sincere gratitude to Drs. P. Venu, Scientist "G", P.M. Padhey, Scientist "F", Late B.K. Sinha, Scientist "F", Late P. Lashminarasimhan, Scientist "E", S.S. Dash, Scientist "E", and other Scientists of the Botanical Survey of India for their moral support.

We tender our heartfelt thanks to the Principal Conservator of Forest & Chief Wildlife Warden, Chennai for their permission to conduct field survey.

We also express our warmest thanks to Drs. M. Palanisamy, Scientist "E", S. Kaliamoorthy, Scientist "E", R. Manikandan, Scientist "E", V. Sampath Kumar, Scientist "E", M.Y. Kamble Scientist "D", K.A. Sujana, Scientist "D", W. Arisdason, Scientist "D" and Dr. M. Murugesan, Scientist "C"; scientific staff, Ms. R. Mehaladevi, Bot. Asst., Ms. Anantha Lakshmi, Bot. Asst., Mr. Rakesh G. Vadhyar, Bot. Asst., Mr. Arivazhagan, Pres. Asst.; administrative staff, Mr. M. Murugesan, OS, Mr. M. Segar, UDC, Mr. K. Sivaramakrishnan, MTS and technical staff, Mrs Late R. Meiyalagan, ex-Field Asst., Late A. Michael Raj, ex-Field Asst., C. Kaliappan, Field Asst., C. Vijayakumar, MTS, T. Balan, MTS, K. Chandran, MTS, and outsourced staff, Mr. Muthu, Mr. Immanuvel, Mr. Mugilan, BSI, SRC, Coimbatore for their diligent support while undertaking the project.

We extend our special thanks to Dr. V. Ravichandran, AJCB-PDF, Mr. Basil Paul, SRF, Mr. P. Murugan, SRF, Mr. Sulaiman, SRF, Botanical Survey of India, Mr. M. Premkumar, Research Scholar, Mr. B. Karthik, Research Scholar and Mis. S.P. Nithya, Research Scholar, Coimbatore, for their help in various ways while undertaking this Annual Action Plan.

We extend our heartfelt thanks and appreciation to Mr. V. Ramesh, Photographer, for his help in preparing colour photo plates.

Finally, our gratitude and thanks to our family members, which cannot be expressed in terms of words.

Authors

PREFACE

Cyperaceae is a cosmopolitan and seventh largest family of flowering plants. It is found in different habitats from marshes to deserts. The minute spikelets of the species and the complex inflorescence structure make their taxonomy highly complicated. Morphologically the plant appears like a grass. Many species provide food, fodder, fuel, medicines, weaving, perfumery materials, etc. They also form a natural constituent of wetlands and riverside vegetation, where their densely tangled rhizomes control the soil erosion and involved in water purification. In spite of the economic and ecological significance, this group receives little attention from flora workers because of the floral complexity and inadequate herbarium collections. Therefore, the present study has been carried out to assess the floristic composition of the sedges in Tamil Nadu.

Tamil Nadu is situated at the south-eastern extremity of the Indian peninsula which harbours a rich diversity of sedges. Despite scattered account of the family is available in some previous works, an exclusive taxonomic study on the Cyperaceae is not available for the State.

The present flora is an outcome of intensive field surveys undertaken in different localities in Tamil Nadu. Detailed descriptions, illustrations, phenology, distribution, and colour photographs of the species have been provided in the work. Identity of the species was confirmed with the local and national Floras and other relevant literature. A total of 219 taxa under 20 genera are documented and studied comprehensively. Of the total recorded sedge species, 9 species are restricted to Indosrilanka, 11 species are endemic to India, 19 species are endemic to the Western Ghats and 31 species are endemic to Tamil Nadu. We hope that this book will contribute as a good reference source for researchers, students and policymakers.

Authors

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PLATE-1



Kolli Hills, Namakkal District



Tambirabarani River, Thuthookudi District



Kakachi-Upper Kothayar, Tirunelveli District



Tambirabarani River, Tirunelveli District



Vellode Bird Sanctuary, Erode District



Yelagiri Foot Hill, Vellore District



Sitrari Hills, Dharmapuri District



Kariachal Is. Ramanathapuram District

PLATE - 2



Bulbostylis barbata (Rottb.) C.B. Clarke



Carex baccans Nees



Carex filicina Nees



Carex filicina Nees



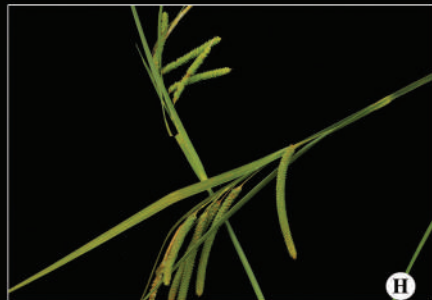
Carex lindleyana Nees



Carex maculata Boott



Carex myosurus Nees

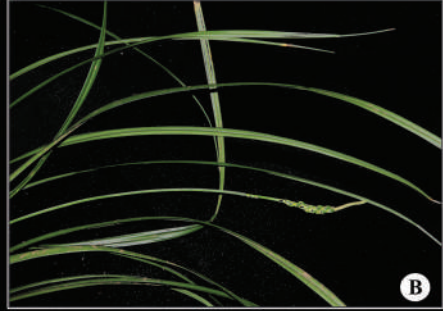


Carex phacota Spreng

PLATE -3



Carex speciosa Kunth



Carex speciosa Kunth



Cyperus alopecuroides Rottb.



Cyperus alternifolius L.



Cyperus arenarius Retz.



Cyperus arenarius var. *nairii* Vairayya, G.V.S.Murthy & Ratna Kumar



Cyperus bulbosus Vahl



Cyperus castaneus Willd.

PLATE -4



Cyperus clarkei T. Cooke



Cyperus compressus L.



Cyperus conglomeratus subsp. *pachyrrhizus*
(Nees ex Boeckeler) T. Koyama



Cyperus conglomeratus subsp. *pachyrrhizus*
(Nees ex Boeckeler) T. Koyama



Cyperus corymbosus Rottb.



Cyperus corymbosus Rottb.



Cyperus cuspidatus Kunth



Cyperus cyperinus (Retz.) Suringar

PLATE - 5



Cyperus cyperoides (L.) Kuntze



Cyperus cyperoides (L.) Kuntze



Cyperus difformis L.



Cyperus digitatus Roxb.



Cyperus distans L. f.



Cyperus distans L. f.



Cyperus dubius Rottb.



Cyperus dubius Rottb.

PLATE -6



Cyperus exaltatus Retz.



Cyperus involucratus Rottb.



Cyperus javanicus Houtt.



Cyperus iria L.



Cyperus iria L.



Cyperus michelianus (L.) Delile subsp. *pygmaeus* (Rottb.) Asch. & Graebn.



Cyperus pilosus Vahl



Cyperus pumilus L.

PLATE -7



Cyperus rotundus L.



Cyperus rubicundus Vahl



Cyperus squarrossus L.



Cyperus squarrossus L.



Cyperus tenuispica Steud.



Eleocharis atropurpurea (Retz.) J. Presl & C. Presl



Eleocharis congesta D. Don

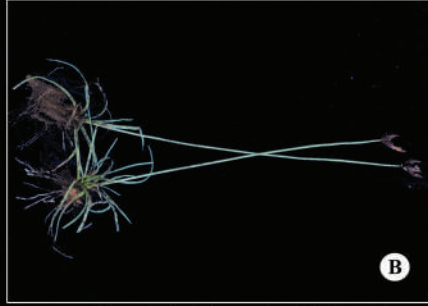


Eleocharis geniculata (L.) Roem. & Schult.

PLATE - 8



Fimbristylis aestivalis (Retz.) Vahl



Fimbristylis amplocarpa Govind



Fimbristylis amplocarpa Govind



Fimbristylis aphylla Steud.



Fimbristylis argentea (Rottb.) Vahl



Fimbristylis bisumbellata (Forssk.) Bubani



Fimbristylis cinnamometorum (Vahl) Kunth



Fimbristylis cinnamometorum (Vahl) Kunth

PLATE -9



Fimbristylis cymosa var. *spathacea* (Roth) T. Koyama



Fimbristylis dichotoma (L.) Vahl



Fimbristylis dichotoma (L.) Vahl



Fimbristylis dipsacea (Rottb.) C.B. Clarke



Fimbristylis eragrostis (Nees & Meyen) Hance



Fimbristylis ovata (Burm.f.) J.Kern



Fimbristylis quinquangularis (Vahl) Kunth



Fimbristylis quinquangularis (Vahl) Kunth

PLATE -10



Fimbristylis schoenoides (Retz.) Vahl



Fimbristylis sieberiana Kunth



Fimbristylis salbundia (Nees) Kunth



Hypolytrum nemorum (Vahl) Spreng.



Kyllinga brevifolia Rottb.



Kyllinga melanosperma Nees



Kyllinga nemoralis (J.R. Forst. & G. Forst.) Dandy ex Hutch. & Dalziel



Lipocarpha chinensis (Osbeck) J. Kern

PLATE - 11



Lipocarpha gracilis (Rich. ex Pers.) Nees



Lipocarpha squarrosa (L.) Goetgh.



Pycreus flavidus (Retz.) T. Koyama



Pycreus flavidus (Retz.) T. Koyama



Pycreus polystachyos (Rottb.) P.Beauv.



Pycreus pumilus (L.) Nees



Pycreus sanguinolentus (Vahl) Nees ex C.B. Clarke



Rhynchospora corymbosa (L.) Britton

PLATE - 12



Rhynchospora rugosa subsp. *brownie*
(Roem. & Schult.) T. Koyama



Schoenoplectiella juncooides (Roxb.) Lye



Schoenoplectiella juncooides (Roxb.) Lye



Schoenoplectiella mucronata (L.) J. Jung & H.K. Choi



Scleria corymbosa Roxb.



Scleria lithosperma (L.) Sw. subsp. *lithosperma*



Scleria lithosperma (L.) Sw. subsp. *lithosperma*



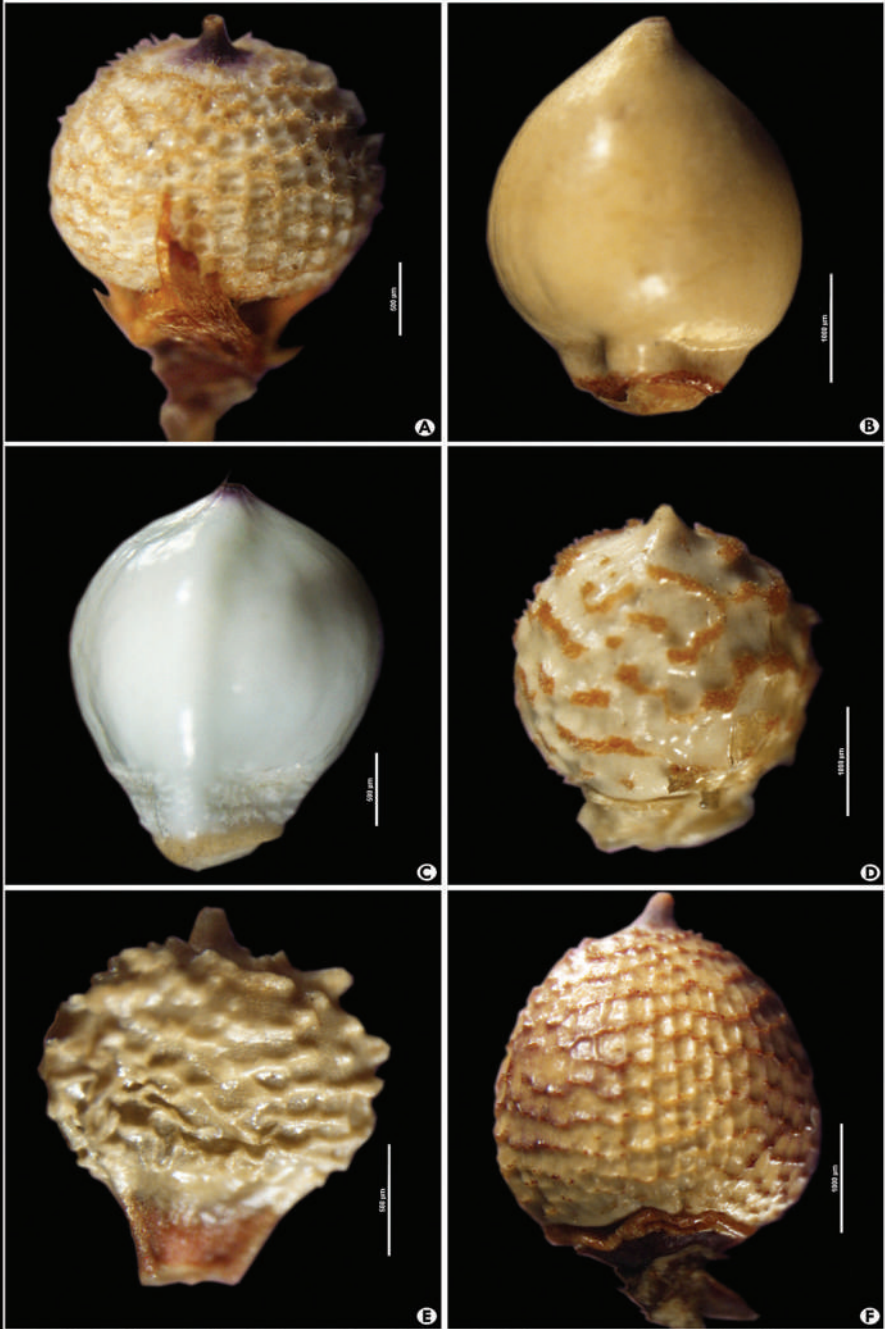
Scleria terrestris (L.) Fassett

PLATE-13



A. *Carex baccans* Nees; B. *C. filicina* Nees var. *filicina*; C. *C. lenta* D. Don; D. *C. leucantha* Arn. ex Boott; E. *C. ligulata* Nees; F. *C. lindlayana* Nees; G. *C. maculata* Boott; H. *C. nubigena* D. Don; I. *C. phacota* Spreng.

PLATE-14



A. *Scleria biflora* Roxb.; B. *S. corymbosa* Roxb.; C. *S. lithosperma* (L.) Sw. subsp. *lithosperma*;
 D. *S. lithosperma* (L.) Sw. subsp. *linearis* (Benth.) Koyama; E. *S. pergracilis* (Nees) Kunth;
 F. *S. terrestris* (L.) Fasset

INTRODUCTION

The family name Cyperaceae is derived from the generic name *Cyperus* L., originally from the Greek 'kupeiros', meaning sedge. The family was established by Jussieu in his *Genera Plantarum* (1789). Cyperaceae are the seventh largest family in the Angiosperms and third largest in the Monocotyledons (Simpson & al., 2011), with 5,387 species in 106 genera. *Carex* (2,000 spp.) and *Cyperus* (550 spp.) are the dominant genera in the family (Govaerts & al., 2007). This cosmopolitan family Cyperaceae comprises grass-like monocots, found in different habitats ranging from marshes to deserts, and the members of the family dominate many ecosystems, including Tundra and Savanna. Some species are distributed in specific habitat, with narrow distribution range, whereas others are ubiquitous weeds that occur in a variety of environments.

The morphology and architecture of spikelet and inflorescence form the basis for classification of different ranks within the family. However, the very small nature of the spikelet and the complex structure of the inflorescence are often complicate the interpretation and there is still controversy over the recognition of some of the subfamilies, tribes and genera. Comprehensive molecular studies in the family are still not complete so there are no unambiguous solutions to solve various taxonomic problems. Many species have a tufted growth habit; long, thin-textured, narrow, flat leaves with a sheathing base, jointed culms and much-branched inflorescences of tiny flowers, they are often described as graminoid, meaning grass-like. But some grasses and sedges do not fit to the graminoid image, by having leaf blades rounded in cross section or no leaf blades at all, or having compact, head-like inflorescences, etc. (Archer, 1998).

All members of the sedge family having habit such as the giant herb, papyrus, climbers (in genus *Scleria*), Xerophyte - like *Microdracoides* from West tropical Africa with woody branching stem, etc. can be comfortably accommodated by this term. Along with the similarities to grasses, there are many unique characters to differentiate the sedges from the grasses such as, three-ranked leaves with closed sheaths, angular culm with solid pith, conspicuously bracteate inflorescence and presence of perianth bristles or scales, etc. from the latter. It is also apparently very close with *Juncus*, which can be differentiated in close observations.

General Morphology: The members of the family are usually annual or perennial herbs except the African genus *Microdracoides*, which is tree-like. They are characterized by the grass-like or rush-like habit with or without rhizomes, the inconspicuous flowers enclosed by the distichously or spirally arranged glumes on a spikelet and the indehiscent fruit known as 'nut' or 'achene'

Underground Parts: The annuals are always with fibrous roots and perennials with short or long creeping rhizomes. The rhizomes are usually small and woody, but sometimes a long creeping or emitting stolons, which often bear tubers (*Cyperus rotundus* L.). The rhizomes and stolons are technically an underground system and often clothed with fibrous remains of old leaf sheaths.

Culms: The stems are known as culms and are usually tufted but occasionally solitary. The culms are capillary or slender to very stout, few millimeters (*Eleocharis* spp.) to several meters long (*Scleria* spp.), without nodes or nodose (*Scleria* spp. and *Fuirena* spp.), solid or hollow, trigonous, triquetrous, multiangular, terete or strongly compressed, usually smooth, at times scabrid especially on the angles.

Leaves: Leaves are usually 3-ranked when the culms are trigonous or triquetrous, often distichous or polystichous, usually in a basal cluster, but at times a few or almost all cauline. They are sessile, shorter to much longer than culm and flat. In some species the leaves are reduced to basal sheaths only. Leaf sheaths are usually closed. The ligule (a projection at the top of the sheaths) is generally absent but sometimes represented by a fringe of hairs or a membrane (*Fimbristylis* spp.).

Inflorescence: The inflorescence in this family is constituted by the arrangement of spikelets wherein the inconspicuous minute flowers are arranged. It is normally anthelate or capitate and are usually subtended by foliaceous or glumaceous involucre bracts. In many types of sedges the inflorescence is terminal but sometimes a pseudolateral cluster is also observed as in *Schoenoplectiella* spp. The various types of inflorescences present in Cyperaceae are: umbellate, paniculate, spicate, corymb, etc. It may be simple, compound, decompound or supra-decompound. The floral parts of the sedge inflorescence are detailed below.

i. Prophylls: Prophylls are small scale-like organs varying in form and size, attached to different parts in the inflorescence.

ii. Spikelets: Spikelets in sedges vary in their size, shape, colour and arrangement. Each spikelet is generally subtended by a prophyll and below that a bract. The main axis of a spikelet is called rachilla. It may be persistent or deciduous and winged or wingless. Each spikelet consists one or more tiny flowers subtended by small scales called glume. The glumes and flowers may be spirally or distichously arranged.

a. Glumes: Glumes exhibit variations in their number, arrangement, size, shape, colour, nervation, apex, etc. Glumes are arranged spirally, distichously or subdistichously. The shape of the glumes can be linear, lanceolate, ovate, obovate, oblong, orbicular or spatulate. The apex can be acute, acuminate, obtuse, aristate, mucronate, sinulate, etc. The colour varies from stramineous to different shades of brown.

b. Flowers: The flowers are minute and inconspicuous. The number of stamens (usually 1–3), the size of anthers, nature of connective appendages are varying in each species. The style can be uniformly slender, thickened towards base and hence with a pyramidally thickened base in most tristigmatic species (*Eleocharis* spp.).

c. Fruits: The fruits in Cyperaceae are one-seeded, indehiscent and usually known as 'nut' or 'achene'. The nut is sessile or subsessile or rarely stipitate. It can be lenticular, planoconvex or trigonal and the shape varies as oblong, obovoid, ovoid or globose; apex can be obtuse, acute, apiculate or beaked. The surface of the nut varies according to the species.

The family has considerable economic importance as many members provide food, fodder, fuel, medicines, weaving, perfumery materials, etc. Sedges are of crucial importance in maintaining the primary productivity of grasslands and marshlands. The chief importance of sedges lies in forming a major natural constituent of wetlands and riverside vegetation, where their densely tangled rhizomes contribute to erosion control and water purification. The dense sedge beds provide food and shelter for birds, animals and other aquatic life – thus attracting ecotourism. Sedges are important indicators of environmental damage, especially to aquatic habitats. They are particularly sensitive to the lowering of water tables and or/water pollution and there are observable declines in many species. In spite of the economic and ecological significance this group receives little attention from flora workers because of the minute flowers enclosed in glumes and arranged in complicated inflorescence of spikelet along with inadequate herbarium collections. Hence an attempt has been made to document and understand these sedge resources in Tamil Nadu state for sustainable management and utilization.

Previous Works: At global level comprehensive and critical floristic information on sedges are provided by Linnaeus (1753, 1754), Torrey (1836), Beetle (1946), Kuekenthal (1949), Kern (1974), Reznicek (1990), Thomas (1998), Govaerts & al. (2007), etc. Cyperologists have demonstrated an excellent level of cooperation over recent years for documentation and evolutionary aspects of the family. Therefore, biosystematic, monographic and experimental studies are much more advanced in different parts of the globe as compared to those in the Indian subcontinent. The first taxonomic treatment of sedge in India was given by C.B. Clarke (1893) in the Flora of British India, wherein 449 species under 28 genera have been described. Regional floristic studies and inventories were published by Fischer (1931), Hooper (1998), Matthew (1983), Verma (1982, 1985), Verma & Chandra (1979, 1980), Prasad & Singh (2002), Wadood Khan (1983, 1999, 2000, 2007), more recently Yarraya & Murthy (2012) have also contributed significantly to the taxonomy of this family in India. But there is no exclusive taxonomic study on the Cyperaceae of Tamil Nadu hitherto. Therefore, the present study has been carried out to prepare a comprehensive taxonomic account of Cyperaceae of Tamil Nadu with following objectives

Study Area: Tamil Nadu state is situated at the south-eastern extremity of the Indian peninsula. The state lies between latitudes 8°5' and 13°35' N and longitudes 76°15' and 80°20' E, and covers an area of 1,30,058 km², occupying 4.08% of the total area of India. It has a coastline of about 990 km and a land boundary of about 1200 km. The state is bounded on the north by Karnataka and Andhra Pradesh, on the south by the Indian Ocean, on the east by the Bay of Bengal and in the west by the Arabian Sea and the states of Kerala and Karnataka.

The geographical area of the state has a roughly rhomboidal appearance with the longer diagonal of it stretching from Pulicat lake in the north to Kanyakumari in the south and the shorter diagonal from Gudalur in the west to Point Calimere in the east. The Union Territory of Puducherry including Karaikal is within the

geographical region of the state. The state also has a chain of twenty coral islands collectively termed as Rameswaram and Krusadai group of islands and several reefs extend along the northern shore of Gulf of Mannar. Administratively, 38 districts have been demarcated in Tamil Nadu, with Chennai, formerly Madras, as the capital of the state. The various districts are Ariyalur, Chengalpet, Chennai, Coimbatore, Cuddalore, Dharmapuri, Dindigul, Erode, Kallakurichi, Kancheepuram, Kanyakumari, Karur, Krishnagiri, Madurai, Nagapattinam, Namakkal, Nilgiris, Perambalur, Pudukottai, Ramanathapuram, Ranipet, Salem, Sivagangai, Tenkasi, Thanjavur, Theni, Thiruvallur, Thiruvarur, Thoothukudi, Tiruchirappalli, Tirunelveli, Tirupathur, Tiruppur, Tiruvannamalai, Vellore, Viluppuram and Virudhunagar. These districts and their headquarters are shown in **Map 1**.



MAP 1: STUDY AREA

Materials and Methods: The study has been carried out to assess the floristic composition of the sedges in Tamil Nadu. Distribution details of endemic, endangered and economically important species were collected by conducting a field study and literature. During the course of the study (April, 2016 to March, 2020), 9 field trips (Table 1) have been conducted to different parts of the Tamil Nadu state, which resulted in the collection of specimens (vouched 453 field numbers) belonging to sedge species along with their photographs and field notes. In addition to the personal collections, materials housed at MH were studied to understand the variation and distribution of each taxon. The field data on habit, habitat, flowering, fruiting, indumentum, colour, fragrance, etc. were also recorded in the field itself. Photographs were also taken then and there for further study. The specimens collected from different parts of the state were processed for herbarium following the standard herbarium procedures (Jain & Rao, 1976; Forman & Bridson, 1989). The processed specimens were affixed on the mounting sheet using fevicol for giving mechanical strength to the specimen. Voucher specimens (892 numbers) were deposited in the Madras Herbarium, Botanical Survey of India, Southern Regional Centre, Coimbatore (MH), for future study and reference.

All mounted specimens were critically studied with a stereomicroscope. Detailed descriptions, illustrations, phenology, distribution, colour photographs have been provided. These descriptions were compared with local and national Floras for confirming the identity. The specimens were cross matched with authentic specimens deposited at MH. Virtual images of various international herbaria particularly K, were also consulted.

CYPERACEAE Juss.

Perennials or annual herbs with or without stolens / rhizomatous base, at times forming a tuber or corm. Culms usually trigonous to terete or 4–6 angular or flattened and solid or hollow, nodose and leafy or subscapose and nearly naked, rarely transversely septate. Leaves radical or cauline, usually with closed sheathing at base and a linear blade, occasionally leaves reduced to subaphyllous sheaths; ligules hardly developed; sheaths with contraligule along abaxial side. Inflorescence terminal, rarely pseudolateral, mostly antherlate, paniculate, racemose, spicate or congested heads, subtended by leafy involucral bracts bearing 1 to numerous spikelets. Spikelets with few to many glumes imbricated or distichous on rachilla axis. Flowers in axillary of glumes or at times bisexual cymule at axil, or rachilla ends with terminal pistillate flower and 0 to few staminate second order spikelets at axils of some glumes; prophylls distinct at base, at times prophylls well developed into bottle shaped utricle enclosing or surrounding its much reduced spikelet. Flowers bisexual or unisexual, rarely dioecious, naked or with perianth of 1 to many hypogynous bristles or scales. Stamens usually 1 to 3 (6). Pistil bi or tricarpellate; style elongated or short with 2 or 3 fid sitgmas. Ovary unilocular, maturing into an achene or nutlet.

c. 109 genera and 5500 species are found in tropical and subtropical regions to temperate zones of in moist conditions including in wetland areas. c. 39 genera and c. 580 species are reported from India and c. 20 genera and c. 219 taxa are found in Tamil Nadu.

Key to genera

- | | |
|---|----------------------------|
| 1a. Plants dioecious; flowers strictly unisexual | 2 |
| 1b. Plants polygamomonoecious; all flowers as a rule bisexual or at least 1 flower bisexual, other flowers usually male | 3 |
| 2a. Female flower and nutlet enclosed by a urticliform prophyll (Utricle), often subtended by single glume, without disk at base | 4. Carex |
| 2b. Female flower and nutlet not enclosed by a urticliform prophyll, often subtended by 2 or 3 glumes, with disk at base | 19. Scleria |
| 3a. Plants leafless, reduced to tubular sheaths; involucre bracts culm or glume-like or absent | 4 |
| 3b. Plants leafy; involucre bracts foliaceous | 5 |
| 4a. Inflorescence reduced to 1 terminal spikelet; styles articulated with nutlets, style bases much dilated, cone-like or subglobose, usually persistent; involucre bracts 1–3, glume-like or setaceous or absent | 7. Eleocharis |
| 4b. Inflorescence pseudolateral with many spikelets; styles continuous with the nutlets, style bases slender, persistent or not; involucre bract single, culm like | 18. Scirpus |
| 5a. Spikelets much reduced, usually very few (mostly 1–3) flowered; lower glumes of spikelets much smaller and empty, at times glumes absent | 6 |
| 5b. Spikelets many flowered; all glumes more or less equal in size | 8 |
| 6a. Styles articulated with ovary and nutlets, style base very large, conically dilated, persistent at apex of nutlet | 16. Rhynchospora |
| 6b. Style continuous with the ovary, without thickened base or joint | 7 |
| 7a. Style with 2 branches; stigmas 2 | 11. Kyllinga |
| 7b. Style with 3 branches; stigmas 3 | 13. Lipocarpa |
| 8a. Style jointed with ovary; style base dilated or spongy thickened, clearly demarcated from it | 9 |
| 8b. Style continuous with ovary; style base not demarcated and not dilated as above | 10 |
| 9a. Nutlet crowned by persistent style base; leaf sheath with long silky hairs at apex | 3. Bulbostylis |
| 9b. Nutlet not crowned by persistent style base; leaf sheath without long silky hairs at apex | 8. Fimbristylis |
| 10a. Glumes distichous | 11 |
| 10b. Glumes spirally arranged | 14 |
| 11a. Glumes prominently winged | 5. Courtoisina |
| 11b. Glumes not winged | 12 |
| 12a. Rachilla deciduous; spikelets falling as single unit; plant aromatic | 15. Queenslandiella |
| 12b. Rachilla persistent; spikelets not falling as single unit; plant not aromatic | 13 |
| 13a. Nutlet trigonous, dorsiventrally compressed with 1 side facing spikelet axis | 6. Cyperus |
| 13b. Nutlet 2-sided, laterally compressed with 1 margin facing spikelet axis | 14. Pycrus |

- 14a. Hypogynous scales or bristles present 15
 14b. Hypogynous scales absent; hypogynous bristles present or absent 18
 15a. Outer hypogynous scales folded, transversely and sharply keeled, ciliate or spinulose on the keel 16
 15b. Hypogynous scales when present, not as above or perianth with 1–6 bristles 17
 16a. Hypogynous scales 2; leaves with well developed blades on radical and cauline in position; culms not septate **10. Hypolytrum**
 16b. Hypogynous scales numerous; leaves without blades and represents with bladeless sheaths at base of culms; culms tranversely septate **12. Lepironia**
 17a. Leaves with a collar around the culms near orifice; glumes usually with long cilia; hypogynous scales 3, usually alternate with 3 hypogynous bristles; rhizome if present not tuberiferous **9. Fuirena**
 17b. Leaves without a collar around the culms; glumes not with long cilia; hypogynous bristles 6; rhizome emitting tuberiferous stolons **2. Bolboschoenus**
 18a. Involucral bract glume like, sheathing the culm, shorter than inflorescence **20. Trichophorum**
 18b. Involucral bracts leafy or culm like, longest one exceeding the inflorescence 19
 19a. Inflorescence a large terminal corymb **1. Actinoscirpus**
 19b. Inflorescence pseudolateral in position, anthelate or head like **17. Schoenoplectiella**

1. ACTINOSCIRPUS (Ohwi) R. W. Haines & Lye

Robust perennials; stolons long, creeping, slender, terminates into a small tuber. Culms usually solitary or in tufts, 90–180 cm high, base thickened, sharply 3-angled, sides concave. Leaves few, linear, acute at apex, 50–80 cm long, margin scabrid; ligulate; sheaths broad, spongy, straw coloured, with prominent transverse nerves. Involucral bracts 3 or 4, leafy, exceeding the inflorescence, margins apically scabrous. Inflorescence a large terminal corymb, with many spikelets. Spikelets solitary, terminal one sessile, others pedicellate. Glumes spirally imbricate, broadly elliptic, cymbiform, subtending a bisexual flower, deciduous. Perianth bristles 5 or 6, mostly longer than nutlet, retrorsely scabrous, deciduous with nutlet. Stamens 3. Style base persistent; stigmas 3. Nutlet obovate, compressed trigonous, beaked at apex.

Eastern Paletropics. A monotypic genus.

Actinoscirpus grossus (L.f.) Goetgh. & D.A. Simpson in Kew Bull. 46:171. 1991; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 249. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 338. 2021. *Scirpus grossus* L.f., Suppl. Pl.:104. 1781; C.B. Clarke in Hook.f., Fl. Brit. India 6: 659. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1666 (1156). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1786. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:68. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:335. 2015. *Hymenochaeta grossa* (L.f.) Nees in Wight, Contr. Bot. India:119. 1834. *Schoenoplectus grossus* (L.f.) Palla, Allg. Bot. Z. Syst. 17:Beibl. 3. 1911.

Stoloniferous perennial. Culms solitary or few in tufts, scapose, 1–2 m high, trigonous below the inflorescence, sides concave. Leaves few, 50–100 cm long, shorter than culms, flat, keeled, margins revolute, scabrid; sheaths spongy, tightly clasping the culm base. Involucral bracts 3 or 4, leafy, up to 60 cm long, exceeding the inflorescence. Inflorescence a large terminal corymb; primary, secondary and tertiary rays present. Spikelets solitary, pedicellate, except terminal one, elliptic to ovate, 3–5 × 2.5–3 mm, dark brown, densely many flowered. Glumes elliptic to broadly ovate, cymbiform, c. 2.5 mm long, obtuse at apex, ciliate, short mucronate, keel green. Perianth bristles 6, light brown, slightly longer than nutlet, retrorsely scabrid. Stamens 3; anthers linear, connective deltoid. Style 3-fid. Nutlet broadly ovate, 1–1.6 × c. 1 mm, apiculate, pale brown or brown.

Fl. & Fr.: Aug. – Dec.

Habitat: Marshy and inundated areas.

Distrib.: Salem and Tiruchirappalli. Throughout India. Eastern Paleotropics.

2. BOLBOSCHOENUS (Ascher.) Palla

Perennials, tuberous, tubers swollen, stoloniferous, stolons long. Culms triquetrous. Leaves Cauline, laminate; lower sheaths often spatulate, nodose. Inflorescence terminal, corymb-like or capitate; bracts leafy, many. Spikelets large, with spirally arranged glumes. Flowers hermaphrodite; hypogynous bristles to 6 or absent. Stamens 3. Style base not enlarged, persistent. Nuts large, more or less smooth. Embryo schoenoplectoid.

Chiefly in Eastern Asia and Eastern North America, c. 8 species, 2 in India and 1 in Tamil Nadu.

Bolboschoenus maritimus (L.) Palla in Koch, Syn. Deutsch. Schweiz. Fl. ed. 3, 2532. 1904; Hooper in Saldanha & Nicolson, Fl. Hassan 658. 1976; Sharma & al., Fl. Karnataka 303. 1984, p.p.; Chandrab. & N.C. Nair, Fl. Coimbatore: 313. 1988; Prasad & Singh, Sedg. Karnataka in J. Econ. Taxon. Bot. Add. Ser. 21: 43. 2002; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 250. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 338. 2021. *Scirpus maritimus* L., Sp. Pl. 1: 51. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 658. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1666 (1156). 1931; Kern in van Steenis, Fl. Males. 1. 7: 499. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 69. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 340. 2015. *Schoenoplectus maritimus* (L.) Lye in Blyttia 29: 145. 1971; Karthik. & al., Fl. Ind. Enum. Monocot.: 69. 1989.

Perennials, erect herbs; rhizomes long, horizontal, creeping, producing large stout tubers at nodes; tubers ovoid, up to 3 cm in diam., blackish. Culms stout,

erect, solitary from tuberous base, 40–60 cm high, 6–12 mm thick near base, 1–3 mm thick near inflorescence, trigonous, glabrous, leafy up to middle. Leaves well developed, cauline, grass-like, linear or flat, 30–40 × 0.4–0.6 cm, glabrous, upper ones usually overtopping the inflorescence, acuminate or gradually narrowed to a fine triquetrous tip, striate, with prominent midrib; sheaths up to 12 cm long, tightly closed except basal one, glabrous, truncate or slightly produced at mouth; ligule absent. Inflorescence usually compound umbel, rarely reduced to a single spikelet, up to 1.5–6 cm long. Involucral bracts usually many, not sheathing, lower ones foliaceous, upper ones linear, usually exceeding the inflorescence, up to 8 cm long, glabrous, acuminate. Primary rays quite unequal, 1–4 cm long. Spikelets solitary or in clusters of 3, terete, cylindrical, oblong to oblong-ovoid, 0.8–2 × 0.3–0.5 cm, subacute at apex, reddish brown or ferruginous, densely many-flowered. Glumes ovate or oblong-ovate, 5–7 × 3–4 mm, membranous, emarginate or lacerate at apex, pubescent, midrib strong, produced into a long antrorsely scabrid awn at apex. Perianth bristles 3–6, unequal, shorter than nut, retrorsely scabrous, caducous. Stamens 3; anther linear-oblong, c. 3 mm long, with a well developed bristly connective appendage; filaments elongate up to 5 mm long. Ovary obovate, c. 0.6 mm long; style filiform, c. 2 mm long; stigmas 2 or 3, longer than style, c. 3.5 mm long. Nutlet planoconvex to trigonous, broadly obovoid to suborbicular, 2.5–3 × 1–2 mm, pale yellow or blackish brown, smooth.

Fl. & Fr.: Jul.– Dec.

Habitat: Swamp and moist areas and edges of paddy fields, lakes, ponds, ditches, often standing in water.

Distrib.: Tamil Nadu (Coimbatore), Karnataka and other parts of India (except North-east India). Eastern Asia and Eastern North America.

Note: Chandra Bose & Nair (1988) reported this species in Flora of Coimbatore as a new record to Tamil Nadu.

3. BULBOSTYLIS Kunth

Annuals or tufted perennials. Culms erect, slender to capillary, angular, at times many noded, striate or sulcate, leafy at base. Leaves capillary or very narrow, rarely reduced to bladeless sheaths; blade often inrolled or canaliculate; eligulate; sheaths usually with tuft of long white hairs on mouth laterally. Inflorescence terminal or pseudolateral simple or compound, anthelate or capitate, few to many spikelets, or rarely reduced to a single spikelet. Involucral bracts short or long, setaceous to leafy. Spikelets usually angular, ovoid to ellipsoid, few to several flowered; rachilla persistent, narrowly winged. Glumes spirally arranged or rarely distichous, herbaceous or membranous, caduceous, usually strongly keeled, subtending a flower. Flowers bisexual, without hypogynous bristles. Stamens 1–3; anthers oblong

or linear-oblong. Style articulate with the ovary, filiform, glabrous, base thickened as button like and persistent on nutlet apex; stigmas 3. Nutlet triquetrous, obovate, 3-sided, minutely stipitate.

Pantropical to warm temperate regions of the world, with highest concentration in tropical Africa and South America, c. 100 species, 5 in India; 5 species and 1 subspecies in Tamil Nadu.

Key to species

- 1a. Inflorescence anthelate, simple to compound umbel; nutlet transversely wrinkled 2
- 1b. Inflorescence capitate or a head of clustered spikelets; nutlet smooth or granulated 3
- 2a. Spikelets compactly arranged with short rays; rays up to 5 mm long; glumes pubescent; stamen 1 **3. B. thoursii**
- 2b. Spikelets loosely arranged with elongated rays; rays up to 1.8 cm long; glumes glabrous; stamens 2 **2. B. densa**
- 3a. Glumes bilobed at apex; keel spongiously swollen at base; nuts granulate **5. B. swamyii**
- 3b. Glumes not bilobed at apex; keel not swollen at base; nuts smooth 4
- 4a. Annuals with slender culms; inflorescence not prickly; glumes glabrous or glabrescent; nutlets triquetrous, broadly obovoid **1. B. barbata**
- 4b. Perennials with stout rhizome and culms; inflorescence prickly; glumes densely pubescent; nutlets oblong-obovoid **4. B. subspinescens**

1. *Bulbostylis barbata* (Rottb.) C.B. Clarke in Hook.f., Fl. Brit. India 6: 651. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1662 (1153). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 153. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1725. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum:352. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 33. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1394. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 32. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 250. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 338. 2021. *Scirpus barbatus* Rottb., Descr. Icon. Rar. Pl.: 52. 1773. *Isolepis barbata* (Rottb.) R.Br., Prodr. Fl. Nov. Holland.: 222. 1810. *I. barbata* (Rottb.) R.Br. var. *capillaries* Nees in Wight, Contr. Bot. India: 109. 1834. *Stenophyllus barbatus* (Rottb.) T. Cooke, Fl. Bombay 2: 887. 1908.

Densely tufted annuals. Culms very slender, erect, 8–15 cm high, 0.4–0.6 mm thick, sulcate, smooth, glabrous. Leaves much reduced than culm, filiform to very slender, 0.1–0.5 mm wide, acute to acuminate at apex, glabrous to sparsely pilose, scabrous on lower surface towards apex; ligule absent; sheaths membranous, stramineous to brownish when dry, mouth white-hyaline, usually with long white hairs; leaves at times reduced to sheaths. Inflorescence a terminal capitate of 3–19 sessile spikelets, 2–10 mm across, subspherical at maturity. Involucral bracts 2–4, setaceous, 6–26 mm long, shorter to much longer than inflorescence, dilated at base, usually scabrous on

lower surface. Spikelets ovoid to ovoid-lanceolate, angular, 2–6 × 1–2 mm, subacute at apex, obtuse to rounded at base, few flowered. Glumes ovate to broadly ovate, 2–2.4 × 1.2–1.6 mm, mucronate, membranous, strongly keeled, brownish to yellowish with green keel, usually puberulous on outer surface, glabrous, margin ciliolate. Stamen 1; anther linear-oblong, c. 0.6 mm long; filament up to 2.4 mm long. Ovary obovate, c. 0.4 mm long; style filiform, c. 1 mm long; stigmas 3, shorter than style. Nutlet triquetrous, broadly obovoid, c. 0.6 × 0.5 mm, rounded to emarginate at apex, stramineous, pale brown to yellowish, smooth, finely reticulate with minute isodiametric cells in many rows; persistent style base depressed.

Key to subspecies

- 1a. Culms usually slender; lower glumes up to 2.4 mm long; keel of glumes mucronate at apex **1.1** subsp. **barbata**
 1b. Culms rigid; lower glumes up to 3.1 mm long; keel of glumes excurrent to a recurved cusp of c. 0.5 mm long at apex **1.2.** subsp. **pulchella**

1.1. subsp. **barbata**

Fl. & Fr.: Aug. – Dec.

Habitat: Roadsides, sandy areas in forests and plantations, banks of streams and waste lands.

Distrib.: All districts. Throughout India. Paleotropics and southern USA.

1.2. subsp. **pulchella** (Thwaites) T.Koyama in Bot. Mag. (Tokyo) 93: 341. 1980 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 328. 1985; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 34. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 250. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 338. 2021. *Isolepis pulchella* Thwaites, Enum. Pl. Zeyl.: 350. 1864. *Scirpus thwaitesii* Boeckeler in Linnaea 38: 380. 1874. *Bulbostylis barbata* (Rottb.) C.B. Clarke var. *pulchella* (Thwaites) C.B. Clarke in Hook.f., Fl. Brit. India 6: 652. 1893.

Culms 0.4–1.2 mm thick, more rigid, usually light purple towards base. Leaf sheaths purplish-brown. Glumes usually glabrous or subglabrous. Lower glumes longer, up to 3.1 mm long, keel of glumes excurrent to a recurved cusp of c. 0.5 mm long.

Fl. & Fr.: Oct. – Nov.

Habitat: Wastelands, open grasslands and margins of water courses.

Distrib.: Tamil Nadu (Cuddalore and Erode). India and Sri Lanka.

2. *Bulbostylis densa* (Wall.) Hand. - Mazz., Vegetations bilder 20 (7): 16. 1930; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 153. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1726. 1983; Bhargavan in A.N. Henry & al., Fl.

Tamil Nadu 3: 65. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 33. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1395. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 34. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 250. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021. *Scirpus densus* Wall. in Roxb., Fl. Ind. 1:231. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 6: 652. 1893. *Isolepis densa* (Wall.) Schult., Mant. 2: 71. 1824. *I. trifida* Nees in Wight, Contr. Bot. India: 108. 1834. *Fimbristylis trifida* (Nees) Trin., Syst. Cat. Fl. Pl. Ceylon: 102. 1885. *Bulbostylis capillaris* (L.) Kunth ex C.B. Clarke var. *trifida* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 6: 652. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1662 (1153). 1931.

Tufted annuals. Culms very slender, 5–27 cm high, 0.2–0.4 mm thick, sulcate, smooth, glabrous. Leaves shorter than culm, filiform, acute to acuminate at apex, 0.4–10 cm long, 0.1–0.3 mm wide, glabrous, at times pilose to scabrous towards apex on lower surface and revolute margins; sheaths membranous, usually with white hairs on hyaline orifice. Inflorescence simple to subcompound umbel, rarely contracted and nearly head like, with 2–6 spikelets, up to 4.7 cm broad. Involucral bracts very short, setaceous to glume like, much shorter than inflorescence; rays 1–5, filiform, up to 1.8 cm long. Spikelets solitary or clustered, ovate to oblong-ovate, 2.5–4 × 1.3–2.5 mm, subacute at apex, angular, subdensely few flowered. Glumes spiral, broadly ovate, c. 2 × 1.2 mm, acute to obtuse at apex, membranous, strongly keeled, minutely ciliolate at margins, brownish, often hyaline towards base. Stamens 2; anthers oblong, c. 0.3 mm long, acute at apex; filaments elongate up to 2 mm long. Ovary obovate, c. 0.4 mm long; style filiform, c. 1 mm long; stigmas 3, much shorter than style. Nutlet triquetrous, broadly obovoid, c. 1 × 0.6 mm, apex contracted with persistent depressed bulbous style base, minutely stipitate, stramineous to greyish-brown to purple at maturity, densely and irregularly granular to punctulate; epidermal cells minute, isodiametric, not very clear on the corrugate surface.

Fl. & Fr.: Sep. – Dec.

Habitat: Roadsides, grasslands, rocky hill regions, open marshy areas and in rice fields.

Distrib.: Tamil Nadu (Madurai, Nilgiri, Salem, Tiruchirappalli and Tirunelveli). Throughout India. Tropical Africa, Asia and Australia.

3. *Bulbostylis thoursii* (Roem. & Schult.) Lye ex Veldkamp & Verloove, Blumea 59: 10. 2014; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 251. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021. *Bulbostylis puberula* C.B. Clarke in Hook.f., Fl. Brit. India 6:652. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1662 (1153). 1931. Karthik. & al., Fl. Ind. Enum. Monocot.: 33. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 35. 2015.

Bulbostylis puberula (Poir) C.B. Clarke var. *gracilis* C.E.C. Fisch. in Gamble, Fl. Madras: 1662 (1153). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; *Scirpus puberulus* Michx. in Fl. Bor. Amer. 1: 31. 1803. *Isolepis gracilis* Nees in Linnaea 8: 91. 1833. *Fimbristylis gracilis* (Nees) R.Br., Prodr. Fl. Nov. Holland.: 227. 1810.

Densely tufted annuals; roots fibrous. Culms very slender, sulcate, 8–25 cm high, 0.3–0.5 mm thick, puberulous or glabrous, often hispid below the inflorescence. Leaves much shorter than culm, capillary, acute to acuminate at apex, 0.2–0.4 mm wide, puberulous on lower surface and margins; sheaths membranous, puberulous, stramineous to straw coloured, orifice with long white hairs, at times leaves reduced to bladeless sheaths. Inflorescence simple, rarely subcompound anthela, 1–1.4 cm wide, with 1 to few spikelets, often congested to almost capitate inflorescence, rarely reduced to a single spikelet. Involucral bracts 2–4, filiform, longest one usually exceeding the inflorescence, up to 2.5 cm long, margins ciliate, rays up to 5, 1–5 mm long. Spikelets solitary, oblong-ovoid or ovoid, 2–4 × 1.4–2 mm, subacute at apex, rounded at base, few flowered. Glumes spiral, ovate to broadly ovate, 0.8–1.6 × c. 1.3 mm, membranous, mucronulate at apex, strongly keeled, margins ciliolate, densely pubescent dorsally, pale to dark brown; mucro excurved. Stamen 1; anther linear-oblong, c. 0.6 mm long; filament elongate up to 1.8 mm long. Ovary obovate, c. 0.2 mm long; style filiform, c. 1 mm long with depressed globose base; stigmas 3, shorter than style. Nutlet triquetrous, broadly obovoid, c. 1 × 0.5 mm, contracted at apex, minutely stipitate with persistent depressed bulbous style base, transversely wavy to wrinkled, stramineous, epidermal cells longitudinally oblong.

Fl. & Fr.: Jul. – Jan.

Habitat: Waste lands, paddy fields, riverbanks and sea shores.

Distrib.: Tamil Nadu (Tirunelveli). Peninsular India. Tropical Africa, Madagascar and Malesia.

4. *Bulbostylis subspinescens* C.B. Clarke in Hook.f., Fl. Brit. India 6: 652. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1662 (1153). 1931; Datar & Vartak, Journ. Univ. Poona. Sci. & Tech. 48: 30, t. 6, f. 1–7. 1976; Karthik. & al., Fl. Ind. Enum. Monocot.: 33. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 36. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 251. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021.

Perennials; roots fibrous. Culms rather stout, obtusely angular, 15–25 cm high, 0.8–1 mm thick, rigid, curved, often twisted, pubescent. Leaves up to half the length of the culm or to 2 cm long, filiform, rigid, channelled, hispid-pubescent, sometimes reduced to bladeless sheaths; sheaths membranous, orifice with long white needle-like cilia. Inflorescence simple, almost prickly head, capitates, globose at the end of stems with numerous spikelets, 1–1.5 cm wide. Involucral bracts 3 or

4, filiform, with dilated base, shorter or as long as to slightly overtopping heads, pubescent, densely long hairy at top, 8–12 flowered, angular, acute, brownish. Spikelets stellately spreading; rachis winged. Glumes ovate-oblong, $2.5-3 \times 0.7-0.9$ mm, lowest pair distichous, upper ones spiral, densely pubescent, narrowly hyaline margined, nerveless on sides, strongly keeled; keel 3-nerved, extending to 0.2 mm long, often recurved mucro. Stamen usually 3, sometimes 1 in lower flower; anther linear-oblong, to 1.2 mm long. Ovary obovate, c. 0.2 mm long; style filiform-trigonus, c. 1.5 mm long, glabrous, base persistent on nut; stigmas 3-fid, shorter than style. Nutlet oblong-obovoid, $0.8-1 \times 0.5-0.6$ mm long, obtusely trigonus, smooth, shining, white to pale brown, with a tumor-like persistent style base at apex.

Fl. & Fr.: Oct. – Nov.

Habitat: Sandy soils and in sea coast.

Distrib.: Tamil Nadu (Kanchipuram and Karur). Andhra Pradesh and Karnataka.

Endemic.

5. *Bulbostylis swamyii* Govind. in Proc. Indian Acad. Sci. (Plant. Sci.) 94 (1): 11.f.1. a-g. 1985; Karthik. & al., Fl. Ind. Enum. Monocot.: 33. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 37. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash Fl. Pl. India Annot. Checkl. Monocot.: 251. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021.

Annuals; roots fibrous. Culms filiform, 5–8 cm high, glabrous, villose at inflorescence. Leaves shorter or as long as culm, capillary, acute to acuminate at apex, glabrous; sheaths membranous, orifice with long white bristle like cilia. Inflorescence at the end of culms, single head, 5–7 mm wide, with many spikelets, often congested to almost capitate inflorescence, densely villose with long white hairs. Involucral bracts 3–4, setiform, much longer, longest one usually exceeding the inflorescence, 1.5–2.5 cm long. Spikelets sessile, ovate, 6–8-flowered, $3-5 \times 1.5-2$ mm. Glumes oblong with almost parallel sides, $2.5-3 \times 2-2.5$ mm, including awn, bilobed at apex, densely hairy or scabrous, strongly keeled, with broad, thick spongiously swollen base; awn 0.5–0.7 mm long. Stamen usually 3; anther linear-oblong, c. 0.6 mm long; filament elongate up to 1.8 mm long. Ovary obovate, c. 0.2 mm long; style capillary, c. 1 mm long, glabrous; stigmas 3-fid. Nutlet obovoid, c. 0.5–0.7 mm wide, granulated, not wrinkled.

Fl. & Fr.: Oct. – Dec.

Habitat: Wet open grass lands, margins of water courses and wet sandy soils.

Distrib.: Erode and Pudukottai. **Endemic.**

4. CAREX L.

Perennials with creeping rhizomes, monoecious, rarely dioecious. Culms tufted, arising centrally or laterally, erect or obliquely erect, usually trigonous or triquetrous and solid, rarely terete and hollow, phyllopodic or aphyllpodic, often covered at base by persistent and disintegrated leaf sheaths; radical sheaths coloured with brown, reddish-brown, purple brown or dusky brown. Leaves tristichous, basal and subbasal (radical and cauline), narrowly or widely linear or rarely lanceolate, sheathing at base; sheaths often closed. Inflorescence paniculate, subpaniculate, spicate or fasciculate, with 2 to many spikelets or with a single terminal spike. Spikelets bisexual (androgynous) or unisexual, sessile or pedicelled; when unisexual normally terminal one male (staminate) and lateral ones female (pistillate) often with an urticuliform or ocreiform cladoprophyll surrounding it. Male flowers with 3 stamens; anthers linear; filaments distinct. Female flowers with a single pistil, enclosed in a sac like prophyll (utricle or perigynium); style branched above into 2 or 3 stigmas, protrude through the small orifice at the apex of the utricle. Utricle chartaceous, membranaceous or coriaceous, sessile or stipitate, beakless to strongly beaked, nerveless, nerved or ribbed, glabrous, or pubescent or hispid, papillose or smooth, sometimes spongy at base; beak truncate, obliquely cleft, bidentate. Nutlet trigonous or triquetrous, planoconvex or lenticular, sessile or stipitate, beaked, enclosed within the utricle.

Throughout the world, c. 1800 species, 152 in India and 29 species and 2 varieties in Tamil Nadu.

Key to species

- | | |
|---|----------------------------|
| 1a. Styles with bifid stigma; nutlets biconvex to planoconvex | 2 |
| 1b. Styles with trifid stigma; nutlets trigonous or triquetrous | 9 |
| 2a. Utricles distinctly beaked; beak 1–2 mm long; terminal spikelets always bisexual, androgynous, male part above, female part below | 3 |
| 2b. Utricles not or hardly beaked; spikelets unisexual, terminal spikelet wholly male, lateral ones female; female spikelets sometimes androgynous with very short male part above | 8 |
| 3a. Inflorescence head-like or simple spicate; all spikelets sessile, ovoid; cladoprophylls absent at base of spikelets; involucre bracts not sheathing | 4 |
| 3b. Inflorescence not simple spicate; spikelets usually lower ones distinctly peduncled, cylindrical or subcylindrical; cladoprophylls present at base of peduncle of spikelets, often hidden in the sheaths of bracts; involucre bracts long sheathing | 6 |
| 4a. Utricles usually nerveless, not winged; leaves 3–6 mm wide, flat; female glumes brownish | 28. C. wallichiana |
| 4b. Utricles faintly to strongly many nerved on each face, winged; leaves 1–3 mm wide, canaliculate; female glumes white scarious, greenish to pale or yellowish brown | 5 |
| 5a. Leaf sheaths 6–10 cm long; involucre bracts (lower bracts) 5–12 cm long; utricles 3.5–4 mm long, strongly nerved with faces more or less convex; beak serrulate-margined | 20. C. nubigena |
| 5b. Leaf sheaths 3–5 cm long; involucre bracts 1.5–5 cm long; utricles 2.6–3 mm long, faintly nerved with one faces concave; beak glabrous or smooth | 8. C. hokarsarensis |

- 6a. Spikelet single at each node; peduncles if present not capillary; utricles 5.5–6 mm long, glabrous, strongly nerved dorsally, faintly nerved ventrally; beak 2–3 mm long

17. C. longipes

- 6b. Spikelets fasciculate in panicles on each node, 1–3 on each fascicle; peduncles capillary; utricles 3–5 mm long, strongly nerved on both faces; beak 0.8–1.5 mm long 7

- 7a. Inflorescence 3–6 noded; lower bracts 22–30 cm long; female glumes 2–3 mm long; utricles 0.8–1 mm broad, 7–13 nerved on each face; nutlet 2–2.5 mm long **12. C. lenta**

- 7b. Inflorescence 8 or 9 noded; lower bracts 6–13 cm long; female glumes 3.5–6 mm long; utricles 1.2–1.5 mm broad, 4–6 nerved on each face; nutlet 1.8–2 mm long

16. C. longicuris

- 8a. Large robust herbs, up to 130 cm high; leaves 20–80 cm long; utricles densely ferruginously or reddish glandular-papillose; female glumes truncate or bilobed with emarginated apex and 0.5–2 mm long awn; lateral female spikelets without small male part

21. C. phacota

- 8b. Slender herbs, 30–45 cm high; leaves 10–15 cm long; utricles glabrous; female glumes apiculate with rounded apex, not awned; lateral female spikelets without terminal male part

22. C. psedoaperta

- 9a. Inflorescence with 1–3, rarely 4 or 5 spikelets 10

- 9b. Inflorescence with 5 to many spikelets 13

- 10a. Inflorescence with 2–3 spikelets, usually 1 terminal and 1–3 lateral or axillary; plants usually robust; leaves up to 1 cm wide

25. C. speciosa

- 10b. Inflorescence strictly with single terminal spikelet; plants usually slender; leaves up to 3 mm wide 11

- 11a. Leaves capillary; rhizome, involucre bracts and bracteoles absent **3. C. capillacea**

- 11b. Leaves not capillary; rhizome, involucre bracts and bracteoles present 12

- 12a. Plants up to 15 cm high; leaves linear, 1.2–2.5 mm wide; spikelets 5–6-flowered; utricles triquetrous, strongly many nerved; nutlets 2–5 mm long

4. C. christii

- 12b. Plants 15–40 cm high; leaves crescentiform, 0.5–1 mm wide; spikelets many-flowered; utricles obtusely trigonous, 7–9-nerved at dorsal side; nutlets 1.25–1.5 mm long

24. C. rara

- 13a. Inflorescence paniculate, fasciculate or rarely congested in heads; terminal spikelets always bisexual; all spikelets androgynous with male part terminal, female part below

14

- 13b. Inflorescence racemose with a single spikelet at each node; terminal spikelets wholly male; spikelets mostly unisexual; female spikelets lateral, rarely with short male part at top

23

- 14a. Spikelets very slender, almost filiform, fasciculate with long capillary peduncles, 5–12 arising from the sheaths on each node; prophyll at the base of peduncles tubuliform

15

- 14b. Spikelets thick, not filiform, paniculate with solitary peduncle at each node, distant from one another, rarely binate; prophyll at the base of peduncle or spikelet utriculiform

16

- 15a. Leaves 5–12 mm wide; utricles linear-lanceolate, 6–8 mm long, dorsally 5 or 6-nerved, ventrally 2 or 3-nerved

27. C. walkeri

- 15b. Leaves 4–6 mm wide; utricles fusiform or elliptic, 5–6 mm long, plurinervis **5. C. eluta**

- 16a. Spikelets 2–6 cm long, 4–8 mm wide, often cylindrical; beak of utricles indistinct or less than 1 mm long; female glumes often hyaline margined atleast near apex 17

- 16b. Spikelets 0.5–2 cm long, up to 3 mm wide, usually ovoid, linear, ellipsoid, rarely cylindrical; beak as long as to slightly shorter than utricles or more than 1 mm long; female glumes not hyaline margined 18
- 17a. Androgynous spikelet with male part almost equal to female part; leaves 0.3–1 cm wide; utricle narrowly ellipsoid, tapering at both ends, not inflated, with often faintly nerved **19. C. myosurus**
- 17b. Androgynous spikelet with male part much shorter than female part; leaves 0.8–2 cm wide; utricle obovoid to subglobose or broadly ellipsoid, not tapering at both ends, strongly inflated, strongly nerved **1. C. baccans**
- 18a. Utricles 8–12 or many nerved on each face; female glumes whitish or pale brown 19
- 18b. Utricles 2–6-nerved on each face; female glumes brown, ferruginous to dark reddish to purple brown 21
- 19a. Inflorescence congested head-like from partial panicles; utricles glabrous **15. C. lindleyana**
- 19b. Inflorescence subpaniculate; utricles pubescent 20
- 20a. Spikelets ovoid in outline congested into head like remotely spaced clusters, male and female parts almost equal; style base conical; utricle lanceolate to ovate-lanceolate, 5–7 mm long, beak 2.5–3.5 mm long; rhachis of inflorescence pubescent **13. C. leucantha**
- 20b. Spikelets linear to oblong in outline, not in clusters; male part shorter than female part; style base not conical; utricle elliptic, 3.5–5 mm long; beak 1.3–2 mm long; rhachis of inflorescence glabrous **29. C. wightiana**
- 21a. Utricles and beak scabrous or hispid above, 2–4 nerved on each face; female glumes awned **7. C. glaucina**
- 21b. Utricles and beak glabrous, 4–6 or many nerved on each face; female glumes aristate or muticous 22
- 22a. Leaves 5–7 mm wide; spikelets ovoid or ellipsoid, 0.5–0.7 cm long, pale-ferruginous green; utricles not or hardly recurved, beak with bifid mouth; female glumes with 1.5–2.5 mm long arista **23. C. raphidocarpa**
- 22b. Leaves 8–15 mm wide; spikelets linear or cylindrical, 0.6–2 cm long, yellow-brown to reddish-brown; utricles recurved, beak with oblique mouth; female glumes muticous or acuminate or subobtuse at apex **6. C. filicina**
- 23a. Utricles nerveless, densely hirsute; culms aphyllopodic 24
- 23b. Utricles 3–5 or many nerved; glabrous, more or less pubescent or papillose; culms phyllopodic 25
- 24a. Culms 30–100 cm high; male spikes 1.5–3 cm long; achene obovoid, 2.5–3 mm long **14. C. ligulata**
- 24b. Culms 20–25 cm high; male spikes 0.7–1 cm long; achene ellipsoid, 1.8–2.2 mm long **10. C. kotagirica**
- 25a. Utricles 3–5 nerved on each face; beak of utricles 0.2–0.5 mm long or indistinct; female glumes dark purplish brown, muticous 26
- 25b. Utricles many nerved on each face; beak of utricles 0.8–3 mm long, distinct; female glumes whitish to pale brown, awned 27
- 26a. Spikelets 3–8 with one male terminal spikelet; utricles densely covered raised papillae, subabruptly beaked, 0.5 mm long; dark purple-brown **18. C. maculata**

- 26b. Spikelets many, with 3 male terminal spikelets together; utricles glabrous, granulate, beak obscure or 0.2 mm long, dusk grey **26. C. vicinalis**
- 27a. Leaves 1–4 mm wide; utricle 2–3 mm long, densely hispidulous or pubescent; beak 0.8–1 mm long; nutlet mitrate **2. C. breviculmis**
- 27b. Leaves 4–10 mm wide; utricle 5–7 mm long, sparsely pubescent to glabrous; beak 1–3 mm long; nutlet not mitrate 28
- 28a. Lateral spikelets wholly female; culms utricles ellipsoid, shiny pale green; lateral to sterile shoots, independent **11. C. lateralis**
- 28b. Lateral spikelets female and androgynous; utricles fusiform, olivaceous, dull; culms central arising from basal sheaths **9. C. jackiana**

1. Carex baccans Nees in Wight, Contr. Bot. India: 122. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 722. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1687 (1169). 1931; Fyson, Fl. S. Ind. Hill Stat.: 650. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 153. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 34. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1397. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 44. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 252. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021.

Loosely tufted perennials; rhizome short, stout, woody, oblique, shortly creeping. Culms erect, robust, prominently trigonous, up to 130 cm high, 4–5 mm thick. Leaves widely linear, 50–100 × 0.8–2 cm, distributed throughout the culm, more dense on lower portion, upper ones exceeding the culm, gradually attenuated into a long acute apex, dark green, coriaceous, stiff, scabrid on upper surface, revolute, at times flat; sheaths membranous, 9–18 cm long, tightly surrounding the culm, lower ones reddish-brown or blackish-red to purple brown, disintegrating into oblique fibres, upper ones greenish. Panicle compound, interrupted, occupying the upper third to more than ½ of the culm; secondary or partial panicles 5–7, single at each node, oblong to elliptical, 3–20 cm long, further branched into 3–10 simple spikelets. Involucral bracts leafy; lower bracts 15–30 cm long, exceeding the inflorescence, long sheathed, 2–6 cm long; upper bracts much reduced, 2–5 cm long; bracteoles glumiform, scaly, usually aristate, reddish-brown; peduncles of upper panicles usually included in sheaths, lower ones more exerted, smooth or scaberulous, subterete to slightly angled. Cladophylls at base of spikelets, utriculiform below, glumiform at above. Spikelets numerous, sessile or subsessile, androgynous, 2–6 cm long, greenish to reddish-brown, suberect, subdensely flowered; male part linear, tapering at apex; female part cylindrical, usually longer than male part. Male glumes subulate, oblong-lanceolate, 3–5 mm long, mucronate to short awned at apex, glabrous. Stamens 3. Female glumes ovate to elliptic or oblong, 2.5–4 mm long, obtuse to acute at apex, basal ones with short awn at apex, straw coloured, margins hyaline, glabrous or hispidulous. Style short, not thickened at base; stigmas 3. Utricle obovoid to subglobose or broadly ellipsoid, 3–5 × 2–3 mm, obscurely trigonous, strongly inflated, abruptly beaked, loosely enveloping nutlet, subcoriaceous, distinctly nerved, glabrous to sparsely hispidulous, reddish

to blackish-red at maturity; beaks subterete, compressed, curved, 0.2–0.4 mm long, bidentate. Nutlet ellipsoid, 2.5–3.5 × 1–1.5 mm, trigonous, angles prominent, distinctly beaked, usually shortly bent to stipitate, dark brown or fuscous.

Fl. & Fr.: Sep. – Mar.

Habitat: Evergreen and semi-evergreen forests. Common in wet slopes and grasslands at high elevations.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Kanyakumri, Nilgiri and Tirunelveli). Peninsular India, Central and Northeast India. Tropical and subtropical Asia.

2. *Carex breviculmis* R.Br., Prodr. Fl. Nov. Holland.: 242. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 746. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 34. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 45. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 252. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 339. 2021. *C. royleana* Nees in Wight, Contr. Bot. India: 127. 1834; B.D. Sharma & al. in Biol. Mem. 2 (1&2):154. 1977.

Tufted, rhizomatous annuals or short lived perennials; rhizome short, creeping. Culms phyllopodic, erect or oblique, obtusely trigonous, slender, up to 30 cm high, 0.5–1 mm thick, glabrous or scaberulous at angles. Leaves basal and subbasal, numerous, linear, 10–25 × 0.1–0.4 cm, much shorter to exceeding the culm, long attenuated at apex, flat to revolute, erect to spreading, rough, minute protuberances on the upper surface; sheaths membranous, lower ones bladeless and surrounds the base, older ones become fibrous. Inflorescence spicate. Involucral bracts leafy, lower bracts exceeding the culm, scarcely sheathing, sheaths pale, membranous; upper bracts much reduced, filiform; peduncles 4–6 cm long, trigonous, smooth or scaberulous at angles. Spikelets subsessile or shortly pedicelled, 3–6 together on a radicle scape, erect to patulous, upper ones crowded to approximate, lower ones spaced, oblong or cylindrical, 0.5–1.5 cm long; male spikelet in terminal, linear, pale; female spikelets lateral or at about the middle, subdensely flowered, rarely gynaeandrous. Male glumes ovate to oblong, 2–3 × 1–1.5 mm, glabrous. Stamens 3. Female glumes oblong-ovate or oblong-acuminate, cymbiform, 2–3 mm long, rigidly incurved at base, acute to very obtuse at apex, membranous, milky-white, midrib light green, excurrent into 0.5–3 mm long scabrid awn, whitish or brownish, glabrous or sparsely ciliate at margins. Style short, dilated at base, at times forming a button; stigmas 3. Utricle ellipsoid or obovoid, 2–2.5 × 1–1.2 mm, obtusely trigonous, membranous, strongly many nerved, stipitate, densely hispidulous or pubescent, rarely glabrescent, bright green to brownish at maturity, subabruptly beaked at apex; beak pyramidal or conic, 0.8–1 mm long, emarginate

or faintly bifid, apex glabrous and whitish-hyaline. Nutlet ellipsoid-obovoid, 1.5–2 × 1–1.2 mm, obtusely trigonous, mitrate, contracted at apex and then expanded into a discoid annulus, abruptly beaked, shortly stipitate; style subsistent at base, fuscous.

Fl. & Fr.: Dec. – Jan.

Habitat: Grasslands and shola margins .

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). Kerala, Himachal Pradesh and Northeast India. Indo-Malesia to Australia and New Zealand.

3. *Carex capillacea* Boott, 1: 44, t. 110. 1858; Nelmes in Reinwardtia 1: 405. 1951; C.B. Clarke in Hook.f., Fl. Brit. India 6: 713. 1894; B.D. Sharma & al. in Biol. Mem. 2(1&2): 153. 1977. Karthik. & al., Fl. Ind. Enum. Monocot.: 34. 1989; Matthew, III. Fl. Palni Hills t. 762. 1996; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1398. 1999; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 340. 2021. *C. rara* Boott subsp. *capillacea* (Boott) Kukenth. in Engl. Pflanzenr. 38: 102. 1909; C.E.C. Fisch. in Kew Bull. 1934: 169. 1934.

Densely tufted with slender culms, rhizome absent; Culms phyllopodic, triquetrous, capillary, up to 60 cm high. Leaves linear, capillary, 2–3 mm wide, equal or longer than culm, flat or channelled, margins smooth; sheaths membranous, short, basal, brownish, splitting into fibres. Inflorescence solitary, terminal spike, up to 2 cm long. Involucral bracts and bracteoles absent. Spikelets sessile, oblong or subcylindric, 0.5–2 × 0.2–0.5 cm, androgynous, 8–24 flowered, male part shorter and wider than female part. Glumes oblong-ovate, 2–3 × 1–1.5 mm, obtuse to acute, mucous, translucent, pale brown, glabrous, 3-nerved. Stamens 3. Styles slightly thickened at base; stigma 3-fid. Utricle pyramidal, oblong or ovoid, 2–5 × 0.8–2 mm, obtusely trigonous, subinflated, glabrous, often with minute reddish dots, slightly emarginate-beaked at apex. Nutlet oblong-ellipsoid, 1.5–2 × 1–1.2 mm, obtusely trigonous, abruptly short-beaked, shortly stipitate, brownish.

Fl. & Fr.: Jun. – Aug.

Habitat: In marshy and exposed hill areas of high altitudes.

Distrib.: Tamil Nadu (Dindigul and Nilgiri). Sikkim Himalaya. Bhutan, Japan and Malesia to Australia.

4. *Carex christii* Boeckeler, Beitr. Cyper. 1: 44. 1888; C.E.C. Fisch. in Gamble, Fl. Madras:1686 (1168). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:65. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 35. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 47. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 252. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 340. 2021.

Tufted, slender, rhizomatous, perennials; rhizome short, woody. Culms phyllopodic, triquetrous, slender, up to 15 cm high, glabrous, base slightly swollen and enclosed in sheaths. Leaves basal, linear, shorter, 1.2–2.5 mm wide; sheaths membranous. Inflorescence spicate. Involucral bracts leafy, long, sheathing, sheaths pale, membranous. Spikelets single, terminal, linear-oblong, 1.2–1.5 mm long, 5–6 flowered; male part very slender and narrower than female part; female part much shorter than the male part, 2–2.5 mm broad. Male glumes broadly oblong, glabrous, slightly clasping at the base to culm. Female glumes usually 2, broadly oblong-ovate, 2–3 mm long, margins hyaline, obtuse or subacute at apex, pale-ferruginous, mucous translucent. Style 3-fid, thickened at base. Stigmas 3. Utricle ovate or ellipsoid, 2–2.3 × 1–1.5 mm, triquetrous, membranous, strongly many nerved, straight or curved, white pubescent on margins, greenish or whitish, beaked at apex; beak very short, bifid. Nutlet obovoid, 2–2.5 × 1–1.5 mm, pale to dark brown, abruptly shortly beaked.

Fl. & Fr.: Dec. – Jan.

Habitat: Grasslands of hilly regions

Distrib.: Tamil Nadu (Nilgiri). **Endemic**.

Notes: This species included based on the C.E.C. Fisher report of its occurrence in Niligirs in Flora of Presidency Madras (*l.c.*). No authentic specimens found in any herbarium. It needs further study.

5. Carex eluta Nelves in Kew Bull. 1940: 271. 1940; Karthik & Sharma in J. Bombay Nat. Hist. Soc. 80: 76. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 340. 2021.

Rhizomatous perennials; rhizome short, creeping. Culms 65–90 cm high, trigonous. Leaves basal and cauline, 4–6 mm broad, stiff, subcoriaceous, more or less revolute-margined; sheaths purplish or dark reddish-brown. Inflorescence paniculate, consists of 5 or 6 fascicles, interrupted. Involucral bracts leafy, broad, sheathing. Spikelets numerous, androgynous, linear-cylindrical, 4–8 cm long, pedunculate, capillary; male part at apex, shorter than female part. Female glumes oblong-ovate or oblong-obovate, 4–5 mm long, boat-shaped, reddish-veined on both sides, costa 3-nerved, margin hyaline, with c. 3 mm long straight, scabriusculam awn. Style 3-fid. Utricle fusiform or elliptic, 5–6 mm long, suberect, trigonous, glabrous, hispidulous on margins, plurinervis, attenuated at base, beaked at apex; beak 2.5–3 mm long, 2-fid. Nutlet oblong, 3–4 mm long, trigonous.

Fl. & Fr.: Dec. – Jan.

Habitat: Grasslands of hilly regions

Distrib.: Tamil Nadu (Nilgiri). **Endemic**

6. *Carex filicina* Nees in Wight, Contr. Bot. India: 123. 1834 nom. cons.; C.B. Clarke in Hook.f., Fl. Brit. India 6: 717. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1169). 1931; Fyson, Fl. S. Ind. Hill Stat.: 648. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2):154. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1727. 1983; K.K.N.Nair & M.P.Nayar, Fl. Courtallum 2: 352. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1399. 1999; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 255. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 340. 2021. *C. filicina* Nees var. *leptocarpa* (C.B. Clarke) Kük. in Engl., Pflanzenr. IV 20 (38): 274. 1909. *C. leptocarpus* C.B. Clarke in Hook.f., Fl. Brit. India 6: 719. 1894. *C. caricina* (D. Don) Ghildyal & Bhattacharyya in J. Econ. Tax. Bot. 7: 602. 1985. *C. caricinus* D. Don., Prodr. Fl. Nepal 39. 1825.

Tufted, rhizomatous perennials; rhizome short, stout, woody, knotty, not creeping, occasionally shortly prostrate. Culms erect, rigid, up to 175 cm high, 2–5 mm thick below, distantly 2–6-noded, triquetrous, angles obtuse to acute, ribbed or smooth. Leaves basal, subbasal to evenly spaced on culm, usually not exceeding the culm, at times as long as culm, linear to broadly linear, 24–80 × 0.8–1.5 cm, long acute at apex, flat or canaliculate, dark green, two lateral nerves conspicuous, glabrous, upper margins scabrid; sheaths 4–12 cm long, loosely surrounding the culm, membranous; basal sheaths reddish, purple-brown to reddish-brown, more or less disintegrating into fibres; upper sheaths dark greenish with purple brown nerves or pale yellowish. Inflorescence a compound panicle, contiguous or interrupted, occupying upper 15–55 cm of culm; partial panicles 4–13, single and middle ones binate, pyramidal or ovate-lanceolate in outline, 6–12 cm long, dense to sublux, upper branches with single spikes, lower ones branched further into 2–7 simple spikelets. Involucral bracts leafy, equal to slightly exceeding the inflorescence, but longer than their subtending partial panicles, 11–14 cm long, sheathing base 2–3 cm long, orifice obliquely truncate with brownish margins; upper bracts much reduced, linear up to 5 cm long; bractoles glumiform, ovate or filiform, 1–1.5 mm long, obtuse at apex, hispidulous; peduncle long exerted, 2–9 cm long, 0.5–1 mm thick, slender, smooth below, hispidulous on upper angles. Spikelets numerous, androgynous, slender, 0.6–2 cm long, sessile, sometimes appears at right angles to rachis, linear or cylindrical, subdense to lax flowered, yellow-brown to reddish-brown; rachis hispid or hispidulous; male part linear, 5–7 mm long, usually shorter, at times equal to female part. Male glumes ovate to lanceolate, larger than female glumes, glabrous, bright red. Stamens 3. Female glumes ovate to elliptic-lanceolate, shallowly cymbiform, 1.5–2 × 0.6–1.4 mm, acuminate or subobtusate to subacute at apex, membranous, reddish or brown with dark brown or dark red spots, glabrous or hispidulous, 3–5-nerved, midrib faint, excurrent into a short awn, straight, up to 0.8 mm long. Style slightly thickened at base; stigmas 3. Utricle lanceolate or narrowly ellipsoid, 2.5–4 × 0.5–1 mm, obtusely trigonous, exceeding subtending glumes, tapering and suddenly narrowed

into very slender long beaked at apex, very shortly stipitate, membranous, 4–6 conspicuously nerved on each face, glabrous, greenish to stramineous, often with reddish or brownish patches; beak 1.2–1.6 mm long, obliquely truncate at membranous orifice, distinctly nerved, glabrous or sparsely hispid on margins, reddish-brownish, recurved or subrecurved, not divaricate. Nutlet ellipsoid, 1.5–2 × 0.6–0.8 mm, trigonous, shortly stipitate at base, straight or often slightly bent to much recurved at apex, beaked, strongly divaricate or not; beak short, thickened at apex.

Fl. & Fr.: Aug. – Mar.

Habitat: All forest types. As an undergrowth in swampy and marshy places in forests at high altitude.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai, Kanyakumri, Nilgiri and Theni).Throughout India. Indo-China, Japan, Malesia, Myanmar, Nepal and Sri Lanka.

7. *Carex glaucina* Boeckeler in Linnaea 40: 353. 1876; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1728. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 65. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 49. 2015. *C. mercarensis* Hochst. ex Steud. var. *major* Steud. ex C.B. Clarke in Hook.f., Fl. Brit. India 6: 719. 1894. *C. lindleyana* Nees var. *major* (Steud.) C.E.C. Fisch. in Gamble, Fl. Madras: 1687 (1169). 1931.

Rhizomatous perennials; rhizome short, stout, woody, usually not creeping. Culms erect, rigid, prominently trigonous, 30–80 cm high, 3–4 mm thick below, smooth, 3–5-noded. Leaves basal, 2–6 in cauline, linear to broadly linear, 25–60 × 0.7–1.2 cm, usually not exceeding the culm, long acute at apex, flat or canaliculate, dark green, glabrous or puberulous, margins scabrid towards apex, sheathing at base; sheaths 3–7 cm long, loosely surrounding the culm, mouth membraneous; basal sheaths short, reddish-brown, disintegrating into fibres. Inflorescence a compound panicle, 20–45 cm long; partial panicles 3–7, distant, 2 or 3 at each node, oblong in outline, 4–10 cm long. Involucral bracts leafy, lower bracts shorter than inflorescence, but longer than their subtending partial panicles, 8–10.5 cm long, sheathing base 1.5–3 cm long, glabrous; upper bracts reduced, linear, 4–5 cm long; bracteoles glumiform, ovate, 0.8–1 mm long; peduncle 1.5–4 cm long, slender, 0.5–0.8 mm thick, glabrous. Cladophylls glumiform, broadly ovate, 1–1.3 × 0.8–1 mm, midnerve excurrent into 1–3 mm hispidulous awn. Spikelets numerous, sessile, androgynous, 1–2 cm long, cylindrical, loosely to subdensely flowered, yellowish-brown; male part terminal, ¼ of spikelet, linear, slender; female part usually longer; rachis angular, pubescent or appressed pubescent. Male glumes ovate, larger than female glumes, glabrous or hispidulous. Stamens 3. Female glumes ovate to oblong, 1.5–2 × 1–1.3 mm, obtuse or acute at apex, membranous, dark

purple brown, glabrous, hispid above, midrib excurrent up to 0.5 mm long scabrid awn. Style slightly thickened at base; stigmas 3. Utricle ellipsoid, 2–3 × 0.5–1 mm, exceeding the subtending glumes, trigonous, prominently bifid, beaked at apex, 2–4-nerved on each face, slightly recurved at above, glabrous, scabrous or hispid at above, greenish to stramineous, tinged with purple; beak 1–1.5 mm long. Nutlet ellipsoid, 1.2–2 × 0.8–1 mm, trigonous, shortly stipitate at base, beaked at apex, beak 0.2–0.5 mm long.

Fl. & Fr.: Mar.– Dec.

Habitat: Margins of evergreen forests and high altitude hills

Distrib.: Tamil Nadu (Kanyakumari). Peninsular India (Western Ghats). Mauritius.

8. *Carex hokarsarensis* E.U. Haq. & Dar in *Rheedea* 20 (1): 29. 2010; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 50. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 256. 2020.

Rhizomatous perennials; rhizome short. Culms solitary, up to 25 cm high, 1–1.5 mm thick, trigonous below inflorescence, strongly ribbed, grooved, smooth or minutely scabrous. Leaves basal, 2–3 mm wide, linear to broadly linear, much shorter than stems, canaliculate, glabrous, margins often convolute, sheathing at base; sheaths 3–5 cm long. Inflorescence solitary spike with many sessile spikelets (head-like), c. 2 × 0.8–1 cm, congested, terminated by culm. Involucral bracts 2, leafy, ovate to oblong lanceolate, 1.5–5 cm long, margins scarious, not sheathing at base, much overtopping the inflorescence. Spikelets numerous, sessile, androgynous, ovoid, 0.5–0.6 cm long, acutish, greenish-stramineous in appearance; cladophylls absent at base; male part terminal, much shorter, flowers very few or 1 or 2; female part usually longer, flowers many, appears of wholly female spikelet. Stamens 3. Female glumes ovate, 2.7–3 × 1–1.3 mm, shorter than utricles, acute to acuminate at apex, mucicous, white scarious with yellowish brown sides in upper half. Style bifid. Utricle ellipsoid, 2.6–3 × 0.8–1 mm, compressed, with one face concave, with narrow, glabrous or smooth winged throughout, faintly 13–15-nerved on each face, greenish to stramineous, beaked at apex; beak 1–1.2 mm long, glabrous, distinctly 2-fid at apex with sharp teeth. Nutlet broadly ellipsoid, 1.1–1.4 × 0.6–0.8 mm, biconvex, shortly apiculate with medianly raised line.

Fl. & Fr.: Oct. – Dec.

Habitat: In slopes of hills and moist forests. Rare.

Distrib.: Tamil Nadu (Nilgiri (Ooty)). Northwest Himalaya and Jammu & Kashmir. China, Japan and Sri Lanka.

Notes: This species is known earlier from Jammu & Kashmir, Wadoodkhan (2015) reported this species as new record to South India based on collection from Ooty.

9. *Carex jackiana* Boott in Proc. Linn. Soc. London 1: 260. 1846; C.B. Clarke in Hook.f., Fl. Brit. India 6: 735. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Fyson, Fl. S. Ind. Hill Stat.: 650. 1932; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1729. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 37. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 52. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 257. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 340. 2021.

Tufted, rhizomatous perennials; rhizome very short, 1.5–2 mm thick, not creeping. Culms phyllopodic, erect, up to 110 cm high, 1–2 mm thick below, central arising from basal sheaths, compressed trigonous, angles narrowly pale winged or obtuse to acute, smooth, ultimately subflaccid. Leaves basal and subbasal, relatively few per culm, linear, 26–35 × 0.4–1 cm, usually much shorter than culm, acuminate or shortly attenuated at apex, flat, 3 conspicuous costate, greenish or whitish, soft, glabrous; sheaths thin, soft, pale to whitish or brownish, loosely disintegrating into soft fibres. Inflorescence spicate, spikelets 3–8 on a radicle scape. Involucral bracts of lower spikelets leafy, exceeding the inflorescence, sheathing base 2–4 cm long; upper bracts leafy to subleafy, equaling or slightly shorter than inflorescence, sparsely or shortly sheathing; peduncles 5–8 cm long, slender, smooth, trigonous or compressed. Terminal spikelet male, ebracteate, sessile or subsessile, slender, 1.2–2.5 × 0.2–0.3 cm, pale green, slightly exceeding the next lateral spikelet; lateral spikelets female, rarely androgynous, cylindrical or oblong-cylindrical, 1–3 × 0.5–0.7 cm, subloosely flowered, upper 2 or 3 spikelets approximate or subfastigate, shortly pedicelled to subsessile, lower 1 or 2 spikelets much spaced, on a long exerted pedicels, at times additional spikelet borne on the peduncle of the lowest spike by branching. Male glumes oblong-lanceolate, 3–5 mm long. Stamens 3. Female glumes oblong-ovate to oblong-lanceolate, 3–6 × 1.8–2 mm, usually cymbiform to conduplicate, acute to subobtuse at apex, mucronate, thinly membranous, white, with 3-nerved, greenish central stripe, midrib and 2 adjacent nerves ending in an upright mucro, up to 0.8 mm long. Style slender, not thickened at base; stigmas 3. Utricle fusiform, 5–7 × 1.5–2 mm, trigonous, distinctly many nerved, glabrous, straight to very slightly curved, apex gradually beaked, subabruptly narrowed below to thick short stipe like base, olivaceous, dull; beak 2.5–3 mm long, compressed, glabrous, straight or deeply bifid, orifice oblique or nearly truncate with lanceolate teeth. Nutlet oblong-obovoid to suborbicular, 2–3 × 1.5–2 mm, trigonous, apex rounded or abruptly contracted into a very short stout beak, substipitate at base, pale to yellowish.

Fl. & Fr.: Dec. – Mar.

Habitat: Evergreen forests and in High Wavy Mountains.

Distrib.: Tamil Nadu (Coimbatore, Nilgiri, Salem and Tirunelveli). Kerala and Northeast India (Khasi hills). Australia, China, Indo-Malesia and Sri Lanka.

10. *Carex kotagirica* A. Maji & V.P. Prasad in Rheedeia 25 (2): 81. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 257. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021.

Perennial with short rhizome, 20–25 cm high. Rhizome ultimately woody, clothed with blackish remnants of old bladeless sheaths; roots wiry. Culms densely tufted, erect, trigonous, 3–4 mm thick, 5–7-noded, enclosed by the leaf sheaths; internodes 2.5–3 cm long, pubescent on the angles. Leaves 5–7 per culm, linear-lanceolate, acuminate at apex, 12–17 × 0.5–0.7 cm, scabrous on the margins towards apex; lowest ones reduced to bladeless sheath or with a short lamina; sheaths hairy on the angles towards the mouth, membranous on the margin towards the lamina. Inflorescence with 3–5 somewhat closely arranged spikes. Bracts foliaceous, sheathing, exceeding the inflorescence. Spikes unisexual, peduncled, the terminal one male and all others females. Male spike erect, terete, on c. 1 cm long peduncle, linear, 7–10 × 1.5–2 mm, brownish, many-flowered. Male glumes membranous, oblong-ovate, acute to obtuse at apex, minutely to prominently mucronate, rarely some of the glumes mucicous, 3–3.5 × 1.5–2 mm, with a prominent midrib which often surpasses into a ciliate mucro, brown dotted along the mid-vein and on both sides in upper half, pubescent along the upper margins. Stamens 3; filaments elongate up to 3 mm; anthers linear-oblong, c. 1.3 mm long. Female spikes erect to somewhat spreading, on a 4–6 mm long peduncle, cylindrical, oblong, 12–20 × 5–7 mm, densely many-flowered (8–20). Female glumes oblong-ovate, acute or at times somewhat retuse at apex, mucronate, 3–3.3 × c. 2 mm (including the mucro), with a prominent mid-vein extending to up to 0.3 mm long mucro, stramineous when dry, with brown dotted along the mid-vein and on both sides in the upper half, pubescent along the upper margins. Style c. 1.5 mm long; stigmas 3, protruding through the apex of the utricle. Utricle trigonous, ellipsoid, 4–4.5 × 1.2–1.7 mm (including the 1.1–1.5 mm long beak), brownish, densely hirsute, beaked; beak bifurcate at apex. Nutlets trigonous, ellipsoid, 1.8–2.2 × c. 1.1 mm, brownish.

Fl. & Fr.: Aug. – Sep.

Habitat: In n moist forests on the hills, above 1800 m altitude.

Distrib.: Tamil Nadu (Nilgiri). **Endemic** to Tamil Nadu.

11. *Carex lateralis* Kuek. in Engl., Pflanzenr. 38: 639. 1909; R.R. Stewart in Bull. Bot. Surv. India 9: 153. 1968 (1967); Kern & Nooteb. in Steenis Fl. Malesiana 1.9 (1): 146. f. 12 (24). 1979; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 38. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 52. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020. *C. jackiana* Boott var. *minor* C.B. Clarke in Hook.f., Fl. Brit. India 6: 735. 1894 p.p.

Rhizomatous perennials; rhizome short. Culms 5–50 cm high, 0.25–1 mm thick, lateral to sterile shoots, independent, very slender to filiform, triquetrous.

Leaves 4–7 mm wide, sterile shoots much overtopping the stems, margins often convolute. Inflorescence of 3–4 crowded spikelets, terminal to the culms, subsessile or shortly exerted or with wholly included peduncles. Involucral bracts leafy, much overtopping the inflorescence. Spikelets male part terminal, cylindrical, 5–10 × 0.5–1 mm, often inconspicuous; lateral spikelets wholly female, oblong, few, 4 or 5 flowered, erect, 7–12 × 5–7 mm. Stamens 3. Glumes oblong-ovate, 3.8–5 mm long, subacute, whitish with 3-nerved keel, sometimes nerves inconspicuous, with c. 1.5 mm long, more or less flat awn. Style 3-fid, much thickened at base. Utricle ellipsoid, trigonous, 5–6 × 1.5–2 mm, sparsely pubescent to glabrous, faintly to distinctly many nerved, more conspicuous near base, shiny pale green, subabruptly contracted into beak; beak 1–1.5 mm long, glabrous, distinctly 2-fid at apex. Nutlet ellipsoid, 1.5–1.8 mm, granulate from minute cells, brownish to blackish, mucous.

Fl. & Fr.: Dec. – Mar.

Habitat: In swampy and marshy places of forests at high altitude.

Distrib.: Tamil Nadu (Coimbatore, Nilgiri, Salem and Tirunelveli). South India and Northwest Himalayas. Australia, China, Indo-Malesia and Sri Lanka.

12. *Carex lenta* D. Don in Trans. Linn. Soc. London 14: 327. 1824; B.D. Sharma & al, in Biol. Mem. 2 (1&2) : 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 38. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 53. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 251. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021. *C. brunnea* sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 705. 1894, non Thunb. 1784; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; Fyson, Fl. S. Ind. Hill Sta.: 648. 1932; Matthew, Ill. Fl. Palni Hills t. 1398. 1996; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1398. 1999.

Loosely to densely tufted, rhizomatous perennials; rhizome short, obliquely ascending. Culms erect, slender, but rigid, 40–125 cm high, 1.5–2.5 mm thick, inclined at above, glabrous, clothed at base with sheaths and fibrous remnants. Leaves basal and subbasal, shorter or slightly exceeding the culm, linear or broadly linear, 40–90 × 1–1.5 cm, gradually attenuated into a long acute apex, coriaceous, stiff, folded, glabrous, scabrid on upper surface; sheaths membranous, 5–10 cm long, basal ones rigid, bladeless, eventually disintegrating into parallel fibres. Inflorescence a slender, loosely interrupted panicle, slender, occupying 15–35 cm of culm, 3–6-noded; panicles solitary or in fascicles of 2–4 at each node, or in lower fascicles 1 or 2 branches further racemosely divided and bearing 2 or 3 simple side spikelets. Involucral bracts leafy, lower bracts 22–30 cm long, exceeding the inflorescence; sheathing base 2–5 cm long; upper bracts setaceous, shortly sheathing; bracteoles very slender, linear; peduncles of upper panicles usually shorter or included in sheaths, lower ones more exerted, 3–15 cm long, glabrous. Cladophylls glumiform. Spikelets numerous, sessile or subsessile, androgynous, 1–3 cm long, flowers loose or often spaced at base

and subdense towards apex; rachis slender, glabrous; male part terminal, linear, 0.8–1 mm thick, shorter except in terminal spikelets; female part linear-cylindrical, 2–4 mm thick, usually longer than male part. Male glumes ovate, lance-ovate or obtusely triangular, $2-3 \times 0.8-1$ mm. Female glumes ovate, oblong-ovate to lanceolate, $2-3 \times 1-1.5$ mm, thinly membranous, orange brown or light brown, subacute to acuminate at apex, midrib greenish, obscurely 3-nerved, ending at glume apex or forming a minute mucro, not awned, margin whitish, ciliolate. Style erect, thickened at pyramidal annulate base; stigmas 2, 1.6–2 mm long. Utricle elliptic, $3-5 \times 1.2-1.5$ mm, erect, longer than subtending glume, subabruptly contracted above to a compressed long beak, very shortly stipitate at base, 7–13-nerved on each face, hispid on nerves, dark brown or orange brown at maturity, beak bifid, 0.8–1.2 mm long with two 0.2–0.3 mm long sharp teeth. Nutlet elliptic or lenticular, $2-2.5 \times 1-1.5$ mm, much flattened, tightly inclosed, contracted at both ends.

Fl. & Fr.: May – Dec.

Habitat: In Evergreen forests, shade areas especially on shola floors.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai, Nilgiri and Tirunelveli). Assam, Himachal Pradesh, Jammu & Kashmir and Kerala. Australia, Southern China, Indo-China, Malesia, Pakistan and Sri Lanka.

13. *Carex leucantha* Arn. ex Boott in Proc. Linn. Soc. London 1: 257. 1845; Boott. Ill. *Carex* 1: 10. t. 28. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 721. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:38. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 54. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021.

Rhizomatous perennials; rhizome short, slender, prostrate to 1 cm long. Culms central, solitary or in fascicles, slender, but rigid, up to 110 cm high, 0.8–1 mm thick, acutely trigonous, glabrous, 4–6-noded, internodes 2–10 cm long, clothed at base with sheaths and fibrous remains. Leaves basal, numerous, linear or narrowly linear, $30-60 \times 0.2-0.5$ cm, shorter or equaling the culm, gradually attenuated into a long acute apex, soft, strongly recurved, glabrous, slightly rough on upper surface; sheaths membranous, 3–7 cm long, pale brown to straw brown, striate, orifice transversely truncate. Inflorescence subpaniculate with 6–10 spikelets at 3–5-nodes, upper 3–5 spikelets forms a terminal subspicate clusters, lateral spikelets congested into 2–4 head like clusters, all clusters remotely spaced. Involucral bracts leafy, 2 or 3, longer than inflorescence, 10–30 cm long, sheathing base 1–4 cm long; upper bracts spathaceous or setaceous, 2–6 cm long, hardly sheathing; peduncles erect, 0.5–8 cm long, trigonous or compressed, mostly inclosed, occasionally binate at lower nodes. Cladophylls utriculiform. Spikelets androgynous, ovate in outline, 0.8–1.2 cm long, pale; rachis pubescent or glabrous; male and female parts

almost equal in length; male part lanceolate, 5–6 mm long; female part oblong, subdensely many flowered. Male glumes similar to female glumes. Female glumes ovate or ovate-lanceolate, 3–3.5 × 1–1.5 mm, acuminate at apex, membranous, pale and tinged with light brown, midrib projected beyond the glume apex into a straight 0.7–1 mm long awn. Style 2–3 mm long, 3-lobed, conical at base; stigmas 3. Utricle lanceolate to ovate-lanceolate, 5–7 × 1.5–2.5 mm, trigonous, spreading at maturity, attenuated into a long beak at apex, faintly 8–11-nerved on each face, pale to slightly straw coloured, pubescent, cuneate at base; beak straight, 2.5–3.5 mm long, spinulose on edges, the orifice obliquely truncate exposing 3 stigmas laterally. Nutlet elliptic, 3–3.5 × 1.3–1.6 mm, triquetrous, subacute at both ends.

Fl. & Fr.: Jun. – Nov.

Habitat: Grasslands of hilly regions.

Distrib.: Tamil Nadu (Tirunelveli). Kerala. Sri Lanka.

14. *Carex ligulata* Nees in Wight, Contr. Bot. India: 127. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 747. 1894; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020. *C. hebecarpa* C.A.Mey. var. *ligulata* (Nees.) Kük. in Engl., Pflanzenr. IV: 745. 1909; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; Fyson, Fl. S. Ind. Hill St.: 650. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2):154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 37. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 49. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021. *C. hebecarpa* C.A. Mey. ssp. *ligulata* (Nees.) T. Koyama in Ohashi, Fl. E. Himal. 3: 123. 1975; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1728. 1983; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1400. 1999. *C. maubertiana* Boott, Ill. Carex 1: 45, t. 114. 1858; Kern & Nooteb. in Steenis, Fl. Males. I. 9: 168. 1979.

Loosely tufted, rhizomatous perennials; rhizome short, prostrate, knotty, covered with reddish-brown scales. Culms aphyllopodic, erect from ascending base, triquetrous, 35–100 cm high, 2–3 mm thick, clothed with bladeless sheaths, ½ to 1/3 of culm and leaved only above the middle, 5–8-noded below inflorescence. Leaves equaling to exceeding the culm, linear to linear-lanceolate, 10–30 × 0.5–1 cm, gradually long acute at apex, flat, rough on upper surface, margins faintly scabrous, dark green above, whitish-green beneath; basal sheaths bladeless, rarely shortly bladed, upper sheaths portion 2–10 cm long, membranous, purplish or reddish-brown, ultimately dark purple. Inflorescence spicate. Involucral bracts leafy, lower 2–4 bracts longer, 9–20 cm long, exceeding the inflorescence; sheathing base 2–4 cm long; upper 2 or 3 bracts reduced, setaceous, sheathless or shortly sheathing; peduncles slender, 0.5–3 cm long, lower ones inclosed in bract sheath. Spikelets 5–7, subcontiguous; terminal spikelet male, erect, sessile or subsessile, linear, 1.5–3 × 0.1–0.2 cm, pale or light brown, exceeding or almost equal to upper most

lateral spikelet; lateral spikelets female, erect, cylindrical or oblong-cylindrical, 2–4 × 0.4–0.6 cm, subloosely many flowered, glaucous green. Male glumes ovate, 1.5–2 × 1–2 mm, glabrous. Female glumes ovate, 2–3 × 1.2–1.5 mm, membranous, acute at apex, pale and densely brown, lineolate, glabrous, 3-nerved, ending in a mucro at glume apex or projecting beyond into a straight 0.5 – 0.75 mm long awn. Style bulbous at base, subsistent; stigmas 3. Utricle ovate-elliptic, 3–5 × 1.5–2 mm, obtusely trigonous, contracted above to an erect beak, attenuate at base, nearly nerveless, tomentose or densely pubescent with spreading white hairs, dark purple or cinnamon to greenish at maturity; beak 1–1.5 mm long, hirsute, the orifice bifid. Nutlet elliptic, 2.5 × 1–1.2 mm, triquetrous, brown, tightly inclosed.

Fl. & Fr.: Jun. – Jan.

Habitat: Openings in evergreen forests and along the fringes of forests.

Distrib.: Tamil Nadu (Coimbatore, Dindigul (Madurai), Nilgiri and Salem). Andhra Pradesh, Himachal Pradesh, Jammu & Kashmir and Northeast India (Khasi hills). China, Japan and Sri Lanka.

15. *Carex lindleyana* Nees in Wight, Contr. Bot. India: 121. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 721. 1894; Fyson, Fl. Nilgiri and Pulney Hills: 444. 1915; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1169). 1931; Fyson, Fl. S. Ind. Hill Stat.: 649. 1932; Seb. in Bull. Bot. Surv. India 2: 6. 1960; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 38. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1401. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 54. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021. *C. thyrsoflora* Boott, Ill. Gen. Carex 1: 12. t. 34. 1858. *C. cruciata* sensu Thwaites, Enum. Pl. Zeyl.: 355. 1864 non Wahlenb. 1803.

Rhizomatous perennials; rhizome short, creeping or suberect. Culms central, erect with obliquely ascending base, solitary to loosely tufted, 20–80 cm high, 1–2 mm thick, distantly 1–3-noded below the panicle, smooth, glabrous, clothed at base with red to brown scales and their fibrous remains. Leaves mostly basal, 1–3 upper ones distantly arranged on culm, shorter or as long as culm, linear, 20–38 × 0.3–0.7 cm, gradually narrowed to subacute at apex, subcoriaceous, flat, light green; sheaths 3–6 cm long, greenish, basal sheaths reddish-brown. Inflorescence paniculate, 10–18 cm long, interruptedly bearing 2–5 much congested head like partial panicles; partial panicles ovoid to ovoid-ellipsoid in outline, 2–4 × 1–1.5 cm, densely bearing many spikelets in spicate or in part paniculate manner, rusty brown. Involucral bracts leafy, shorter than inflorescence; lower bracts 3–12 cm long, sheathing base 2–4.5 cm long; upper bracts 1.5–3 cm long, setaceous; bracteoles narrow, 1.5–2 mm long, scaly, ensiform, awned; peduncles 2.5–12 cm long, glabrous or hispidulous. Spikelets androgynous, ovoid or ellipsoid, 0.6–1.5

cm long, pale to rusty brown, upper ones subsessile or on a short inclosed pedicel, lower 1 or 2 on a long exerted pedicel; male part terminal, longer than female part, 5–7 mm long; female part 4–5 mm long. Male glumes lanceolate, 3–4 × 0.8–1 mm, acuminate, membranous, shortly awned. Female glumes ovate-lanceolate, 3–4 × 1–1.5 mm, shallowly boat shaped, gradually acute at apex, with distinct keel, membranous, glabrous, pale brown to brown, 1 or 3 -nerved, often ending with short awn or mucronate. Style not markedly thickened at base; stigmas 3. Utricle elliptic to ovate-elliptic or oblong, 3.5–4 × 1–1.5 mm, obtusely trigonous, narrowed to a erect beak at apex, contracted at base, membranous, glabrous, sparsely hispidulous on margins near apex, many nerved on each face; beak 1–1.5 mm long, much shorter than body, orifice deeply bifid with sharp teeth. Nutlet broadly elliptic, oblong or obovoid, 2–2.5 × 1–1.2 mm, sharply triquetrous, muticous, dark brown at maturity.

Fl. & Fr.: Jun. – Jan.

Habitat: Grasslands, slopes and wet places of high wavy mountains.

Distrib.: Coimbatore, Dindigul (Madurai) and Nilgiri. Karnataka and Kerala. Sri Lanka.

16. *Carex longicruris* Nees in Wight, Contr. Bot. India: 124. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 705. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:66. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 38. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 55. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021. *C. longipes* sensu Thwaites, Enum. Pl. Zeyl.: 355. 1864 non D. Don 1825.

Tufted, rhizomatous perennials; rhizome short, woody, knotty, covered with brown fibres. Culms erect, slender, but stiff, 60–130 cm high, 1–1.5 mm thick, trigonous, smooth, distantly 2 or 3 -noded. Leaves basal, 1 or 2 upper ones cauline, shorter or as long as culm, narrowly linear, 23–50 × 0.2–0.4 cm, gradually tapering into a long acute apex, stiff, folded or enrolled at base, flat at above, glabrous, scabrous on upper surface and on margins; sheaths membranous, 3–10 cm long, fuscous, eventually more or less disintegrated into brown fibres, orifice truncate, dark brown. Inflorescence a very slender compound panicle, bearing numerous spikelets, 20–35 cm long, subcontiguous above, interrupted below, 8 or 9-noded, internodes 2–10 cm long; peduncles very slender, 2–6 cm long. Involucral bracts leafy, shorter than inflorescence, lower bracts 6–13 cm long; sheathing base 1–4 cm long, greenish or brownish, orifice oblique, brown tinged; upper bracts setaceous; bracteoles minute, filiform, brownish. Spikelets single or in fascicles of 3 or 4 at each node, sometimes further divided into capillary branches, androgynous, cylindrical, 1–3 cm long; male part terminal, subulate, 5–8 mm long, few flowered, pale brownish; female part longer, linear, loosely 4–11 flowered. Male glumes

lanceolate, 2–3 mm long. Female glumes ovate or oblong-lanceolate, 3.5–4 × 0.8–1 mm, obtuse to acuminate at apex, brownish to yellowish-brown, hyaline at margins, hispidulous above, faintly 3-nerved, shortly awned or cuspidate. Style thickened at base, 1–1.5 mm long; stigmas 2, elongated, 5–7 mm long. Utricle lenticular, ellipsoid, 3.5–4 × 0.8–1 mm, equaling or slightly exceeding the subtending glume, narrowed into a linear beak at apex, cuneately shortly stipitate at base, glabrous or with few spinules on margins near apex, 4–6-nerved on each face, brownish to orange brown; beak 1–1.5 mm long, orifice bifid with teeth. Nutlets elliptic, lenticular, 1.8–2 × 0.8–1 mm, muticous, yellowish-brown at maturity.

Fl. & Fr.: Jan. – Mar.

Habitat: Near water courses in semi-evergreen forests.

Distrib.: Tamil Nadu (Coimbatore and Nilgiri). Kerala, Sikkim and throughout Himalayas. China and Sri Lanka.

17. *Carex longipes* D. Don ex Tilloch & Taylor, Philos. Mag. 62: 455. 1823; D. Don, Trans. Linn. Soc. London 14: 329. 1824 & Prodr. Fl. Nepal 43. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 6: 704. 1894; Karthik. & al., Fl. Ind. Enum. Monocot.: 38. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1402. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 56. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 251. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 341. 2021.

Rhizomatous perennials; rhizome short. Culms 15–80 cm high, 1–1.5 mm broad, slender. Leaves subbasal, sometimes upper one cauline, 2–3 mm wide, shorter to longer than stems. Inflorescence lax, consists of c. 7 spikelets. Involucral bracts leafy, long sheathing. Spikelets androgynous, single at each node, cylindrical, 3–4 × 0.4–0.6 cm long, upper one contiguous, the lower ones 1–3 branched near the base; male part terminal c. 5 mm long, much shorter than lower female part, sessile or with shortly exerted peduncles, the lowest one usually scabrid with long capillary, more or less scabrid peduncles. Glumes ovate, lanceolate, 3–4 mm long, shorter than the utricule, acute to emarginate at apex, ferruginous with hyaline margins, glabrous with 3-nerved, dark central stripe, with c. 1.5 mm long awn overtopping the utricule. Style 2-fid, distinctly thickened at base. Utricle ellipsoid, biconvex, 5.5–6 × 1.5–2 mm, glabrous, strongly 6–9 nerved dorsally, faintly nerved ventrally, pale green to yellowish or pale brown, shining; beak 2–3 mm long, distinctly 2-fid with 0.5–0.7 mm long teeth at apex. Nutlet broadly ellipsoid, biconvex, 2.5–3 mm, beaked.

Key to varieties

- 1a. Leaves 2–3 mm wide; spikelets with male part c. 5 mm long, sessile or with shortly exerted peduncles; utricles 5.5–6 mm long **17.1. var. longipes**
- 1b. Leaves 4–5 mm wide; spikelets with male part 9–22 mm long, exerted with filiform peduncles; utricles 6–7 mm long **17.2. var. dissitiflora**

17.1. var. longipes

Fl. & Fr.: Jan. – Mar.

Habitat: On grassy slopes of high altitude hills.

Distrib.: Tamil Nadu (Dindigul (Madurai) and Nilgiri). Peninsular India and Himalayas. Nepal and Sri Lanka.

17.2. var. dissitiflora C. B. Clarke in Hook.f., *Fl. Brit. India* 6: 705. 1894; Fyson, *Fl. Nilgiri and Pulney Hills*: 443. 1915; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1686 (1168). 1931; Fyson, *Fl. S. Ind. Hill Stat.*: 648. 1932; B.D. Sharma & al., in *Biol. Mem.* 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 66. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 38. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1403. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 56. 2015.

Rhizomatous perennials; rhizome short. Culms stout. Leaves 4–5 mm wide, lower peduncles very short. Spikelets 4–8 cm long, with 0.9–2.2 cm long male part, on up to 4 cm long, exserted, filiform peduncles. Utricle ellipsoid, 6–7 mm long, glabrous, strongly 6–9-nerved dorsally, faintly nerved ventrally, pale green to yellowish or pale brown, shining; beak 2–3 mm long, distinctly 2-fid with 0.5–0.7 mm long teeth at apex. Nutlet broadly ellipsoid, biconvex, 2.5–3 mm, beaked.

Fl. & Fr.: Oct. – Dec.

Habitat: Wet areas of forests of hill slopes.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai and Nilgiri). South and Northeast India. Rare.

18. Carex maculata Boott in *Trans. Linn. Soc. London* 20: 128. 1846; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 735. 1894; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1686 (1169). 1931; Fyson, *Fl. S. Ind. Hill Sta.*: 649. 1932; B.D. Sharma & al., in *Biol. Mem.* 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 67. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 38. 1989; K.M. Matthew, III. *Fl. Palni Hills*: 765. 1996; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1403. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 57. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 258. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 342. 2021.

Densely tufted perennials; rhizome short, woody, ascending, not creeping. Culms phyllopodic, erect, 30–60 cm high, 1.5–2 mm thick, obtusely trigonous, smooth, clothed with orange-brown long leaf sheaths and their fibrous remains at base. Leaves mostly subbasal, one to few above on the lower part of culm and spaced, linear, 20–40 × 0.4–1 cm, shorter or nearly equaling the culm, shortly attenuated at apex, flat or revolute, soft, glabrous, greenish or whitish; sheaths 7–13 cm long, membranous, rusty brown or pale with dark red dotted, occasionally disintegrating into soft fibres. Inflorescence spicate. Involucral bracts leafy, lower 2 bracts

exceeding the inflorescence, 9–15 cm long; sheathing base 1–2 cm long, greenish, orifice oblique, brown tinged; uppermost bracts setaceous, not or scarcely sheathing at base; peduncles slender, 2–10 cm long, obtusely trigonous, 0.5–1 mm thick. Spikelets 3–5, erect, lowest slightly spaced, upper 2 or 3 subfastigate; terminal spikelet male, subsessile or shortly pedicelled, linear-cylindrical, 1.5–3.5 × 0.1–0.2 cm, lightly orange or reddish-brown, often exceeding the next lateral spikelet; lateral spikelets female, rarely androgynous, cylindrical, 1–4 × 0.2–0.4 cm, densely many flowered, subloosely arranged, pale green to dark brown, upper ones subsessile or on short inclosed pedicel, lowermost one on a long exerted pedicel. Male glumes oblong, 2.5–3.5 × 1–1.5 mm, tapering at apex, reddish. Stamens 3. Female glumes oblong-ovate or oblong, 1.8–2 × 0.6–1 mm, subobtuse to acute at apex, thinly membranous, dark purple-brown, 3–5-nerved, ending below the glume apex or rarely midrib reaching the apex. Style slightly thickened at base; stigmas 3, recurved. Utricle ellipsoid or broadly ellipsoid, 1.7–3 × 1–1.5 mm, trigonous, compressed, erect to subpatent, often exceeding the subtending glume, subabruptly very shortly beaked at apex, contracted at base; dark purple brown, 3–5-nerved on each face, densely papillose; beak 0.2–0.5 mm long or indistinct, orifice entire. Nutlet ellipsoid or obovoid, 1.5–1.8 × 1–1.2 mm, rounded to mucronate at apex, loosely enveloped, trigonous.

Fl. & Fr.: Mar.– Apr.

Habitat: Moist and marshy areas of hills

Distrib.: Nilgiri and Tirunelveli. Kerala, Madhya Pradesh and Northeast India (Khasi hills). China, Formosa northeastwards to Japan, and eastwards to western Malesia.

19. *Carex myosurus* Nees in Wight, Contr. Bot. India: 122. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 723. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1687 (1169). 1931; Fyson, Fl. S. Ind. Hill Sta.: 649. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1729. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 39. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1403. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 57. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 258. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 342. 2021.

Loosely tufted, perennials; rhizome stout, woody, elongated, hardly creeping, covered with fibrous remains of sheathing scales. Culms erect, robust, trigonous, up to 150 cm high, 2.5–4 mm thick, clothed at base with reddish-brown to blackish leaf sheaths or their fibrous remains. Leaves basal and subbasal, a few cauline, conspicuously spaced, equaling or slightly exceeding the culms, widely linear, 60–80 × 0.3–1 cm, gradually attenuated into a long acute apex, flat to revolute, coriaceous, stiff, glabrous, scabrid on upper surface, dark green; sheaths membranous, 10–20 cm long, reddish-brown or blackish-red, splitting into fibres. Inflorescence simple

to compound, narrow and interrupted panicle, occupying upper 25–100 cm of culm; partial panicles 5–9, oblong or oblong-lanceolate, solitary at each node, 8–20 cm long, further branched into 2–8 simple spikelets; upper ones approximate and fastigiate, sessile or on shortly exerted pedicels, lower ones distant to very distant from another, on long exerted pedicels. Involucral bracts leafy, lower ones exceeding the inflorescence, 10–30 cm long; sheathing base 3–6 cm long, glabrous or sparsely hispidulous; upper bracts subleafy or setaceous, not sheathing; bracteoles glumiform; peduncles 2–8 cm long, trigonous, scabrid or scaberulous. Cladophylls utriculiform. Spikelets numerous, androgynous, oblong-linear, 4–6 × 0.4–0.9 cm, subdensely flowered; rachis scaberulous; male part terminal, linear, cylindrical, almost equal to female part; female part oblong, 2–3.5 cm long. Male glumes subulate, 3–4 mm long, mucronulate. Stamens 3. Female glumes oblong-ovate or oblong, 3.5–4 × 1–1.5 mm, rounded or subtriangular at apex, flat to deeply cymbiform at above, incurved below, brownish, white hyaline margined near apex, keel 3-nerved, usually excurrent up to 1.5 mm long awn, glabrous to minutely hispidulous. Style short, not thickened at base; stigmas 3. Utricle narrowly ellipsoid, 3.5–4.5 × 0.9–1.4 mm, acutely trigonous or subcompressed, gradually to subabruptly narrowed into a beak, tapering at both ends, not inflated, slender and faintly 6–8-nerved on dorsal face, 3–6-nerved on ventral face, glabrous or sparsely hispid at upper half; beak 0.7–1 mm long, planoconvex or compressed, slightly tapering, bifid, orifice not oblique, with 0.2–0.5 mm long slender teeth. Nutlet broadly ellipsoid, 2–2.5 × 0.8–1 mm, trigonous, abruptly beaked at apex, straight to bent or stipitate at base, dark brown to blackish.

Fl. & Fr.: Dec. – Mar.

Habitat: Grasslands, marshy areas of hills and stream banks.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai and Nilgiri). Throughout India. China and Indo-Malesia.

20. *Carex nubigena* D. Don in Trans. Linn. Soc. London 14 (2): 326. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 6: 702. 1894; Fyson, Fl. Nilgiri and Pulney Hills:442. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1685 (1168). 1931; Fyson, Fl. S. Ind. Hill Stat.: 647. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 154. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1730. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 40. 1989; K.M. Matthew, Fur. Ill. Fl. Tamilnadu Carnatic 4:766. 1996; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1404. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 58. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 260. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 342. 2021. *C. nubigena* D.Don var. *fallax* (Steud.) C.B. Clarke in J. Linn. Soc., Bot. 36: 301. 1904. *C. lenticularis* D. Don in Trans. Linn. Soc. London 14 (2): 331. 1824 non Michx. 1803.

Densely tufted, perennials; rhizome very short and inconspicuous. Culms central, compressed, obtusely trigonous, 30–100 cm high, 1–2 mm thick, slender, rigid, glabrous, hispidulous below the inflorescence, often more or less hollow, clothed at base with dark brown scales and their fibrous remains. Leaves basal and subbasal, shorter than culms, narrowly linear, 20–55 × 0.1–0.3 cm, gradually long acute at apex, canaliculate, much folded when dry, greenish; sheaths 6–10 cm long, basal sheaths with reduced blades to scaly, ferruginous, eventually disintegrating into brown fibres. Inflorescence spicate, usually terminal, pyramidally oblong head like, 2–4 × 0.7–1.2 cm, sessile, contiguous or interrupted below. Involucral bracts leafy, lower 2 bracts exceeding the inflorescence, 5–12 cm long, usually not sheathing; upper bracts setaceous, 2–3 cm long, non-sheathing. Cladoprophylls absent. Spikelets 5–15 in a group, much congested, androgynous, ovoid to subglobose, 0.5–1 cm long; male part terminal, consists of very few flowers; female part densely flowered, greenish and eventually becoming straw coloured. Male glumes smaller, ovate to lanceolate, 1.5–2.5 mm long. Female glumes ovate-lanceolate or oblong-lanceolate, 2–3 × 1–1.5 mm, acute or obtuse at apex, thinly membranous, white, with greenish or brownish central stripe, scarious below, midrib 3-nerved, projecting beyond the glume apex up to 1 mm long awn or mucro. Style slender, elongated, not thickened at base; stigmas 2. Utricle broadly ovoid to ellipsoid, 3.5–4 × 1.2–2 mm, planoconvex, membranous, narrowed into a distinct beak, greenish and often purplish or reddish-spotted, strongly 9–12 or many nerved on each face, glabrous, margins widely winged; beak linear, 1.2–2 mm long, compressed, bifid, serrulate margined, orifice oblique, with minutely 2-teeth. Nutlet widely elliptic or suborbicular, 1.3–1.5 × 0.8–1 mm, biconvex, shortly beaked at apex, stipitate at base.

Fl. & Fr.: Almost throughout the year.

Habitat: Grasslands and in moist places on hills.

Distrib.: Coimbatore, Dindigul (Madurai) and Nilgiri. Throughout India, Afghanistan, China, Japan, Malesia, Myanmar, Sri Lanka and Sumatra.

21. *Carex phacota* Spreng., Syst. Veg. 3: 826. 1826; Boott. Ill. *Carex* 1:63.t. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 708. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1686 (1169). 1931; Fyson, Fl. S. Ind. Hill Sta.:648. 1932; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 154. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1730. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 40. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1405. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 59. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 261. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 342. 2021.

Loosely tufted perennials; rhizome short, woody, shortly creeping. Culms erect, up to 130 cm high, 1–3 mm thick, acutely trigonous, ribbed, smoother

sparsely scaberulous just below inflorescence, base clothed with dark brown or ferruginous sheaths and their fibrous remains. Leaves subbasal, occasionally 1 or 2 upper on culm, shorter to much longer than culms, linear, 20–80 × 0.4–0.8 cm, gradually attenuated into a long acute at apex, stiff, folded with recurved margins, scabrous; sheaths 6–10 cm long, membranous, ferruginous or yellow brown, often splitting into fine, reticulate fibres. Inflorescence spicate. Involucral bracts of the lower female spikelets leafy, 16–30 cm long, usually much exceeding the terminal spikelet or inflorescence, not sheathing or shortly sheathing; upper bracts setaceous, equaling or shorter than subtending spikelet, not sheathing, but with two conspicuous, membranous auricles; bracteoles glumiform; peduncles 3–5 cm long, very slender, subterete to obtusely trigonous, 0.2–0.5 thick glabrous or sparsely scaberulous. Spikelets 4–6, subapproximate, lowest spaced; terminal spikelet male, sessile or shortly pedicelled, linear, 2–5 cm long, brownish; lateral spikelets androgynous with a small male part at apex or rarely wholly female, cylindrical, 3–7 × 0.4–0.5 cm, densely many flowered, greenish to brownish, terete, drooping; upper one shortly pedicelled, lower ones long pedicelled. Male glumes obovate, 3–4 mm long, awned, purplish. Stamens 3 (or 2). Female glumes ovate-oblong or ovate, 1–3 × 0.7–1.5 mm, truncate or bilobed, often canaliculate, thinly membranaceous, ferruginous with pale margins, or pale with reddish flecks, obtuse to shallowly emarginate at apex, 3-nerved central stripe, excurrent into scaberulous margined, 0.5–2 mm long awn. Style slender, not or scarcely thickened at the base; stigmas 2. Utricle broadly elliptic, obovoid or suborbicular, 2.3–3 × 1.5–2 mm, usually compressed, biconvex, rounded or mucronate at apex, beak not developed, shortly stipitate at base, nerveless or obscurely 1 to few nerved on dorsal face towards base, densely and ferruginously, sometimes reddish, glandular to papillose. Nutlet pyriform to orbicular or suborbicular, 1.8–2 × 1.2–1.8 mm, compressed, biconvex, rounded to truncate or minutely beaked at apex, shortly stipitate at base, subloosely enveloped, brownish or yellowish.

Fl. & Fr.: Jan. – Jul.

Habitat: Marshy areas in evergreen forests and on higher altitudes.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai, Nilgiri, Salem and Tirunelveli). Bihar, Jharkhand, Northeast India, Peninsular India and West Bengal. Indo-Malesia.

22. *Carex pseudoaperta* Boeckeler ex Kuek. in Engl., Pflanzenr. 38: 325. 1909; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1169). 1931; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:41. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 59. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 262. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 342. 2021.

Rhizomatous perennials; rhizome very short. Culms 30–45 cm high, 1–1.5 mm thick, slender. Leaves basal, 1 or 2 upper ones cauline, 10–15 × 0.4–0.5 cm. Inflorescence compound panicle, branches very slender. Involucral bracts foliaceous, shorter than inflorescence, long sheathing, upper ones setaceous. Spikelets androgynous, 3–5; male linear, 2.5–4 cm long, female cylindrical, 1.5–2 mm long. Female glumes oblong, rounded sometimes apiculate, brown, midrib green, margins sometimes very narrowly hyaline, 1.5–2 mm long, not awned. Style 2-fid. Utricle ovate, compressed, 2–4 mm long, glabrous, hardly beaked, mouth minutely emarginate, brown, 2–4 mm long. Nutlets 1.5–1.7 × 0.4–0.5 mm, muticous.

Fl. & Fr.: Jan. – Jul.

Habitat: Marshy areas at higher altitudes.

Distrib.: Tamil Nadu (Nilgiri). Bihar, Jharkhand, Northeast India, Peninsular India and West Bengal. Indo-Malesia.

Notes: It is a little known species represented with only Gamble's collections in Herbarium. It is allied to *Carex lindleyana* Nees.

23. *Carex raphidocarpa* Nees in Wight, Contr. Bot. India:122. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6:719. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1686 (1169). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:41. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1405. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:59. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 262. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 342. 2021.

Rhizomatous perennials; rhizome short. Culms 60–80 cm high, stout. Leaves shorter, 5–7 mm wide, glabrous or minutely puberulous, upper most sheaths sometimes puberulous at the mouth. Inflorescence paniculate, lax, peduncled, usually branched, bearing numerous spikelets. Involucral bracts leafy, up to 20 cm long. Spikelets androgynous, ovoid or ellipsoid, 0.5–0.7 cm long, pale-ferruginous green; male part terminal, 2–3 mm long, much shorter than lower female part. Male glumes ovate, 1.5–2 mm long; female glumes shorter than the utricule, with 1.5–2.5 mm long arista, almost as long as the body of utricule, ferruginous or golden-brown or brownish on sides. Stigma 3-fid. Utricle ellipsoid or void, narrowed into a slender beak nearly as long, 4 to 6-ribbed, glabrous; beak with bifid mouth. Nutlets ellipsoid, triquetrous, 2–2.2 × 0.5–0.7 mm, yellowish with short curved beak.

Fl. & Fr.: Oct. – Dec.

Habitat: Marshy areas and slopes of hills at higher altitudes. Rare

Distrib.: Tamil Nadu (Dindigul Madurai and Nilgiri). South India. Bihar, Jharkhand, Northeast India, Peninsular India and West Bengal. Indo-Malesia.

Notes: It is a rare species earlier known from Pulney Hills now it is reported from Niligiri Hills based on collections from Ooty by Wadoodkhan (2015).

24. *Carex rara* Boott in Proc. Linn. Soc. London 1: 284. 1845; C.B. Clarke in Hook.f., Fl. Brit. India 6: 713. 1894; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 41. 1989; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 263. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021.

Densely tufted perennials; rhizome short, very short or rarely erect-ascending with slightly elongated internodes 1–1.5 cm long. Culms slender, 15–40 cm high, 0.3–0.7 mm thick, acutely triquetrous, smooth, striate, leaved only at base. Leaves few to a culm, shorter to longer than culms, crescentiform, 0.5–1 mm wide, canaliculate on adaxial side, with smooth margins; sheaths 1–7 cm long, membranous, pale green to ferruginous, often splitting into brownish fibres. Inflorescence a single terminal spike, without bract. Spike androgynous, erect, cylindrical to oblong-cylindrical, 0.7–2 × 0.3–0.4 cm; male part linear, shorter than female part, 3–7 × 0.8–1 mm, brownish; female part 0.4–1.5 cm long, subdensely many-flowered. Female glumes ovate-elliptic to ovate, 1.5–2 × 1–1.2 mm, shallowly boat-shaped, membranaceous, pale and brownish on both sides especially along the margins, obtuse or 2 or 3 toothed at apex, 3-nerved, sometimes forming a mucro. Style not thickened at base; stigmas 3. Utricle broadly ovate, 2–2.7 × 0.8–1 mm, obtusely trigonous, slightly inflated, glabrous, thinly herbaceous, 7–9-nerved at dorsal side, nerveless at ventral side, rounded or shortly stipitate at base, abruptly attenuate above into a short straight 0.3–0.6 mm long beak, orifice membranous, subtruncate to minutely 2-toothed. Nutlet ovate, triquetrous, 1.25–1.5 × 0.8–1 mm, abruptly contracted at base, subacute at apex.

Fl. & Fr.: Jan. – Jul.

Habitat: In hills at higher altitudes.

Distrib.: Tamil Nadu (Nilgiri). Central to Eastern Himalaya. Australia, Bhutan, Borneo, Japan and Sri Lanka

25. *Carex speciosa* Kunth, Enum. Pl. 2:504. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 729. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1168). 1931; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 154. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1731. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 42. 1989; K.M. Matthew, Ill. Fl. Palni Hills: t. 767. 1996; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1405. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 60. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 264. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021.

Tufted perennials; rhizome short, woody. Culms erect to oblique, prominently trigonous, with subacute to very narrowly winged angles, 30–100 cm high, 1–1.5 mm thick, usually robust, smooth or finely scaberulous on angles, clothed at base with fuscous, leaf sheaths and their fibrous remains. Leaves subbasal, crowded, usually longer than culms, linear, 20–45 × 0.3–1 cm, gradually narrowed into long attenuated apex, flat or flat-plicate, stiff, often with revolute margins, glabrous, with minute rough protuberances on upper surface towards apex; sheaths 3.5–6 cm long, eventually disintegrating into brown fibres. Inflorescence spicate, usually one terminal and 1 or 3 axillary spikelets, distantly arranged, lowest sometimes arising from basal sheath. Involucral bracts leafy, 3–5 cm long, usually exceeding the terminal spike; sheaths membranous, 1–2 cm long; bract of terminal spike glumiform, amplexicaul or shortly sheathing the culm; peduncles 3–6 cm long, trigonous, angles acute, glabrous. Spikelets androgynous, cylindric or slightly compressed, 1–3 cm long; male part terminal, 0.5–1.5 cm long, acute at apex, subdensely flowered; female part usually much longer or about as long as male part, 1–2 cm long, subaxillary flowered, usually on shortly to longly exerted pedicels. Male glumes oblong or oblong-ovate, 1.5–2 mm long, obtuse or acute at apex, muticous. Stamens 3. Female glumes broadly ovate or oblong-ovate, 2.5–3 × 1–2 mm, cymbiform above, obtuse or subacute at apex, many nerved, whitish-stramineous, translucent, midrib prominent, extending into a firm tip at apex or muticous. Style 1–1.5 mm long, pyramidally thickened at base, angles ciliolate, persistent on nutlet; stigmas 3. Utricle ellipsoid or ovoid, 3.5–5.5 × 1.5–2.5 mm, trigonous or triquetrous, gradually beaked at apex, hardly stipitate at base, coriaceous, strongly multinerved, straight or slightly curved, glabrous, white pubescent on margins, greenish or brownish-stramineous, sometimes whitish; beak 0.4–0.5 mm long, shortly bifid or bilobed. Nutlet obovoid, or ellipsoid, 3–4 × 1.5–2 mm, triquetrous, distinctly white angled, abruptly minutely beaked at apex, shortly stipitate at base, pale to dark brown.

Key to varieties

- 1a. Leaves 3–8 mm wide; spikelets 1 or 3, all 1–3 cm long; female glumes 2.5–3 mm long; utricles 3.5–5.5 mm long **25.1. var. speciosa**
 1b. Leaves 10–13 mm wide; spikelets 1–5, terminal one 5–7 cm long, lateral one 3–5 cm long; female glumes 3.8–4 mm long; utricles 5–7 mm long **25.2. var. courtallensis**

25.1. var. speciosa

Fl. & Fr.: Feb. – Nov.

Habitat: Grasslands and slopes of hills at higher altitudes.

Distrib.: Tamil Nadu (Dindigul Madurai, Nilgiri, Salem and Tirunelveli). Throughout India. China and Indo-Malesia.

25.2. var. courtallensis (Nees ex Boott.) Kuek. in Engl., Pflanzenr. 38: 481. 1909; Rao & Verma, Cyper. N.E. India 79. 1982; Karthik. & al., Fl. Ind. Enum. Monocot.: 42.

1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 61. 2015. *Carex courtallensis* Nees ex Boott. Ill. *Carex* 1: 52. t. 138. 1858. *C. speciosa* sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 729. 1894 p.p. *non* Kunth 1837.

Rhizomatous perennials; rhizome short. Culms 30–45 cm high, caespitose, winged and scaberulous below the inflorescence. Leaves subbasal, often exceeding the culm, 10 - 13 mm wide, acuminate, flat. Inflorescence consists of 1–5 spikelets. Involucral bracts foliaceous, shorter or longer than inflorescence, shortly sheathing. Spikelets terminal one 5–7 cm long, lateral one 3–5 cm long; male part terminal, 1/3 of the spikelets, attenuated at base; female part at base. Glumes broadly ovate or suborbicular, lanceolate, up to 1.5 mm long, female glumes 3.8–4 mm long, obtuse or abruptly apiculate, green, concolorous. Style persistent, very rigid, thickened at the base. Utricle acutely trigonous, 5–7 mm long, acutely trigonous, multistriate, concave on the inner surface, rounded on the back, the interior margins slightly winged and ciliate, beaked at apex; beaks c. 1 mm long, conical, truncate, 2-fid with ciliate margins. Nutlets ellipsoid, trigonous, with prominent angles, stipitate, pale brown with darker markings, finely reticulate.

Fl. & Fr.: Oct. – Dec.

Habitat: Wet areas of forests of hill slopes.

Distrib.: Tamil Nadu (Tirunelveli). Eastern Himalayas, South and Northeast India. Rare.

26. *Carex vicinalis* Boott. Ill. 4:133. t. 428. f. 2. 1867; C.B. Clarke in Hook.f., Fl. Brit. India 6:735. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1688 (1169). 1931; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 62. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 266. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021.

Rhizomatous perennials; rhizome short, woody. Culms up to 100 cm high, 1.5–2.5 mm thick, slender. Leaves subradical, 2–5 mm wide, shorter than to nearly equalling the culm, acute at apex; sheaths ferruginous or pale with dark red spots. Inflorescence male spikelets 3, close together, terminal, linear, 1–1.2 cm long; female spikelets many, distant on long capillary peduncles, linear, 2.5–3.5 cm long. Involucral bracts very narrow, not sheathing. Female glumes oblong, 2–3 mm long, dark purplish-brown, midrib green, margins narrowly hyaline. Style 3-fid, slightly thickened at base. Utricle ellipsoid, 2–2.8 mm long, equalling their glumes, narrowed to stipitate base, very short beaked at apex, dusky grey, 3–5 nerved, granulate. Nutlet ellipsoid or obovoid, prominently trigonous, 1.5–1.8 × 0.8–1 mm, subobtuse with a minute 0.2 mm long beak at apex or sometimes beak obscure, minutely stipitate at base.

Fl. & Fr.: Feb. – Nov.

Habitat: Grasslands and slopes of hills at higher altitudes

Distrib.: Tamil Nadu (Nilgiri). **Endemic**

27. *Carex walkeri* Arn. ex Boott. in Proc. Linn. Soc. London 20: 129. 1846; Boott. Ill. *Carex* 1: 2. t. 4. 1858; C.B. Clarke in Hook.f., Fl. Brit. India 6: 725. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1688 (1168). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 155. 1977; T. Koyama in Dassan. & Fosb. Rev. Hand. Fl. Ceylon 5: 381. 1985; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 67. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 62. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 266. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021.

Rhizomatous perennials; rhizome short, creeping. Culms 60–120 cm high, 1.5–2.5 mm broad, trigonous. Leaves basal and cauline, 40–80 × 0.5–1.2 cm, stiff, subcoriaceous, more or less revolute-margined; sheaths purplish or dark reddish-brown. Inflorescence consists of 5 or 6 fascicles, pendent, interrupted or the upper 2 or 3 fascicles subcontiguous, axis scabrid on angles, the lower ones 10–30 cm long, upper ones 3–8 cm long, branches exserted, capillary. Spikelets androgynous, linear-cylindrical, 4–8 cm long; male part shorter than female part, rarely whole spikelet becoming male bearing only 1 or 2 female flowers at base. Female glumes obovate, oblong, 4–5 mm long, boat-shaped, reddish-veined on both sides, costa 3-nerved, with c. 2.5 mm long straight, scabrous awn. Style 3-fid. Utricle linear-lanceolate, suberect, 6–8 × 0.5–1 mm, trigonous, dorsally 5 or 6-nerved, ventrally 2 or 3-nerved, olive-green and tinged with rusty-brown above the middle, narrowed at base, hispidulous on margins, beaked at apex; beak 2.5–3 mm long, 2-fid. Nutlets linear-oblong, 3–5 mm long, trigonous.

Fl. & Fr.: Oct. – Nov.

Habitat: Moist forests, cliffs and slopes of hills at higher altitudes

Distrib.: Tamil Nadu (Nilgiri and Tirunelveli). Sri Lanka. **Rare.**

28. *Carex wallichiana* Spreng. Syst. Veg. 3: 812. 1826; Rao & Verma, Cyper. N.E. India: 66. 1982; B.D. Sharma & al, in Biol. Mem. 2 (1&2):154. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:63. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 266. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021. *Carex foliosa* D. Don, Trans. Linn. Soc. London 14: 327. 1824 & Prodr. Fl. Nepal: 42. 1825; C.E.C. Fisch. in Gamble, Fl. Madras:1685 (1168). 1931; Fyson, Fl. S. Ind. Hill Sta.: 647. 1932; K.M. Matthew, Ill. Fl. Palni Hills: 763. 1996; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1400. 1999. *C. muricata* L. var. *foliosa* (D. Don) C.B. Clarke in Hook.f., Fl. Brit. India 6: 703. 1894; Fyson, Fl. Nilgiri and Pulney Hills: 443. 1915.

Rhizomatous perennials; rhizome short, woody. Culms 20–60 cm high, 1–3 mm broad, slender, smooth, sparsely hispid below the inflorescence. Leaves usually shorter, sometimes longer, very narrow, 3–6 mm wide, flat. Inflorescence oblong, head-like. Spikelets androgynous, ovoid to subglobose, 5–15 × 5–7 mm, crowded or lowest 1 or 2 loose; male part consists of very few flowers; cladoprophylls absent at base; lowest bracts foliaceous, membranous margined at base, usually not sheathing; upper one glume like. Female glumes ovate to oblong, c. 3 × c. 1 mm, translucent, scarious below, brownish, mucronate or muticous. Style 2-fid, base very slender, much narrower than nut beak. Utricle ellipsoid or suborbicular, 3.5–4 × 0.5–1 mm, greenish-white on one face, purplish on the other face or wholly greenish, usually nerveless or slightly nerved, not winged, narrowed in to beak; beak c. 1 mm long, 2-fid. Nutlet suborbicular or ellipsoid, 1.3–1.5 × 0.7–0.8 mm, very shortly beaked.

Fl. & Fr.: Apr.– Aug.

Habitat: In fringes of forests at higher altitudes and shade areas especially on shola floors.

Distrib.: Tamil Nadu (Dindigul Madurai and Nilgiri). South India and Himalayas.

29. *Carex wightiana* Nees in Wight, Contr. Bot. India: 122. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 720. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1686 (1169). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 63. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 266. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021.

Loosely tufted, perennials; rhizome slender, short, horizontal. Culms erect, stout, acutely triangled, up to 100 cm high, 1.5–3 mm thick, smooth, clothed at base with leaf sheaths and their fibrous remains. Leaves basal, as long as or shorter than culms, linear, 60–80 × 0.5–1 cm, long attenuated at apex, flat, soft, glabrous; sheaths membranous, 2– 6 cm long, brown, disintegrating into fibres. Inflorescence subpaniculate, with 5–8 spikelets, occupying the upper 30–40 cm of the culm; upper ones on short peduncles, lower ones on long exserted peduncles. Involucral bracts leafy, lower ones equaling or exceeding the inflorescence, 20–25 cm long; sheathing base 2–3.5 cm long, glabrous, orifice obliquely truncate; upper bracts reduced, 5–8 cm long, setaceous, hardly sheathing; bracteoles glumiform, 1–1.5 mm long, shortly awned; peduncles 2–4 cm long, slender, trigonous, 0.3–0.5 mm thick, glabrous. Spikelets androgynous, suberect, linear when young, oblong at maturity, 0.8–1.2 × 0.7–0.8 cm, greenish or pale; male part terminal, shorter than female part, lanceolate, 4–5 mm long, less flowered; female part 6–8 mm long, many flowered; rachis glabrous. Male glumes ovate, 2–3 mm long. Stamens 3. Female glumes ovate or lanceolate, 3–3.5 × 1–1.5 mm, acute or acuminate at apex, membranous, pale brown or straw coloured, glabrous, midrib excurrent into 0.7–2

mm long straight awn. Style 2–2.5 mm long, thickened at base, conical; stigmas 3. Utricle elliptic, 3.5–5 × 1–1.5 mm, trigonous, pale to straw coloured, delicately 8–12-nerved on each face, pubescent, base cuneate, contracted into a short stipe, apex gradually narrowed into a long straight beak; beak 1.3–2 mm long, bifid, spinulose on margins or scabrous, orifice obliquely truncate. Nutlets elliptic, 2.5–3 × 1.2–2 mm, triquetrous, subacute at both ends.

Fl. & Fr.: Dec. – Feb.

Habitat: Semi-evergreen and evergreen forests, moist areas on slopes of hills.

Distrib.: Tamil Nadu (Tirunelveli and Nilgiri). South India (Kerala). **Endemic. Threatened** (Nayar, 1997).

Notes: This endemic species earlier known from Courtallum hills of Tirunelveli now it is reported from Nilgiri hills based on collections from Ooty by Wadoodkhan (2015).

5. COURTOISINA Sojak

Tufted, non-rhizomatous annuals. Culms erect, scapose. Leaves grass like, basal. Inflorescence umbel with globose spikes. Spikelets several flowered, compressed; rachilla internodes elongated, scarcely winged, disarticulating at base. Glumes distichous, persistent, winged; lower 2 glumes empty; upper glumes subtending a flower. Flowers bisexual; bristles absent. Stamens 3. Style shorter than stamens, persistent, base not distinct, slightly thickened; stigmas 3, linear, longer than style. Nutlets trigonous, beaked, finely punctulate.

Tropical Africa and Madagascar, c. 2 species, 1 in India and Tamil Nadu

Courtoisina cyperoides (Roxb.) Soják, Čas. Nár. Muz. Praze, Rada Přír. 148: 193. 1980 (1979); V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 266. 2020. *Kyllinga cyperoides* Roxb., Fl. Ind. 1: 187. 1820. *Courtoisia cyperoides* (Roxb.) Nees in Linnaea 9: 286. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 625. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1645 (1143). 1931. *Cyperus pseudokyllingoides* Kük. in Engl., Pflanzenr. 4: 501. 1936; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 156. 1977; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 116. 2015. *Indocourtoisia cyperoides* (Roxb.) Bennet & Raizada in Indian Forester 107: 432. 1981; Karthik. & al., Fl. Ind. Enum. Monocot.: 57. 1989.

Erect annuals; non-rhizomatous. Culms tufted, slender, obtusely 3-angled, 20–50 cm high, smooth. Leaves several, basal, as long as culm, linear, gradually acuminate, 2–6 mm wide; sheath short, loosely enclosing the culm, 2–4 cm long, yellow, membranous. Inflorescence compound to decompound umbel. Involucral bracts 3–7, leafy, lower 2 or 3 longer than inflorescence; primary and secondary rays present. Spikes globose, 5–10 mm across, greenish-yellow. Spikelets densely clustered, strongly compressed, broadly ellipsoid to oblong-elliptic, 3–4 × 1.5–2

mm, 1 or 2-flowered; rachilla slender, narrowly winged. Glumes 4, distichous, lower 2 empty, upper 2 bisexual, elliptic, cymbiform, 3–5 mm long, membranous, mucronate at apex, keel glaucous, broadly winged. Stamens 3; anthers oblong, 0.4–0.5 mm long; filaments up to 3 mm long. Style short, 0.4–0.7 mm long; stigmas 3, c. 0.7 mm long, slightly longer than style, laxly papilliferous. Nutlet trigonous, 2.7–3 × c. 0.7 mm long, narrowly oblong, densely punctulate, dark reddish-brown.

Fl. & Fr.: Oct. – May.

Habitat: A weed on the margins of stagnant waters and marshy areas in grasslands.

Distrib.: Tamil Nadu (Nilgiri). Throughout India except Northeast. Tropical Africa and Indo-Malesia.

6. CYPERUS L.

Annuals or perennials, often rhizomatous or stoloniferous. Culms tufted or solitary, triquetrous, trigonous or at times subterete, usually leafy at base. Leaves tritichous, narrowly linear, grass like, rarely lanceolate or elliptic, lower ones often scale like, at times reduced to subphyllous sheaths, covering base of culm and rhizome. Inflorescence terminal, rarely pseudolateral, usually anthelate, simple to decompound, sometimes capitate. Involucral bracts leafy, not sheathing. Rays subtended by a foliaceous bract similar to leaves, the base enclosed in a tubular, two keeled prophyll, the bracts usually approximate as though forming an involucre. Spikelets more or less compressed, quadrangular or subterete, 1 to many flowered, sessile, prophyllate at base, usually compressed; rachilla persistent, often winged. Glumes distichous, usually 2 basal ones empty. Flowers bisexual; upper most often staminate or barren. Hypogynous scales or bristles absent. Stamens 3, 2 or 1, with connective of anthers often produced into an apical appendage. Style continuous with the ovary, not jointed at base, 3-fid or 2-fid, rarely almost undivided. Nutlet sessile or shortly stipitate, trigonous, triquetrous or lenticular or planoconvex.

A cosmopolitan genus mostly distributed in tropics, c. 600 species, c. 100 in India and 46 species, 2 subspecies and 2 varieties in Tamil Nadu.

Literature: KOYAMA, T. (1961). The genus *Cyperus* in Eastern Asia, Quart. Journ. Taiwan Mus. 14: 163. KUKENTHAL, G. (1935 – 1936). Scirpoideae - Cyperae, In: Engler, pflanzenr. 101 (IV. 20):1 – 671. MERCADO, B. L. (1979). A monograph on *Cyperus rotundus* L., Biotrop. Bull. No. 15:1 – 63.

Key to species and subspecies

- | | |
|---|--------------------------|
| 1a. Inflorescence of solitary head or capitate just above the involucral bracts | 2 |
| 1b. Inflorescence of simple to compound umbel above the involucral bracts | 9 |
| 2a. Inflorescence a pseudolateral cluster of spikelets | 28. C. laevigatus |
| 2b. Inflorescence not as above | 3 |

- 3a. Annuals with fibrous roots at base 4
- 3b. Perennials with rhizomatous base 6
- 4a. Stigmas 3; nutlets obtusely trigonous **41. C. pulchellus**
- 4b. Stigmas 2; nutlets triquetrous or planoconvex or lenticular 5
- 5a. Nutlet triquetrous; involucre bracts 2 or 3, up to 4 cm long, faintly exceeding the inflorescence; spikelets digitate, spreading, oblong, 8–15 × 3–5 mm; stamens 3
43. C. rubicundus
- 5b. Nutlet planoconvex or lenticular; involucre bracts 2 to 8, up to 15 cm long, all exceeding the inflorescence; spikelets often twisted, ovate to ovate-lanceolate, 3–5 × 1.5–2 mm; stamens 1 or
30. C. michelianus subsp. pygmaeus
- 6a. Glumes usually 15–17-nerved; rachilla broadly winged **19. C. dubius**
- 6b. Glumes at most 13-nerved; rachilla wingless 7
- 7a. Involucre bracts 3–5, lowest bract up to 21 cm long; leaf sheaths purplish; style scarcely divided at apex **6. C. cephalotes**
- 7b. Involucre bracts 1–3, lowest bract up to 7.5 cm long; leaf sheaths stramineous to reddish-brown; style divided into 3 cleft from apex 8
- 8a. Rhizome long creeping, slender; spikelets ovate-lanceolate, up to 18 flowered; nutlet planoconvex with angular dorsal surface **2. C. arenarius**
- 8b. Rhizome short and woody; spikelets oblong-elliptic, 20–30-flowered; nutlet trigonous
10. C. conglomeratus subsp. pachyrrhizus
- 9a. Culms with long sheath at basal part; sheaths usually bladeless, at times with short blade towards apex 10
- 9b. Culms with long blades and sheaths throughout 14
- 10a. Culms transversely septate; involucre bracts scaly, up to 1.2 cm long, usually reduced and much shorter than inflorescence **3. C. articulatus**
- 10b. Culms not transversely septate; involucre bracts leafy, well developed and usually exceeding or at times shorter than inflorescence 11
- 11a. Involucre bracts many in numbers, 19–23 or more per inflorescence
25. C. involucreatus
- 11b. Involucre bracts usually 2–5 in numbers, at most 12 per inflorescence 12
- 12a. Spikelets arranged in digitate, subsessile clusters on individual spikes / rays; nutlet up to 0.5 mm long **40. C. prolifer**
- 12b. Spikelets arranged in spaced rachis on individual spikes / rays; nutlet above 1 mm long 13
- 13a. Culms obtusely trigonous to subterete; involucre bracts equalling or much shorter than inflorescence, reaches up to 20 cm long; primary rays up to 13 cm long; spikelets suberect to spreading; glumes lance-ovate, acute **11. C. corymbosus**
- 13b. Culms trigonous to triquetrous; Involucre bracts much exceeding the inflorescence, reaches up to 35 cm long; primary rays up to 4 cm long; spikelets compressed; glumes oblong, obtuse
33. C. pangorei
- 14a. Spikelet falling off as single entity when nutlets ripened; glumes indehiscent and intact with rachilla and nutlet 15
- 14b. Spikelet with rachis persistent; glumes dehiscent; rachilla remaining attached to rachis as glumes and nutlets fall with maturity 21

- 15a. Culms annuals with fibrous roots **29. C. maderaspatanus**
- 15b. Culms perennials with short or long rhizomatous and stoloniferous 16
- 16a. Spikelets bearing 3 to many nutlets; glumes folded with prominent keel, loosely enclosing the nutlet 17
- 16b. Spikelets bearing 1 or 2 nutlets only; glumes involute without distinct keel and tightly enclosing the nutlet 19
- 17a. Culm base bulbous, swollen with inflated basal sheaths **14. C. cyperoides**
- 17b. Culm base not bulbous 18
- 18a. Spikes in globose or subglobose head; spikelets stellately / digitately arranged; glumes oblong-lanceolate; nutlet 1.8–2.2 mm long **8. C. compactus**
- 18b. Spikes in cylindrical or oblong; spikelets arranged in right angles to rachis; glumes broadly ovate; nutlet 1.2–1.5 mm long **27. C. javanicus**
- 19a. Culms base bulbous, swollen with inflated basal sheaths **7. C. clarkei**
- 19b. Culms base not bulbous 20
- 20a. Spikelets usually with 1 nutlet; stolens long, slender **34. C. paniceus**
- 20b. Spikelets with mostly 2 or 3 nutlets; stolens absent **13. C. cyperinus**
- 21a. Spikelets arranged in digitate form on distinct axis of primary or secondary rays 22
- 21b. Spikelets arranged on central rachis with distinct space on axis of primary or secondary rays 33
- 22a. Culms slender, annuals or short lived perennials with fibrous root system 23
- 22b. Culms erect and thickened robust perennials with rhizomes, stolens and or swollen culm bases 28
- 23a. Leaves canaliculated; glumes with recurved mucronate to awned at apex 24
- 23b. Leaves flattened; glumes not mucronate or unawned at apex 26
- 24a. Stamen 1 **5. C. castaneus**
- 24b. Stamens 2 or 3 25
- 25a. Lower involucre bract up to 18 cm long; spikelets up to 14 per spike cluster, 12–45 mm long, up to 5 mm wide; rachilla winged with c. 0.7 mm long internodes; glumes 2–2.5 mm wide; nutlet dark brownish **9. C. compressus**
- 25b. Lower involucre bract up to 9 cm long; spikelets up to 20 per spike cluster, 5–15 mm long, up to 3 mm wide; rachilla wingless with c. 0.3 mm long internodes; glumes 0.5–1 mm wide; nutlet yellowish **12. C. cuspidatus**
- 26a. Spikelets usually longer, up to 40 mm long; glumes acute at apex **48. C. zollingeri**
- 26b. Spikelets usually shorter, up to 20 mm long; glumes truncate to obtuse or subacute at apex 27
- 27a. Nutlet triquetrous, elliptic to obovoid, 0.5–0.7 × c. 0.3 mm; lowest involucre bract up to 30 cm long **15. C. difformis**
- 27b. Nutlet obtusely trigonous, broadly obovoid to subglobose, c. 0.3 × 0.25 mm; lowest involucre bract up to 15 cm long **47. C. tenuispica**
- 28a. Robust perennials with culms up to 1 m high, 4–12 mm thick; leaves much longer, up to 90 cm long; keel of glumes very broad, cellularly spongy; nuts triquetrous 29
- 28b. Slender perennials or annuals with culms up to 40 cm high; leaves usually shorter, up to 22 cm long; keel of glumes not as above; nuts trigonous 30

- 29a. Leaf blades many, 1–2 cm wide, abruptly acute at apex; inflorescence corymbiform, 4–7 cm wide; spikelets 6–10 flowered; rachilla narrowly winged; nutlet triquetrous, with thickened corky angles, dark brown to blackish at maturity **16. C. diffusus**
- 29b. Leaf blades few, 0.5–1 cm wide, acuminate at apex; inflorescence diffusely branched, 7–25 cm wide; spikelets up to 60 flowered; rachilla wingless; nutlet trigonous, without corky angles, yellowish-brown at maturity **37. C. platystylis**
- 30a. Glumes mucronate with 0.7–1 mm long, mucro strongly recurved; stamens 1 or 2. **44. C. squarrossus**
- 30b. Glumes muticous or mucronulate with very short, 0.2–0.4 mm long, subula; stamens 3
31
- 31a. Culms triquetrous throughout to almost 3-winged; spikelets 3–9 digitately clustered, 1–1.5 mm broad; glumes 1–1.3 mm long; nutlets c. 0.5 mm long **23. C. haspan**
- 31b. Culms not triquetrous; spikelets not digitately clustered, 2–3 mm broad; glumes 2–3 mm long; nutlets 0.9–1.5 mm long
32
- 32a. Culms 2–3 mm wide, prominently 7-ribbed throughout; leaves 6–8 mm wide; spikelets 4–7 mm long, more or less angular; glumes trullate with nerveless sulcate sides, sigmoideus strongly keeled, notched at apex **32. C. palianparaiensis**
- 32b. Culms 0.75–1 mm wide, pentaquetrous; leaves 2–4 mm wide; spikelets 10–15 mm long, subcompressed; broadly ovate with almost straight keel, hyaline vertical band lateral to keel, entire at apex **38. C. polyanthelus**
- 33a. Slender annuals or perennials, without creeping stolens, at times with slightly swollen culm base
34
- 33b. Robust perennials with stolens, rhizomes and considerably swollen culm bases
36
- 34a. Annuals with fibrous roots; leaves 4–6 mm wide; involucre bracts 3 or 4, up to 45 cm long; glumes broadly obovate to orbiculate; nutlets obovate **26. C. iria**
- 34b. Rhizomatous perennials; leaves 5–12 mm wide; involucre bracts 4–8, up to 80 cm long, glumes ovate to broadly ovate; nutlets ellipsoid to elliptic – ovoid
35
- 35a. Culms smooth on angles; Spikelets 0.5–1 mm wide, suberect; connective of anthers setulose on top; glumes 1.2–1.8 × 0.5–0.7 mm, keel 3–5-nerved; cladophylls scabrous on the keel; nutlets 0.8–1 × 0.3–0.4 mm **20. C. elatus**
- 35b. Culms scabrous on upper angles; Spikelets 2.5–3 mm wide, compressed; connective of anthers wholly setulose or scabrous; glumes 2–2.5 × 1.5–2 mm, keel strongly 3-nerved; cladophylls smooth; nutlets 1.8–2 × 0.8–1 mm **36. C. platyphyllus**
- 36a. Style with 2 stigma branches **1. C. alopecuroides**
- 36b. Style with 3 stigma branches
37
- 37a. Rachilla of spikelets narrowly to broadly winged, wing caducous at maturity
38
- 37b. Rachilla of spikelets wingless
47
- 38a. Culms slender, 0.5–2 mm thick
39
- 38b. Culms stout, 3–15 mm thick
43
- 39a. Spikelets subquadangular (in cross section); nutlet triquetrous, c. 2 mm long **46. C. tenuiculmis**
- 39b. Spikelets flattened to subcompressed or almost terete; nutlet trigonous to planoconvex, 1–1.8 mm long
40
- 40a. Culms arising from tunicate like bulb; stolens filiform, easily disarticulating **4. C. bulbosus**
- 40b. Culms bases forming a globose to ovoid tuber or corm like enlargement; stolens conspicuous and persistent
41

- 41a. Culms sharply to obtusely trigonous; leaves folded and falcate; glumes cymbiform; nutlet biconvex or planoconvex, with concave ventral surface **45. C. stoloniferous**
- 41b. Culms triquetrous; leaves flat, linear; Glumes ovate, elliptic-ovate or oblong ovate; nutlet obovoid to oblong-obovoid 42
- 42a. Glumes 2.3–2.5 × 1.3–1.5 mm, distinctly 7–9-nerved, yellowish to pale brown, keel not prominent; rachilla straight; nutlets not punctulate **21. C. esculentus**
- 42b. Glumes 3– 4 × 2–2.5 mm, distinctly or indistinctly 5–7-nerved, usually sanguineous, keel prominent; rachilla prominently flexuous; nutlets minutely punctulate **42. C. rotundus**
- 43a. Nutlet triquetrous; glumes shallowly emarginated at apex, with broadly hyaline margins towards apex **31. C. nutans**
- 43b. Nutlet trigonous; glumes not as above 44
- 44a. Spikelets lanceolate to oblong-lanceolate, c. 1.5 mm wide 45
- 44b. Spikelets filiform, subterete to linear, less than 1 mm wide 46
- 45a. Culms 30–60 cm high, 2–3 mm thick; leaf blades c. 5.5 mm wide; spikelets 20–100 per spike **24. C. imbricatus**
- 45b. Culms 70–175 cm high, 4–15 mm thick; leaf blades 6–35 mm wide; spikelets up to 40 per **22. C. exaltatus**
- 46a. Nutlet 1–1.5 mm long; rachilla flexuous with c. 1 mm long internode **18. C. distans**
- 46b. Nutlet 0.7–1 mm long; rachilla straight with 0.4–0.5 mm long internode **17. C. digitatus**
- 47a. Spikelets 2–4.5 mm wide; anthers 1.5–2 mm long **39. C. procerus**
- 47b. Spikelets up to 1.5 mm wide; anthers less than 1.5 mm long **35. C. pilosus**

1. Cyperus alopecuroides Rottb., Descr. Pl. Rar.: 20. 1772 & Descr. Icon. Rar. Pl.: 38. t. 8. f. 2. 1773; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1733. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 75. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021. *Juncellus alopecuroides* (Rottb.) C.B. Clarke in Hook.f., Fl. Brit. India 6: 595. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1629 (1133). 1931.

Tufted perennials with short rhizome. Culms stout, up to 140 cm high, 5–8 mm thick, trigonous, smooth. Leaves as long as culm, broadly linear, 30–70 × 0.4–1.6 cm, coriaceous, turgid near base, gradually tapering to long acuminate apex, margins and nerves scabrid, midrib prominent below and 2 lateral nerves strongly marked at above; sheaths 5–20 cm, brown or greyish. Inflorescence a compound umbel, up to 34 cm long. Involucral bracts 5–7, 2–4 longer than inflorescence, leafy, more than 55 cm long and c. 10 mm wide. Primary rays 5–12, usually unequal, up to 25 cm long, trigonous, smooth, most of them rebranching; secondary rays short, up to 10 cm long, at times longest secondary branches with small tertiary rays; prophylls tubular, up to 3.5 cm long, with a leaf blade of 1.5 cm long. Spikes in clusters, digitately arranged, cylindrical or oblong-cylindrical, 2–4 cm long, 6–15 mm wide. Spikelets spicately arranged, ovate to oblong-lanceolate, 3–6 × 2–3 mm,

usually spreading, 10–30-flowered; rachilla straight, flattened, narrowly winged, persistent. Glumes broadly ovate to elliptic ovate, 1.5–2 × 1–2 mm, obtuse to apiculate at apex, membranous, 5–7-nerved, yellowish or grey, with reddish-brown stripes, margins yellowish or pale, at times inrolled. Stamens 2; anthers linear-oblong, c. 0.5 mm long; filaments up to 2 mm long. Styles 1–1.2 mm long; stigmas 2. Nutlet planoconvex, 0.5–0.8 × 0.5–0.6 mm, yellowish-brown, slightly flattened, finely reticulate or almost smooth, shiny.

Fl. & Fr.: Mar.– Apr.

Habitat: Marshy swamps and lake margins.

Distrib.: Tamil Nadu (Coimbatore and Salem)

Throughout India. Tropical Africa, Madagascar and Indo-Malesia.

2. *Cyperus arenarius* Retz., Obs. Bot. 4: 9. 1786; Nees in Wight, Contr. Bot. India: 77. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 595. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1640 (1140). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1733. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 43. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:76. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021. *C. conglomeratus* Rottb. var. *arenarius* (Retz.) Coss., Expl. Sci. Algerie 2: 245. 1855.

Rhizomatous perennials; rhizome erect or horizontally long creeping, slender, 1–2 mm thick, branching, brownish, covered with brown scales. Culms usually solitary, at times 2 or 3 together, 4–32 cm high, c. 1.3 mm thick, almost terete to trigonous, smooth, densely covered with leaf sheaths towards base. Leaves few or many, 2–30 cm × 1–2 mm, shortly extending the inflorescence, linear, recurved, thick, canaliculate or at times with fused margins, basal margins scabrous, lower leaves reduced to bladeless sheaths; sheaths striate, stramineous to reddish-brown, splitting into fibres at maturity, mouth margin straight. Inflorescence a dense head with 1–3 cm across, few to many spikelets. Involucral bracts 1–3, leafy, suberect to reflexed; lowest bract 2–7.5 cm long, usually much exceeding the inflorescence. Spikelets ovate to ovate-lanceolate, compressed, subacute at apex, 6–14 × 3–5 mm, 10–18-flowered, whitish-stramineous to light brownish; rachilla straight, wingless, hollowed. Glumes oblong-ovate to broadly ovate, closely imbricate, 4–5 × 2–3 mm, obtuse or shallowly emarginate and mucronate at apex, membranous, 9–13-nerved, stramineous to reddish-brown, hyaline at margins in upper half. Stamens 3; filaments elongate up to 5.5 mm; anthers oblong, c. 2 mm long. Style 1.5–5 mm long, 3 cleft from apex; stigmas 3, 2–3 mm long. Nutlet planoconvex with angular dorsal surface, obovoid to elliptic obovoid, 1.7–2 × 1–1.2 mm, apiculate to obtuse at apex, smooth to minute punctulate, blackish-brown.

Key to varieties

- 1a. Inflorescence a single globose head, 1.8 – 3 cm across; rays absent or rarely 1 cm long; glumes 9–13-nerved; nutlets 1.7–2 mm long **2.1. var.arenarius**
- 1b. Inflorescence umbellate with 3 or 4 globose heads, 4.5–6 cm across; rays 2 or 3, 3.4– 4.5 cm long; glumes 13–16-nerved; nutlets 1.5–1.7 mm long **2.2. var.nairii**

2.1. var.arenarius

Fl. & Fr.: Jul. – Dec.

Habitat: In sandy, coastal, saline areas and river banks.

Distrib.: Chengalpattu, Kanniyakumari, Ramanathpuram, Thanjavur and Tirunelveli. Peninsular India, East and Northwest India. Southern & Central Asia and Sri Lanka.

2.2. var. nairii K. Yarrayya, G.V.S. Murthy & P.K. Ratna Kumar in *Taiwania* 61(3): 221. 2016.

Perennials. Rhizome horizontally long creeping, slender, 1–2 mm thick, branching, clothed with brownish scales. Culms usually solitary, at times 2–3 together, obtusely trigonous, 28–44 cm high, 1.5–2 mm thick, smooth, densely covered with leaf sheaths towards base, up to 8 cm long. Leaves few to many per culm, shorter than inflorescence, linear, recurved, thick, canaliculate or at times fused at margins, 18–24 cm × 1–2 mm thick, often scabrous on margins towards base, lower leaves reduced to bladeless sheaths, stramineous, striate, splitting into fibres at later stage. Inflorescence umbellate with 3–4-globose heads, 4.5–6.0 cm across, having 2–3 primary rays up to 4.5 cm long; involucre bracts 1–3, suberect to reflexed, lowest 8–10 cm long, usually much overtopping the inflorescence, each globose head bearing 5–15 spikelets. Spikelets compressed, ovate to ovate-lanceolate, subacute at apex, 10–14 × 4–6 mm, 10–22-flowered, stramineous to light brownish; rachilla straight, wingless, excavated. Glumes densely imbricate, oblong-ovate to broadly ovate, obtuse at back, obtuse or shallowly emarginated and mucronate at apex, 5–6 × 2–3 mm, 13–16-nerved, membranous and hyaline at margins in upper half, stramineous to reddish brown. Stamens 3; filaments elongate, up to 5.5 mm long; anthers oblong, 1.2–1.4 mm long. Style 0.8–1.0 mm long; stigmas 3, 1.8–2.1 mm long. Nutlet broadly obovate, 1.5–1.7 × 1.0–1.3 mm, concave-convex with weak angulate dorsal side, rounded to umbonulate at apex, contracted at base, smooth, minutely punctulate, maturing blackish-brown.

Fl. & Fr.: Dec.– Apr.

Habitat: Seashore of Islands with sandy soil.

Distrib.: Tamil Nadu (Gulf of Mannar Marine Biosphere Reserve, Appa Island). **Endemic** to Tamil Nadu.

3. *Cyperus articulatus* L., Sp. Pl.: 44. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 611. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1641 (1140). 1931; Matthew, Ill. Fl. Tamilnadu Carnatic: t. 780. 1982; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1734. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore:316. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:43. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1408. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:77. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021.

Rhizomatous perennials; rhizome woody, long creeping, thickened at base of culms, covered with reddish-brown scales. Culms terete to obtusely trigonous, up to 2 m high, 5–8 mm wide, spongy, transversely septate green or greyish-green. Leaves bladeless; blades of uppermost sheaths up to 3 cm long; sheaths usually 2 or 3, papery, up to 40 cm long, mouth oblique, yellowish-brown to reddish. Inflorescence a compound umbel, 6–16 cm long, 3–13 cm wide. Involucral bracts 2 or 3, upright, up to 1.2 cm long, rigid, much shorter than and scale like below the inflorescence; primary rays 6–15, up to 12 cm; secondary rays up to 2 cm long; spikes globular or slightly elongated, 7–15 spikelets, spreading, greyish-green or brown. Spikelets linear, suberect to obliquely arranged, 6–28 × c. 1.5 mm, acute at apex, slightly compressed, 11–25-flowered; rachilla flexuous, prominently winged; internodes c. 1 mm long; wings lanceolate, whitish-hyaline. Glumes imbricate, oblong-ovate or elliptic-ovate, 2.5–3 × 1.5–2 mm, obtuse or subacute at apex, membranous, keeled, 5–7-nerved; keel narrow, greenish, sides hyaline towards margins. Stamens 3; anthers linear, c. 1 mm long, with smooth connective appendage; filaments up to 3 mm long. Style 0.5–0.7 mm long; stigmas 3, 2–2.5 mm long. Nutlet oblong to narrowly elliptic-oblong, 1.6–1.8 × c. 0.7 mm, apiculate at apex, trigonous, concave, finely reticulate and papillose, glossy, brown or silvery brown.

Fl. & Fr.: Mar. – Apr.

Habitat: Common in shallow standing water or wet banks of canals, ponds, lakes and irrigated areas with muddy bottom, often forming large patches.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindiguland and Tiruchirappalli). Andhra Pradesh, Delhi, Gujarat, Karnataka and Maharashtra. Pantropics and subtropics.

4. *Cyperus bulbosus* Vahl, Enum. Pl. Obs. 2: 342. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 611. 1893; Rama Rao, Fl. Pl. Travancore: 431. 1914; C.E.C. Fisch. in Gamble, Fl. Madras: 1641 (1140). 1931; Chandrab. & N.C. Nair, Fl. Coimbatore: 316. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:44. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast &

Maharashtra: 80. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021.

Tufted stoloniferous perennials; stolons thin, easily disarticulating, 0.5 mm thick, ending into a bulbil of 8–12 mm thick with dark blackish-brown scales. Culms trigonous, smooth, 12–30 cm high, 0.5–1.5 mm thick, base swollen, often with remains of bulbil. Leaves numerous, shorter to much longer than culm; sheaths up to 8 cm long, yellowish, grey or brownish, soft, mouth margin slightly concave; blades trigonous or flat, more than 20 cm long, 1.5–3 mm wide, very long attenuate at apex, keeled, revolute, often curved, scabrous, green or greyish-green, margins smooth. Inflorescence a simple umbel or multiple spike, 3–9 cm long. Involucral bracts 2 or 3, leafy, up to 12 cm long, patent to reflexed, lowest 1 or 2 exceeding the inflorescence, clearly spaced. Primary rays 2–5, 0.5–3 cm long, each ending with compact cluster of 3–10 spirally arranged spikelets; tubular prophyll up to 7 mm long at base of rays. Spikelets linear, 12–15 × c. 2 mm, acute at apex, compressed, 8–20-flowered, reddish-brown; rachilla flexuous, winged, with c. 1 mm long internodes. Glumes imbricate, suberect, ovate or oblong lanceolate, 3–4 × c. 2 mm, acute and usually mucronate at apex, chartaceous, 9–11-nerved, keel greenish, sides reddish-brown to castaneous. Stamens 3; anthers linear, c. 1.5 × 2 long; filaments up to 4 mm long. Style 1.8–2 mm long; stigmas 3, up to 4 mm long. Nutlet trigonous, obovoid to ellipsoid, planoconvex, 1.3–1.8 × c. 0.7 mm, obtuse and apiculate at apex, finely reticulate, blackish at maturity.

Fl. & Fr.: Sep. – Dec.

Habitat: Sandy beaches, riversides and marshy fields.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Ramanathapuram and Tirunelveli). Throughout India. Tropical Africa, Southern Asia, Malesia and Northern Australia.

Notes: Bulbs are edible.

5. *Cyperus castaneus* Willd., Sp. Pl. 1: 278. 1797; C.B. Clarke in Hook.f., Fl. Brit. India 6: 598. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1639 (1139). 1931; K.K.N.Nair & M.P.Nayar, Fl. Courtallum 2: 353. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 68. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 80. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 345. 2021.

Tufted annuals with fibrous roots. Culms slender, triquetrous, 4–12 cm high, 0.2–0.8 mm thick. Leaves few, usually basal, linear, 1.5–6 × c. 0.1 cm, canaliculated, acute to gradually narrowed to apex; sheaths up to 1 cm long, dark purple.

Inflorescence simple or congested into a single head in elongated rays, up to 4.5 cm long and 5 cm wide. Involucral bracts 3–5, patent, the longest up to 5.5 cm long, setaceous, much exceeding the inflorescence; rays 2–6, slender, up to 3.5 cm long, with stellately clustered in groups of 4–20 spikelets forming heads without elongated rachis. Spikelets linear, 6–20 × 1–2 mm, subacute, strongly compressed, 10–35-flowered; rachilla persistent, wingless, with c. 0.5 mm long internodes. Glumes oblong, 1–1.5 × 0.5–1 mm, subobtuse and mucronate at apex, subchartaceous, ultimately patent, strongly keeled, mucro recurved, chestnut brown. Stamen 1; anther elliptic-oblong, c. 0.2 mm long; filament up to 1 mm long. Style 0.7–0.9 mm long; stigmas 3. Nutlet oblong with parallel sides or oblong-obovoid, c. 0.7 × 0.3 mm, trigonous, apiculate at apex, reddish-brown.

Fl. & Fr.: Jul. – Nov.

Habitat: Along water courses, open sandy areas, paddy fields and waste lands.

Distrib.: Tamil Nadu (Chengalpattu, North Arcot, Pudukkottai, Ramanathapuram, Tiruchirappalli and Tirunelveli). Peninsular India and Central & East Himalayas. Indo-Malesia to Northern Australia.

6. *Cyperus cephalotes* Vahl, Enum. Pl. Obs. 2: 311. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 597. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1639 (1139). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 68. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:82. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 267. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 345. 2021. *Anosporum cephalotes* (Vahl) Kurz in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist.: 84. 1870.

Perennials with short creeping rhizomes and slender stolons. Culms solitary or few together, 14–35 cm high, rigidulous, trigonous. Leaves 2 to many, mostly at basal, shorter than to exceeding the inflorescence; blades linear, 5.5–26 × 0.2–0.4 cm, canaliculated towards base, flat at above, gradually tapering to acute apex, scabrid on margins; sheaths up to 6 cm long, lower ones purplish. Inflorescence of ovoid or globose head, 1–1.3 × 1–1.5 cm, bearing 1–4 glomerules of 3–8 spikelets. Involucral bracts 3–5, up to 21 cm long, patent to reflexed, dilated and purplish-striate at base. Spikelets congested, ovate-lanceolate, 3.5–7 × 2.5–4 mm, compressed, subacute at apex, at times slightly recurved, brown with yellowish-margins, 10–16-flowered; rachilla wingless. Glumes densely imbricate, ovate, 3.5–4 × 1.5–2 mm, acute and mucronate at apex, subcoriaceous, prominently keeled, pale brown to chestnut brown; keel acute to narrowly winged, 3-nerved, often scabrid, sides faintly 3–5-nerved. Stamens 3; anthers linear, 1–1.5 mm long; filaments up to 4 mm long. Style scarcely divided at apex, 3–4 mm long, linear; stigmas 3. Nutlets trigonous to dorsally compressed, oblong-ovoid, 1–1.5 × 0.7–1 mm, apiculate at apex, stipitate, stipe c. 1 mm long.

Fl. & Fr.: Jul. – Sep.

Habitat: Permanent pools, streams and marshy places.

Distrib.: Tamil Nadu (Coimbatore, Nilgiri and Tirunelveli). Andaman & Nicobar Islands, East and Northeast India, Central India and South India. Indo-Malesia and China to Australia.

7. *Cyperus clarkei* T. Cooke, Fl. Bombay 2: 873. 1908; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 83. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021. *Mariscus bulbosus* C.B. Clarke in Hook.f., Fl. Brit. India 6:620. 1893. *M. clarkei* (T. Cooke) T. Koyama in J. Jap. Bot. 51: 313. 1976; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1770. 1983.

Rhizomatous perennials; rhizome subglobose, stoloniferous, 5–10 cm long, covered with brown scales. Culms solitary, trigonous, 35–55 cm high, 1.5–2 mm wide, acutely angular. Leaves mostly basal, up to 20 cm long, 2–3 mm wide, acuminate at apex, flaccid with undulated margins; sheaths oblong, forming swollen base of culms, whitish. Inflorescence simple umbel. Involucral bracts 5 or 6, leafy, spreading or ascending, lowest bract up to 20 cm long. Spikes cylindrical, 1–2.5 cm long with many spikelets, sessile or peduncled. Spikelets oblong to terete, 2–3 × 1–1.5 mm, distinctly nerved, often suberect, deciduous as a whole, one flowered, greenish to stramineous; rachilla obscure. Glumes 2, unequal, elliptic-oblong, 2.8–3 × 1.5 mm, strongly keeled, inflated with enrolled margins, rounded on back, sides 3–4-nerved, brownish. Stamens 3; anthers linear, c. 1 mm long, with prominent appendiculate tip. Style shorter than nutlet, glabrous. Nutlet trigonous, narrowly ellipsoid-oblong, 2–3.5 × 0.8–1 mm, slightly curved, apiculate at apex, punctulate, pale yellow to brown.

Fl. & Fr.: Oct. – Dec.

Habitat: Occasional on wet hill slopes, often under shade.

Distrib.: Tamil Nadu (Salem). Western peninsular India and Northwest India. Sri Lanka.

8. *Cyperus compactus* Retz., Observ. Bot. 5: 10. 1789; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 83. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 345. 2021. *Mariscus compactus* (Retz.) Bold., Zakfl. Java: 77. 1916. *M. microcephalus* J. Presl & C. Presl, Reliq. Haenk.1:182. 1828.

Perennials with short corm like rhizome; stolons absent. Culms solitary or a few together, trigonous to subterete, 26–95 cm high, 2–5 mm thick, smooth.

Leaves linear, longer or shorter than culm, rigid, canaliculated, 4–7 mm wide, septate, nodulose, scabrous on margins and midrib above; lower sheaths strongly septate, nodulose, reddish-brown. Inflorescence compound or decompound, 7–28 cm wide, reddish-brown. Involucral bracts 4–7, patent to reflexed; lower bracts exceeding the inflorescence, up to 90 cm long. Primary rays 6–10, spreading, up to 18 cm long; secondary rays 4–9, up to 3 cm long. Spikes globose or subglobose, dense, 1–2 cm wide, with many stellately arranged spikelets; rachis short, up to 5 mm long. Spikelets subterete or slightly compressed, linear-lanceolate, up to 1 cm long, 4–6 flowered; rachilla winged. Glumes oblong-lanceolate, 3–4.5 × 1–1.5 mm, obtuse or subobtuse at apex, reddish-brown or rarely pale, with 2 or 3-nerve on sides, faintly keeled. Stamens 3; anthers oblong, c. 1 mm long; filaments up to 4 mm long. Style c. 1.4 mm long; stigmas 3, c. 1.5 mm long. Nutlet trigonous, linear-oblong, 1.6–2.2 × c. 0.4 mm, apiculate at apex, slightly convex on one side, yellowish-brown.

Fl. & Fr.: Mar. – Sep.

Habitat: Swampy grasslands, ditches in forests, wet rice fields, along river banks.

Distrib.: Tamil Nadu (Chengalpattu and Tirunelveli). Throughout India. South and Southeast Asia.

9. *Cyperus compressus* L., Sp. Pl.: 46. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 605. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1734. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1409. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:84. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 345. 2021.

Tufted annuals with fibrous roots. Culms triquetrous, 5–40 cm high, 1–2 mm thick, smooth to striate. Leaves usually shorter than culm, folded, linear, gradually narrowed to an acute apex, up to 13 cm long, 2–4 mm wide, usually scabrous along margins towards apex, at times lowest sheaths bladeless; sheaths striate, pale brown to reddish-brown towards base. Inflorescence a simple umbel, at times reduced to a single cluster of spikes. Involucral bracts 3–5, up to 18 cm long, lower ones exceeding the inflorescence. Rays up to 5, 1.5–14 cm long, patent. Spikes broadly ovoid, subdigitately bearing of 3–14 spikelets. Spikelets patent or spreading, oblong-lanceolate to linear, 12–45 × 3–5 mm, strongly compressed, subacute at apex, usually yellowish-green, up to 44-flowered; rachilla flexuous, winged, internodes c. 0.7 mm long, wings caduceus. Glumes rigid, ovate, 3.5–4.2 × 2–2.5 mm, acute and mucronate at apex, keeled, 4-nerved on both sides, margins hyaline, mucro up to 1 mm long, often

slightly excurved. Stamens 3; anthers linear-oblong, up to 1 mm long, with faint connective appendage; filaments up to 3.5 mm long. Style 1–1.5 mm long; stigmas 3, c. 2 mm long. Nutlet triquetrous, broadly obovoid, often slightly oblique, up to 1.5×1 mm, obtuse at apex, minutely apiculate, dark brownish at maturity.

Fl. & Fr.: Throughout the year.

Habitat: Along banks of streams and watercourses and wastelands.

Distrib.: All districts. Throughout India. Pantropical.

10. *Cyperus conglomeratus* Rottb., Descr. Icon. Rar. Pl.: 21. t. 15, f. 7. 1773 **subsp. *pachyrrhizus*** (Nees ex Boeckeler) T. Koyama in Bot. Mag. (Tokyo) 93: 344. 1980 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5:211. 1985; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 85. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 346. 2021. *C. pachyrrhizus* Nees ex Boeckeler in Linnaea 35: 545. 1868; C.B. Clarke in Hook.f., Fl. Brit. India 6: 602. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 72. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1413. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 107. 2015. *C. conglomeratus* Rottb. var. *pachyrrhizus* (Nees ex Boeckeler) Trim. ex Hook.f. in Trim., Handb. Fl. Ceylon 5: 23. 1900; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 272. 2020.

Tufted, rhizomatous perennials; rhizome short, densely covered with brown scales or hairs. Culms trigonous, 10–18 cm high, smooth, glaucous. Leaves few, basal, linear, c. 8 cm \times 1–3 mm, shorter than culms, gradually tapering to an obtuse apex, coriaceous, glaucous-green; sheaths 2–4 cm, broader than blades, pale stramineous; at times basal sheaths reduced, scale like. Inflorescence a globose head, 2.5–3 cm wide, densely bearing of 40–75 spikelets. Involucral bracts 2, up to 15 cm long, slightly longer than head. Spikelets sessile, oblong, 1.5–2 cm \times 4–5 mm, obtuse at apex, strongly compressed, 20 to 30-flowered; rachilla flexuous, wingless. Glumes distichous, closely imbricate, ovate, 4– 4.5 \times 2–2.5 mm, obtuse at apex, mucronate, 7–9-nerved, acutely keeled towards apex, sides pale, stramineous, margins hyaline. Stamens 3; anthers c. 2 mm long, connective not distinctly produced. Style c. 2.5 mm long; stigmas 3-fid. Nutlet ellipsoid, trigonous, 1.8–2 \times c. 1 mm, apiculate, punctulate, blackish.

Fl. & Fr.: May – Jul.

Habitat: Sandy sea shores in coastal areas.

Distrib.: Tamil Nadu (Ramanathapuram and Tirunelveli). Gujarat, Maharashtra and Kerala. Sri Lanka.

11. *Cyperus corymbosus* Rottb., Descr. Icon. Rar. Pl.: 42. t.7. f. 4. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 612. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1641 (1140). 1931; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1735. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 86. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 346. 2021. *C. tagetiformis* Roxb. ex Kunth, Enum. Pl. 2:56. 1837. *C. enodis* var. *longispiculatus* Kuntze, Revis. Gen. Pl. 2: 749. 1891. *C. corymbosus* Rottb. var. *longispiculatus* (Kuntze) Kuk. in Engl., Pflanzenr., IV, 20 (101): 82. 1936.

Rhizomatous perennials; rhizome woody, horizontally creeping, 3–5 mm thick, covered with dark brown scales. Culms erect, spongy, 75–130 cm high, 3–5 mm thick, obtusely trigonous to subterete, gradually narrowed towards apex, smooth, base with 2–3 papery or membranous sheaths. Leaves reduced; sheaths loosely enclosing the culm, c. 25 cm long, greyish-green or brownish, often with reddish tint, mouth margin oblique, at times upper sheaths with blades, c. 8 × 0.5 cm, rigid, smooth to faintly scabrous. Inflorescence a conical compound umbel, 6–18 × 2–9 cm. Involucral bracts 2–4, up to 20 cm long, leafy, shorter than inflorescence, flat or margins slightly recurved, margins and keel scabrous; primary rays 5–11, unequal, up to 13 cm long; tubular prophyll up to 20 mm long; secondary rays short, up to 4.5 cm long, terminating with spikes of 4–10 spikelets. Spikelets spicately arranged, suberect to spreading, linear to subterete, 10–25 × c. 1 mm, subacute at apex, rusty brown, 12–24-flowered; rachilla at times flexuous, broadly winged; internodes 0.8–1 mm long; wings white-hyaline. Glumes imbricate, lance-ovate, 2.2–2.5 × c. 1.5 mm, acutish at apex, membranous, 3-nerved on back, sides nerveless, scarious towards margins. Stamens 3; anthers linear, c. 1 mm long; filaments elongate up to 3 mm long. Style 0.7–1 mm long; stigmas 3, up to 4 mm long. Nutlet trigonous, narrowly elliptic-oblong, c. 1.3 × 0.4 mm, apiculate at apex, greyish-brown when mature.

Fl. & Fr.: Sep. – Jan.

Habitat: Along banks of streams and marshy places.

Distrib.: Chengalpattu and Salem. Throughout India. Madagascar, Myanmar, Nepal, Sri Lanka, tropical West Africa, tropical South America and Vietnam.

12. *Cyperus cuspidatus* Kunth in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 1:204. 1815; C.B. Clarke in Hook.f., Fl. Brit. India 6: 598. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1735. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1409. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 86. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu

Compend.: 343. 2021. *C. uncinatus* sensu C.E.C. Fisch. in Gamble, Fl. Madras: 1639 (1139). 1931 non Poir. 1806.

Tufted annuals with fibrous roots. Culms erect, triquetrous, 10–19 cm high, smooth. Leaves linear, 5–9 × 0.1–0.2 cm, canaliculated, folded, rigid, gradually narrowed to apex; sheath keeled, closed, glabrous, stramineous to pale brown. Inflorescence a simple umbel, c. 4 × 4 cm. Involucral bracts 3 or 4, patent, unequal, longest one up to 9 × 0.2 cm, exceeding the inflorescence; primary rays 3; secondary rays absent. Spikes in dense cluster of c. 20 spikelets each, ovoid, oblong or globose. Spikelets digitately arranged, strongly compressed, linear, 0.5–1.5 × 0.2–0.3 cm, greenish, 12–35-flowered; rachilla persistent, wingless, with c. 0.3 mm long internodes. Glumes oblong to spatulate, 1–1.5 × 0.5–1 mm, emarginated at apex, strongly mucronate, subchartaceous, keel acute, greenish, usually purple, 3-nerved, sides nerveless, ferruginous to castaneous. Stamens 2 or 3; anthers elliptic or broadly oblong, c. 0.2 mm long; filaments up to 1 mm long. Style c. 0.3 mm long; stigmas 3, longer than style. Nutlet obovoid to oblong-obovoid, 0.5–0.75 × 0.3–0.4 mm, trigonous, minutely apiculate, yellowish.

Fl. & Fr.: Jul. – Nov.

Habitat: Occasional, in open, moist, sandy soils, in cultivated fields, damp sandy places, in dry deciduous forests.

Distrib.: Tamil Nadu (Coimbatore and Dindigul). Throughout India. Pantropical.

13. *Cyperus cyperinus* (Retz.) Suringar, *Cyperus* Mal. Arch.: 154. t.6. f.10. 1898; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 155. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 69. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 87. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 268. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 346. 2021. *Kyllinga cyperina* Retz., *Observ. Bot.* 6: 21. 1791. *Mariscus cyperinus* (Retz.) Vahl, *Enum. Pl. Obs.* 2: 377. 1805. *M. pictus* Nees in Wight, *Contr. Bot. India*: 90. 1834. *M. cyperinus* (Retz.) Vahl var. *pictus* (Nees) Karthik. in Karthik. & al., *Fl. Ind. Enum. Monocot.*: 63. 1989.

Rhizomatous perennials; rhizome woody, short, covered with brown fibres; stolons absent. Culms solitary or a few tufted, triquetrous, 14–55 cm high, 1–3 mm thick, smooth. Leaves shorter than culm, linear, flat or canaliculated, attenuate towards apex, scabrid on margins and midrib towards apex; lower sheaths reddish to dark brown. Inflorescence simple, head like, at times with short rays. Involucral bracts 4–7, much exceeding the inflorescence. Rays usually absent. Spikes broadly cylindrical to obovoid, 7–20 × 7–9 mm, usually attenuate towards base, densely bearing numerous spikelets. Spikelets obliquely erect to horizontally divergent, subterete, linear-oblong, 2–8 ×

c. 1 mm, usually 2-flowered. Glumes 4; lower 2 ovate, 1–1.3 mm long; third glume elliptic to ovate-lanceolate, 3–4 × c. 1.5 mm, acute at apex, with membranous sides; keel greenish, 3-nerved. Stamens 3; anthers c. 1 mm long; filaments up to 3 mm long. Style very short, c. 0.5 mm long; stigmas 3, c. 2 mm long, much longer than style. Nutlets trigonous, oblong-ellipsoid, 2–2.5 × 0.6–1 mm, shortly apiculate, punctulate, slightly curved, brownish at maturity.

Fl. & Fr.: Jun. – Aug.

Habitat: Occasional in moist, shady places.

Distrib.: Tamil Nadu (Chengalpattu, Comibatore, Dindigul Madurai, Kanyakumari and Nilgiri). Andaman & Nicobar Islands, Peninsular India, Northwest and Eastern India. Southeast Asia, Malesia, Polynesia and Australia.

14. *Cyperus cyperoides* (L.) Kuntze, Revis. Gen. Pl. 3: 333. 1898; B.D. Sharma & al., in Biol. Mem. 2 (1&2): 155. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 89. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 268. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 346. 2021. *Scirpus cyperoides* L., Mant. Pl. 2: 181. 1771. *Kyllinga sumatrensis* Retz., Observ. Bot. 4: 13. 1786. *Mariscus concinnus* Schrad. ex Nees in Mart., Fl. Bras. 2: 47. 1843. *M. sieberianus* Nees ex C.B. Clarke in Hook.f., Fl. Brit. India 6: 622. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1645 (1143). 193. *M. sumatrensis* (Retz.) J. Raynal in Adansonia 15: 110. 1975; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1775. 1983; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1432. 1999.

Stoloniferous perennials with short woody rhizome; rhizome 6–10 cm thick, covered with brown fibres; stolon covered with brown scales, at times stolons absent. Culms solitary or up to a few closely arranged, erect, rigid, triquetrous, 14–80 cm high, 1–3 mm thick, smooth. Leaves linear, up to 3.8 cm × 3–6 mm, gradually attenuate at apex; sheaths reddish-brown at base. Inflorescence simple, rarely subcompound umbel. Involucral bracts 5–10, lower ones much exceeding inflorescence, lowest bract up to 20 cm long; rays usually 9, slender, patent, straight, up to 9 cm long, smooth. Spikes cylindrical, not attenuate to base, 2–4 cm long, 6–8 mm wide. Spikelets numerous, one flowered, deciduous above the 2 basal glumes, leaving a knob. Basal glumes 0.75–1 mm long, distichous, nutlet bearing glumes c. 3 mm long, 1-nerved. Stamens 3. Ovary ovoid, c. 1 mm long. Nutlets c. 2 mm long, brownish.

Fl. & Fr.: Jul. – Aug.

Habitat: In marshes, wet places in forests and shady places at high altitudes.

Distrib.: Tamil Nadu (Comibatore, Dindigul Madurai, Nilgiri, Salem and Tirunelveli). Throughout India. Tropical and subtropical regions of Asia, Africa and Australia.

15. *Cyperus difformis* L., Cent. Pl. 2:6. 1756; C.B. Clarke in Hook.f., Fl. Brit. India 6: 599. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1139). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1736. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 316. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 69. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1409. 1999; Pallith., Pock. Fl. Sirumalai Hills: 267. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 89. 2015; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 269. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 347. 2021.

Tufted annuals with fibrous roots, non-rhizomatous. Culms erect, triquetrous, 15–60 cm high, 1–4.2 mm thick, smooth. Leaves shorter or longer than culm, gradually tapering to acute apex, 2–6 mm wide, smooth; sheaths stramineous to pale brown. Inflorescence simple or compound, lax, 2–9 cm wide, at times congested to globose cluster of spikelets. Involucral bracts 2 or 3; lower 2 much exceeding the inflorescence; lowest bract up to 30 cm long, at times suberect and then inflorescence looks like lateral. Primary rays 3–9, 1–6 cm long, smooth. Spikes globose, 5–20 mm across, with many dense spikelets, greenish, brownish or blackish. Spikelets digitately arranged, linear-oblong or oblong-ovate, 1.5–5 × c. 1 mm, obtuse at apex, compressed, 10–30-flowered; rachilla persistent, with c. 0.2 mm long internodes, wingless. Glumes very small, loosely arranged, orbicular or broadly ovate, 0.4–0.8 × 0.8–1 mm, obtuse or slightly emarginated at apex, slightly keeled, membranous, keel yellowish, faintly 3-nerved, often purplish-brown, margins hyaline. Stamens 1 or 2; anthers oblong, c. 0.1 mm long; filaments elongate, up to 0.7 mm long. Style short, c. 0.15 mm long; stigmas 3, slightly longer than style. Nutlet triquetrous, elliptic-obovoid, 0.5–0.7 × c. 0.3 mm, nearly equaling the glume, minutely apiculate, shortly stipitate, pale brown.

Fl. & Fr.: Throughout the year.

Habitat: Very common in marshes of ditches, pastures, margins of tanks, marshes along road sides and open grasslands.

Distrib.: Tamil Nadu (All districts). Throughout India. Tropical and subtropical regions of the old world.

16. *Cyperus diffusus* Vahl, Enum. Pl. Obs. 2: 321. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 603. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1139). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989; V.P. Prasad & al., in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 269. 2020. *C. pubisquama* Steud., Syn. Pl. Glumac. 2: 20. 1855. *C. diffusus* Vahl var. *macrostachyus* Boeckeler in Linnaea 35: 534. 1868; B.D. Sharma & al., in Biol. Mem. 2 (1&2):155. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989. *C. diffusus* Vahl subsp. *macrostachyus* (Boeckeler) T. Koyama in Gard. Bull. Singapore 30: 139. 1977 & in Dassan. & Fosberg,

Revis. Handb. Fl. Ceylon 5: 198. 1985. *C. laxus* Lam. subsp. *macrostachyus* (Boeckeler) Karthik. in Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 102. 2015.

Rhizomatous perennials; rhizome short, woody, corm like, covered with brown scales. Culms solitary or tufted, 35–100 cm high, 3–4 mm thick, trigonous, triquetrous below the inflorescence, smooth. Leaves many, mostly basal, linear, 37–95 × 1–2 cm, abruptly acute at apex, flat, margins scabrous, prominently 3-nerved; sheaths up to 10 cm long, purplish-brown. Inflorescence compound to decomposed, 7–25 cm wide, diffusely branched. Involucral bracts 4–10, spreading, longer ones exceeding the inflorescence. Primary rays many, spreading, up to 6 cm long, smooth; secondary rays up to 3 cm long. Spikelets digitately arranged, 2–5 together, at times solitary, sessile when in cluster, faintly compressed, oblong, 4–7 × c. 2 mm, subacute at apex, 6–10 flowered; rachilla straight, narrowly winged, persistent, internodes 0.4–0.5 mm long. Glumes broadly ovate to suborbicular, 1.5–2 × c. 1.8 mm, obtuse and mucronate at apex, membranous, keeled, keel strongly 3-nerved, sides faintly nerved, margins whitish hyaline. Stamens 3; anthers linear-oblong, c. 0.7 mm long with connective, appendage at apex; filaments up to 1.5 mm long. Style minute; stigmas 3, c. 1 mm long. Nutlets ellipsoid, c. 1.5 × 0.6 mm, triquetrous, apiculate, dark brown to blackish at maturity.

Fl. & Fr.: Dec. – Aug.

Habitat: Marshy areas of evergreen forests and hills.

Distrib.: Tamil Nadu (Coimbatore and Nilgiri). South India. Indo-Malesia to Pacific Islands and east Asia.

17. *Cyperus digitatus* Roxb., Fl. Ind. 1: 209. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 6: 618. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1642 (1141). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 155. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1736. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1410. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 90. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 269. 2020. *C. digitatus* Roxb. var. *hookeri* (Boeckeler) C.B. Clarke in Hook.f., Fl. Brit. India 6: 618. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 435. 1915 & Fl. S. Ind. Hill Sta.: 636. 1932. *C. exaltatus* Retz. var. *oatesii* C.B. Clarke in J. Linn. Soc., Bot. 21: 188. 1884. *C. oatesii* (C.B. Clarke) C.B. Clarke in Hook.f., Fl. Brit. India 6: 618. 1893. *C. digitatus* Roxb. var. *oatesii* (C.B. Clarke) Kuk. in Engl., Pflanzenr. 4, 20(101): 57. 1935.

Perennials with woody rhizome. Culms tufted or solitary, up to 120 cm high, 3–4 mm thick, trigonous, often triquetrous at above, smooth. Leaves shorter than

to equaling the culm, coriaceous, flat or slightly plicate, 5–10 mm wide, midrib prominent below and 2 lateral nerves at above, scarious on margins; sheaths purplish-brown towards base. Inflorescence compound or decompound, 12–42 cm wide. Involucral bracts 3–12, spreading, mostly exceeding the inflorescence, up to 55 cm long; primary rays 4–10, unequal, up to 22 cm long, smooth; secondary rays up to 3 cm long. Spikes 3–9, digitately arranged, 2–6 × 1–3 cm, cylindrical, with loosely arranged many spikelets; rachis narrowly winged, glabrous. Spikelets spicately arranged, slightly compressed, linear, 5–18 × 1–1.5 mm, 8–40-flowered; rachilla straight, winged, with c. 0.5 mm long internodes; wings lanceolate, c. 1 × 0.2–0.3 mm, yellowish-hyaline, caducous. Glumes elliptic, 1.8–2.2 × c. 1 mm, acute to apiculate at apex, membranous, keeled; keel greenish or brownish, 5–7 -nerved, sides yellowish to pale reddish-brown, nerveless. Stamens 3; anthers linear, c. 0.5 mm long with a short connective appendage; filaments elongate up to 2 mm long. Style 1–1.2 mm long; stigmas 3, up to 1.3 mm long. Nutlet trigonous, ellipsoid to oblong-obovoid, c. 1 × 0.5 mm, apiculate, yellowish-brown.

Fl. & Fr.: Aug. – Dec.

Habitat: In Marshy fields.

Distrib.: Tamil Nadu (Dindigul Madurai, Nilgiri, Salem and Tiruchirappalli). Almost throughout India. Bangladesh, Bhutan, Myanmar, Nepal, Pakistan and Sri Lanka.

18. *Cyperus distans* L. f., Suppl. Pl.: 103. 1781; C.B. Clarke in Hook.f., Fl. Brit. India 6: 607. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931; Fyson, Fl. S. Ind. Hill Stat.: 636. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 155. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1737. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1410. 1999; Pallith., Pock. Fl. Sirumalai Hills: 267.2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 90. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 269. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 347. 2021. *C. nutans* sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 607. 1893. *C. distans* L.f. var. *pseudonutans* Kuk. in Engl., Pflanzenr. 4, 20(101): 140. 1936; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989.

Short rhizomatous perennials. Culms solitary to tufted, 25–90 cm high, 2–4 mm thick, triquetrous in the upper half, trigonous at below, smooth. Leaves 2–3 per culm, linear, shorter than to as long as culm, flat, gradually acuminate towards apex, 3–8 mm wide, scabrous on upper margins; sheaths up to 15 cm long, purplish at base. Inflorescence compound to decompound, usually spreading, up to 24 cm. Involucral bracts 2–6, spreading; lower ones exceeding the inflorescence. Primary rays 6–12, patent, unequal, up to 17 cm long, smooth; secondary rays up to 6 cm long. Spikes broadly ovoid to pyramidal, bearing up to 20 spikelets; rachis glabrous.

Spikelets spicately arranged, suberect to horizontally spreading, narrowly linear, 10–20 × c. 1 mm, subterete, 6–10-flowered; rachilla flexuous, winged, internodes c. 1 mm long. Glumes membranous, distantly arranged, oblong-ovate or elliptic, 1.6–2 × c. 1 mm, obtuse at apex, keel not prominent, greenish, 3–5-nerved, sides usually reddish-brown, upper margins hyaline. Stamens 3; anthers oblong, c. 0.5 mm long; filaments up to 2 mm long. Style c. 0.5 mm long; stigmas 3, up to 1.5 mm long. Nutlets trigonous, oblong, 1.2–1.5 × 0.3–0.5 mm, apiculate at apex, minutely punctulate, dark brown.

Fl. & Fr.: Oct. – Dec.

Habitat: Occasional, in wet soil along the banks of streams and rivers, wet rocky areas, small ditches in grass lands, wet rice fields in ghats.

Distrib.: Tamil Nadu (All districts). Northeast & Northwest India and South India. Africa, Malesia, Sri Lanka and Taiwan.

19. *Cyperus dubius* Rottb., *Descr. Icon. Rar. Pl.*: 20. t. 4, f.5. 1773; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2):155. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 70. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 93. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 269. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 348. 2021. *Mariscus dubius* (Rottb.) Kuk. ex C.E.C. Fisch. in Gamble, *Fl. Madras*:1644 (1142). 1931; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 63. 1989.

Tufted, rhizomatous perennials; stolons absent. Culms erect, slender, triquetrous, 15–45 cm high, 1–2 mm thick, smooth; culm base bulbous with thickened basal sheaths and fibrous remains. Leaves linear, much shorter than to nearly equaling the culm, 2–5 mm wide, flat or with slightly incurved margins, gradually acuminate to apex, margins scabrid towards apex. Inflorescence a dense, lobed head with 1–6 spikes, broadly ovoid, subglobose, or suboblong, 1–2 cm wide. Involucral bracts 3–5, spreading to reflexed, the longest up to 20 cm long. Spikelets numerous, erect, ovate, 5–8 × 1.5–2.5 mm, acute, turgid to flattened; rachilla broadly winged. Glumes 4–9, distichous, broadly ovate, 2.5–3.5 × 2–3 mm, subacute at apex, 15–17-nerved, whitish. Stamens 3; anthers oblong, c. 1.5 mm long. Stigmas 3. Nutlets oblong-ellipsoid, 1.5–2 × c. 0.5 mm, trigonous, light brownish.

Fl. & Fr.: Aug. – Dec.

Habitat: Occasional in wet rocky situation on hill slopes.

Distrib.: Tamil Nadu (All districts). Throughout India. Tropical Africa, Indo-China to Malesia.

20. *Cyperus elatus* L., *Cent. Pl.* 2: 301. 1756; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 618. 1893; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1642 (1141). 1931; Bhargavan in A.N.

Henry & al., Fl. Tamil Nadu 3: 70. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:45. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1411. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 93. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 270. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 348. 2021. *Cyperus racemosus* Retz., Obs. Bot. 6: 20. 1789.

Rhizomatous perennials; rhizome short, non stoloniferous. Culms 50–200 cm high, 4–10 mm broad, trigonous to triquetrous, smooth on angles. Leaves as long as culms, 5–10 mm wide; sheath dark purple or purplish brown. Inflorescence simple to compound, 25–30 cm long and broad, with usually spikes in sessile clusters, mostly erect to suberect, narrowly cylindric, 2–7 × 0.3–0.5 cm. Involucral bracts leafy, 4–8, up to 70 cm long. Spikelets rhachis straight, winged. Glumes 9 or more on the longest spikelets, ovate, 1.2–1.8 × 0.5–0.7 mm, acute, mucronate, sides 3–5-nerved, golden yellow to dark brown. Clodoprophylls scabrous on keel. Stamens 3; anthers c. 0.5 mm long, appendages of anthers setulose on top. Style 3-fid. Nutlet ellipsoid, trigonous, 0.8–1 × 0.3–0.4 mm, apiculate, greyish brown.

Fl. & Fr.: Oct. – Dec.

Habitat: In river banks and swamps.

Distrib.: Tamil Nadu (Coimbatore Dindigul and Madurai). Peninsular and Central India. Malaysia and Thailand.

21. *Cyperus esculentus* L., Sp. Pl.: 45. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 616. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1641 (1141). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2):155. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 70. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 45. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 94. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 269. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 348. 2021.

Rhizomatous perennials, 10–30 cm high; rhizome short; stolons wiry slender, yellowish clothed with fibrous sheaths often ending in horizontally zoned, ovoid, blackish tubers, 0.8–1.5 cm broad. Culms 1–2 mm wide, triquetrous, slender. Leaves shorter than or as long as culms, 1.5–2 mm wide, coriaceous, glaucous beneath. Inflorescences simple or subcompound, sometimes contractae. Involucral bracts 3–6, obliquely spreading, lower 1 or 2 overtopping the inflorescence; spikes ovate-oblong with few to many spikelets. Spikelets spicately arranged, compressed, linear-oblong, 6–15 × 1.5–2 mm, subobtuse, 12–16 flowered; rhachilla straight, glabrous, winged. Glumes loosely imbricate, obliquely erect, elliptic-ovate or oblong ovate, obtuse, 2.3–2.5 × 1.3–1.5 mm, yellowish to pale brown with hyaline margins, 7–9-nerved; keel not prominent. Stamens 3; anthers c. 1.5 mm long with red connective appendage. Style 3-fid, short, c. 1 mm long. Nutlet obovoid to oblong-obovoid, trigonous, 1.3–1.5 × 0.8–1 mm, obtuse at apex, hardly apiculate.

Fl. & Fr.: Sep. – Oct.

Habitat: In wet and swampy areas, paddy fields, wet agricultural fields, margins of tanks and ditches.

Distrib.: Tamil Nadu (Coimbatore and Nilgiri). Almost throughout India. Malaysia and Thailand.

Note: The tubers are sometimes used as food.

22. *Cyperus exaltatus* Retz., *Observ. Bot.* 5:11. 1789; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 617. 1893; C.E.C. Fisch. in Gamble, *Fl. Madras*:1642 (1141). 1931; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 155. 1977; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2): 1737. 1983; K.K.N. Nair & M.P. Nayar, *Fl. Courtallum* 2: 353. 1987; Chandrab. & N.C. Nair, *Fl. Coimbatore*: 318. 1988; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3:70. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*:45. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1411. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 94. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 270. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 348. 2021. *C. venustus* R. Br., *Prodr. Fl. Nov. Holland.*: 217. 1810. *C. altus* Nees in Wight, *Contr. Bot. India*: 84. 1834.

Tufted perennials with short, woody rhizome. Culms trigonous, 75–175 cm high, 4–10 mm thick, smooth. Leaves equaling to longer than culm, coriaceous, flat or plicate, 6–15 mm wide, midrib prominent, 2 lateral nerves at above, margins scabrid; sheaths spongy, purplish-brown to blackish towards base. Inflorescence compound or decomposed, 12–35 cm long. Involucral bracts 4–6, lower 2–4 exceeding the inflorescence, up to 70 cm long. Primary rays 6–9, unequal, up to 23 cm long, slender, erect to patent, smooth; secondary rays up to 7 cm long. Spikes digitately arranged, at times solitary on slender peduncles, cylindrical, 2–6 cm × 7–15 mm, subdensely to loosely bearing up to 44 spikelets; rachis visible among the spikelets, glabrous. Spikelets spicately arranged, obliquely patent to almost right angle to rachis, oblong to oblong-lanceolate, 4–10 × 1.5–2 mm, flattened, 8–26-flowered, usually reddish-brown or brownish; rachilla straight, winged, wings caduceous; internodes c. 0.4 mm long. Glumes ovate to broadly ovate, c. 2 × 1.2–1.5 mm, mucronate at apex, membranous, keel green, 3-nerved; sides nerveless, brownish to shining brown. Stamens 3; anthers oblong, 0.5–0.7 mm long with a shortly produced connective appendage; filaments up to 2 mm long. Style 1–1.5 mm long; stigmas 3, c. 1 mm long. Nutlet trigonous, ellipsoid, 0.6–0.8 × 0.2–0.4 mm, minutely apiculate, yellowish-brown.

Fl. & Fr.: Aug. – Dec.

Habitat: Common along banks of rivers and margins of tanks.

Distrib.: Tamil Nadu (All districts). Almsot throughout India. Southeast Asia from India to Japan and southwards to southern Australia, Tropical Africa.

23. *Cyperus haspan* L., Sp. Pl.:45. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 600. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1139). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2):155. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1738. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 71. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 45. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1411. 1999; Pallith., Pock. Fl. Sirumalai Hills: 268. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 96. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 270. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 348. 2021. *C. juncooides* Lam., Tabl. Encycl. 1: 147. 1791. *C. haspan* L. var. *flaccidissimus* Kuk. in Engl., Pflanzenr. 4, 20(101): 248. 1936. *C. haspan* L. subsp. *juncooides* (Lam.) Kuk. in Engl., Pflanzenr. 4, 20(101): 249. 1936.

Rhizomatous perennials; rhizome creeping; roots reddish-purple. Culms 13–42 cm high, triquetrous. Leaves few, mostly in basal position, linear, 2–22 × 0.2–0.5 cm, acute at apex, sometimes reduced to lanceolate appendage of sheaths; sheaths up to 5 cm long, reddish-brown. Inflorescence compound, many rayed, up to 13 cm wide, branches ending in 3–9 digitately arranged clusters of spikelets. Involucral bracts 2–3, up to 13 cm long; primary rays many, slender, unequal, up to 10 cm long, smooth; secondary rays up to 2 cm long. Spikelets digitately arranged, strongly compressed, linear-oblong to linear-lanceolate, 5–10 × 1–1.5 mm, acute at apex, 10–24-flowered; rachilla enclosed by densely arranged glumes, persistent, wingless. Glumes suberect, oblong-ovate, 1–1.3 × 0.5–0.7 mm, obtuse and muticous at apex, membranous, keel 3-nerved, green; sides pale brown to purplish-brown, nerveless. Stamen 1; anther oblong, c. 0.5 mm long, with bristly connective appendage at apex; filament up to 1.2 mm long. Style c. 0.5 mm long, narrowed to base; stigmas 2, as long as or slightly longer than style. Nutlets trigonous, broadly obovoid, c. 0.5 mm long and as wide, minutely apiculate at apex, prominently stipitate, granulate to verruculose, creamy-yellow.

Fl. & Fr.: Throughout the year.

Habitat: Along banks of streams, paddy fields and marshy areas.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Nilgiri, Tiruchirappalli and Tirunelveli). Throughout India. Pantropical.

24. *Cyperus imbricatus* Retz., Observ. Bot. 5: 12. 1789; C.E.C. Fisch. in Gamble, Fl. Madras:1641 (1141). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2):155. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 71. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 45. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1412. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 97. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 270. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 349. 2021. *C. radiatus* Vahl, Enum. Pl. Obs. 2: 369. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 617. 1893. *C. verticillatus* Roxb., Fl. Ind.: 209. 1820.

Rhizomatous perennials; rhizome short, ascending or horizontal, with tillers. Culms trigonous, 30–60 cm high and 2–3 mm thick, smooth, lower edges obtuse. Leaves shorter than or equaling culm; blades up to 40 cm long, c. 5.5 mm wide, flat or folded, apex trigonous, acute keeled, margins narrowly recurved, margins and keel towards apex scabrous; sheaths up to 20 cm long, soft, brown or dark brown, often reddish, mouth margin faintly concave. Inflorescence a conical or rounded umbel, 5–15 cm long. Involucral bracts 4 or 5, lowermost bracts leaf like, more than 40 cm long; primary rays 5–8, up to 8 cm long; tubular prophyll c. 10 mm long, bi-nerved; secondary rays c. 4 cm long, ending with 5–8 spreading clusters of spikes; at times small tertiary rays with 2 or 3 clusters of spikes. Spikes 10–35 × 3–8 mm, with 20 to 100 spikelets closely imbricating, spirally to digitately arranged; rachis angular, narrowly winged, reddish-brown. Spikelets 4–8 × c. 1.5 mm, not reflexed, prophyll glume like, c. 0.6 mm long; rachilla c. 0.3 mm wide, flat, quadrangular, internodes c. 0.25 mm long. Glumes cymbiform, c. 1.5 mm long, mucronate, faintly keeled, 5-nerved, sides obscurely nerved, reddish-brown, margins widely scarious, faintly inrolled. Nutlets ellipsoid, c. 0.6 × 0.3 mm, obtusely trigonous, yellowish-brown, very finely reticulate, smooth.

Fl. & Fr.: Mar.– Jul.

Habitat: In marshy localities, river banks and wet open grass lands. Rare.

Distrib.: (Dindigul, Madurai, Kancheepuram and Nilgiri). Assam, Kerala, Madhya Pradesh, Rajasthan and West Bengal. Pantropical.

25. *Cyperus involucratus* Rottb., *Descr. Icon. Rar. Pl.*: 22. 1772: Baijnath in *Kew Bull.* 30:522. 1975; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 97. 2015. *C. flabelliformis* Rottb., *Descr. Icon. Rar. Pl.*: 42, t. 12, f. 2. 1773; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 155. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 70. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 45. 1989. *C. alternifolius* L. subsp. *flabelliformis* (Rottb.) Kuk. in *Engl., Pflanzenr.* 4, 20 (101):193. 1936.

Tufted, rhizomatous perennials; rhizome stout, horizontal. Culms obtusely trigonous to subterete below, up to 150 cm high, 4–8 mm thick, covered at base with bladeless sheaths of more than 33 cm long, sulcate, scabrous below the inflorescence. Leaves reduced to long, pale sheaths, brownish towards base; uppermost sheath with short blade. Inflorescence a decompound umbel, 6–30 cm wide. Involucral bracts many, distinctly spaced, all exceeding the inflorescence, more or less equal in length, 16–39 cm × 5–15 mm, flat, obliquely patent to reflexed, abruptly acuminate at apex, margins scabrid. Primary rays many, slender, subequal in length, 2–10 cm long, smooth; secondary rays 4–10 in numbers. Spikelets in clusters of 3–10, ovate, elliptic or oblong-lanceolate, 4–9 × 2–2.5 mm, flattened, 8–40-flowered; rachilla straight, wingless, internodes c. 0.25 mm long. Glumes membranous, ovate, c. 2.5 × 1.5 mm, acute at apex, 3–5-nerved; keel prominent, green; sides ferruginous to red tinged, margins broadly hyaline. Stamens 3; anthers linear, c. 1 mm long with

an acute connective appendage; filaments elongate, up to 2.5 mm long. Style c. 1 mm long; stigmas 3, c. 1 mm long. Nutlet trigonous, elliptic to obovate, c. 1 × 0.5 mm, apiculate at apex, yellowish-brown.

Fl. & Fr.: Sep. – Oct.

Habitat: Grown as ornamental plant.

Distrib.: Tamil Nadu (Nilgiri). Introduced and naturalised in South India, Delhi, Karnataka, Sikkim and West Bengal. Tropical and subtropical Africa and Arabia.

26. *Cyperus iria* L., Sp. Pl.: 45. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 606. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2):155. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1738. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 353. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:71. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 45. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1412. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 98. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 270. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 349. 2021. *C. iria* L. var. *paniciformis* C.B. Clarke in Hook.f., Fl. Brit. India 6: 607. 1893.

Annuals with fibrous roots. Culms usually tufted, at times solitary, up to 90 cm high, 2–4 mm thick, slender or somewhat stout, triquetrous, smooth. Leaves usually shorter than culms at times longer, flat or canaliculate, 4–6 mm wide, linear, gradually narrowed to acute apex, margins scabrid towards apex; sheaths reddish-brown. Inflorescence compound, loosely arranged, 3–15 cm long, at times variable in size and shape. Involucral bracts 3 or 5, lower bracts exceeding the inflorescence, up to 45 cm long; rays 3–8, unequal, patent, slender, up to 11 cm long, ending with 3–6 spikes. Spikes oblong-ovoid, with 5–26 spikelets; rachis glabrous. Spikelets spicately arranged, oblong to linear-oblong, strongly compressed, erect to patent, 4–8 × c. 2 mm, obtuse at apex, 6–16-flowered; rachilla straight, wingless, internodes 0.5–0.8 mm long. Glumes loosely arranged, membranous, broadly obovate to orbiculate, 1–1.5 × c. 1.5 mm, obtuse to emarginated, at times shortly mucronate at apex, sharply keeled, keel 3–5 nerved, green; sides nerveless, yellowish-stramineous, margins hyaline towards apex. Stamens 3; anthers oblong, c. 0.3 mm long; filaments up to 1 mm long. Style minute; stigmas 3, c. 0.5 mm long. Nutlet obovate, 1–1.5 × c. 0.6 mm, triquetrous, stipitate, brownish.

Fl. & Fr.: Nov. – Dec

Habitat: Common in rice fields, marshes along road sides, banks of water courses.

Distrib.: Tamil Nadu (All districts). Delhi, Karnataka, Madhya Pradesh, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh. Tropical Asia and East Africa, introduced in U.S.A. and West Indies.

27. *Cyperus javanicus* Houtt., Nat. Hist.:1, 7. t. 88. f. 1. 1782; Kern in Steenis, Fl. Malesiana 1. 7 (3): 635. 1974; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; K.S.Kumar & Kathiresan, in Indian J. forest. 41(4): 319–322. 2018; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 270. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 349. 2021. *Mariscus javanicus* (Houtt.) Merr. & F.P. Metcalf, Lingnan Sci. J. 21: 4. 1945. *Cyperus pennatus* Lam., Tabl. Encycl. 1: 144. 1791. *Mariscus albascens* Guadich. in Freyc., Voy. Uranie: 415. 1829. *M. pennatus* (Lam.) Domin, Biblioth. Bot. 85: 440. 1915.

Tufted perennials with short rhizome, non-stoloniferous. Culms obtusely trigonous or subterete, 40–90 cm high, 2–5 mm thick, stout, densely papillose. Leaves many, linear, exceeding the culm, rigid, coriaceous, slightly spongy, septate, nodulose, canaliculated, gradually acuminate towards apex, with drooping top, 5–10 mm wide, margins and keel scabrous, greyish-green; sheaths cylindrical, castaneous to purplish-brown, often shiny. Inflorescence large, compound to decomposed, 10–17 cm wide. Involucral bracts 5–7, widely spreading, with drooping top, lower bracts exceeding the inflorescence. Primary rays 6–12, rigid, up to 10 cm long, papillose; secondary rays short. Spikes cylindrical or oblong, obtuse at apex, 1.5–3 × 1–1.5 cm, bearing many spikelets; rachis 1–2 cm long, glabrous. Spikelets oblong to oblong-lanceolate, arranged at right angles to rachis or slightly reflexed, flattened and turgid. Glumes 2.5–3.5 × 2–2.5 mm, acute at apex, hardly keeled, 7–9-nerved, pale, ultimately shining brown or purplish-lineolate, keel greenish, margins whitish-hyaline. Stamens 3; anthers linear-oblong, 0.8–1.2 mm long; filaments up to 3.6 mm long. Style c. 1 mm long; stigmas 3, slightly longer than style. Nutlets trigonous, obovoid to subellipsoid, 1.2–1.5 × 0.7–0.9 mm, apiculate at apex, dark brown to blackish, shining.

Fl. & Fr.: Throughout the year.

Habitat: Occasional, along road sides in wet situation in coastal belt.

Distrib.: Tamil Nadu (Nilgiri). Throughout India. Pantropical.

28. *Cyperus laevigatus* L., Mant. Pl. 2: 179. 1771; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1739. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 315. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 71. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:101. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 271. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 349. 2021. *Juncellus laevigatus* (L.) C.B. Clarke in Hook.f., Fl. Brit. India 6: 596. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1629 (1133). 1931.

Rhizomatous perennials; rhizome terete, creeping, 1.5–3.5 mm thick, covered with brown scales. Culms usually in a row from the nodes of long rhizome, at times

tufted, 10–45 cm high, 1–2 mm thick, rigid, erect or reflexed in the upper portion, cylindrical. Leaves usually reduced to papery sheaths; upper most leaf with a short blade, terete, 0.5–3.5 cm long, obtuse to acute at apex; sheaths cylindrical, 1–6 cm long. Inflorescences a pseudolateral cluster of 2–18 sessile spikelets, 5–18 mm wide, straw coloured. Involucral bracts 2; longest one erect, 1.5–5.5 cm long; acute at apex, secondary bract short, spreading. Spikelets compressed, oblong-lanceolate, 5–10 × c. 2 mm, acute at apex, 10–22-flowered; rachilla quadrangular, wingless. Glumes distichous, closely imbricate, membranous, broadly ovate, c. 2 × 2 mm, acute and minutely mucronate at apex, usually with reddish-brown spots, midrib prominent towards apex. Stamens 3; anthers linear-oblong, c. 1 mm long, yellowish with reddish-brown tip; filaments up to 2.2 mm long. Style 1–1.3 mm long; stigmas 2, shorter than style. Nutlet obovoid, up to 1.5 mm long, planoconvex, apiculate, stipitate, punctulate, grey or stramineous.

Fl. & Fr.: Jul. – Sep.

Habitat: Common in marshes of tanks, ditches, along banks of rivers.

Distrib.: Tamil Nadu (Coimbatore, Ramanathapuram, Tiruchirappalli and Tirunelveli). Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, and Uttar Pradesh. Central Asia and Pakistan, North and South America.

29. *Cyperus maderaspatanus* Willd., Sp. Pl. 1:278. 1798; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 72. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:104. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 271. 2020. *Mariscus maderaspatanus* (Willd.) Napper, J. E. Africa Nat. Hist. Soc. Natl. Mus. 28: 10. 1971; Karthik. & al., Fl. Ind. Enum. Monocot.:63. 1989. *M. squarrosus* C.B. Clarke in Hook.f., Fl. Brit. India 6: 623. 1893 quoad spec.; C.E.C. Fisch. in Gamble, Fl. Madras: 1645 (1143). 1931. *Cyperus squarrosus* auct. non L. in E.Torner, Cent. Pl. 2:6. 1756. *Mariscus aristatus* (Rottb.) Cherm. in Bull. Soc. Bot. France 85: 366. 1938 nom. illeg. *Cyperus aristatus* Rottb., Descr. Icon. Rar. Pl.: 22. t. 6, f. 1. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 606. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931.

Tufted annuals with fibrous roots. Culms slender, trigonous, 10–20 cm high, 0.5–1 mm thick, smooth. Leaves few, longer than culm, at times shorter, linear, gradually acuminate at apex, margins scabrellate towards apex; sheaths purplish-brown towards base. Inflorescence simple, 2.5–4.5 × 4–8 cm, at times reduced to a single spike. Involucral bracts 3–5, spreading, up to 13 cm long, lower bracts 2–3 exceeding the inflorescence; rays 2–6, slender, spreading, unequal, 1.5–4 cm long. Spikes hemispherical, 1.5–3 cm wide, bearing 6–18 spikelets. Spikelets compressed, linear, 5–15 × 2–3 mm; 8–22-flowered; rachilla flexuous, broadly winged, internodes 0.8–1 mm long. Glumes narrowly oblong, 2.5–3.5 × c. 1 mm; keel strong, green, excurrent into 0.5–1 mm long recurved arista, prominently 3-nerved; sides stramineous,

nerveless. Stamen 1; anther linear-oblong, c. 0.5 mm long; filament elongate up to 2 mm long. Style c. 1 mm long; stigmas 3, slightly shorter or as long as style. Nutlet trigonous, oblong, 1.2–1.5 × c. 0.4 mm, slightly curved, minutely apiculate, puncticulate, reddish-brown.

Fl. & Fr.: Nov. – Dec.

Habitat: Occasional in rice fields, pastures, wet places along the road sides.

Distrib.: Tamil Nadu (Chengalpattu and Tirunelveli). Throughout India. Sri Lanka and Tropical Africa.

30. *Cyperus michelianus* (L.) Delile subsp. ***pygmaeus*** (Rottb.) Asch. & Graebn., Syn. Mitteleur. Fl. 2(2): 273. 1904; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 350. 2021. *C. pygmaeus* Rottb., Descr. Icon. Rar. Pl.: 20. t.14, f. 4 & 5, 1773; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1742. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 74. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 117. 2015. *Juncellus pygmaeus* (Rottb.) C.B. Clarke in Hook.f., Fl. Brit. India 6: 596. 1893.

Tufted annuls with fibrous roots. Culms erect or patent, often pulvinate, trigonous, 6–28 cm high, 0.4–1.6 mm thick, smooth. Leaves shorter than to slightly exceeding culm, flat or canaliculated, linear, gradually narrowed towards apex, 1–2 mm wide, margins scabrid towards above; basal sheaths often light brown or reddish. Inflorescence a contracted lobed head, triangular-ovoid or subglobose, up to 14 mm wide, bearing several dense glomerules of spikelets. Involucral bracts 2–7, patent, all exceeding the inflorescence, up to 15 cm long, dilated at base. Spikelets strongly compressed, often twisted, ovate to ovate-lanceolate, 3–5 × 1.5–2 mm, whitish-green to stramineous, 10–20-flowered; rachilla flexuous, wingless. Glumes distichous, often looks irregular due to twisting of rachilla, membranous, lanceolate, c. 1.5 × 0.4 mm, acute or short mucronate at apex, keeled, pale whitish, keel greenish, at times spinulose. Stamens 1 or 2; anthers linear, 0.3–0.6 mm long; filaments elongate up to 2 mm. Style 0.4–0.7 mm long; stigmas 2 or 3, up to 1 mm long. Nutlets planoconvex or lenticular, oblong or elliptic-oblong, c. 1 × 0.3 mm, minutely puncticulate, pale brown.

Fl. & Fr.: Feb. – Apr.

Habitat: On river banks, in dried up pools and ditches and in rice fields.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Erode, Pudukkottai, Ramanathapuram, Salem and Tirunelveli). Throughout India. Sri Lanka and E to Taiwan, in Asia in Iraq, Azerbaidjan (Talysh), Pakistan, Philippines, Malesia and Australia. From Greece, Turkey, Israel to Egypt and Algeria, tropical Africa, S to Namibia, Madagascar, Mauritius.

31. *Cyperus nutans* Vahl, Enum. Pl. Obs. 2: 363. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6: 601. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931; Fyson, Fl. S. Ind. Hill Sta.: 636. 1932; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1739. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 72. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1413. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:107. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 272. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 350. 2021. *C. distans* L.f. var. *major* Thwaites, Enum. Pl. Zeyl.: 432. 1864.

Perennials with short, thick rhizome. Culms tufted, trigonous, triquetrous below the inflorescence, up to 100 cm or more high, 2.5–12 mm thick, smooth. Leaves few, shorter than culms, subcoriaceous, linear, 3–14 mm wide, narrowed to acute at apex, upper margins scabrous, midrib prominent; sheaths reddish-brown towards base, basal sheath blades reduced. Inflorescence compound to decompound, lax, up to 20 cm or more long. Involucral bracts 4–6, lower bracts exceeding the inflorescence; primary rays 6–9, very unequal, erect to spreading, up to 30 cm long, smooth; secondary rays 3–7, up to 6 cm long. Spikes narrow, more or less penicillate, up to 4 cm × 5–10 mm, spreading, bearing 10–24 spikelets, loosely arranged; rachis glabrous. Spikelets spicately arranged, suberect, compressed, linear-oblong, 6–15 × c. 2 mm, 8–14-flowered; rachilla persistent, slightly flexuous, winged; internodes c. 0.8 mm long; wings whitish-hyaline, persistent. Glumes membranous, obliquely erect to patulose, oblong, 2–2.5 × c. 1 mm, obtuse at apex, keeled, dark brown to yellowish-brown, 3-nerved on both sides, margins broadly whitish-hyaline, midnerve extending to an excurrent mucro. Stamens 3; anthers linear-oblong, c. 1 mm long, with distinct and smooth connective appendage; filaments up to 2.5 mm long. Style short; stigmas 3. Nutlet triquetrous, oblong to oblong-ovoid, 1.2–1.5 × c. 0.5 mm, apiculate at apex, brown.

Key to subspecies

- 1a. Primary rays erect to spreading; spikes loosely arranged; rachilla internodes c. 0.8 mm long **31.1. subsp. *nutans***
 1b. Primary rays suberect; spikes densely arranged; rachilla internodes c. 0.5 mm long **31.2. subsp. *eleusinoides***

31.1. subsp. *nutans*

Fl. & Fr.: Mar. – Apr.

Habitat: Degraded deciduous forests and wetlands.

Distrib.: Tamil Nadu (Salem and Tirunelveli). Andhra Pradesh, Assam, Delhi, Gujarat, Karnataka, Kerala, Maharashtra, Punjab, Sikkim, Uttar Pradesh and West Bengal. Tropical Africa and Asia.

31.2. subsp. *eleusinoides* (Kunth) T. Koyama in Gard. Bull. Singapore 30: 136. 1977 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 191. 1985; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1740. 1983; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1413. 1999; Pallith., Pock. Fl. Sirumalai Hills: 268. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:108. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 272. 2020. *Cyperus eleusinoides* Kunth, Enum. Pl. 2: 39. 1837; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 155. 1977. *C. nutans* Vahl var. *eleusinoides* (Kunth) Haines, Bot. Bihar Orissa 5: 898. 1924; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:72. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989.

Rhizomatous perennials; rhizome woody, erect, slender stolons. Culms triquetrous, 85–145 cm high, 2–4 mm thick, gradually narrowed upwards, smooth. Leaves 4–6 mm wide, shorter than culms, sometimes lower ones reduced to sheaths, 3-nerved, coriaceous, dark above, pale beneath. Inflorescence compound or decomposed. Involucral bracts 2–3, leafy, lowest bract up to 40 cm long, others setiform; primary rays 5–6 with sessile or peduncled spikes, suberect. Spikes cylindrical, 1–2 × 0.7–1 cm, with many densely arranged spikelets. Spikelets linear, 5–10 × c. 2 mm, compressed, erect, appressed, greyish, green; rachilla winged, internodes c. 0.5 mm long. Glumes ovate oblong, 1.8–2 × c. 1.2 mm, closely imbricate, acute, mucronate, keel 3-nerved; sides 3–4-nerved, greenish, margins broadly hyaline. Stamens 3; anthers c. 0.7 mm long. Style 3-fid, glabrous. Nutlet trigonous, broadly obovoid, 1.2–1.5 mm long, acutely angled, dotted, brown to blackish at maturity.

Fl. & Fr.: Oct. – Feb.

Habitat: Common, along banks of streams, rivers and swampy areas.

Distrib.: Tamil Nadu (Coimbatore, Dindigul Madurai, Ramanathapuram, Tiruchirappalli and Tirunelveli). Andhra Pradesh, Assam, Goa, Jammu Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Nagpur, Rajasthan, Sikkim and Uttar Pradesh. Indo-Malesia, Australia and tropical Africa.

32. *Cyperus palianparaiensis* Govind. in Proc. Indian Acad. Sci. 100 (6): 409. f.1. 1990; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:109. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 272. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 350. 2021.

Perennials; Culms 25–75 cm long, 2–3 mm wide, prominently 7-ribbed throughout, thickened and woody at base, smooth. Leaves prominently multicostulate, 6–8 mm wide, flat or canaliculate. Inflorescence usually decomposed, consists of 3–8 spikelets per ray, 5–10 mm across. Involucral bracts leafy, 3–5, longest up to 15 cm long. Spikelets linear-oblong or oblong-ovate, angular, compressed, 5–7 × 2–3 mm, 10–16 flowered, spreading at ends of secondary rachis; rhachis flexuous,

winged. Glumes trullate, purplish brown or atrocastaneous, notched at apex, more or less compact, with hyaline margins, nerveless sulcate sides, sigmoideus strong keeled, mucronulate; keel strong, green, 3-nerved, sigmoideus, smooth. Stamens 3; anthers oblong with tridentate crest, 0.5–0.6 mm long. Style 3-fid, 0.5–0.6 mm long. Nutlet variable in shape, suborbicular, broadly elliptic or cuneate with rounded or depressed apex, 0.9–1 × 0.8–0.9 mm, triquetrous with flat or somewhat depressed sides, densely faintly granulate, brown.

Fl. & Fr.: Oct. – Feb.

Habitat: In open places near the margins of rivulets and marshy places.

Distrib.: Tamil Nadu (Madurai). **Endemic** to Tamil Nadu.

33. *Cyperus pangorei* Rottb., Descr. Icon. Rar. Pl.: 31. t. 7, f. 3. 1773; C.E.C. Fisch. in Gamble, Fl. Madras: 1641 (1140). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1740. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 354. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 72. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1414. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 109. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 272. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 351. 2021. *C. tegetum* Roxb., Fl. Ind. 1: 211. 1820. *C. dehiscens* (Nees) Nees in Linnaea 9: 286. 1835. *Papyrus pangorei* (Rottb.) Nees in Wight, Contr. Bot. India: 88. 1834. *P. dehiscens* Nees in Wight, Contr. Bot. India: 89. 1834.

Rhizomatous perennials; rhizome stout, woody, covered with brownish scales; roots somewhat thick, usually branched into blackish fibrous hairs. Culms usually in a row along creeping rhizome or subtufted, erect, 50–150 cm high, trigonous to narrowly triquetrous towards apex, smooth. Leaves usually reduced to 2–4 subphyllous sheaths surrounding the base, at times apical one developed into up to 12 cm long blades; sheaths long, brownish to purplish-brown towards base, uppermost sheath up to 30 cm long. Inflorescence a compound umbel, lax, 5–22 × 3–18 cm. Involucral bracts 3–5, patent, usually exceeding the inflorescence, up to 35 cm long; primary rays short, up to 4 cm long, ending in corymb like spikes of 4 × 10 spikelets; rachis smooth. Spikelets spicately arranged, compressed, linear, 10–20 × 1–1.8 mm, subacute at apex, usually reddish-brown, at times stramineous, 12–30-flowered; rachilla straight, winged, internodes c. 1 mm long; wings lanceolate, reddish-brown. Glumes closely imbricate, oblong to oblong-lanceolate, 2.5–3 × 1–1.5 mm, obtuse at apex, membranous, hardly keeled, 5-nerved on back; sides nerveless, usually reddish-brown, margins involute. Stamens 3; anthers linear, c. 1 mm long; filaments up to 3 mm long. Style 1–1.5 mm long; stigmas 3, longer than style. Nutlet trigonous, oblong or oblong-obovoid, 1–1.6 × 0.3–0.5 mm, minutely apiculate at apex, yellowish-brown to blackish-brown.

Fl. & Fr.: Sep. – Jan.

Habitat: Occasional, along banks of rivers, margins of tanks, streams, lakes and swamps.

Distrib.: Tamil Nadu (Almost all districts). Throughout India. Nepal, Pakistan, Myanmar and Sri Lanka.

34. *Cyperus paniceus* (Rottb.) Boeckeler in *Linnaea* 36: 381. 1870; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 156. 1977; K.K.N. Nair & M.P. Nayar, *Fl. Courtallum* 2: 354. 1987; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 72. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 110. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 272. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 351. 2021. *Kyllinga panicea* Rottb., *Descr. Icon. Rar. Pl.*: t. 4, f. 1. 15. 1773. *Mariscus paniceus* (Rottb.) Vahl, *Enum. Pl. Obs.* 2: 373. 1805; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 620. 1893; C.E.C. Fisch. in *Gamble, Fl. Madras*: 1644 (1143). 1931.

Rhizomatous perennials; rhizome short, 2–3 mm thick, clothed with dark brown fibres; stolons long, slender, c. 0.5 mm thick, covered with reddish-brown membranous scales. Culms very slender, trigonous, 10–30 cm high, c. 0.6 mm thick, smooth. Leaves shorter or equaling culm, gradually narrowed to acute apex. Inflorescence simple, up to 1 × 1.5 cm. Involucral bracts 3–5, longest bract up to 14 cm long. Spikes sessile or subsessile, cylindrical, up to 10 × 6 mm, bearing many spikelets. Spikelets lanceolate, slightly curved, horizontally spreading, 2.5–3.5 × c. 0.5 mm, bearing one nutlet. Glumes 4; lower 2 ovate, c. 1 mm long; third glume ovate-lanceolate, up to 3 mm long, acute at apex, nutlet bearing; fourth glume much reduced, sterile. Stamens 2 or 3; anthers linear, c. 1 mm long. Style very short; stigmas long, reflexed. Nutlet trigonous, oblong, c. 2.5 × 0.7 mm, slightly curved, acute at apex, brown.

Fl. & Fr.: Oct. – Dec.

Habitat: Occasional, in moist shady areas, semi-evergreen forests.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Nilgiri, Ranipet, Tiruchirappalli and Tirunelveli). Peninsular India, Central, East and Northeast India. Indo-Malesia.

35. *Cyperus pilosus* Vahl, *Enum. Pl. Obs.* 2: 354. 1805; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 609. 1893; C.E.C. Fisch. in *Gamble, Fl. Madras*: 1641 (1140). 1931; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 156. 1977; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2): 1741. 1983; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3: 73. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 47. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1414. 1999; Pallith., *Pock. Fl. Sirumalai Hills*: 268. 2001; Wad.

Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:112. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 351. 2021. *C. marginellus* Nees in Wight, Contr. Bot. India:83. 1834. *C. obliquus* Nees in Wight, Contr. Bot. India: 86. 1834. *C. pilosus* Vahl var. *obliquus* (Nees) C.B. Clarke in J. Linn. Soc., Bot. 21: 151. 1884 & in Hook.f., Fl. Brit. India 6: 610. 1893. *C. pilosus* Vahl var. *polyanthus* C.B. Clarke in J. Linn. Soc., Bot. 21: 148. 1884 & in Hook.f., Fl. Brit. India 6: 610. 1893.

Perennials with short rhizome; stolons slender, clothed with scales. Culms usually solitary, at times few together, erect, acutely triquetrous, 30–70 cm high, 3–5 mm thick, smooth. Leaves shorter than to as long as culm, canaliculated, 4–10 mm wide, gradually tapering to an acute apex, margins scabrid towards apex; sheaths purplish-brown towards base. Inflorescence compound, loose to subdense, variable in size. Involucral bracts 3–5, spreading, lower bracts much exceeding the inflorescence; primary rays 6–7, unequal, spreading, up to 14 cm long; secondary rays 2–4. Spikes ovoid, 1–2.5 × 1–2 cm, bearing 6–20 spikelets; rachis hirsute. Spikelets spicately arranged, horizontal to reflexed, compressed, linear-oblong to oblong-lanceolate, 4–7 × 1.5–2 mm, subacute at apex, 6–20 flowered; rachilla straight, wingless or at times faintly winged, internodes c. 0.8 mm long. Glumes subdensely imbricate, ovate, 2–2.2 × 1–1.2 mm, obtuse and mucronate at apex, slightly keeled, 5–7-nerved; midrib green; sides stramineous to reddish-brown, margins broad, whitish-hyaline. Stamens 3; anthers oblong, c. 0.5 mm long; filaments up to 2 mm long. Style short, c. 0.3 mm long; stigmas 3, c. 1.5 mm long. Nutlet triquetrous, ellipsoid to obovoid, 1–1.2 × c. 0.7 mm, faintly apiculate at apex, yellowish-brown to dark brown.

Fl. & Fr.: Oct. – Dec.

Habitat: Common in marshy areas, wet rice fields, river banks, open wet areas.

Distrib.: Tamil Nadu (Dindigul, Madurai, Nilgiri and Tirunelveli). Arunachal Pradesh, Assam, Himachal Pradesh, Jammu Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagpur, Orissa, Rajasthan, Sikkim, Uttar Pradesh and West Bengal. Bangladesh, Bhutan, Myanmar, Nepal, Sri Lanka, Tropical Asia, Australia and Tropical West Africa.

36. *Cyperus platyphyllus* Roem. & Schult., Syst. Veg. 2 : 876. 1817; C.B. Clarke in Hook.f., Fl. Brit. India 6: 618. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1134 (1139). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 73. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 113. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 351. 2021. *C. pallidus* Nees in Wight, Contr. Bot. India: 79. 1834. *Anosporum pallidum* (Nees) Boeckeler in Linnaea 36: 412. 1870.

Rhizomatous perennials; rhizome short; non stoloniferous; Culms stout, 40–100 cm high, 3–8 mm wide, triquetrous, smooth, scabrous on the angles above. Leaves basal, as long as or shorter than culms, 8–12 mm wide, coriaceous, flat or channelled, septate-nodulose, scabrous on the margins and midrib; sheaths light brown or purplish shaded. Inflorescence compound or decompound, very dense to somewhat loose, depressed corymbose or semiglobose, in outline, up to 20 cm across, with numerous spikelets. Involucral bracts 5–8, slightly spaced, spreading, lower ones longest up to 80 cm long. Spikelets digitately arranged in clusters of 3–8, spreading, compressed, oblong-lanceolate, acute, 5–15 × 2.5–3 mm, stramineous and brownish shaded; rhachis wingless. Glumes ovate to broadly ovate, 2–2.5 × 1.5–2 mm, subobtusate and mucronulate, cellular-reticulate, with brownish sides and narrow hyaline margins; keel broad, strongly 3-nerved. Cladoprophylls smooth. Stamens 3; anthers linear, 0.5–1 mm long, connective of anthers wholly setulose or scabrous. Style 3-lobed, flattened, c. 1 mm long, shorter than nutlet. Nutlet ellipsoid to elliptic-ovoid, trigonous, 1.8–2 × 0.8–1 mm, dorsally compressed, with concave ventral side, with corky thickened angles, glaucous-brownish and with stramineous or yellow angles.

Fl. & Fr.: Oct. – Dec.

Habitat: Along water courses, ponds, tanks, lakes, swampy areas and marshes.

Distrib.: Tamil Nadu (Tiruchirappalli and Tirunelveli). Andhra Pradesh, Assam, Kerala, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal. Indo-Malesia to Australia.

37. *Cyperus platystylis* R. Br., Prodr. Fl. Nov. Holland.:214. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 598. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1134 (1139). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 73. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:113. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 351. 2021. *C. pallidus* Nees in Wight, Contr. Bot. India:79. 1834. *Anosporum pallidum* (Nees) Boeckeler in Linnaea 36: 412. 1870.

Perennials with short rhizome; stolons absent. Culms solitary, rarely 2 or 3 together, 35–80 cm high, triquetrous, smooth, scabrous on angles at above. Leaves few, basal, linear, as long as or longer than culm, 32–70 × 0.5–1 cm, gradually acuminate, subcoriaceous, scabrid on margins and midrib; sheaths compressed, 7–12 cm long, basal ones bladeless, purplish. Inflorescence compound to decompound, very dense to loose, 6–13 × 4–7 cm, corymbiform, with numerous spikelets. Involucral bracts 5–8, spreading, lower bracts much exceeding the inflorescence, the longest 30–55 × c. 0.8 cm; primary rays 10–14, spreading, up to 10 cm long, smooth; secondary rays up to

4 cm long; prophylls setaceous, short. Spikelets digitately arranged in groups of 3–7, oblong-lanceolate or ovate-lanceolate, 6–15 × 2.5–4 mm, acute at apex, compressed, golden brown, up to 60-flowered; rachilla persistent, wingless. Glumes ovate, thick membranous, 2–2.5 × 1.5–2 mm, obtuse, mucronulate at apex, cellular to reticulate with brownish sides and narrow hyaline margins; keel broad, strongly 3-nerved, golden brown. Stamens 3; anthers linear, 0.5–1 mm long, connective produced into a bristly appendage; filaments up to 2.5 mm long. Style flattened, c. 1 mm long, narrowed to base, ciliate; stigmas 3, short. Nutlet trigonous, dorsally compressed with concave ventral side, ellipsoid to elliptic-ovoid, 1.5–2 × 0.5–1 mm, apiculate at apex, angles corky thickened, yellowish-brown.

Fl. & Fr.: Oct. – Nov.

Habitat: Along water courses, open sandy areas, waste lands and swamps.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Tiruchirappalli and Tirunelveli). Andhra Pradesh, Assam, Kerala, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal. Indo-Malesia to Australia.

38. *Cyperus polyanthelus* Govind. in Proc. Indian Acad. Sci. 88 B: 234. 1979; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 73. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 114. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 352. 2021.

Rhizomatous perennials; rhizome woody; Culms 20–80 cm high, 0.75–1 mm wide, pentaquetrous. Leaves basal, as long as the culms, 2–4 mm wide, smooth on the margins and nerves; sheaths lowermost leafless. Inflorescence compound or decomposed, lax, 5–8 rayed, 5–10 cm broad. Involucral bracts leafy, 3, divaricate, lowermost up to 30 cm long. Spikelets many, digitately arranged in clusters of 3–7, sessile, subcompressed, obovate or elliptic lanceolate, 10–15 × 2–2.5 mm, 12–20 flowered; rhachis straight, winged. Glumes broadly ovate, 1.8–2 × 1.5–1.75 mm, obtuse, minutely mucronate with sulcate and nerveless sides, shining, castaneous brown, closely overlapping, loose in fruiting; keel green, 3-nerved, hyaline vertical band lateral to keel. Stamens 3; anthers linear oblong, c. 0.6 mm long, white bristly tipped. Style 3-fid, 0.2–0.3 mm long. Nutlet suborbicular, obovate, triquetrous, 0.8–0.9 × 0.6–0.75 mm, more or less tricostulate, with densely granulate depressed or concave sides, yellow ultimately becoming brown.

Fl. & Fr.: Oct. – Nov.

Habitat: In open marshy grass lands at high altitudes.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai and Kanyakumari). **Endemic** to Tamil Nadu.

39. *Cyperus procerus* Rottb., Descr. Icon. Rar. Pl.:29. t. 5, f. 3. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 610. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1641 (1140). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1741. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 73. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1415. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:114. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 352. 2021.

Rhizomatous perennials; rhizome stoloniferous; stolons slender, distantly covered with scales. Culms solitary or few together, erect, 50–125 cm high, 4–7 mm thick, triquetrous, smooth. Leaves few, mostly basal, 35–75 × 0.8–1.2 cm, shorter or longer than culms, scabrid, linear, gradually acuminate towards apex, canaliculate, spongy or subcoriaceous, margins scabrid; sheaths up to 32 cm long, purplish. Inflorescence compound, 12–25 × 10–15 cm. Involucral bracts 3–4, unequal, longest bract up to 56 cm long; primary rays 3–7, very unequal, 5–20 cm long, sparsely scabrid to glabrous; secondary rays shorter. Spikes broadly ovoid, loose, 2–4 cm long; rachis winged, hispid or scabrous. Spikelets 4–18 in terminal spikes or 2–4 in lateral spikes, oblong to linear-lanceolate, compressed, 0.7–4 × 0.2–0.45 cm, pale coloured, tinged with reddish-brown, 10–40-flowered; rachilla wingless. Glumes ovate, 2–3 × 1.5–2 mm, obtuse at apex, pale brownish to reddish-brown. Stamens 3; anthers 1.5–2 mm long, connective appendage red. Styles as long as nutlets; stigmas 3. Nutlet obovoid, triquetrous, 1–1.5 × 0.6–0.8 mm, minutely apiculate, stipitate, smooth, blackish-brown.

Fl. & Fr. Mar. – Apr.

Habitat: In swamps, marshes, pools, wet rice fields and sea coasts.

Distrib.: Tamil Nadu (Chengalpattu, Cuddalore, Dindigul, Kallakurichi, Madurai, Pudukkottai, Thanjavur, Tiruchirappalli and Viluppuram). Assam, Karnataka, Kerala, Madhya Pradesh and West Bengal. South and Southeast Asia and Australia.

40. *Cyperus prolifer* Lam., Tabl. Encycl. 1: 147. 1791; Yarrayya & al. in Indian. J. Pl. Sci. 4 (4) : 58. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 352. 2021. *Papyrus laxiflorus* Spreng., Syst. Veg. 1: 232. 1824.

Tufted, rhizomatous perennials. Culms trigonous to terete, 15–100 cm × 2–6 mm, glabrous. Leaves reduced to bladeless sheath; sheaths more than 32 cm long. Inflorescence umbel. Involucral bracts 2 or 3, leafy, horizontal or reflexed, 5–12 cm × 1.5–4 mm, shorter than inflorescence; primary rays 10–25 cm long; secondary rays 0.5–5 cm long. Spikelets 1–30, linear-lanceolate, ellipsoid to narrowly ovoid, 6–17 × 1–1.5 mm, compressed to quadrangular. Glumes 5–12, 1.2–1.6 × 0.6–0.9 mm, mucronulate at apex, 1–3-ribbed, reddish-brown. Stamens 3; anthers 1–1.2 mm

long. Styles c. 0.3 mm long; stigmas 1–1.3 mm. Nutlet obovoid, c. 0.4 × 0.2 mm, obtuse at apex, cuneate at base, brownish, finely reticulate.

Fl. & Fr.: Jul. – Sep.

Habitat: Pond shores and marshes.

Distrib.: Tamil Nadu (Villupuram). Kerala. Tropical East Africa.

41. *Cyperus pulchellus* R. Br. Prodr. 213: 1810; Kern in Reinwardita 3(1): 39. 1954 & in Steenis, Fl. Malesiana 1.7(3): 632. 1974; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:116. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020. *Cyperus leucocephalus* auct. non Retz. 1789; C.B. Clarke in Hook.f., Fl. Brit. India 6: 602. 1893 p.p.; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931. *Sorostachys pulchellus* (R. Br.) Lye in Nor. Journ. Bot. 1:189, f. 4. 1981; Karthik. & al., Fl. Ind. Enum. Monocot.: 73. 1989

Annuals, slender; Culms 10–15 cm high, 0.8–1 mm wide, angular. Leaves filiform or setiform, shorter than or as long as culm, 0.5–0.8 mm wide, strongly convolute. Inflorescence with solitary, sessile, terminal capitate heads on culms, 8–12 mm in diam. with many spikelets. Involucral bracts often foliaceous, the longest 6–8 cm long, erect, the others spreading or deflexed. Spikelets compressed, linear, 5–7 × 1–1.3 mm, closely crowded, acute; rhachis wingless. Glumes ovate, 1–1.3 × 0.8–1 mm, closely imbricated, sides nerveless, slightly incurved in nutlets, pale or rufous, with distinctly recurved mucro at apex; keel 3-nerved. Stamens 3; anthers muticous. Style 3-fid, filiform, glabrous. Nutlet oblong, obovoid, obtusely trigonous, 0.5–0.6 mm long, narrowed at base, dotted in upper half.

Fl. & Fr.: Jun. – Nov.

Habitat: Along sea coastes, pastures, river banks and swampy areas. Rare.

Distrib.: Tamil Nadu (Nilgiri). South, Central and Eastern India. Tropical regions of Asia, Africa and Australia.

42. *Cyperus rotundus* L., Sp. Pl.: 45. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 614. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1641 (1140). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1742. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore:317. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1415. 1999; Pallith., Pock. Fl. Sirumalai Hills: 269. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:117. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil

Nadu Compend.: 353. 2021. *C. rotundus* L. subsp. *tuberosus* (Rottb.) Kuk. in Engl., Pflanzenz. 20(101): 114. 1935; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 74. 1989. *C. tuberosus* Rottb., Descr. Pl. 28. t. 7. f. 1. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 616. 1893.

Rhizomatous perennials; rhizome long, with slender persistent stolons ending in tubers; tubers ovoid or subglobose to ellipsoid, often zonate, ultimately blackish. Culms usually solitary, at times few together, slender, triquetrous, 12–40 cm high, 1–2 mm thick, smooth. Leaves few to several, mostly in basal, linear, usually shorter than culm, 2–6.5 mm wide, flat, gradually narrowed to acuminate at apex, margins scabrid towards apex, dark green at above, pale beneath; sheaths 1–5 cm long, pale brown, disintegrating into fibres at maturity. Inflorescence simple to compound, 2.5–12 × 3–10 cm, loose. Involucral bracts 2–5, spreading, shorter than inflorescence or lowest bract exceeding, upper margins scabrous; primary rays 3–9, slender, patent, unequal, lowest ray up to 10 cm long. Spikes densely to subloosely bearing 4–11 spikelets; rachis glabrous. Spikelets spicately arranged, suberect to spreading, strongly compressed, linear, 10–35 × 1.5–2.5 mm, acute at apex, 10–35-flowered, reddish-brown; rachilla flexuous, broadly winged, wings hyaline, persistent, internodes 0.5–0.8 mm long. Glumes distichous, obliquely erect, ovate, 3–4 × 2–2.5 mm, subobtuse to acute at apex, membranous, keeled, 5–7-nerved, usually sanguineous, margins narrow, hyaline. Stamens 3; anthers linear, 1–2 mm long, connective shortly produced smooth, red; filaments elongate up to 4 mm. Style short, up to 2 mm long; stigmas 3, 2.5–3.5 mm long, much longer than style. Nutlet trigonous, oblong to obovoid, 1.1–1.5 × c. 0.7 mm, apiculate at apex, minutely punctulate, brownish.

Fl. & Fr.: Aug. – Dec.

Habitat: Common, weed of agricultural fields, rice fields, in marshes along the banks of water courses.

Distrib.: Tamil Nadu (All districts). Throughout India. Widely distributed in the warmer parts of the whole world.

43. *Cyperus rubicundus* Vahl, Enum. Pl. Obs. 2:308. 1805; Britto & K.M. Mathew in K.M. Mathew, Fl. Tamilnadu Carnatic 3 (2): 1743. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 317. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 74. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 119. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 273. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 353. 2021. *C. teneriffae* Poir. in Lam., Encycl. 7: 245. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6: 601. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1639 (1139). 1931; Fyson, Fl. S. Ind. Hill Stat.: 636. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977.

Tufted annuals with fibrous roots. Culms slender, triquetrous, 5–16 cm high, 0.5–1 mm thick, smooth or scabrid at above; base surrounded by broad, striate, purplish sheaths. Leaves gradually acuminate to apex, 1–2 mm wide, smooth. Inflorescence a head of 4–12 spikelets, 1.5–3.5 cm wide. Involucral bracts 2 or 3, spreading; lowest bract faintly exceeding the inflorescence, 1.5–4 cm long. Spikelets digitate, spreading, strongly compressed, oblong, 8–15 × 3–5 mm, obtuse at apex; rachilla wingless, internodes c. 0.5 mm long. Glumes membranous, broadly ovate, 2–3 × 1.5–2 mm, acuminate or with recurved mucro at apex, acutely keeled with reddish-brown sides, 9–13-nerved. Stamens 3; anthers oblong, c. 0.5 mm long, with a short connective appendage; filaments elongate up to 2.5 mm long. Style c. 1.5 mm long; stigmas 3, shorter than style. Nutlet triquetrous, obovoid, c. 1 × 0.7 mm, minutely apiculate at apex, narrowed towards the base, brown stipitate, margins concave, pale or stramineous, white punctulate.

Fl. & Fr.: Jan. – Nov.

Habitat: Hilly regions, dry and rocky areas.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore and Nilgiri). Peninsular India. Africa, Madagascar, Malesia, South Arabia and North Queensland.

44. *Cyperus squarrossus* L. Cent. Pl. 2:6. 1756; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3:75. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:121. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 274. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 354. 2021. *C. aristatus* Rottb. Descr. Pl. Rar. 22. 1772 & Icon. Rar. Pl. 38. t. 6. f. 1. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 606. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1640 (1140). 1931. *Mariscus squarrosus* (L.) sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 623. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1774. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 64. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1432. 1999; Pallith., Pock. Fl. Sirumalai Hills:273. 2001.

Densely tufted, small, slender annuals; Culms 3–12 cm high, filiform to rather slender, triquetrous, aromatic. Leaves filiform, shorter than culms. Inflorescence simple, open or reduced to pseudolateral clusters of spikes, 5–8 mm in diam.; spikes subglobose or cylindric oblong, 0.5–1.5 × 0.5–1 cm; rays if present 1–3 cm long. Involucral bracts 3, filiform, the longest 3–5 cm long. Spikelets linear, 3–6 × 1–1.5 mm, compressed, squarrose, echinate, 6–10-flowered, brown to chest-nut brown or green tinged; rachis wingless, disarticulating or persistent. Glumes broadly ovate, 1.5–1.8 × 0.3–0.5 mm, sides with 3 or 4-nerved spreading near to margins, margins hyaline; awns almost as long as the body of glumes, recurved; keel green, 3-nerved. Stamen 1; anthers minute, mucous. Style 3-fid, shorter than nutlets, glabrous. Nutlets obovoid, trigonous, 0.8–1 × 0.2–0.3 mm, almost as long as the glumes, smooth or obscurely dotted.

Fl. & Fr.: Aug. – Oct.

Habitat: Common in rice-fields, sandy, hilly areas, pastures, wet rocky areas and margins of water courses.

Distrib.: Tamil Nadu (Almost all districts). Throughout India. Widespread in tropics and subtropics, extending to temperate regions.

45. *Cyperus stoloniferus* Retz., *Observ. Bot.* 4: 10. 1786; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 615. 1893; C.E.C. Fisch. in Gamble, *Fl. Madras*:1641 (1141). 1931; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2): 1743. 1983; Chandrab. & N.C. Nair, *Fl. Coimbatore*: 317. 1988; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu* 3:75. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 48. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1415. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*:122. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 274. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 354. 2021.

Rhizomatous perennials; rhizome woody; stolons persistent, numerous, c. 2 mm thick, greyish or brown, covered with prominently nerved scales, longer than internodes. Culms sharply to obtusely trigonous, 10–35 cm high, 1–1.5 mm thick, greyish-green, smooth, culm base bulbous. Leaves usually equal to culm; blades folded and falcate, up to 4 mm wide, long attenuate at apex, keeled, margin narrowly incurved or inrolled, slightly scabrous; sheaths 2–5 cm, brown, grey or green, strongly nerved and disintegrating into fibres at maturity, one side scarious, mouth margin slightly concave or straight, lowest sheath bladeless. Inflorescence a small umbel, 20–50 mm long. Involucral bracts 2–3, leafy, usually longer than inflorescence; primary rays 3–6, up to 30 mm long. Spikes in clusters, 7–15 × 10–25 mm, digitately formed by 4–10 spikelets on short axis. Spikelets compressed or almost terete, 4–15 × 1.5–3 mm, 5–24-flowered; prophyll glume like, c. 2.5 mm long, narrow, triangular, acute, 3-nerved, scarious; rachis c. 1 mm wide, flat; rachilla faintly flexuous, internodes 0.5–0.7 mm long, broadly winged. Glumes cymbiform, 2–3 mm long with rounded backs, faintly nerved, greyish-brown, margins narrowly scarious. Stigmas 3. Nutlets biconvex or planoconvex, with concave ventral surface, faintly trigonous, 1.2–1.5 × 0.8–1 mm, brown, surface almost smooth and glossy.

Fl. & Fr.: May – Dec.

Habitat: Common in coastal sandy dunes also component of vegetation beyond high tide.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore and Dharmapuri). Andaman & Nicobar Islands and Peninsular India. Australia, Indo-China, Madagascar, Malesia and Sri Lanka.

46. *Cyperus tenuiculmis* Boeckeler in Linnaea 36: 286. 1870; B.D. Sharma & al. in Biol. Mem. 2 (1&2):156. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1744. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 75. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 48. 1989; Pallith., Pock. Fl. Sirumalai Hills: 269. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:122. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 274. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 353. 2021. *C. zollingeri* sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 612. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1641 (1141). 1931, non Steud. 1854.

Perennials with short, woody, corm like rhizome and short stolons. Culms solitary or few together, erect, triquetrous, up to 75 cm high, 1–2 mm thick, smooth. Leaves few, canaliculated, rigid, gradually narrowed to acute apex, 2–5 mm wide, scabrid towards above; sheaths light brown. Inflorescence simple or subcompound, lax, at times reduced to single cluster, up to 17 cm long and as broad. Involucral bracts 3–7, erect, patent; lowest bract at times exceeding the inflorescence, up to 21 cm long; primary rays 4–6, erect to patent, slender, unequal, longest rays up to 15 cm long. Spikes broadly ovoid, up to 4 × 5 cm, bearing 4–12 spikelets; rachis glabrous, faintly scabrid. Spikelets spicately arranged, patent to horizontally spreading, subcompressed, subquadrangular, linear to linear-lanceolate, 10–25 × c. 2 mm, acute at apex, 4–20-flowered, stramineous; rachilla flexuous, broadly winged, internodes c. 1.5 mm long; wings oblong-lanceolate, hyaline, caduceus. Glumes chartaceous, appressed, elliptic to ovate, c. 3.5 × 2 mm, obtuse and mucronulate at apex, keeled, 7–9-nerved, stramineous, margins hyaline keel broad, green. Stamens 3; anthers linear, 1–1.5 mm long, with slightly produced connective appendage; filaments elongate up to 3 mm long. Style 1–1.5 mm long; stigmas 3, up to 1.5 mm long. Nutlet triquetrous, ellipsoid or elliptic to obovoid, c. 2 × 1 mm, minutely apiculate, castaneous to blackish-brown.

Fl. & Fr.: Sep. – Nov.

Habitat: Occasional, in marshes, dry muds along road sides and in open grasslands at higher elevations.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). Throughout India. South and Southeast Asia, Tropical Africa and Australia.

47. *Cyperus tenuispica* Steud., Syn. Pl. Glumac. 2: 11. 1855; C.E.C. Fisch. in Gamble, Fl. Madras: 1640 (1139). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1744. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2:354. 1987; Chandrab. & N.C. Nair, Fl. Coimbatore: 317. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu 3: 75. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 48. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1416. 1999; Pallith., Pock. Fl. Sirumalai Hills: 269. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:123.

2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 274. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 355. 2021. *C. flavidus* C.B. Clarke in J. Linn. Soc., Bot. 21: 22. 1884.

Tufted annuals with reddish fibrous roots. Culms triquetrous, 8–35 cm high, 1–2 mm thick, smooth. Leaves linear, usually smaller or equaling the culm, at times longer, up to 30 cm long, 2–5 mm wide, gradually narrowed to an acute apex, margins smooth or scabrid; sheaths scarious, stramineous to reddish-brown, lower ones bladeless. Inflorescence compound or decompound, relatively large, lax, 2–17 cm wide. Involucral bracts 2 or 3; longest one usually exceeding the inflorescence, up to 15 cm long; primary rays 5–17, suberect to patent, unequal, slender, up to 10 cm long; secondary rays up to 2 cm long. Spikelets digitate, in clusters of 3–9, flattened, linear-oblong, 3–8 × 1–1.5 mm, subacute at apex, 10–30-flowered; rachilla wingless, persistent, internodes c. 0.5 mm long. Glumes subloosely arranged exposing part of rachilla and mature nutlets, membranous, ovate to oblong, 0.7–1 × 0.4–0.8 mm, obtuse and slightly recurved at apex, slightly keeled towards apex; keel greenish, 3-nerved, midnerve excurved as minute mucro; sides nerveless, hyaline or purplish-lineolate. Stamens 2; anthers oblong, c. 0.3 mm long, with smooth connective appendage; filaments up to 1 mm long. Style c. 0.5 mm long; stigmas 3, as long as style. Nutlet obtusely trigonous, broadly obovoid to subglobose, c. 0.3 × 0.25 mm, distinctly stipitate, very minutely apiculate, densely and minutely tuberculate.

Fl. & Fr.: Throughout the year.

Habitat: Along streams, paddy fields and marshy areas.

Distrib.: Tamil Nadu (All districts). Throughout India. Widely distributed in Sri Lanka, Nepal, China, Malesia, South Japan, Tropical Africa and Tropical Australia.

48. *Cyperus zollingeri* Steud., Syn. Pl. Glumac. 2:17. 1854; C.B. Clarke in Hook.f., Fl. Brit. India 6: 612. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1641 (1141). 1931; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 124. 2015. *C. ramosii* Kuk. in Repert. Spec. Nov. Regni Veg. 21: 326. 1925. *C. sphacelatus* Rottb. var. *tenuior* C.B. Clarke in D. Oliver et al., Fl. Trop. Afr. 8: 347. 1901.

Tufted annuals. Culms slender, 30–35 cm × 0.6–1 mm, triquetrous, smooth. Leaves 6–20 cm long, shorter than to equaling the culm; sheaths 1–8 cm, lower ones bladeless, straw coloured, purplish-striate. Inflorescence of simple umbel, 6–16 × 5–13 cm, lax. Involucral bracts 3–8, patent, unequal, lower 2 to 4 bracts up to 15 cm long. Spikes up to 5 cm long. Spikelets subspicate, linear, 1–6 in numbers, terminal one erect, up to 4 × 0.4 cm, acuminate, compressed, subquadrangular, 6–18-flowered, greenish; rachilla flexuous, broadly winged. Glumes appressed with weakly recurved apex, ovate-elliptic, 3–3.5 × c. 2 mm, subacute, 7–9-nerved,

midnerve broad, glaucous-green; sides pale stramineous to light brown, purplish-lineolate, margins broadly hyaline. Stamens 3; anthers 0.5–0.75 mm long. Style c. 2 mm long. Nutlets trigonous, obovoid, 1.2–1.5 × 0.8–1.5 mm, rounded or truncate to somewhat depressed and umbonulate at apex, cuneate to stipitate at base, dark brown at maturity.

Fl. & Fr.: Aug. – Sep.

Habitat: Hilly regions.

Distrib.: Tamil Nadu (Dindigul, Madurai). Tropical Africa, Madagascar, Malesia and Northern Australia.

7. **ELEOCHARIS** R. Br.

Annuals or rhizomatous, at times bulbiferous perennials; rhizome short or absent; stolons usually present. Culms usually tufted or single, erect or arcuate, terete or triangular, rarely transversely septate. Leaves 1 to few per culm, reduced to bladeless tubular sheaths, often with apiculate short erect mucro like appendage at apex; ligule absent. Inflorescence reduced to a single, terminal, ebracteate spikelet, rarely proliferous at base. Spikelets cylindrical, ovoid, angular, rarely compressed, few to many flowered; rachilla persistent. Glumes spirally imbricate, sometimes distichous, oblong-ovate, lanceolate, membranous to subcoriaceous, margins hyaline; lowest 1 or 2 glumes usually empty. Flowers bisexual. Perianth consists of 4–10 hypogynous bristles, shorter or longer than nutlet, retrorsely spinulose, deciduous with nutlet. Stamens 1–3; anthers connective produced into a small subulate appendage. Style base persistent on nutlet, expands to variously shaped; stigmas 2 or 3. Nutlet obovoid, trigonous or biconvex, smooth to reticulate; epidermal cells hexagonal, transversely or vertically oblong.

Tropical to temperate regions of both hemispheres, c. 150 species, c. 22 in India and 8 species and 1 subspecies in Tamil Nadu.

Key to species and subspecies

- | | |
|--|--|
| 1a. Spikelets ovoid to ellipsoid, usually much broader than culm | 2 |
| 1b. Spikelets cylindrical, as broad as culm, at times narrower or broader than culm | 6 |
| 2a. Glumes distichous; nutlet deeply pitted with isodiametric rows of epidermal cells | |
| | 9. <i>E. retroflexa</i> subsp. <i>chaetaria</i> |
| 2b. Glumes spirally throughout; nutlet smooth with indistinct oblong epidermal cells | 3 |
| 3a. Style 3-fid; nutlet trigonous | 4 |
| 3b. Style 2-fid; nutlet biconvex | 5 |
| 4a. Perennials with a definite stoloniferous base; culms acutely 4-angled; persistent style base large, deltoid, compressed at above, pyramidal below, spongy, fuscous | |

12. *E. tetraquetra*

4b. Annuals, at times perennials without stoloniferous base; culms terete to subterete, smooth to faintly ribbed; persistent style base conical, rounded to acute at apex, brownish-white **4. E. congesta**

5a. Perianth bristles 3 or 4, glistening white; nutlet c. 0.6×0.5 mm **2. E. atropurpurea**

5b. Perianth bristles 4–7, purplish or ferruginous; nutlet $0.8 - 1 \times 0.6 - 0.8$ mm

6.E. geniculata

6a. Culms hollow, transversely septate; glumes obtuse to truncate at apex **5. E. dulcis**

6b. Culms solid, without transverse septa; glumes acute to subacute at apex, rarely obtuse or rounded 7

7a. Culms terete; glumes often lacerate hyaline margins at apex **8. E. swamyii**

7b. Culms strongly 3–5 angled; glumes not or narrowly hyaline margined at apex 8

8a. Spikelets twisted from obliquely spiral glumes, obtuse to rounded at apex; perianth bristles shorter than nutlet **11. E. spiralis**

8b. Spikelets not twisted as above, acute at apex; perianth bristles as long as to above the nutlet **1. E. acutangula**

1. Eleocharis acutangula (Roxb.) Schult., Mant. 2: 91. 1824; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1746. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 75. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 48. 1989; Pallith., Pock. Fl. Sirumalai Hills: 269. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 130. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 274. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 343. 2021. *Scirpus acutangulus* Roxb., Fl. Ind.: 1: 216. 1820. *Eleocharis fistulosa* Schult., Mant. 2: 89. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 6: 626. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1648 (1145). 1931.

Tufted, rhizomatous perennials; rhizome short; stolons long, slender, 2–3 mm thick, rooting at nodes. Culms erect, triquetrous, 30–65 cm high, 3–6 mm thick, acute at apex, smooth, not transversely septate. Leaf sheaths tubular, 5–15 cm long, membranous, obliquely truncate at mouth, purplish towards base. Spikelets cylindrical, 1.5–3.8 cm long, as broad as culm, acute at apex, many flowered. Glumes all fertile, at times basal most glume empty, loosely imbricate, broadly oblong or oblong-ovate, c. 4.5×3 mm, obtuse to acute at apex, subcoriaceous, not keeled, midnerve prominent, with many faint nerves on both sides, margins membranous, scarious towards margins. Perianth bristles 6, linear, c. 2.5 mm long, subequal, as long as or slightly exceeding nutlet, slightly broader towards apex, retrorsely spinulose, persistent. Stamens 3; anthers linear-oblong, c. 1.8 mm long, connective appendages very minute, dark brownish; filaments very long, c. 4.6 mm long, hyaline. Ovary obovate, c. 1 mm long; style c. 4.5 mm long; stigmas 3, up to 1.6 mm long. Nutlet obovoid, slightly compressed, c. 2×1.5 mm, biconvex, constricted to a conspicuous neck below the apex, yellowish-brown, epidermal cells transversely oblong, with c. 15 vertical rows on either face; style base conical, subdeltoid, persistent, base $2/3$ as wide as nutlet.

Fl. & Fr.: Jun. – May.

Habitat: Shallow stagnant water in ponds, tanks, rice fields, ditches, marshes and margins of ponds and tanks, marshy regions and grasslands. Often forming large patches or in association with other sedges and wild rice.

Distrib.: Tamil Nadu (Coimbatore, Cuddalore, Dindigul, Kallakurichi Madurai, Ranipettai, Tiruvannamalai, Vellore and Viluppuram Western Peninsular India and Northeast India. Pantropical.

2. *Eleocharis atropurea* (Retz.) J. Presl & C. Presl, Reliq. Haenk. 1: 196. 1928; C.B. Clarke in Hook.f., Fl. Brit. India 6: 627. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1648 (1145). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1746. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 312. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 48. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 131. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 275. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 355. 2021. *Scirpus atropurpureus* Retz., Observ. Bot. 5: 14. 1789. *Eleogenus atropurpureus* (Retz.) Nees in Wight, Contr. Bot. India: 113. 1834.

Tufted annuals. Culms short, capillary to slender, 2–15 cm high, up to 0.25 mm thick, minutely angular to sulcate. Leaf sheaths tubular, membranous, 1–2.5 cm long, oblique truncate at mouth, usually attenuate at apex, purplish towards base and greenish along apex. Spikelets ovoid to oblong-ovoid, 2–5 × c. 2 mm, broader than culm, obtuse at apex, many flowered. Glumes spirally throughout, elliptic-oblong, c. 1.5 × 0.75 mm, obtuse at apex, membranous, loosely arranged at maturity, purplish bands on both sides of green keel, margins narrowly hyaline; basal 2 glumes empty, others fertile. Perianth bristles 3 or 4, c. 1 mm long, shorter than to slightly exceeding the nutlet, persistent, hyaline, whitish, retrorsely spinulose. Stamen 1 or 2; anther linear-oblong, c. 0.5 mm long, connective appendage very minute, apiculate; filament elongate, 0.5–1.3 mm, hyaline. Ovary obovate, c. 0.5 mm long; style c. 1 mm long, bifid about half the length. Nutlet biconvex, obovoid, c. 0.6 × 0.5 mm, smooth, shining blackish-purple when mature; epidermal cells indistinct; persistent style base minute, patelliform, umbonate at middle.

Fl. & Fr.: Oct. – Feb.

Habitat: Wet open places, harvested rice fields, marshy regions, grassy areas on the edges of ponds and in water logged soil.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Cuddalore, Kallakurichi, Ramanathapuram, Tiruchirappalli Tirunelveli and Viluppuram. Peninsular India and Western India. Pantropical.

3. *Eleocharis congesta* D. Don, Prodr. Fl. Nepal.: 41. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 6: 630. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 436. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1648 (1145). 1931; Fyson, Fl. S. Ind. Hill Sta.: 637. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1747. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 48. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1417. 1999; Pallith., Pock. Fl. Sirumalai Hills: 269. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:133. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 275. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 355. 2021. *E. ovata* (Roth) Roem. & Schult., Syst. Veg. 2: 152. 1817. *Scirpus ovatus* Roth, Tent. Fl. Germ. 2 (2): 562. 1793. *E. chaetaria* Roem. & Schultes var. *subvivipara* (Boeckeler) C.E.C. Fisch. in Gamble, Fl. Madras:1648 (1145). 1931. *E. subvivipara* Boeckeler in Linnaea 36: 424. 1870; C.B. Clarke in Hook.f., Fl. Brit. India 6: 629. 1893. *E. congesta* D. Don. var. *subvivipara* (Boeckeler) Koyama in Journ. Sci., Univ. Tokyo (sec. 3) 8: 90. 1961; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977.

Tufted annuals; rhizome decumbent. Culms slender, 8–20 cm high, 0.5–1 mm thick, subterete, sulcate, smooth. Leaf sheaths membranous, 1.5–6 cm long, truncate to oblique at mouth, attenuate to aristate at apex, purplish towards base. Spikelets ovoid to oblong, 4–6 × 2–3 mm, much broader than culm, acute at apex, many flowered, at times proliferate from base into 1–3 slender rays ends with small spikelet. Glumes spirally throughout, membranous, tightly imbricate, oblong-ovate, c. 2.2 × 1 mm, obtuse at apex, 1-nerved and green in middle portion, hyaline on both sides, usually purplish towards margins. Perianth bristles 6, subequal, longest one c. 1.2 mm long, longer than nutlet, whitish, retrorsely scabrid. Stamens 2; anthers oblong, c. 0.75 mm long, connective appendage minute, apiculate; filaments elongate at maturity. Ovary oblong, c. 0.5 mm long; style c. 1.5 mm long, divided up to 2/3 from apex into 3 stigmas, conical at base; stigmas scabrid. Nutlet trigonous, obovoid, 1–2 mm long, smooth, angles narrowly costate, yellowish; epidermal cells oblong, distinct; persistent style base conical, rounded to acute at apex, brownish-white.

Fl. & Fr.: Oct. – Jan.

Habitat: Marshy areas in grasslands, stream banks and wet wastelands.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). Throughout India. Indo-China, China, Nepal and Japan.

4. *Eleocharis dulcis* (Burm.f.) Trin. ex Hensch., Vita Rumphii.:186. 1833; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1747. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 49. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:134.

2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 275. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021. *Andropogon dulce* Burm. f., Fl. Ind.:219. 1768. *Scirpus plantagineus* Retz., Observ. Bot. 5: 14. 1789. *Eleocharis plantaginea* R.Br., Prodr. Fl. Nov. Holland. 1: 224. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 620. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1647 (1145). 1931.

Tufted, rhizomatous perennials; rhizome woody, usually with brownish roots; stolons 2–4 mm thick, at times terminated with tubers. Culms terete, internodes hollow, 40–100 cm high, 2–5 mm thick, acute at apex, septate, striate, nodes prominent when dry. Leaf sheaths 7–26 cm long, acute at apex, obliquely truncate at base, light purplish-brown towards base. Spikelets cylindrical, 2–3 cm long, as broad as or slightly broader than culm, obtuse to acute at apex, many flowered. Glumes broadly oblong to obovate, loosely imbricate, 5–6 × 2–3 mm, obtuse or truncate-obtuse at apex, subcoriaceous, purplish-brown spotted inside, many-nerved, scarious at margins; basal glumes empty, amplexicaul at base. Perianth bristles 6–8, subequal, up to 3 mm long, as long as nutlet, slightly broader towards base, retrorsely scabrid. Stamens 3; anthers 3–4 mm long, often purplish-brown spotted, connective appendage very prominent, 0.25–0.5 mm long, acuminate, slightly recurved; filaments elongate up to 4 mm long. Ovary obovate, c.1 mm long, whitish; style c. 4 mm long, flat and conical at base; stigmas 3, c. 2 mm long, minutely scabrid. Nutlet broadly obovoid, c. 2 × 1.5 mm, biconvex, smooth, with longitudinal furrows on convex face, brownish; epidermal cells very small, hexagonal, in many vertical rows; persistent style base triangular, attenuate at apex, flattened, dark brownish.

Fl. & Fr.: Sep. – Oct.

Habitat: Marshy areas, open wetlands, swamps and mangroves.

Distrib.: Tamil Nadu (Chengalpattu and Tirunelveli). Western Peninsular India, NE and NW India. Paleotropics.

5. *Eleocharis geniculata* (L.) Roem. & Schult., Syst. Veg. 2:150. 1817; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1748. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 49. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1417. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:137. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 275. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021. *Scirpus geniculatus* L., Sp. Pl.:48. 1753. *Eleocharis capitata* (L.) R.Br., Prodr. Fl. Nov. Holland.: 225. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 627. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1648 (1145). 1931; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 335. 1987.

Densely tufted annuals. Culms short, slender to rigid, 12–25 cm high, 0.5–1 mm thick, erect or reflexed, angular to sulcate. Leaf sheaths membranous, 1–4 cm long, truncate to oblique at mouth, acute to attenuate at apex, usually purplish-brown towards base. Spikelets broadly ovoid, oblong-ovoid or globose, 3–6 × 3–4 mm, much broader than culm, obtuse at apex, brownish, many flowered. Glumes elliptic-oblong, membranous, tightly spirally imbricate even at maturity, c. 2 × 1 mm, obtuse at apex, midnerve faint, rusted brown, often with few brown spots. Perianth bristles 4–7, ca 1.2 mm long, purplish or ferruginous coloured, slightly shorter than nutlet, retrorsely scabrid. Stamens 2 or 3; anthers oblong, c. 0.5 mm long, connective appendage very minute, apiculate; filaments elongate, 0.5–2 mm long. Ovary obovate, c. 0.5 mm long; style 1.5–2 mm long, divided half to $\frac{3}{4}$ of the length; stigmas 2. Nutlets obovoid, biconvex, 0.8–1 × 0.6–0.8 mm, smooth, shining, blackish-brown; epidermal cells indistinct; persistent style base minute, conical, as wide as nutlet.

Fl. & Fr.: Jun. – Oct.

Habitat: Wetlands, pond banks, streams, paddy fields and moist sandy areas.

Distrib.: Tamil Nadu (Chengalpattu, Dindigul Madurai, Kanniyakumari, Cuddalore, Kallakurichi, Ranipettai, Tiruvannamalai, Tiruchirappalli, Tirunelveli, Vellore and Viluppuram). Peninsular India, East and NE India. Old and New world.

6. *Eleocharis retroflexa* (Poir.) Urb. subsp. ***chaetaria*** (Roem. & Schult.) T. Koyama in Bull. Natl. Sci. Mus. Tokyo, n.s., 17: 68. 1974; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1749. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 49. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:140. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 276. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021. *Eleocharis chaetaria* Roem. & Schult., Syst. Veg. 2: 154. 1817; C.B. Clarke in Hook.f., Fl. Brit. India 6: 629. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1648 (1145). 1931.

Tufted annuals. Culms very slender, filiform, 5–14 cm high, c. 0.4 mm thick, often curved, minutely angular to sulcate. Leaf sheaths tubular, membranous, 0.5–2 cm long, purplish towards base, whitish-scarious towards apex; upper most sheath usually with a well developed orifice with glume like blade at apex. Spikelets ovoid, slightly flattened, 3–4 × 2–3 mm, usually much broader than culm, few flowered, often proliferating into rays from base, purplish-red. Glumes oblong to obovate, membranous, distichous, at times loosely imbricate at maturity, c. 2.7 × 1.7 mm, obtuse at apex, keeled, hyaline and thinly membranous towards margins; lowest glumes empty, amplexicaul the entire spikelet base. Perianth bristles 6, unequal; longest bristle c. 0.5 mm long, nearly as long as nutlet, whitish, retrorsely spinulose. Stamens 2 or 3; filaments c. 0.7 mm long; connective appendage apiculate. Ovary obovoid, c. 0.7 mm long; style c. 3 mm long, conical at base, divided up to 2/3 into

stigmas, brownish; stigmas 3, scabrous. Nutlets usually up to 4 in each spikelet, broadly obovoid, trigonous, c. 1.1×0.7 mm, with 3 acute angles prominently projecting from apex, yellowish; epidermal cells very prominent, deeply pitted with isodiametric rows of cells; persistent style base pyramidal, extending to three acute projections of nutlet, brownish.

Fl. & Fr.: Oct. – Nov.

Habitat: Marshy areas in grasslands, swamps, paddy fields and riversides.

Distrib.: Tamil Nadu (Dindigul, Madurai). Throughout India. Paleotropics.

7. *Eleocharis spiralis* (Rottb.) Roem. & Schult., Syst. Veg. 2:155. 1817; C.B. Clarke in Hook.f., Fl. Brit. India 6:627. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1647 (1145). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3(2):1749. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:50. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:142. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 276. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021. *Scirpus spiralis* Rottb., Descr. Icon. Rar. Pl.:42. 1773. *Limnochloa spiralis* (Rottb.) Nees in Wight, Contr. Bot. India:114. 1834.

Tufted perennials with short rhizome; stolons c. 3 mm thick, covered with scales. Culms densely triquetrous, 25–70 cm high, 2–6 mm thick, gradually narrowed to an acute apex, not transverse septa and nodes. Leaf sheaths membranous, 5–15 cm long, obliquely truncate at mouth with 2–5 mm long setaceous appendage at apex. Spikelets cylindrical, twisted from obliquely spiral glumes, 2–3.5 cm long, c. 3 mm broad, slightly broader than the apex of culm, faintly narrowed towards obtuse to rounded apex, densely many flowered, whitish. Glumes tightly and spirally arranged, densely imbricate, broadly obovate, c. 3×3 mm, truncate at apex, cuneate at base, subcoriaceous in middle, midnerve prominent, margins hyaline with distinctly brown spotted towards centre and scarious towards margins; lowest glume empty, amplexicaul the entire base. Perianth bristles 4–6, linear, unequal in length, shorter than nutlet, longest bristle c. 1 mm long, minutely and retrorsely scabrid. Stamens 3; anthers linear-oblong, c. 0.5 mm long; connective appendage very minute. Ovary obovate, c. 0.5 mm long; style c. 2 mm long, usually divided into stigmas up to slightly above the base, minutely scabrid; stigmas 3. Nutlet obovate to obtuse, $1.5\text{--}1.7 \times 1.2\text{--}1.4$ mm, compressed, biconvex, yellow to brownish at maturity; epidermal cells oblong, transversely longitudinal; persistent style base conical, smooth, gradually narrowed.

Fl. & Fr.: Aug. – Sep.

Habitat: Wet areas in grasslands, swamps, roadsides, irrigation canals and mangroves.

Distrib.: Tamil Nadu (Nilgiri and Coastal areas of Tamil Nadu carnatic region). Peninsular to Central India. Paleotropics.

8. *Eleocharis swamyii* Govind.in Proc. Indian Acad. Sci. (Pl. Sci.) 94: 13. f. 1.1985; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:142. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021.

Rhizomatous perennials; rhizome thick, elongated. Culms 30–60 cm high, 1.5–2 mm wide, erect, tufted, terete, smooth not septate. Leaf sheaths usually dirty black, shining. Spikelets cylindric, 10–25 × 3–3.5 mm, terete or finally angular, apparently squarrose, broader than culms, obtuse, many flowered, pale brown. Glumes narrowly ovate or ovate lanceolate, 3.5–4 × 1.5–2 mm, cartilaginous, loosely imbricate, suberect or spreading and convolute when dry, subacute or acute, many nerved without prominent midnerve, broadly lacerate hyaline margined in upper half. Hypogynous bristles 7, c. 2 times longer than nut, retrorely scabrous throughout. Stamens 2 or 3; anthers linear, 1–1.5 mm long. Style 2–2.5 mm long; stigma c. 2 times longer than style, sparsely hairy. Nutlets broadly orbicular with short neck, biconvex, 1.7–2 × 1.3–1.5 mm, distinctly cancellate, prominently rimmed above neck, shining, yellow or yellowish brown.

Fl. & Fr.: Oct. – Nov.

Habitat: Marshy areas in grasslands and open swamps.

Distrib.: Tamil Nadu (Kanyakumari). **Endemic** to South India (Tamil Nadu & Andhra Pradesh)

9. *Eleocharis tetraquetra* Nees in Wight, Contr. Bot. India:113. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 630. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1648 (1145). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2):157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 76. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1417. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:143. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 276. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 356. 2021. *Scirpus tetraquetra* (Nees) Thwaites, Enum. Pl. Zeyl.: 434. 1864.

Tufted perennials with short rhizome; stolons definite, long and slender. Culms erect, 30–75 cm high, 0.5–1 mm thick, slender to rigid, acutely 4-angled, prominently ribbed and finely longitudinally striate along sides. Leaf sheaths tubular, herbaceous, closely appressed, purplish below, upper one slightly somewhat oblique, shortly mucronate just below the apex. Spikelet ovoid to oblong-ellipsoid, 10–20 × 3–5 mm, broader than culm, often somewhat inclined, terete, obtuse to acute at apex, densely many flowered, ferruginous to brownish. Glumes spirally throughout, elliptic to oblong-elliptic or lanceolate, membranous to chartaceous,

3–4 × c. 2 mm, densely imbricate, closely appressed when young, lax at maturity, obtuse to acute at apex, 1-nerved, faintly keeled, ferruginous with paler and narrow scarious hyaline margins; basal glumes empty, lowest one amplexicaul the spikelet base. Perianth bristles 6, coarse, flat, about as long as or slightly exceeding the nutlet including style base, laxly to densely retrorsely scabrous or subplumose, rufous. Stamens 2 or 3; anthers linear, c. 1 mm long, minutely apiculate. Style 3 fid; stigmas 3. Nutlet obtusely trigonous, compressed, obovoid, c. 1.3 × 1.2 mm, not constricted below the apex, smooth, shining, yellowish to brown; nutlet covered with absolutely reticulate to vertically oblong epidermal cells, 0.25–0.5 mm long; persistent style base large, deltoid, c. 0.5–0.7 mm, as long as and 0.5–0.8 as wide as nutlet, compressed at above, pyramidal below, spongy, fuscous.

Fl. & Fr.: Oct. – Jan.

Habitat: Marshy areas in grasslands and open swamps.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). Tropical and subtropical Asia and Australia.

8. FIMBRISTYLIS Vahl

Annuals or perennials with short woody rhizome. Culms usually tufted, erect to decumbent, solid, more or less angular, subterete or laterally compressed, striate or sulcate. Leaves linear, basal to lower part of culm, at times reduced to bladeless sheaths; blades mostly flat, rarely laterally compressed and becoming ensiform; ligule a fringe of hairs or membranous or absent; sheaths closed, cylindrical or laterally compressed. Inflorescence terminal, very rarely pseudolateral, usually umbellate, simple or more or less compound, rarely capitate or subcapitate, at times reduced to single spikelet. Involucral bracts leaf like or scale like, sheathing; base of the rays enclosed in a tubular prophyll. Spikelets solitary or in clusters, rarely paired, terete or angular or strongly laterally compressed, mostly ovoid or ellipsoid, few to many flowered; rachilla persistent, very often winged by persistent basal part of glumes. Glumes usually spirally or distichously arranged, rarely subdistichous, at times basal 1 to few glumes empty. Flowers bisexual, hypogynous bristles absent. Stamens 1–3; anthers usually with a short connective. Style articulated with ovary, deciduous with dilated base leaving no button on nutlet, triquetrous or flat, ciliate or glabrous; stigmas 2 or 3. Nutlet trigonous or lenticular, orbicular, obovoid or oblong-linear, smooth, verruculose or tubercled, lineolate when epidermal cells are linear, trabeculate with longitudinal ribs connected by cross bars or cancellate.

All over the world, mostly in tropics and subtropics, with large contribution from tropical Asia, c. 300 species, 115 in India and 59 species, 4 varieties in Tamil Nadu.

Key to species and varieties

- | | |
|---|----|
| 1a. Styles 2-fid, nuts biconvex | 2 |
| 1b. Styles 3-fid, nuts trigonous or triquetrous | 21 |

- 2a. Inflorescence represents with a single terminal spikelet (proliferate in to 1–3 peduncled spikelets) 3
- 2b. Inflorescence simple to decomposed umbels with few to many spikelets 7
- 3a. Leaves usually bladeless, reduced to sheaths; eligulate 4
- 3b. Leaf blade well elongated with sheaths; ligulate 5
- 4a. Culms obtusely trigonous; glumes mucronate with rounded apex; gynophore minute, 0.2 – 0.3 mm long; nutlet obovoid, tuberculate towards margins with 3–5 transverse wavy ridges **33. F. nutans**
- 4b. Culms sharply quadrangular; glumes obtuse or acute-obtuse at apex; gynophore c. 0.5 mm long, flat. nutlet oblong, cylindrical with major part parallel sided, trabeculate from the transversely oblong epidermal cells in between 5–8 vertical ridges **54. F. tetragona**
- 5a. Stamens 1 or 2; involucre bract solitary; glumes with nerveless sides; nutlets verruculose, with isodiametric cells **38. F. polytrichoides**
- 5b. Stamens 3; involucre bracts 2–4; glumes with distinct 4–7 nerves spreading over whole breadth; nutlets reticulate or subtrabeculate 6
- 6a. Involucre bracts 3 or 4, 1–2.5 cm long; spikelets 4.5–6.5 × 1.5–2 mm, castaneous, brownish, 8–20 flowered; nutlet 0.8–1 mm long, subtrabeculate with 14 vertical ridges, tuberculate on margins **41. F. rectifolia**
- 6b. Involucre bracts 2, 0.3–1.2 cm long; spikelets 6–12 × 3–4 mm, whitish or yellowish-brown, many flowered; nutlet 1.3–1.6 mm long, reticulate with many superposedly arranged rounded or isodiametric hexagonal cells on each face **47. F. schoenoides**
- 7a. Leaves eligulate 8
- 7b. Leaves ligulate with series of hairs 14
- 8a. Annuals, non-rhizomatous; glumes without white scarious margins; leaves 0.4–1 mm wide, up to 10 cm long or rarely up to 15 cm long; stamen usually 19
- 8b. Perennials with stout rhizome; glumes with broad, white scarious margins; leaves 2.5 – 4 mm wide, up to 30 cm long or rarely up to 1 m long; stamen usually 3 13
- 9a. Plants glabrous; inflorescence a globose to subglobose capitate compound head; rays absent; spikelets sessile 10
- 9b. Plants more or less hairy (except *F. dipsacea*); Inflorescence a compound to decomposed open corymb; rays present; spikelets stalked 11
- 10a. Spikelets oblong to cylindrical, 3–6 mm long, more or less angular, densely many flowered; glumes broadly ovate, 1–1.2 mm long; Involucre bracts 2–5, largest one up to 9 cm long **5. F. argentea**
- 10b. Spikelets doliiformis, 1–2 cm long, terete, 14–20 flowered; glumes broadly elliptic or suborbicular, 1.2–1.3 mm long, coriaceous; Involucre bracts 2 or 3, 1–2 cm long **16. F. doliiformis**
- 11a. Nutlets obovoid; style base with whorl of long pendent fimbriate hairs covered over nutlet summit **50. F. squarrosa** var. **esquarrosa**
- 11b. Nutlets oblong-cylindrical or suborbicular; style base glabrous or rarely pubescent 12
- 12a. Spikelets squarrose from the recurved awns of glumes; nutlet oblong-cylindrical to subterete, with a row of cleavage appendages on both margins; style base glabrous **15. F. dipsacea**
- 12b. Spikelets not squarrose, awns of glumes erect; nutlet suborbicular without appendages; style with fimbriate hairs towards apex, base shortly pubescent **1. F. aestivalis**

- 13a. Spikelets clustered intermixed with few solitary ones; nutlets granulated, verruculose; stamens 2 **13. F. cymosa** var. **spathacea**
- 13b. Spikelets all solitary; nutlets trabeculate, with 4–7 fine vertical ridges; stamens 3 **17. F. eligulata**
- 14a. Glumes in upper half densely brown or greyish tomentose on beneath; nutlets finely striated 15
- 14b. Glumes glabrous, rarely minutely ciliate on apex margin; nutlets trabeculate or reticulate 16
- 15a. Leaf blades 2–13 cm long; inflorescence with 8–20 spikelets; involucre bracts up to 1.5 cm long, usually shorter than inflorescence; nutlet obovoid, c. 1 mm long, mucronate and slightly depressed at apex **20. F. ferruginea**
- 15b. Leaf blades up to 35 cm long; inflorescence with 3–6 spikelets; involucre bracts up to 11 cm long, usually longer than inflorescence; nutlet subobovate, 1.4–1.6 mm long, obtuse or rounded at apex **49. F. sieberiana**
- 16a. Spikelets atleast partly sessile, clustered intermixed with solitary one 17
- 16b. Spikelets all solitary 18
- 17a. Spikelets small, 3–5 mm long, whitish brown variegated; nutlets 0.4–0.8 mm long with 4–7 vertical ridges on each face; styles filiform, mostly hairy in upper half, 1–1.5 mm long; stamen 1 **45. F. sanjappae**
- 17b. Spikelets large, 4–8 mm long, chest-nut purplish to blackish; nutlets 1.2–1.3 mm long, trabeculate with 11–13 vertical ridges on each face; styles c. 1.5 mm long, hairy throughout; stamens 2 **24. F. latenuciera**
- 18a. Stamens 1 or 2; glumes 1.2–2.5 mm long 19
- 18b. Stamens 2 or 3; glumes 3–7 mm long 20
- 19a. Spikelets narrowly elliptic, 2.5–3.5 × 1.3–1.5 mm, more or less angular; glumes with conspicuous aristate at apex; stamen always 1; nutlets smoothly trabeculate, 0.4–0.8 mm long with 4–6 vertical ridges, in between fine epidermal cells in each face. **6.F.bisumbellata**
- 19b. Spikelets ovoid, oblong-ovoid, 3–8 × 2.5–3 mm, acute at apex; glumes mucronulate; Stamens 2, occasionally 1; nutlets coarsely tuberculate, 0.8–1.1 mm long with 5–11 vertical series of transversely large oblong epidermal cells in each face **14.F.dichotoma**
- 20a. Stamens 2; glumes 3–3.5 mm long, keel indistinct; style 0.8–1 mm long, densely hairy, not thickened at base; stipe of nutlets spongy **7. F. carpopoda**
- 20b. Stamens 3; glumes c. 7 mm long, distinctly keeled; style c. 3.5 mm long ciliate, slightly inflated at base; stalk of nutlets with 3 external appendages **57. F. tristachya**
- 21a. Inflorescence represents with a single terminal spikelet, rarely 2 or 3 or 4 22
- 21b. Inflorescence of simple to decomposed umbels with few to many spikelets 27
- 22a. Leaves ligulate; stamens 2 **35. F. pandurata**
- 22b. Leaves eligulate; stamens 3 23
- 23a. Glumes spirally imbricate; spikelet terete, chestnut brownish; nutlets not pyriform, nor acutely angled or subtruncate at apex 24
- 23b. Glumes distichous to bifarious below; spikelet flattened or subcompressed, stramineous or tinged with brown; nutlets pyriform, acutely angled or subtruncate at apex 26

- 24a. Annuals; glumes 1.75–2 mm long; nutlet 0.8–0.9 mm long, tuberculate, in 7 or 8 regular vertical rows on each face; anthers linear, 0.6–0.8 mm long **29. F. monospicula**
- 24b. Perennials, rhizome very short or absent; glumes 3.3–4 mm long; nutlet c. 1.2 × 1 mm, not as above; anthers oblong, 1.2–2 mm long 25
- 25a. Leaf blades bristle like; spikelets 2.3–5.8 mm long; nutlet irregularly conspicuously trabeculate **52. F. subtrabeculata**
- 25b. Leaf blades flat or rarely channeled; spikelets 4–10 mm long; nutlet not trabeculate as above **22. F. kingii**
- 26a. Dwarf plants, 10–35 cm high; culms and leaves almost filiform, 0.6–1 mm wide; spikelets 7–11 × 3–5 mm; glumes 3–6 × 2–4 mm, spongiously thick along keel; style trigonous, c. 2 mm long **34. F. ovata**
- 26b. Robust plants, up to 80 cm high; culms and leaves not filiform, 1–3 mm wide; spikelets 1.5–3 × 0.4–0.6 cm; glumes 6–8 × 4–5 mm, keel pyramiddally thickened at base; style flat, 4–6 mm long **56. F. triflora**
- 27a. Spikelets sessile, all clustered or partly clustered intermixed with some solitary ones 28
- 27b. Spikelets all solitary, none clustered 43
- 28a. Leaves eligulate; plants usually perennials (except *F. semidisticha*) 29
- 28b. Leaves ligulate; plants mostly annuals 41
- 29a. Spikelets all clustered 30
- 29b. Spikelets not all clustered, some peduncled solitary ones often added 37
- 30a. Spikelets clustered in single capitate head at the end of culms; rays absent; nut tuberculate or Etuberculate 31
- 30b. Spikelets clustered at the end of rays and raylets in simple, compound or decompounds inflorescence; nuts etuberculate 36
- 31a. Glumes muticous, acute or obscurely apiculate; nutlets etuberculate, acutely or globosely trigonous or , triquetrous, not costulate, smooth or with hexagonal quadrate epidermal cells in between 20–22 vertical ridges 32
- 31b. Glumes distinctly mucronate, mucro 0.2–0.7 mm long; nutlets tuberculate, globosely trigonous, tricostulate, trabeculate with 8–14 vertical ridges or reticulate 33
- 32a. Nutlets triquetrous or acutely trigonous, smooth, 0.5–0.6 mm long; capitate heads with many spikelets and foliar involucre bracts; glumes ovate, c. 2 mm long, acute; styles obscure or c. 0.2 mm long **31. F. mycosa**
- 32b. Nutlets globosely trigonous, with 20–22 vertical ridges on each face, 1.3–1.5 mm long; capitate heads with 3–8 spikelets and setaceous involucre bracts; glumes oblong-obovate, 4.8–5.2 mm long, obtuse; styles c. 3 mm long **42. F. rigidiuscula**
- 33a. Nutlets narrowly oblong, 0.6–0.8 mm long, reticulate with epidermal cells in upper half circular, not vertically ridged; glumes linearly scabrous, keel scabrous **46. F. scabrisquama**
- 33b. Nutlets broadly obovate, 1–1.5 mm long, trabeculate or reticulate with distinct vertical ridges; glumes and keel glabrous and smooth, at times minutely ciliate on apex margins 34
- 34a. Leaves curved, tortuous; spikelets lanceolate, 2.5–3 mm wide; glumes broadly ovate, 4.5–5.5 mm long with 0.6–0.7 mm long mucro; style 1.75–2 mm long glabrous or slightly cilia at top; nutlets distinctly tubercled in upper half **55. F. tortifolia**
- 34b. Leaves not as above; spikelets ovoid or ovoid-oblong, 1.5–2 mm wide; glumes deltoid ovate, 2–3 mm long with 0.2 mm long mucro; style 1–1.5 mm long more or less hairy throughout or densely hairy at top; nutlets tuberculate throughout 35

- 35a. Perennials with very short rhizome; capitate head with 2–4 spikelets; spikelets yellowish brown; glumes 2–2.5 mm across; nutlets with 8–10 vertical ridges on each face
23. F. latiglumifera
- 35b. Annuals; capitate head with 3–6 (–10) spikelets; spikelets cinnamomeous-castaneous or chestnut-brown; glumes 2.8–3 mm across; nutlets with 10–14 vertical ridges on each face
48. F. semidisticha
- 36a. Leaves flat, 5–8 mm wide; glumes glabrous, eglandular; nutlets trigonous with 7 – 11 vertical ridges or rows of epidermal cells on each face
2. F. aggregata
- 36b. Leaves very narrow, very narrow with incurved margins, 1–2 mm wide; glumes glandular upwards, at times puberulous; nutlets triquetrous with c. 16 vertical ridges or rows of epidermal cells on each face
36. F. paupercula
- 37a. Stamens 2; glumes 2–2.5 mm long, with broad white scarious hyaline margins, muticous with keel ending below apex; styles glabrous
19. F. falcata
- 37b. Stamens 3; glumes 3–5 mm long, without or narrowly scarious hyaline margins, distinctly mucronate or aristate; styles sparsely to densely hairy or villous at top 38
- 38a. Glumes appressed pubescent in upper half; styles densely pendent villous in upper half; anthers with bristly connective; nutlets napiform, 1–1.5 mm long, tricostulate with concave sides, etuberculate
3. F. amplocarpa
- 38b. Glumes glabrous; styles sparsely to densely hairy; anthers without bristly connective; nutlets obovoid, 0.7–1.2 mm long, non-costulate, smooth or verruculose or minutely tuberculate 39
- 39a. Inflorescence with numerous spikelets; spikelets mostly solitary, few clustered; styles sparsely hairy, at times glabrous; anthers 1–1.5 mm long, muticous at tip; nutlets verruculose
18. F. eragrostis
- 39b. Inflorescence with with 2–10 spikelets; spikelets mostly clustered, few solitary; styles densely hairy at top; anthers 1.5–2 mm long, acute or apiculate or distinctly appendiculate tipped; nutlets smooth or minutely tubercled 40
- 40a. Culms hairy; inflorescence simple umbel; involucre bracts 2 or 3; spikelets ovoid to obovoid, c. 2 mm wide; glumes c. 6 mm long, not aristate at apex; nutlets smooth
59. F. uliginosa
- 40b. Culms glabrous; inflorescence terminal and subterminal or psedolateral umbellate heads; involucre bracts 3–5; spikelets oblong-ellipsoid, 2–5 mm wide; glumes 0.6– 1.2 mm long aristate at apex; nutlets sparsely and minutely tubercled **26. F. matthewii**
- 41a. Stamen 1; glumes mucronulate; spikelets paired or in clusters of 3, hardly angular; nutlets with 4–6 vertical rows of epidermal cells
61. F. woodrowii
- 41b. Stamens 2 or 3; glumes usually muticous; spikelets mostly in pairs, angular; nutlets with 6–8 or several vertical rows of epidermal cells 42
- 42a. Nutlets densely covered with pluricellular tubercles, depressed at apex, crystalline with several regular vertical rows on each face, 0.6–0.7 mm long; glumes not inflated at nutlets; stamens 3; spikelets dark brown
12. F. crystallina
- 42b. Nutlets faintly tubercled without pluricellular outgrowths, rounded at apex, not crystalline, with 6–8 vertical rows on each face, 1.8–2 mm long; glumes inflated at nutlets (tumid); stamens 2; spikelets ferruginous or pale brown
58. F. tumida
- 43a. Glumes densely gland-dotted on back or within, mostly in upper half 44
- 43b. Glumes not gland-dotted 47

- 44a. Spikelets strongly flattened or compressed; styles 2.5–3 mm long, pyramidal base distinctly bristly; glumes distichous, linear-lanceolate, 3–4 mm long
8. F. cinnamometorum
- 44b. Spikelets not as above; styles under 2 mm long, not bristly at base; glumes spiral, ovate or ovate-oblong, 2.5–3 mm long. 45
- 45a. Annuals, stoloniferous; stolons up to 5 cm long, densely clothed by lanceolate striate scales
37. F. pierotii
- 45b. Perennials, non-stoloniferous 46
- 46a. Plants leafy; glumes distinctly mucronate; nutlets triquetrous, not rugose, with 12–16 vertical ridges on each face
39. F. pustulosa
- 46b. Plants leafless; glumes distinctly broad scarious margined, muticous; nutlets with flat faces, densely transversely rugose, with 8–12 vertical ridges on each face
43. F. rugosa
- 47a. Glumes distichous, at times upper ones spiral
32. F. narayanii
- 47b. Glumes all spiral 48
- 48a. Culms strongly compressed, ancipitus or 2-sided 49
- 48b. Culms not compressed, terete or angular, sometimes compressed trigonous (dipterous) 51
- 49a. Annuals; spikelets ovoid, 2–4 mm long; glumes c. 1 mm long; styles c. 0.5 mm long; nutlets 0.5–0.7 mm long
27. F. microcarya
- 49b. Perennials with stout rhizome; spikelets elliptical to oblong-oblancoate or ovate-lanceolate, 4–10 mm long; glumes 2–4 mm long; styles 1–2.3 mm long; nutlets 0.7–1.4 mm long 50
- 50a. Leaves 3–5 mm wide; culms 3–4 mm wide; sheaths laterally compressed, acute on the back; glumes 2–2.8 mm long, mucronate; styles 1–1.3 mm long; nutlets 0.5–0.7 mm long, sparsely to densely verruculose
9. F. complanata
- 50b. Leaves 2–2.5 mm wide; culms 1–1.5 mm wide; sheaths laterally compressed, rounded on the back; glumes 2.5–4 mm long, blunt or muticous with keel ending below the apex; styles 1.7–2.3 mm long; nutlets 1–1.4 mm long, smooth
10. F. consaguinea
- 51a. Cauline leaves reduced to bladeless sheaths; leaves of sterile leafy-shoot present or absent. 52
- 51b. Cauline leaves well developed 56
- 52a. Stigmas very long, c. 3.5 mm long, almost twice longer than styles; inflorescence of 3–5 spikelets; spikelets ovate-lanceolate, 2.5–3.3 mm wide; glumes 3.5–4 mm long; nutlet triquetrous, tricostulate, non-verruculose, 1.4–1.6 mm long
25. F. longistigmata
- 52b. Stigmas up to 2 mm long, smaller than styles; inflorescence of numerous spikelets; spikelets globose or subglobose, 1.5–3 mm wide; glumes 1–2.5 (3) mm long; nutlet trigonous to globosely trigonous, often verruculose, 0.5–1.2 mm long 53
- 53a. Culms subflattened-tetrapterous; leaf sheaths and sterile leaf-blades laterally compressed; leaf-blades equitant, falcate, without prominent midrib, acute on the back; rachilla wingless; glumes obtuse, muticous
28. F. miliacea
- 53b. Culms 5-angular; leaf sheaths rounded or subacute on the back; leaf-blades when present normal, dorsiventrally compressed, not equitant, with prominent midrib and thick or ribbed margins; rachilla more or less winged; glumes acutish, mucronulate. 54
- 54a. Plants leafless, sterile leaf-shoots absent; culms uniseriate on rhizome, close together, prominently 4 or 5-angled; glumes 2–3 mm long; stamens usually 3; nutlets smooth or sparsely verruculose
44. F. salbundia

- 54b. Plants leafy, sterile leaf-shoots present; culms not arranged above; glumes 1–1.5 mm long; stamens 1 or 2; nutlets minutely tubercled or verruculose 55
- 55a. Annuals or biennials; spikelets angular, 1–1.5 mm wide, rusty or yellowish brown; glumes strongly keeled, shortly but distinctly mucornate, acutish; stamens usually 1; styles 0.5 mm long **40. F. quinquangularis**
- 55b. Perennials with short, woody rhizome; spikelets terete, 1.5–2.5 mm wide, brownish to dark brownish; glumes faintly keeled, mucinous, obtuse; stamens 1 or 2; styles c. 1 mm long **4. F. aphylla**
- 56a. Perennials, 25–70 cm high; leaves 2–4 mm wide 57
- 56b. Annuals or slender short lived perennials with short rhizome, 10–40 cm high; leaves 0.3–1.5 mm wide or culms and leaves filiform or capillary 59
- 57a. Spikelets cylindrical, contorted; glumes c. 2.5 mm long; styles not winged **11. F. contorta**
- 57b. Spikelets lanceolate, ellipsoid, oblong, not contorted; glumes 3.5–7 mm long; styles winged 58
- 58a. Spikelets lanceolate, 12–15 mm long; Involucral bracts 2 or 3; glumes glabrous, acuminate at apex; anthers not ciliate, filaments not winged; nutlets obdeltoid-obovate, deeply furrowed on each side or almost 3-lobed **21. F. insignis**
- 58b. Spikelets ellipsoid, oblong, 4–8 mm long; involucral bracts 3–5, rarely 8; glumes minutely and scatteredly scaberulous on upper surface, aristate at apex; anthers 2–8 ciliate hairy at apex; filaments broadly winged, rarely reddish glandular at base; nutlets obovoid **60. F. velliangiriensis**
- 59a. Glumes densely strigose almost throughout; inflorescence compound, with 20–40 spikelets; involucral bracts filiform; styles densely fimbriately villous throughout **51. F. strigosa**
- 59b. Glumes glabrous or glandular pubescent in upper half; inflorescence simple, with 3–6, rarely up to 15 spikelets; involucral bracts setiform; styles glabrous throughout 60
- 60a. Stamens 3; leaves as long as culms; glumes ovate to deltoid ovate, 2–2.8 mm long; styles 1.3–1.5 mm long; nutlets 0.7–0.8 mm long **30. F. monticola**
- 60b. Stamens 1 (2); leaves ½ to as long as culm; glumes broadly ovate, 1.6–2.5 mm long; styles up to 1 mm long; nutlets 0.5–0.6 mm long **3. F. tenera**

1. Fimbristylis aestivalis (Retz.) Vahl, Enum. Pl. Obs. 2: 288. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 637. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1751. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1419. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:165. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 277. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 357. 2021. *Scirpus aestivalis* Retz., Observ. Bot. 4: 12. 1786.

Densely tufted, non-rhizomatous annuals. Culms trigonous, 5–12 cm high, smooth. Leaves few, basal, 3–8 cm long, 0.5–1 mm wide, much shorter than culm, acuminate at apex, margins incurved, sparsely pilose on both surfaces; ligule absent; sheaths 5–15 mm long, compressed, keeled, densely pubescent, light brown.

Inflorescence a compound corymb, subulose, 2–4 cm wide. Involucral bracts 2–4, filiform, the longest up to 7 cm long; rays 3–7. Spikelets solitary, oblong, subterete, 2.5–6 × 1–1.5 mm, acute at apex, greenish-brown, densely 10–40-flowered. Glumes spiral, ovate, c. 1 × 0.7 mm, membranous, keeled, keel green, 3-nerved, excurrent to straight or recurved cusp, yellowish-brown. Stamen 1; anther oblong. Style linear, 0.3–0.7 mm long, flat, fimbriate at above, pyramidally thickened, pubescent at base; stigmas 2, 0.3–0.4 mm long. Nutlets suborbicular obovate, c. 0.5 mm long, biconvex, rounded at apex, stipitate at cuneate base, yellowish.

Fl. & Fr.: Jan. – Apr.

Habitat: Open scrub forests, grasslands and also in marshy areas, along streams and ponds.

Distrib.: Tamil Nadu (Dindigul, Madurai, Nilgiri and Tirunelveli). Throughout India. Asia and Australia.

2. *Fimbristylis aggregata* C.E.C. Fisch. in Bull. Misc. Inform. Kew 1931: 44. 1931 & in Gamble, Fl. Madras:1660 (1152). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:167. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 277. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 357. 2021.

Tufted annuals; roots fibrous. Culms compressed, trigonous, 5–15 cm high, glabrous. Leaves basal, shorter or exceeding the inflorescence, linear, 3–10 cm × 5–8 mm, flat, margins involute; ligule absent; sheaths laterally compressed, 5 – 12 mm long, straw coloured, mouth oblique, membranous with dark brownish spots. Inflorescence compound, terminal, capitate head of globose to subglobose with few to many spikelets, 1–2 cm wide. Involucral bracts 2–5, much longer than inflorescence, largest one up to 9 cm long, c. 0.5 mm wide. Spikelets sessile, oblong to cylindrical, 3–6 × 1–1.5 mm, acute at apex, brownish, more or less angular, densely many flowered; rachilla narrowly winged. Glumes spiral, broadly ovate, 1–1.2 mm long, concave, acute at apex, keeled, 3-nerved, glabrous, eglandular, without hyaline margins. Stamen 1; anther oblong, c. 0.5 mm long; filament flat. Ovary oblong, c. 0.4 mm long; style linear, c. 1 mm long, thickened at base, sparsely ciliate at apex; stigmas 2, c. 0.5 mm long. Nutlet obovoid, c. 0.5 mm long, trigonous with 7–11 vertical ridges or rows of epidermal cells on each face, yellowish.

Fl. & Fr.: Throughout the year.

Habitat: Evergreen Forests. Wet slopes and grasslands at high elevations and restricted to hills.

Distrib.: Tamil Nadu (Coimbatore (Anamalai hills)). **Endemic** to South India (Tamil Nadu & Kerala).

3. *Fimbristylis amplocarpa* Govind. in Proc. Indian Acad. Sci. 80 B: 41. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:168. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 357. 2021.

Tufted, rhizomatous perennials; rhizome stout. Culms more or less 4 or 5-angled, 25–50 cm long, 0.6–0.9 mm, distinct scabrid in upper half, tuberous at base, scabrid. Leaves basal, shorter than culms, 10–20 × 0.1–0.13 cm, flat or concave with thickened margin, eligulate, glabrous; sheaths all lamineferous, glabrous. Inflorescence simple to compound, consists of 3–9 spikelets, lax, patent, umbelliform, 2–4 cm across. Involucral bracts ovate-lanceolate at base, longer or shorter than inflorescence, 1.0–3.5 cm long. Spikelets solitary, rarely 2 or 3 clustered, ovoid-ellipsoid, 5–7 × 2.5–3 mm, subacute-obtuse, terete, castaneous, fucus brown, many flowered; rachilla winged. Glumes broadly ovate, 3–3.5 × 2.8–3 mm, acute-obtuse, mucronate, narrowly scarious margined with 2 or 3 nerves on each side, distinctly ciliate in the margin, appressed pubescent in upper half, somewhat glandular; keel distinct, 5-nerved, sides nerveless, mucro recurved, 0.1–0.2 mm long. Stamens 3; anthers linear, 1.5–1.8 (2.5) mm long, with bristly connective. Style 3-fid, triquetrous with dilated pyramidal base, densely pendent villous in upper half, glabrous below, 2–3 mm long. Nutlets napiform, 1–1.5 × 0.9–1.3 mm, trigonous, truncate at apex, non umbonulate, stipitate, tricostulate with concave sides, etuberculate, outer cells in upper half many, distinct, shortly hexagonal, reticulate in each face.

Fl. & Fr.: Oct. – Nov.

Habitat: Wet open grass lands. Rare.

Distrib.: Tamil Nadu (Coimbatore and Dindigul ,Madurai). **Endemic** to Tamil Nadu.

4. *Fimbristylis aphylla* Steud., Syn. Pl. Glumac. 2: 114. 1855; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 50. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:170. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 357. 2021. *F. quinquangularis* (Vahl) Kunth var. *crassa* C.B. Clarke in Hook.f., Fl. Brit. India 6: 644. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1659 (1151). 1931.

Tufted perennials; rhizome short, woody. Culms 60–90 cm high, 1.5–3 mm thick, acutely 4 or 5-angled, gradually narrowed towards apex. Sterile shoot leaves well developed, 2–3 mm broad, midnerve prominent, scabrid, margins folded towards above. Fertile culm leaves reduced to bladeless sheaths, 3 or 4 in number,

rounded, from base to half length of culm, very rarely short bladed. Inflorescence compound to decompound umbel, c. 7 × 10 cm, loose with many of 60–80 spikelets, globose. Involucral bracts up to 8, filiform, up to 2 cm long; rays many, spreading. Spikelets solitary, terete, ovoid to ellipsoid, 2.5–4 × 1.5–2.5 mm, acute at apex, mostly pedicelled, brownish to dark brownish. Glumes spiral, c. 2.2 × 1.7 mm, membranous, mucicous, obtuse at apex, faintly keeled, 3-nerved, reddish-brown. Stamens 1 or 2; anthers linear-oblong, acute at apex; filaments flat, hyaline. Ovary oblong, c. 0.3 mm long, elongate, stipitate; style trigonous, c. 1 mm long, ciliate towards base, slightly thickened towards base; stigmas 3, c. 1.8 mm long, ciliate. Nutlets obovate, c. 0.5 × 0.3 mm, trigonous, trabeculate, minutely tubercled; epidermal cells transversely linear.

Fl. & Fr.: May – Nov.

Habitat: Marshy areas, near paddy fields and swampy grass lands.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). South, North and NW India. Asia and Africa.

5. *Fimbristylis argentea* (Rottb.) Vahl, Enum. Pl. Obs. 2:294. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 640. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1659 (1151). 1931; Chandrab. & N.C. Nair, Fl. Coimbatore:320. 1988; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1752. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51.1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1419. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:171. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 357. 2021. *Scirpus argenteus* Rottb., Descr. Icon. Rar. Pl.:51. t. 17, f. 6. 1773.

Tufted annuals; roots fibrous. Culms compressed, trigonous, 5–15 cm high, glabrous. Leaves basal, shorter or exceeding the inflorescence, linear, 3–10 cm × 0.5–0.8 mm, linear, flat, margins involute; ligule absent; sheaths laterally compressed, 5–12 mm long, straw coloured, mouth oblique, membranous with dark brownish spots. Inflorescence compound, terminal, capitate head of globose to subglobose with few to many spikelets, 1–2 cm wide. Involucral bracts 2–4, much longer than inflorescence, largest one up to 9 cm long, c. 0.5 mm wide. Spikelets sessile, oblong to cylindrical, 3–6 × 1–1.5 mm, acute at apex, brownish; rachilla narrowly winged. Glumes spiral, ovate, 1–1.2 mm long, ovate, concave, acute at apex, keeled, 3-nerved, margins hyaline. Stamen 1; anther oblong, c. 0.5 mm long; filament flat. Ovary oblong, c. 0.4 mm long; style linear, c. 1 mm long, thickened at base, sparsely ciliate at apex; stigmas 2, c. 0.5 mm long. Nutlet obovoid, c. 0.5 mm long, obscurely vertically striate, biconvex, yellowish.

Fl. & Fr.: Nov. – Dec.

Habitat: Marshy areas, wet places, shady areas, edges of ponds, paddy fields, wet sandy open grass lands.

Distrib.: Tamil Nadu (Almost all districts). Western Peninsula, Central, North and Eastern India. South and Southeast Asia.

6. *Fimbristylis bisumbellata* (Forssk.) Bubani, *Dodecanthea*: 30. 1850; C.E.C. Fisch. in Gamble, *Fl. Madras*:1898 (1151). 1931; B.D. Sharma & al. in *Biol. Mem.* 2(1&2): 157. 1977; K.K.N. Nair & M.P. Nayar, *Fl. Courtallum* 2: 356. 1987; Chandrab. & N.C. Nair, *Fl. Coimbatore*: 321. 1988; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2): 1752. 1983; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 77. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 51. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1419. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*:173. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 278. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 358. 2021. *Scirpus bisumbellatus* Forssk., *Fl. Aegypt. - Arab.*:15. 1775. *Fimbristylis dichotoma* sensu C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 635. 1893 p.p., non (L.) Vahl, 1809.

Tam.:*Kadu korai*

Tufted annuals, greyish-green. Culm erect, slender, triangular, 15–35 cm high, 0.5–1 mm thick, glabrous, striate. Leaves linear, sometimes falcate, flat, c. ½ to as long as culm, 12–35 cm long, 0.5–3 mm wide, obtuse, or abruptly acuminate at apex, glabrous to villous towards above, margins scabrid towards apex; ligule a compact fringe of hairs; sheaths open, chartaceous, villous in upper portions; lower sheaths bladeless, bicarinate, with scarious margins. Inflorescence usually a decompound corymb, 1–7 cm long, up to 5 cm wide, with 15–30 spikes, mostly solitary, occasionally a few sessile grouped together; peduncle grooved. Lowest involucrel bract usually longer than inflorescence, up to 15 cm long; primary rays up to 12, 1–3 cm long; secondary rays up to 4, minute to 3 cm long. Spikelets narrowly elliptic, 2.5–3.5 × 1.3–1.5 mm, more or less angular, acute at apex, light brownish to greyish-brown; rachilla brownish to dark brown, with scarious wings. Glumes spiral, ovate, 1.3–1.8 × c. 1 mm, glabrous, keeled, with prominent mid-nerve, arista conspicuous, margins scarious, faintly ciliate. Stamen 1, at times reduced; anther c. 1 mm long; filament scarious, compressed. Style brown, flat, c. 1 mm long, ciliate, stylopodium whitish, c. 0.25 × 0.25 mm, dilated at base; stigmas 2. Nutlet 0.4–0.8 × 0.4–0.7 mm, lenticular, biconvex, widely obovoid, smoothly trabeculate with 4–6 vertical ridges, in between fine epidermal cells in each face, yellowish to almost white.

Fl. & Fr.: Nov. – Jul.

Habitat: River banks, edges of banks, moist and sandy grasslands, common in paddy fields and often at road sides.

Distrib.: Tamil Nadu (Almost all districts). Throughout India. Paletropics.

7. *Fimbristylis carpopoda* Govind. in Proc. Ind. Acad. Sci. 79, 4: 160. 1974; Yarrayya & al. in Indian. J. Pl. Sci. 4 (4) : 57. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020.

Tufted perennials; roots fibrous. Culms erect, 30–40 cm high, trigonous, flattened below inflorescence, glabrous, smooth. Leaves basal, few to several; blades linear, 15–20 cm long, 2–3 mm wide, flat, glabrous; ligule a fringe of short hairs; sheaths 3–4 cm long, brownish, margins membranous. Inflorescence compound umbel, 3–4 × 2–4 cm, loose. Involucral bracts 5, erect, longer than inflorescence, hirsute hairy at dilated base; rays in simple cymes. Spikelets solitary, ovate, 5–6 × 2–3 mm, acute, reddish-brown; rachilla winged. Glumes spiral; basal 2 glumes empty, broadly ovate to rounded, broader than long, 3–3.5 × c. 3.2 mm, dark brown, keel indistinct, 1-nerved, nerve projecting into mucro of 0.1–0.2 mm long, sides 15–17-nerved, margins scarious in upper half. Stamens 2; anthers 0.5–0.6 mm long. Style linear, 0.8–1 mm long, flat, not thickened at base, densely hairy; stigmas 2, 0.5–0.8 mm long, ciliate. Nutlet obovoid, biconvex, 1.5–1.8 × c. 1.1 mm, yellowish, broadly stipitate, stipe spongy, 0.4–0.5 mm long, outer cells in 18–20 rows on each side.

Fl. & Fr.: Apr. – Jun.

Habitat: Marshy areas in grasslands and along canals.

Distrib.: Tamil Nadu (Dharmapuri). South and Northeast India. **Endemic** to India.

8. *Fimbristylis cinnamometorum* (Vahl) Kunth, Enum. Pl. 2: 229. 1837; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1753. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1419. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:176. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021. *Scirpus cinnamometorum* Vahl, Enum. Pl. Obs. 2: 278. 1805. *Fimbristylis cyperoides* R. Br., Prodr. Fl. Nov. Holland.:228. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 650. 1893. *Abildgaardia cinnamometorum* (Vahl) Thwaites, Enum. Pl. Zeyl.: 347. 1864. *Fimbristylis cyperoides* R. Br. var. *cinnamometorum* (Vahl) C.B. Clarke in Hook.f., Fl. Brit. India 6: 650. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 438. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1659 (1151). 1931; Fyson, Fl. S. Ind. Hill Sta.: 640. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2):157. 1977.

Tufted, rhizomatous perennials; rhizome short, woody. Culms very slender, erect, 20–50 cm high, semiterete or 3-sided, striate. Leaves many, filiform, 5–40 cm long, c. 0.5 mm wide, semiterete or canaliculated and folded, margins involute, subacute, 2-ranked; ligule absent; sheaths 2–9 cm long, membranous, hyaline, mouth oblique. Inflorescence compound, 3–8 cm long and as broad. Involucral bracts 2–4, filiform, from shorter to exceeding inflorescence, lowest bract leafy, up to 7 cm

long; rays 4–7. Spikelets solitary, oblong to lanceolate, 4–7 × 1–1.5 mm, strongly flattened, acute, sessile or pedicellate, reddish-brown, bearing up to 8 flowered. Glumes distichous, basal ones smaller, narrowly ovate, empty; fertile glumes linear-lanceolate, 3–4 × 1–1.5 mm, boat shaped, keeled, hardly reaching the glume apex, 3-nerved, densely reddish gland dotted, light brown. Stamens 3; anthers linear, 1.8–2 mm long, connective distinctly produced. Style 2.5–3 mm long, pyramidal at base, distinctly bristly; stigmas 3. Nutlet ellipsoid to obovate, obtusely trigonous, up to 1 × c. 0.5 mm, shortly stipitate, tuberculate, cream-white, verruculose, transversely lineolate on each side by linear-oblong epidermal cells.

Fl. & Fr.: Sep. – Oct.

Habitat: Wetlands, muddy grass patches and swamps.

Distrib.: Tamil Nadu (Chengalpattu, Dindigul Madurai and Tirunelveli). Western Peninsular, Central and Northeast India. South and Southeast Asia.

9. *Fimbristylis complanata* (Retz.) Link, Hort. Berol. 1:292. 1827; C.B. Clarke in Hook.f., Fl. Brit. India 6: 646. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659 (1151). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1753. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 356. 1987; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1420. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:177. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 278. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021. *Scirpus complanatus* Retz., Observ. Bot. 5: 14. 1788. *Trichelostylis complanata* (Retz.) Nees in Wight, Contr. Bot. India:103. 1834.

Tufted, rhizomatous perennials; rhizome short, horizontal or ascending, with tillers. Culm strongly compressed, 4 angled towards base, 30–75 cm high, 3–4 mm thick, grooved, papillose. Leaves up to 40 cm long, up to ½ of culm; blades flat, 3–5 mm wide, soft, flexuous, greyish-green, many nerved, papillae between nerves, margins scabrous towards apex; ligule a fringe of hairs, c. 0.3 mm long; sheaths up to 7 cm long, laterally compressed, yellowish-green, lowest sheath bladeless, mouth deeply oblique, acute on the back. Inflorescence a decompound umbel, 5–12 × 3–8 cm, bearing 100 to more than 200 spikelets. Involucral bracts 4 or 5, lowest bract leafy, up to 15 cm long, exceeding the inflorescence, others shorter than inflorescence; primary rays many, 2–8 cm long, compressed, deeply grooved, scabrous; secondary umbel to 2 × 4 cm; secondary rays several, to 15 mm long, compressed, scabrous; tertiary umbel to 15 × 15 mm, with 3–7 tertiary rays up to 5 mm long. Spikelets lanceolate or ovate-lanceolate, 4–10 × 1.5–2 mm, 10–30 flowered, brownish. Glumes spiral, 2–2.8 × c. 1.5 mm, acute at apex, keeled, brown, mid-nerve smooth or scabrous, excurrent to mucro, sides nerveless, brown, scarious. Stamens 3; anthers c. 1 mm long, linear-oblong; filaments flat, up to 2 mm long. Styles 1–1.3 mm long; stigmas 3, as long

as style. Nutlet trigonous, obovate, 0.5–0.7 × 0.4–0.5 mm, reticulate, tuberculate, whitish with small brownish stipe, minute epidermal cells in many rows, sparsely to densely verruculose.

Fl. & Fr.: May – Mar.

Habitat: Rice fields, swampy areas, muddy grasslands, river banks.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul (Madurai), Nilgiri, Salem, Tiruchirappalli and Tirunelveli). Throughout India. Pantropics.

10. *Fimbristylis consaguinea* Kunth, Enum. Pl. 2: 228. 1837; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 178. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 279. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021. *F. complanata* var. *kraussiana* C.B. Clarke in Hook.f., Fl. Brit. India 6: 646. 1893.

Tufted, rhizomatous perennials, often forming a large clump; rhizome slender, horizontal, covered with pale brownish scales. Culms closely disposed in a row along rhizome, strongly compressed, erect from obliquely ascending base, slender, 15–55 cm high, 1–1.5 mm thick, trigonous, smooth, glabrous, glaucous-green. Leaves linear, shorter than culm, to 14 cm long, 2–2.5 mm wide, rounded on the back, abruptly acuminate at apex, slightly thickened on margins, hairy; cauline leaves usually with reduced blades; ligule a fringe of short whitish hairs; sheath cylindrical, up to 10 cm long, lower sheaths bladeless, 2–4 cm long, cataphylloid, lightly cinnamon-brown. Inflorescence simple or subcompound umbel, 1–2.5 cm long and as wide, subdensely bearing 3 to 20 spikelets. Involucral bracts 1 or 2, elongated, the lowest bract leafy, 5–25 mm long, slightly shorter than to exceeding the corymb; rays 2–10 mm long. Spikelets solitary or nearly clustered, narrowly elliptical to oblong-oblong, 4–9 × 1.3–2 mm, subacute at both ends, brownish to dark brown, subdensely many flowered. Glumes spirally imbricate, suberect, elliptic or ovate-oblong, 2.5–4 × 1.5–1.6 mm, blunt or muticous at apex, shallowly boat shaped with convex keel, faintly membranous, brown, finely 2 or 3-nerved on each side, margins hyaline, light brown to yellowish. Stamens 3; anthers linear-oblong, c. 0.7 mm long; filaments 1.2–1.5 mm long. Style slender, 1.7–2.3 mm long, glabrous, pyramidal at base; stigmas 3. Nutlet obovate, trigonous, 1–1.4 × 0.7–0.8 mm, rounded to mucronulate at apex, cuneate at base, pale yellowish at maturity, smooth, epidermal cells 10 to 15 rows on each side, transversely oblong.

Fl. & Fr.: Sep. – Jan.

Habitat: Marshy areas in grasslands and wet lands.

Distrib.: Tamil Nadu (Coimbatore and Tirunelveli). Southern Peninsular India. China, Madagascar, Malesia, South Africa and Sri Lanka.

11. *Fimbristylis contorta* C.E.C. Fisch. in Kew Bull. 1931: 45. 1931 & Gamble, Fl. Madras:1659 (1152). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:179. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 279. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021.

Rhizomatous perennials, robust; rhizome stout, woody. Culms 1 or 2, up to 70 cm high, terete. Leaves much shorter to as long as the culms, 20–50 × 0.3–0.4 cm, flat, scabulous, suddenly acute at apex. Inflorescence decompose. Involucral bracts 4 or 5, shorter than inflorescence, scabrid on margins; rays 6–8, terete or subcompressed up to 8.5 cm long, secondary rays up to 2.8 cm long. Spikelets cylindrical, contorted, 5–12.5 × 1.8–2 mm, terminal one often sessile; rachilla winged. Glumes broadly ovate, c. 2.5 mm long, subacute, pale reddish brown with broad hyaline margins, keeled. Stamens 3; anthers linear. Style 3-fid flat or trigonous, slender, c. 1.6 mm long, glabrous or hairy at top; stigma linear, hairy. Nutlet narrowly obovate, c. 1.1 mm long, trigonous, pale brown, minutely verruculose, not lobed, with transversely oblong epidermal cells.

Fl. & Fr.: Sep. – Jan.

Habitat: Marshy areas.

Distrib.: Tamil Nadu (Tirunelveli). **Endemic** to Tamil Nadu.

12. *Fimbristylis crystallina* Govind. in Proc. Indian Acad. Sci. 79 B: 166. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:179. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 279. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021.

Annuals. Culms slender, 3 or 5-angled, 10–20 cm × 0.3–0.8 mm, leafy at base, glabrous. Leaves basal, erect, nearly as long as culm, 1–1.5 mm wide, flat with smooth margin, ligulate, glabrous; sheaths ferruginous brown, glabrous. Inflorescence simple or compound, contracted, consists of 10–25 spikelets, subumbelliform, 1.5–2.5 (3) × 1–1.5 (2). Involucral bracts leafy, narrow, smooth, always shorter than inflorescence. Primary rays 2–4, angular, smooth, 1–2 cm long. Spikelets usually paired, sometimes solitary, sessile or peduncled, narrowly ovoid-elliptic, 3–3.5 (-8) × 1–1.2 mm, erect, acute, always conspicuously angular by the keels, 6–8 flowered, dark brown. Glumes narrowly ovate or cymbiform, 1.75–2 × 1–1.2 mm, compact, muticous, shining with nerveless and depressed sides, glabrous with broad scarious margins; keel very prominent, apparently 1-nerved; rachis raggedly winged. Stamens 3; anthers oblong, 0.5 mm long, apiculate. Style 3-fid, 0.75–8 mm long, glabrous with pyramidal base. Nutlets turbinate, triquetrous, 0.6–0.7 ×

0.2–0.3 mm, slightly asymmetrical, distinctly tricostrate, densely covered with pluricellular tubercles, white yellow, crystalline, stipitate, umbonulate, depressed at apex; outer cells in upper half indistinct, shortly hexagonal-isodimetric, arranged in several regular vertical rows on each face, apparently vertically lineolate.

Fl. & Fr.: Sep. – Jan.

Habitat: Marshy areas.

Distrib.: Tamil Nadu (Coimbatore). **Endemic** to Tamil Nadu.

13. *Fimbristylis cymosa* R.Br. var. ***spathacea*** (Roth) T. Koyama in J. Jap. Bot. 46: 66. 1971. *F. spathacea* Roth, Nov. Pl. Sp.: 24. 1821; C.B. Clarke in Hook.f., Fl. Brit. India 6: 640. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1659 (1151). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1754. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 321. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989. *F. cymosa* R. Br. subsp. *spathacea* (Roth) T. Koyama in Micronesica 1: 83. 1964; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:180. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 358. 2021.

Short rhizomatous perennial. Culms tufted, 10–40 (60) cm high, subterete to triangular, 1–2 mm thick, deeply grooved, smooth, basal part covered with dried sheaths and remnants. Leaves stiff, rosette, 6–18 cm × 1–2 mm, less than ½ of culm, slightly turgid, falcate, involute or flat, margins scabrid towards apex; ligule absent; sheaths 1–2.5 cm, pale brown, glossy, margins scarios, disintegrated into dusky brownish fibres. Inflorescence simple or compound corymb, compact or diffuse; spikes 10 or more, solitary in elongate peduncles, at times spikes sessile and clustered. Involucral bracts 1–4, usually shorter than inflorescence, margins scabrous; rays compressed, triangular to terete. Spikelets ovoid, 2–5 × 1–2.5 mm, more or less terete, greyish-brown to dark brownish; rachis articulate, wings prominent, brownish or colourless. Glumes spirally imbricate, ovate to broadly ovate, 1–1.5 × 0.5–0.7 mm, obtuse at apex, keeled, 3–5 nerved, brownish with hyaline margins. Stamens 2; anthers c. 0.7 mm long. Style c. 0.8 mm, brown; stigmas 2 (or 3), 0.4–0.5 mm long, ciliate. Nutlets ovoid, c. 0.8 × 0.6 mm, thickly biconvex, smooth, lenticular, granulated, verruculose, dark brownish, chestnut black at maturity.

Fl. & Fr.: Jun. – Feb.

Habitat: Marshy and open grasslands, deciduous forests, near seashores and often at sea coast.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Cuddalore, Dindigul, Madurai, Ranipettai, Thanjavur, Tiruchirappalli, Thiruvanamalai, Vellore and Villupuram). Andaman & Nicobar Islands, Southern Peninsular India and East India. Pantropics.

14. *Fimbristylis dichotoma* (L.) Vahl, Enum. Pl. Obs. 2: 287. 1805; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1151). 1931; Fyson, Fl. S. Ind. Hill Sta.: 639. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 77. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 182. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 279. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 359. 2021. *Scirpus dichotomous* L., Sp. Pl.: 50. 1753. *Fimbristylis diphylla* (Retz.) Vahl, Enum. Pl. Obs. 2: 289. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 636. 1893. *Scirpus diphyllus* Retz., Observ. Bot. 5: 15. 1788.

Tufted perennials; rhizome short or reduced. Culms up to 70 cm high, c. 2.5 mm thick, trigonous, rigid. Leaves 10–30 cm long, as long as or shorter than culm, canaliculate, rarely flat, acute at apex, scabrid, margins more or less incurved; ligule a fringe of hairs; sheaths rusty or pinkish. Inflorescence simple to decompose, 5–12 cm long, 1–10 cm wide. Involucral bracts 3–7, the lowest 1 or 2 leafy, up to 12 cm long; primary rays 3–5, 4–11 cm long, glabrous or pilose; secondary rays 3. Spikelet usually solitary, rarely in clusters of 2–10, ovoid, oblong-ovoid, 3–8 × 2.5–3 mm, acute at apex; rachilla winged. Glumes spiral, suberect, broadly ovate to suborbicular, 1.2–2.5 mm long, membranous, reddish-brown, glabrous, mucronulate, keel 3-nerved, sides hyaline, 3-nerved. Stamens 2, occasionally 1; anthers linear, c. 1 mm long; filaments up to 2 mm long. Style 2-fid, c. 1.5 mm long, narrowed towards apex, dilated at base, basally glabrous; stigmas 2, ciliate. Nutlet obovoid, biconvex, 0.8–1.1 mm long, glossy, umbonulate, stipitate, coarsely tuberculate with 5–11 vertical series of transversely large oblong epidermal cells in each face.

Key to subspecies

- 1a. Nutlet cancellated by 5–11 vertical series of transversely oblong epidermal cells
14.1. subsp. *dichotoma*
 1b. Nutlet cancellated by 15–24 rows of transversely oblong hexagonal epidermal cells
14.2. subsp. *podocarpa*

14.1. subsp. *dichotoma*

Fl. & Fr.: Throughout the year.

Habitat: Swampy grasslands and open wetlands.

Distrib.: Tamil Nadu (Almost all districts). Throughout India. Pantropics.

14.2. subsp. *podocarpa* (Nees) T. Koyama in Micronesica 1: 87. 1964 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 310. 1985; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1755. 1983; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1420. 1999; Pallith., Pock. Fl. Sirumalai Hills: 270. 2001; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 359. 2021. *Fimbristylis podocarpa* Nees in Wight, Contr. Bot. India: 98. 1834. *F. tomentosa* Vahl, Enum. Pl. Obs. 2: 290. 1805. *F. diphylla* Vahl var. *pluristriata* C.B. Clarke in Hook.f., Fl. Brit. India 6: 637. 1893.

Tufted, non-rhizomatous perennial. Culms erect, trigonous, compressed, up to 50 cm high. Leaves basal, linear, 10–45 cm × 2–4 mm, half to longer than culm, flat, obtuse at apex, pubescent, margins more or less incurved; ligule a fringe of dense white hairs; sheaths 2–3 cm long, compressed. Inflorescence simple to compound umbel, 1.5–3 cm long, 1.3–2.5 cm wide. Involucral bracts 2–5, pubescent, many nerved, lower bract leafy, up to 15 cm long, exceeding the inflorescence; secondary rays up to 3 cm long with linear bracts. Spikelets solitary, ovoid, 4–8 × 2.5–4 mm, acute at apex, brown. Glumes spiral, ovate, 1.5–2 × 1–1.5 mm, mucronate. Stamen 1; anther 0.4–0.7 mm long. Style gradually tapering from base to apex; stigmas 2, 0.5–1 mm long. Nutlet obovate, biconvex, c. 1 × 1 mm, cancellated by 15–24 rows of transversely oblong hexagonal epidermal cells.

Fl. & Fr.: Mar. – Nov.

Habitat: Marshy areas and grasslands.

Distrib.: Tamil Nadu (Dindigul, Madurai, Ranipet, Salem, Tirupattur Tiruvannamalai, and Vellore. South China and Indo-Malesia.

15. *Fimbristylis dipsacea* (Rottb.) C.B. Clarke in Hook.f., Fl. Brit. India 6: 635. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1151). 1931; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 356. 1987; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1755. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 52. 1989; Wad. Khan, Cyperaceae Western Ghats, W. Coast & Maharashtra: 190. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 279. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 359. 2021. *Scirpus dipsaceus* Rottb., Descr. Icon. Rar. Pl.: 56. t. 12, f. 1. 1773.

Tufted annuals with fibrous roots. Culms trigonous, 3–10 cm high, slender, glabrous. Leaves few, 1–3.5 cm long, narrowly linear to setaceous, subacute at apex; ligule absent; sheath very small, 8–10 mm long, compressed, keeled on back, mouth truncate, lower sheaths bladeless. Inflorescence usually a simple umbel, lax. Involucral bracts 4 or 5, erect, unequal, filiform, up to 8 mm long; rays ending with solitary subglobose or oblong spikelets. Spikelets squarrose, 4–7 × 3–3.5 mm, densely many flowered; rachilla narrowly winged. Glumes spiral, oblong, c. 2 mm long (incl. awn), strongly keeled, keel 3-nerved, projecting beyond the glume apex forming c. 1 mm long awn, margins scarios. Stamen 1; anther oblong, c. 0.5 mm long, apiculate at apex; filament elongate, up to 1.5 mm long. Style linear, dilated at base, wholly glabrous; stigmas 2, longer than style. Nutlet oblong to obtuse, c. 0.6 mm long, biconvex, subterete, brownish, cleavage appendages on both margins, caducous, stipe minute, narrow; epidermal cells minute, transversely oblong.

Fl. & Fr.: Apr. – May.

Habitat: Marshy open grasslands and muddy places.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Salem, Thanjavur and Tirunelveli). Western Peninsular India, Central India, North India and NE India. Indo-China, Malesia, Myanmar and Sri Lanka.

16. *Fimbristylis doliiformis* Govind. in *Rheedea* 8 (1): 89. f. 2. 1998; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 191. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 279. 2020

Annuals. Culms obtusely trigonous, 3–10 cm high, 0.5–1 mm wide, smooth. Leaves shorter than culms, 3–7 × 0.07–0.1 cm, flat or canaliculate, abruptly acute to acuminate, eligulate, glabrous; sheaths pale brown, glabrous. Inflorescence capitate, consists of 2–4 (5) spikelets, 1–1.5 × 0.5–1 mm. Involucral bracts leafy, 2 or 3, overtopping the inflorescence, 1–2 cm long. Spikelets doliiformis, 1–2 cm long, cinnamomeous or castaneous brown, clustered, sessile, terete, 14–16 (–20) flowered. Glumes spiral, broadly elliptic or suborbicular, 1.2–1.3 × 0.7–0.8 mm, abruptly ending in conical apex, coriaceous without hyaline margins, castaneous or cinnamomeous brown, slightly keeled; keel 3-nerved; rachis narrowly winged or almost wingless. Stamen 1; anthers 0.25–3 mm long. Style bifid, filiform, 0.6–0.7 mm long, slender, flat, glabrous except sparsely hairy behind bifurcation, abruptly dilated with cupular base. Nutlet orbiculoid or suborbiculoid, 0.4–0.5 × 0.3–0.4 mm, stramineous or brownish, translucent, umbonulate, distinctly stipitate, biconvex with uniformly thickened margin, shining, smooth; stipe 0.1 mm long; obscurely reticulate by transversely elongated, oblong epidermal cells.

Fl. & Fr.: Sep. – Nov.

Habitat: Semi-wet lands.

Distrib.: Tamil Nadu (Tiruchirappalli). **Endemic** to Tamil Nadu.

17. *Fimbristylis eligulata* Govind. in *Proc. Indian Acad. Sci.* 76 B: 184. 1972; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 78. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 52. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 192. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 279. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 359. 2021.

Rhizomatous Perennials; rhizome stout. Culms 5–30 cm high, 1–1.4 mm thick, smooth. Leaves eligulate, basal, shorter to as long as culms, 1–2.5 mm wide, glabrous or hairy, sometimes curved; sheaths glabrous with ferruginous margins. Inflorescence simple to compound, consists of 10–20 spikelets, 1–3 cm long and broad. Involucral bracts setiform, much shorter than inflorescence, 5–15 mm long. Spikelets all solitary, ovoid, 5–6 × 2–3 mm, many flowered, dark to chestnut brown finally becoming pale; rachis wingless. Glumes ovate, subacute, 2–2.2 × 1.3–1.5 mm, mucous, sides nerveless or invisibly 1 or 2-nerved, broadly hyaline margined,

keeled; keel 5-nerved. Stamen 3; anthers linear, 0.7–0.8mm long, muticous. Style bifid, very slender or almost as wide as the staminal filaments, 0.7–0.9 mm long, distinctly pyramidally dilated at base, hairy in upper half. Nutlet obovoid, biconvex, 0.5–0.7 × 0.4–0.5 mm, trabeculate, rounded to sometimes slightly depressed at apex, with 4–7 (–6–9) fine vertical ridges, in between transversely oblong minute epidermal cells, nut-base conspicuously wider than the narrow stipe with often few tubercles at base.

Fl. & Fr.: Sep. – Nov.

Habitat: Along the shores, sandy banks of the back waters and rivers, wet grasslands.

Distrib.: Tamil Nadu (Chengalpattu, Chennai, Ramanathpuram and Tiruchirappalli). Endemic to Tamil Nadu.

18. *Fimbristylis eragrostis* (Nees & Meyen) Hance in J. Linn. Soc., Bot. 13: 132. 1873; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1755. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 52. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1421. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:193. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 280. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 359. 2021. *Abildgaardia eragrostis* Nees & Meyen in Wight, Contr. Bot. India: 95. 1834. *Fimbristylis nigrobrunnea* Thwaites, C.B. Clarke in Hook.f., Fl. Brit. India 6: 648. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659 (1151). 1931.

Erect, rhizomatous perennials; rhizome woody, covered with dark brownish old leaf sheaths. Culms mostly solitary to tufted, tetragonous, 10–50 cm high, compressed. Leaves many, basal, rosette like, linear, 4–30 cm × 3–4 mm, usually subfalcate to falcate, obtuse or rounded and apiculate at apex, flat, subcoriaceous, scabrid on margins towards apex, lightly green; ligule absent; sheaths 2–4 cm long, yellowish-brown. Inflorescence simple to compound umbel, 3–6 cm long and as wide, spikelets numerous. Involucral bracts 3–5, unequal, 0.5–2 cm long, smaller than inflorescence; rays 2–6. Spikelets mostly solitary, few clustered, oblong or oblong-lanceolate, 0.5–1.8 × 0.2–0.4 cm, moderately laterally flattened, dark brown, bearing 8–25 flowered. Glumes distichous to subspiral, broadly ovate, 2.5–5 × 2–3 mm, chartaceous, subacute with mucronate apex, keeled, shiny, yellowish-brown. Stamens 3; anthers 1–1.5 mm long, muticous at tip. Style slender, glabrous or sparsely hairy, dilated at base, c. 3 mm long; stigmas 3. Nutlet broadly obovate, c. 1 × 0.7 mm, trigonous, rounded at apex, verruculose, light straw coloured.

Fl. & Fr.: Sep. – Oct.

Habitat: Grassy hill slopes and wet places.

Distrib.: Tamil Nadu (Coimbatore, Nilgiri, Salem and Tirunelveli). Andaman & Nicobar Islands, Peninsular India and NE India. Formosa, Hainan, Malesia, South China, Sri Lanka and tropical Australia.

19. *Fimbristylis falcata* (Vahl) Kunth, Enum. Pl. 2: 239. 1837; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1756. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 52. 1989; Pallith., Pock. Fl. Sirumalai Hills: 270. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 194. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 280. 2020; *Scirpus falcatus* Vahl, Enum. Pl. Obs. 2: 275. 1805. *Trichelostylis junciformis* Nees in Wight, Contr. Bot. India: 106. 1834. *Fimbristylis junciformis* (Nees) Kunth, Enum. Pl. 2: 239. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 647. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1660 (1152). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977. *F. falcata* (Vahl) Kunth var. *pseudolatifolia* W. Khan & Taur R.D. in Bioinfolet 6 (2): 106. 2009; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 196. 2015.

Perennials; rhizome 6–10 mm thick, woody, suberect, 3–7 cm long, covered with old leaf sheaths; roots fibrous, 0.3–1 mm thick, dark brown. Culms solitary, 10–30 cm high, 0.5–1 mm thick, 4 or 5-angled, smooth. Leaves many, rosette like, shorter than culms, usually at base, 6–25 cm long, blade falcate, many nerved, suddenly contracted at tip, mucronate at apex, glabrous; ligule absent; sheath rounded, closed, 0.5–2 cm long, lower sheaths subpersistent. Inflorescence compound to decomposed umbel, 2–11.5 cm long, 4–8 cm broad. Involucral bracts leafy, 3 or 4, filiform, up to 3.2 cm long, linear; primary rays 5–9, unequal, 1–7 cm long, angular, slender; secondary rays 3–7, 0.5–2.7 cm long, subterete; prophylls 3 or 4, 0.4–1 cm long. Spikelets single, paired or in clusters on raylets, ovoid, 2.5–4 mm long, 1–1.5 mm wide, subterete, acute at apex, contracted at base, many flowered; rachilla winged. Glumes spiral, ovate, 2–2.5 × 1.2–2 mm, mucous with keel ending below apex, keel convexed, with broad white scarious hyaline margins, glabrescent, 5–7-nerved at dorsal side, brownish. Stamens 2; anthers linear-oblong, c. 0.8 mm long, connective with short white bristle at tip; filaments flat, elongated, c. 2.8 mm long, hyaline. Ovary oblong, c. 0.5 mm long, stipitate; style triquetrous, 1.3–1.8 mm long, slender, glabrous, thickened at base; stigmas 3, up to 1 mm long. Nutlets trigonus, obovoid, 0.6–0.8 × 0.5–0.7 mm, stipitate, convex, subdensely verruculose, with transversely rectangular or isodiametric epidermal cells.

Fl. & Fr.: Jun. – Oct.

Habitat: Open grasslands on hills.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Tiruchirappalli and Tirunelveli). Throughout India. Indo-China, Malesia, Nepal, Pakistan, Sri Lanka and Thailand.

20. *Fimbristylis ferruginea* (L.) Vahl, Enum. Pl. Obs. 2: 291. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 638. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1151). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1756. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 52. 1989; Pallith., Pock. Fl. Sirumalai Hills:270. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:197. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 280. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021. *Scirpus ferrugineus* L., Sp. Pl.: 50. 1753.

Tufted perennials; rhizome horizontal, short, covered with brownish scales; roots fibrous, thick. Culms slender, angular, up to 80 cm high and c. 2 mm thick, rigid, striate, slender. Leaves radical, linear, 2–13 × 0.1–0.2 cm, shorter than culm, flat or folded, scabrid, gradually narrowed to acuminate towards apex; ligule a dense fringe of hairs; sheaths 2–10 cm long, loosely surrounding the culm, margins hyaline, dark brown, basal leaves cataphylloid. Inflorescence simple or subcompound umbel with 8–20 spikelets. Involucral bracts 2 or 3, up to 1.5 cm long, shorter than inflorescence, stiff. Spikelet solitary, ovoid or oblong, 0.7–1 cm, rusty brown; rachilla winged. Glumes spiral, obovate to orbicular, c. 4 × 3 mm, thick, sides nerveless, subacute to mucronulate at apex, keeled, keel 1-nerved, upper half densely brown or greyish tomentose beneath. Stamens 3; anthers linear, up to 2 mm long; filaments up to 2.5 mm long. Style flat, c. 3 mm long, ciliate, base dilated; stigmas 2, papillose. Nutlets obovoid, biconvex, c. 1 mm long, mucronate and slightly depressed at apex, stipitate, fulvous, glossy, smooth, umbonulate.

Fl. & Fr.: Jun. – Dec.

Habitat: Swampy grasslands, marshy places and in saline water logged areas.

Distrib.: Tamil Nadu (Almost all districts). Throughout India except Northeast India. China, Malesia, Japan and Sri Lanka.

21. *Fimbristylis insignis* Thwaites, Enum. Pl. Zeyl.: 349 & 433. 1864; C.B. Clarke in Hook.f., Fl. Brit. India 6: 645. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659 (1151). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 202. 2015.

Short rhizomatous perennials, robust; roots thick, rigid. Culms erect, tufted, trigonous or compressed, 30–60 cm high, 0.5–1.2 mm thick, smooth, glabrous. Leaves many, up to 1/3 length of culm; blades linear or nearly falcate, 5–18 cm × 2–4 mm, coriaceous, suddenly contracted at rounded apex, grass green beneath, whitish-green on upper surface, glabrous, margins incurved, scabrid; ligule absent; sheaths 1–2 cm long, pale brownish, ventral side hyaline, mouth obliquely truncate, margins ciliolate. Inflorescence simple to compound corymbs, 3–10 cm long, 3–5 cm wide, loose. Involucral bracts 2 or 3, 5–15 mm long, uppermost one with subulate, scabrous blade; rays 2 to 6, 1–5 cm long, very unequal, stiff,

compressed to trigonous, smooth, each bearing 1 to 4 spikelets. Spikelets solitary, lanceolate, terete, 12–15 × 3–4 mm, acute at both ends, brown, tightly many flowered. Glumes spirally imbricate, the lowest 2 to 4 empty and smaller than the rest; fertile glumes ovate, 5–7 × 2.5–3.5 mm, shallowly boat shaped, acuminate at apex, chartaceous, costa 1-nerved, yellowish, ending in a short subulate cusp, 0.5–0.7 mm long, orange-brown, slightly shiny, narrowly pale hyaline on upper margin. Stamens 3; anthers c. 2 mm long. Style 5–5.5 mm long, wing like edges fimbriate above the middle, hyaline margined, slightly pyramidal at base; stigmas 3, 1.5–2 mm long. Nutlet broadly obdeltoid-obovate, trigonous, 1–1.25 × 0.8–1 mm, subtruncate at apex, cuneate at base, deeply furrowed on each side or almost 3-lobed, whitish-brown at maturity, verruculose, inconspicuously cancellated with isodiametric epidermal cells, sometimes tuberculate.

Fl. & Fr.: Sep. – Nov.

Habitat: Marshy areas.

Distrib.: Tamil Nadu (Coimbatore (Anamalai hills)). South India (Kerala) and North West Himalaya. China and Indo-Malesia.

22. *Fimbristylis kingii* Gamble ex Boeckeler, Beitr. Cyper. 2: 40. 1890; C.B. Clarke in Hook.f., Fl. Brit. India 6: 633. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 437. 1915; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1150). 1931; Fyson, Fl. S. Ind. Hill Sta.: 638. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1757. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 78. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1421. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 204. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 281. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021.

Tufted, short rhizomatous perennials. Culms obtusely angled, 10–35 cm high, c. 1 mm thick, glabrous or shortly hairy. Leaves shorter to as long as culm, flat or rarely channelled, acute at apex, densely hairy; ligule absent; sheaths membranous. Inflorescence simple with terminal spikelet. Involucral bracts 2, up to 4 × 0.8 mm, glumes like, keeled, margins hyaline. Spikelet solitary, terminal, ovoid, 0.4–1 × 0.3–0.5 cm, terete, acute at apex, chestnut brownish, many flowered. Glumes densely spirally imbricate, ovate, 3.5–4 × 2 mm, membranous, obtuse to acute at apex, mucronate, keeled, 3–5-nerved, reddish-brown, margins hyaline. Stamens 3; anthers oblong, c. 2 mm long; filaments elongate, up to 4 mm long. Style apically ciliate; stigmas 3, ciliate. Nutlet trigonous, obovoid, c. 1.2 × 1 mm, smooth or sparsely verruculose, short stipitate, stramineous, greyish.

Fl. & Fr.: Jul. – Dec.

Habitat: Open grasslands, moist rocky exposed areas, water logged rice fields, along banks of small streams and grasslands.

Distrib.: (Coimbatore, Dharmapuri, (Chitteri hills), Dindigul, Madurai and Nilgiri). Southern Western Ghats of India. **Endemic.**

23. *Fimbristylis latiglumifera* Govind. in J. Bombay Nat. Hist. Soc. 69: 161. 1972; B.D. Sharma & al. in Biol. Mem. 2 (1&2):157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 205. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 281. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021.

Tufted, rhizomatous perennials; rhizome very short, indistinct. Culms trigonous, 5–25 cm high, (–0.5) 0.9–1.3 mm thick, glabrous, scabrid or smooth towards apex. Leaves eligulate, basal, shorter than culms, 0.5–2 mm wide, erect or falcate, flat, glabrous, lowermost reduced to sheaths. Inflorescence simple, capitate, consists of 2–4 spikelets. Involucral bracts filiform, much shorter than inflorescence; rays absent or sometimes 1 or 2. Spikelets clustered, oblong-ovoid, 7–8 × 1.5–2 mm, acute or subacute, yellowish brown, 10–20 flowered; rachis winged. Glumes broadly deltoid-ovate, subacute, 2–2.5 mm across, distichous in lower half, imbricate in upper half, with distinct keel; keel 3 or 4-nerved, with curved, 0.2 mm long mucro, sides nerveless, with distinct scarious margins. Stamen 3; anthers ellipsoid, 0.3–0.6 mm long, apiculate. Style 3-fid, triquetrous, with slightly dilated pyramidal base, 1.2–1.3 mm long, sparsely fimbriate throughout. Nutlet globose-obovoid, trigonous, 1–1.1 × 0.75–0.9 mm, tricostulate, with convex sides, umbonulate, abruptly attenuating at base, minutely stipitate, verruculose, dark brown; epidermal cells transversely hexagonal in the upper half, in 8–10 more or less regular vertical rows.

Fl. & Fr.: Sep. – Nov.

Habitat: Along the shores, sandy banks of the back waters and rivers, wet grasslands.

Distrib.: Tamil Nadu (Nilgiri). **Endemic** to Tamil Nadu.

24. *Fimbristylis latenucifera* Govind. in J. Bombay Nat. Hist. Soc. 69: 159. 1972; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 205. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 281. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021.

Rhizomatous perennials; Culms trigonous, up to 40 cm high, 0.5–1.5 mm thick. Leaves ligulate, distichous, basal, crowded near the base, shorter or as long as culms. Inflorescence simple to subcompound, with up to 2 cm long rays. Involucral bracts

setiform, as long as to shorter than the inflorescence. Spikelets chest-nut purplish to blackish, 4–8 × 2–3.5 mm, up to 16 flowered. Glumes almost as long as broad or slightly longer, 2–2.5 × 2–2.2 mm, with not or narrow hyaline margin. Stamens 2. Style very slender, as wide as to narrower than staminal filaments, as long as to slightly longer than nutlets, c. 1.5 mm long, hairy throughout. Nutlet suborbicular to broadly obovate, 1.2–1.3 × 0.8–1 mm, abruptly attenuated into narrow base ended with minute to small, cupular gynophore with often 11–13 vertical rows of transversely oblong epidermal cells on each face, trabeculate, distinctly apiculate to almost shortly beaked.

Fl. & Fr.: Oct. – Nov.

Habitat: Margins of water courses and swamps. Rare

Distrib.: Tamil Nadu (Nilgiri). **Endemic** to Tamil Nadu.

25. *Fimbristylis longistigmata* Govind. in in Proc. Indian Acad. Sci. 76 B: 190. 1972; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 209. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 281.2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021.

Rhizomatous robust perennials; rhizome very short; woody. Culms 40–100 cm high, 1.5–3 mm thick below, trigonous or compressed-trigonous, smooth or scabrous on angles below the inflorescence, glabrous. Leaves eligulate, shorter than the culms, 3–6 mm wide; sheaths 2–15 cm long, rounded. Inflorescence simple, 2–3 cm across with 3–5 spikelets. Involucral bracts leafy, 3–5, the lowest much surpassing the inflorescence, 10–25 cm long. Spikelets solitary, ovate-lanceolate, 9–11 mm long, 2.5–3.3 mm wide, somewhat angular, acute at apex, brown or chestnut-brown, tightly many flowered. Glumes ovate-oblong, deeply boat-shaped, 3.5–4 × 2.6–2.8 mm long, acute, brown or reddish brown with hyaline margins, keeled; keel 3-nerved, mucronate. Stamens 3. Style 3-lobed, 1.8–2.2 mm long; stigmas very long, c. 3.5 mm long, exerted from glumes, give velvety appearance to spikelets. Nutlet broadly ellipsoid or obovoid, 1.4–1.6 × 0.9–1.2 mm, triquetrous, tricostrate, non-verruculose, indistinctly reticulate by transversely oblong epidermal cells on each face.

Fl. & Fr.: Oct. – Dec.

Habitat: Margins of water courses and swamps. Rare

Distrib.: Tamil Nadu (Kanyakumari). **Endemic** to Tamil Nadu.

26. *Fimbristylis matthewii* Murugesan & al. in J. Thrt. Taxa 2 (13) :1379. 2010; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 281. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 360. 2021.

Rhizomatous perennials, densely tufted; rhizome short, woody. Culms 25–50 cm high, 4 or 5-angled, glabrous, much thickened at base by old leaf-sheaths. Leaves half or as long as culms, linear or filiform, 7–25 × 0.1–0.2 cm, sometimes convoluted at margins, rarely narrowed at base, acute to shortly acuminate at apex, distantly scabrid along margins at base; eligulate; sheaths 2–5 cm long, blackish or brownish, glabrous, breaking into fibres at maturity. Inflorescence compound to decompose, terminal and subterminal or pseudolateral umbellate heads. Involucral bracts leafy, 3–5, setaceous from a broad base, 0.5–2.5 cm long, scabrid at base, sharply spinulose scabrid towards apex, shortly and suddenly pointed at apex, prominently-faintly 1-nerved. Spikelets 2–9 (10) clustered, sessile, some peduncled solitary, oblong-ellipsoid, 0.7–1.2 × 0.2–0.5 cm, 15–30 flowered. Glumes imbricate, ovate or oblong, 3.5–4 × 2–2.5 mm, 5–9-nerved, reddish brown, narrowly scarious at margins, keeled; keel produced small 0.6–1.2 mm long arista at apex; sparsely, minutely scaberulous on nerves of the keel and upper surface of the glume in apical half; rachilla prominently winged. Stamens 3; filaments linear, subequal, 1.8–3.5 mm long; anthers linear-oblong, 1.5–2 mm long, sagittate or cordate at base, acute or apiculate at apex. Ovary trigonous, obovate, 1–1.2 × 0.7–0.9 mm. Style 3-fid, trigonous, slightly dilated pyramidal at base, 2.5–3 mm long, ciliate above middle and very dense at apex; stigmas 3, ciliate, 1.5–2.5 mm long, shorter than style. Nutlet broadly obovoid, trigonous, 1–1.2 × 0.8–1 mm, umbonulate at apex, shortly stalked, sparsely and minutely tubercled, blackish or brownish.

Fl. & Fr.: Jun – Sep.

Habitat: In open grasslands, at higher altitudes above 1800 m.

Distrib.: Tamil Nadu (Coimbatore). **Endemic** to Tamil Nadu.

27. *Fimbristylis microcarya* F. Muell., *Fragm.* 1:200. 1859; Yarrayya & *al.* in *Indian. J. Pl. Sci.* 4 (4) : 57. 2015; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 213. 2015; V.P. Prasad & *al.* in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 282. 2020. *F. complanata* var. *microcarya* (F.Muell.) C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 646. 1893. *F. autumnalis* var. *microcarya* (F.Muell.) Kuk. in *Bot. Jahrb. Syst.* 69: 258. 1938.

Tufted annuals. Culms erect, slender, 10–35 cm high, 1–1.7 mm wide, strongly compressed, ridged, hardly winged below inflorescence, glabrous, scabrous on flattened edges at apex. Leaves basal, few, flat, linear, c. 9 cm × 2 mm, abruptly acuminate at apex, shorter than culms, many nerved; ligule a dense fringe of short hairs; sheath 1–1.5 cm long, light brownish coloured. Inflorescence a decompose umbel, open, 4–6 cm long, 3–5 cm wide. Involucral bracts 3 or 4, suberect, shorter to as long as inflorescence, margins scabrid; primary rays and ultimate rays cymose, or spicate. Spikelets solitary, ovoid, 2–4 × 1–1.5 mm, acute at apex, few flowered, brownish; rachilla winged. Glumes spiral, basal two glumes empty, c. 1 × 1 mm, shorter than

fertile glumes; fertile glumes ovate, 1–1.5 × c. 1.5 mm, acute at apex, mucronulate, yellowish to brownish with hyaline margins, excurrently keeled, 3-nerved. Stamen 1; anther oblong, 0.3–0.4 mm long; filament flat. Style linear, c. 0.5 mm long, triquetrous, pyramidally thickened at base, glabrous; stigmas 3, shorter than style. Nutlet obovoid, trigonous to triquetrous, 0.5–0.7 × 0.3–0.4 mm, stipitate, smooth or sparsely verruculose, whitish, transversely linear-oblong isodiametric epidermal cells.

Fl. & Fr.: Jan. – Mar.

Habitat: Margins of lakes, side of rivers, wet rocky crevices.

Distrib.: Tamil Nadu (Ramanathpuram). Throughout India. East Asia, widely distributed in North Australia.

28. *Fimbristylis miliacea* (L.) Vahl, Enum. Pl. Obs. 2: 287. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 644. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1660 (1152). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1757. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 357. 1987; Chandrab. & N.C. Nair, Fl. Coimbatore: 320. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 214. 2015. *Scirpus miliaceus* L., Syst. Nat. ed. 10: 868. 1759 & Sp. Pl. ed. 2: 75. 1762. *Trichelostylis miliacea* (L.) Nees in Wight, Contr. Bot. India: 103. 1834. *Fimbristylis littoralis* Gaud. in Fre. Voy. Bot. 413. 1826; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989.

Tufted annuals or biennials. Culms usually subflattened-tetrapterous, 10–50 (70) cm high, 1–2 mm thick, 2 sharp edged, glabrous, covered at base. Leaves shorter to as long as culm, up to 40 cm long, 1–3 mm wide, at times exceeding the inflorescence, laterally compressed, falcate, equitant, without prominent midrib, with prominent 8–13 parallel nerves, grooved, gradually tapering to acute apex, upper leaves reduced to sheaths or with short blades; ligule absent; sheaths covering base of culms, 10–15 cm long, strongly laterally compressed. Inflorescence compound to decompound umbel, 7 × 4 cm long and as wide with many spikelets. Involucral bracts 3–5, up to 2.5 cm long, shorter than inflorescence, filiform; primary rays 3–7, unequal, angular, up to 4.5 cm long. Spikelets solitary, 1.5–3 mm long, pedunculate or sessile, globular or subglobular, terete, obtuse, few to more than 30 flowered, brownish; rachilla wingless. Glumes spiral, ovate, 1–1.2 mm long, cymbiform, obtuse, mucicous, keeled, 3 nerved, brownish to almost hyaline margins. Stamens 1 or 2; anthers c. 0.7 × 0.3 mm, mucronate; filaments flat, elongate. Style 0.3–0.4 mm, brown, base mostly bulbous, ciliolate towards apex; stigmas 3, as long as style. Nutlet trigonous, ovoid to obovoid, 0.5–0.6 × 0.3–0.4 mm, rounded at apex, verruculose, stipitate, light yellowish, cancellated with 5–7 rows of transversely linear-oblong epidermal cells.

Fl. & Fr.: Oct. – Jan.

Habitat: Marshy grasslands, paddy fields, shallow ponds and wetlands.

Distrib.: (Chengalpattu, Coimbatore, Ranipettai, Thiruvannamalai, Tirunelveli and vellore). Sri Lanka, South China, tropical Africa and tropical Australia.

29. *Fimbristylis monospicula* Govind. in in Proc. Indian Acad. Sci. 79 B: 169. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 215. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 282. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 361. 2021.

Annuals. Culms 10–35 cm high, 0.2–0.3 mm thick, 5–7-ribbed, rigid, hirsutely hairy. Leaves many, 1/3 or as long as the culms, 0.5–0.75 mm wide; sheaths obliquely truncate, 9–11-ribbed, glabrous, chest-nut brown. Spikelets single or 2 or 3, terminal, ovoid or elliptic-ovoid, 3–6 × 3–4 mm, obtuse, terete, bracteates, castaneous brown, many flowered. Glumes densely spirally imbricate, oblong, ovate or suborbicular, 1.75–2 × 1.5–1.8 mm, crustaceous, obtuse, shining, glabrous, castaneous to fuscous brown, distinctly keeled, with nerveless sides and narrow scarious margins; rachilla not or narrowly winged. Stamens 3; anthers linear, apiculate, 0.6–0.8 mm long. Style 3-fid, triquetrous, with slightly dilated pyramidal base, 0.7–0.8 mm long, densely fimbriate. Nutlet broadly obovoid, 0.8–0.9 × 0.6–0.7 mm, distinctly tricolostulate, densely tubercled, stipitate, brown; epidermal cells in upper half hexagonal, transversely elongated, much impressed, tuberculate, in 7 or 8 regular vertical rows on each face.

Fl. & Fr.: Oct. – Nov.

Habitat: Moist areas of hills of high altitude.

Distrib.: Tamil Nadu (Dindigul, Madurai and Salem. **Endemic** to South India (Tamil Nadu, Andhra Pradesh and Karnataka).

30. *Fimbristylis monticola* Hochst. ex Steud. Syn. Pl. Glumac. 2: 111. 1855; C.B. Clarke in Hook.f., Fl. Brit. India 6: 642. 1893; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 216. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 282. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 361. 2021. *F. tenuifolia* Thwaites, Enum. Pl. Zeyl.: 434. 1864.

Short rhizomatous perennials. Culms densely tufted, erect, slender, up to 35 cm high, trigonous, smooth, glabrous. Leaves at base, as long as culms, filiform, inrolled, less than 1 mm wide, glabrous, margins scabrid; ligule absent; sheaths up to 4 cm long, hyaline, margins ciliolate, pale brownish. Inflorescence a simple umbel.

Involucral bracts 2 or 3, setaceous, up to 1 cm long. Spikes 1–2.5 × 1–2 cm. Spikelets 3–6, solitary, lance-ovate to oblong, 4–8 × 1.5–3 mm, slightly flattened, acute at apex, base subacute, dark brown, up to 25 flowered. Lower glumes bifarious, upper ones spiral; basal 2 or 3 glumes empty; fertile glumes ovate to deltoid ovate, 2–2.8 × 1.5–2 mm, boat shaped, acute and mucronate at apex, chartaceous, keeled, 3-nerved, pale to dark reddish-brown. Stamens 3; anthers c. 1 mm long. Style 1.3–1.5 mm long, slender, glabrous, pyramidal at base; stigmas 3, up to 1.4 mm long. Nutlet obovate, 0.7–0.8 mm long, trigonous with convex sides, yellowish-grey; epidermal cells oblong.

Fl. & Fr.: Aug. – Dec.

Habitat: Marshy areas in evergreen forests.

Distrib.: Tamil Nadu (Erode). South India (Kerala) and Maharashtra. Sri Lanka.

31. *Fimbristylis mycosa* Govind. in *Rheedea* 7 (2): 124. 1997; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 216. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 282. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 361. 2021.

Perennials; rhizome obscure. Culms few, 8–20 cm high, 0.8–1 mm, trigonous towards top and subterete towards base, smooth, few leaved, tumid due to covering by sheaths and scales. Leaves eligulate, few, coriaceous, shorter than the culms, 0.5–1.5 mm wide, flexuous, variously curved, flat, canaliculate or inrolled, gradually acuminate, smooth margined except sparsely scabrescent apex; sheaths entire, tubular, membranous with 'V' shaped mouth; lowermost scales 2 or 3, ovate lanceolate, horny, prominently nerved, entire. Inflorescence distinctly capitate, globose or subglobose with many spikelets, 1 cm across. Involucral bracts leafy, 3–5, subequal erect, longer than inflorescence, the longest up to 5 cm long; rays absent. Spikelets congested, sessile, usually elliptic ovoid, 1.8–2 × 0.6–0.7 mm, subtumid, acute. Glumes distichous in lower half, imbricate in upper half, ovate, c. 2 mm long, chartaceous, usually acute or obscurely apiculate, castaneous brown, obtusely keeled with nerveless sides and narrow hyaline margin; keel 3–5-nerved with nerves ending upto apex, green. Stamens 1–3; anthers oblong, rounded at apex and base, 0.5–0.6 mm long. Style 3-fid, glabrous, obscure or c. 0.2 mm long. Nutlet sessile, rhomboidal, triquetrous or acutely trigonous, 0.5–0.6 × 0.3–0.4 mm, smooth, beaked, yellowish.

Fl. & Fr.: Sep. – Nov.

Habitat: Semi-wet lands.

Distrib.: Tamil Nadu (Dindigul or Madurai (Nursery valley)). **Endemic** to Tamil Nadu.

32. *Fimbristylis narayanii* C.E.C. Fisch. in Bull. Misc. Inform. Kew 1931: 46. 1931 & in Gamble, Fl. Madras: 1660 (1152). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 220. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 282. 2020.

Non-rhizomatous annuals. Culms densely tufted, erect, 7–22 cm high, 0.3–0.5 mm thick, compressed, quadrangular. Leaves basal, many, linear, shorter than culm, 2–8 × 0.1–0.2 cm, acute, scabrid on margins in upper part; ligule absent; sheaths striate, 0.5–1.5 cm long, compressed, stramineous. Inflorescence a simple umbel, bearing 2–4 spikelets, 1–2 cm long and wide. Involucral bracts 2–4, up to 8 mm long; rays 0.7–1.6 mm long. Spikelets solitary, oblong, 7–14 × 1.5–3 mm, flat, acute at apex, brown, 10–12 flowered. Glumes distichous, at times upper ones spiral, loosely imbricate, basal 1 or 2 glumes empty, ovate-lanceolate, 2–3 × 1–1.7 mm, acute at apex, keeled, sides yellowish-brown, margins hyaline. Stamens 2; anthers linear-oblong, c. 0.5 mm long; filaments hyaline, elongate. Ovary oblong; style c. 2 mm long, base not gland dotted; stigmas 3, shorter than style. Nutlets obovoid, trigonous, c. 1 × 0.5 mm, tubercled; isodiametric epidermal cells in 7–10 vertical rows, whitish to yellowish.

Fl. & Fr.: Sep. – Feb.

Habitat: Along river banks, moist rocky slopes and in open plaças.

Distrib.: Tamil Nadu (Tirunelveli). Northwest Himalaya and South India. **Endemic.**

33. *Fimbristylis nutans* (Retz.) Vahl, Enum. Pl. 2: 285. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 632. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1150). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 79. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 53. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 221. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 361. 2021. *Scirpus nutans* Retz., Obs. Bot. 4: 12. 1786.

Rhizomatous perennials, densely tufted; rhizome short, decumbent. Culms 20–75 cm high, 0.5–1.5 mm thick, obtusely trigonous, smooth, glabrous, clothed at base with bladeless sheaths. Leaves eligulate, basal; sheaths cylindrical, pale brownish. Inflorescence a single terminal spikelet, which is eventually inclined. Involucral bract 1, subulate ovoid to ovoidal-ellipsoid, 8–16 × 4–6 mm, subacute, terete, brown, densely many flowered. Glumes tightly imbricate, broadly ovate to shallowly boat-shaped with flattish back, 4–5 × 2.5–3 mm, mucronate with rounded apex, thinly chartaceous, brown with dark brown striate on both sides of broad yellow-brownish keel, broadly hyaline on margins; keel 5-nerved, ending in a straight mucro. Style 2-fid, 2–2.5 mm long, flat, relatively broad, scarcely dilated at base, ciliate in upper half; gynophore minute,

0.2–0.3 mm long. Nutlet obovoid, 1.2–1.5 × 1–1.3 mm, biconvex or almost flat on inner side, with obtuse edges, shortly and broadly stipitate, tuberculate towards margins with 3–5 transverse wavy ridges.

Fl. & Fr.: Sep. – Feb.

Habitat: Wetlands.

Distrib.: Tamil Nadu (Chengalpattu). Andaman & Nicobar Islands and Northeast (Khasia hills) India. Australia, Borneo, Burma, China and Sri Lanka.

34. *Fimbristylis ovata* (Burm. f.) J. Kern in *Blumea* 15: 126. 1967; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 157. 1977; K.K.N. Nair & M.P. Nayar, *Fl. Courtallum* 2:357. 1987; Chandrab. & N.C. Nair, *Fl. Coimbatore*: 320. 1988; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2):1758. 1983; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3:80. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 54. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1421. 1999; Pallith., Pock. *Fl. Sirumalai Hills*: 271. 2001; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 221. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 282.2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 361. 2021. *Carex ovata* Burm.f., *Fl. Ind.*:194. 1768. *Abildgaardia ovata* (Burm.f.) Kral in *Sida* 4:71. 1971; Joseph, *Aquatic Angiosp. Malabar*: 303. 1991. *Fimbristylis monostachyos* (L.) Hassk., *Pl. Jav. Rar.*: 6. 1848, "*monostachya*"; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 649. 1893; C.E.C. Fisch. in *Gamble, Fl. Madras*: 1657 (1152). 1931. *Cyperus monostachyos* L., *Mant. Pl.*: 180. 1771.

Tufted, dwarf, rhizomatous perennials; rhizome short, knotty. Culms erect, trigonous, 10–35 cm high, filiform or slender, trigonous, flattened towards apex, thickened at base, compressed. Leaves many, filiform or linear, shorter to as long as culm, 10–30 cm × 0.6–1 mm, slender, subacute at apex, margins scabrid; ligule absent; sheaths c. 5 cm long, straw coloured. Inflorescence a single terminal spikelet, often proliferate into 1 or 2 additional peduncled spikelets. Involucral bracts 2, very small, scale like, with mid nerve elongated into awn; peduncle of proliferate spikelet 0.8–1.5 cm long. Spikelets ovate, 7–11 × 3–5 mm, acute at apex, slightly compressed, yellowish-green; rachilla winged. Lower glumes distichous, empty, awned; upper ones becoming more or less spirally imbricate, broadly ovate, 3–6 × 2–4 mm, boat shaped, acute and mucronate at apex, strongly keeled, spongiously thick along keel; pale yellowish. Stamens 3; anthers linear-oblong, c. 2 mm long, apiculate; filaments flat, hyaline, elongate. Ovary oblong, c. 1 mm long; style dilated at base, trigonous, c. 2 mm long, ciliate; stigmas 3, shorter than style. Nutlet trigonous, c. 2.5 × 1.5 mm, pyriform, shortly stipitate, tuberculate, cream-white; epidermal cells isodiametric, in many vertical rows.

Fl. & Fr.: Sep. – Mar.

Habitat: Wet grasslands and marshy areas.

Distrib.: Tamil Nadu (Almost all districts). Throughout India. Pan-tropical.

35. *Fimbristylis pandurata* Govind. in Rheedea 7 (2): 124. f.125. 1997; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 223. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 361. 2021.

Annuals, dwarf in size. Culms 4-gonous, 2–2.5 cm high, c. 0.5 mm wide, rigid. Leaves ligulate, 0.75 mm broad, flat or involute, smooth, usually as long as stems; cauline leaves 1 or 2, reduced to short blades; ligulate; sheaths sparsely hairy. Inflorescence simple, consisting of 3 spikelets, centre one undeveloped, 4.5–5 × 3–4 mm. Involucral bracts 2 or 3, pandurate, 2.3–2.5 × 0.9–1 mm, with 1.2 mm long awn. Spikelets solitary, elliptic-ovoid or broadly obtrullate, 3.5–4 × 1–1.2 mm, subterete, acute, brown, upto 10-flowered; rachilla wingless. Glumes ovate lanceolate, 2–2.2 × 0.9–1 mm, translucent, acute, spiral-subdistichous, muticous, obtusely keeled; keel 3-nerved; margins narrowly hyaline; sides nerveless. Stamens 2; anthers linear oblong, c. 1 mm long. Style 3-fid, glabrous. Nutlet narrowly obovoid or elliptic ovoid, 0.8–1 × 0.2–0.3 mm, greyish white with more or less rough surface, rounded at apex, non umbonulate, sessile, triquetrous.

Fl. & Fr.: Sep. – Nov.

Habitat: Semi-wet lands.

Distrib.: Tamil Nadu (Dindigul, Madurai). **Endemic** to Tamil Nadu.

36. *Fimbristylis paupercula* Boeckeler in Linnean 38: 396. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 6: 647. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 437. 1915; C.E.C. Fisch. in Gamble, Fl. Madras: 1660 (1152). 1931; Fyson, Fl. S. Ind. Hill Sta.: 639. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1759. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1422. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 224. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021.

Rhizomatous annuals; rhizome short, obliquely descending. Culms angular, up to 40 cm high, slender, scabrous-pilose. Leaves ligulate, as long as to ½ culm, very narrow with incurved margins, 1–2 mm wide. Inflorescence subcompound; rays 4 or 5, 2–2.5 cm long. Involucral bracts 3, the lowest sometimes longer than inflorescence, spinulose-scabrid, apex often puberulous. Spikelets 2–7 or in cluster, ellipsoid, 0.6–0.7 cm long, brown. Glumes ovate, minutely mucronate, keel slightly

excurrent as a mucro, glandular upwards, at times puberulous. Style 3-fid, longer than nutlets, ciliate. Nutlets triquetrous, 0.7–0.8 mm, obtuse at apex; outer cells shortly transversely elliptic, regularly arranged in \underline{c} . 16 vertical series on each face.

Fl. & Fr.: Aug. – Dec.

Habitat: In marshy areas of hills of higher altitudes.

Distrib.: (Dindigul, Madurai, Nilgiri and Tirunelveli). **Endemic** to South India.

37. *Fimbristylis pierotii* Miq. in Ann. Mus. Bot. Lugduno-Batavum 2: 145. 1865; C.B. Clarke in Hook.f., Fl. Brit. India 6: 642. 1893; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021.

Annuals, rarely grown as perennials, stoloniferous; stolons up to 5 cm long, densely clothed by lanceolate striate scales, finally hardening into a woody rhizome. Culms up to 40 cm high, slender, glabrous. Leaves as long as or half to culms, flat, acute. Inflorescence simple or rarely compound umbel, consisting of 5–14 spikelets, 2.5–8 cm across. Involucral bracts short. Spikelets solitary, ellipsoid lanceolate, 7–8 × 0.3–0.4 mm, up to 10-flowered. Glumes spiral, ovate, 2.5–3 mm long, boat-shaped, shortly acuminate, chestnut or testaceous, usually round glands in upper half, margins. Style 3-fid, 1.5 mm long, glabrous, deciduous with narrow style base. Nutlets obovoid, shorter than glume, straw-coloured, laxly reticulate smooth or somewhat tubercled, tip subpyramidal.

Fl. & Fr.: Aug. – Dec.

Habitat: In open grassy slopes.

Distrib.: Tamil Nadu (Coimbatore). East and North West Himalayas of India. Japan.

38. *Fimbristylis polytrichoides* (Retz.) Vahl, Enum. Pl. Obs. 2: 248. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 632. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1759. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 226. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021. *Scirpus polytrichoides* Retz., Observ. Bot. 4: 11. 1786.

Short lived perennials; roots fibrous, occasionally short rhizome covered with brownish scales. Culms densely tufted, setaceous, subterete to trigonous, 10–35 cm high, c. 0.5 mm thick, slender, covered at base, glabrous. Leaves canaliculated,

acicular, 4–20 cm × 0.2–0.5 mm, acute at apex; ligule shortly hairy; sheaths membranous, 1–4 × 0.4–0.7 cm. Inflorescence terminal or pseudolateral, with a solitary spikelet. Involucral bract 1, stiff, 1–2 cm long, scale like, midnerve of bract prolonged beyond the scale apex, exceeding or not. Spikelet ellipsoidal to oblong-ovoid, terete to subterete, 0.5–1 cm × 2.5–4 mm, acute at apex, densely many flowered, brownish-grey; rachilla winged. Glumes tightly imbricate, elliptic to oblong-elliptic, up to 3 mm long, boat shaped, thin, obtuse at apex, sides nerveless, apically puberulous, stramineous or pinkish, keel 1–3 -nerved, margins hyaline. Stamens 1 or 2; anthers linear-oblong, c. 1 mm long, minutely apiculate at apex; filaments up to 2 mm long. Style 2-fid, c. 1 mm long, ciliate at apex, dilated at base. Nutlets obovoid, biconvex, up to 1 mm long, acutely angled, rounded at base, shortly stipitate, greyish to black, verruculose, obscurely striate, with isodiametric cells.

Fl. & Fr.: Oct. – Nov.

Habitat: Marshes, wet hollows, ditches on saline mud or sandy soil near to the coast.

Distrib.: (Chengalpattu, Ramanathapuram, Tiruvannamalai, Thanjavur Tirunelveli and Vellore). Western Peninsular, Central and Eastern India. Tropical Africa and Asia.

39. *Fimbristylis pustulosa* Govind. in in Proc. Indian Acad. Sci. 90: 444. 1981; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 228. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021.

Rhizomatous perennials; rhizome elongate, thick, woody, usually obliquely sometimes horizontally creeping with short or congested internodes. Culms 30–90 cm high, 0.6–1.0 mm wide, approximate, uniseriately and linearly arranged, flattened, glabrous, sometimes scabrid just behind inflorescence, usually 3-noded, bearing tubular sheaths with recurved blades or bladeless. Leaves cauline ones 1–3 (–5) cm long, on sterile shoots as long as or shorter than culms, ligulate, 2–5 mm broad, flat. Inflorescence simple, sometimes with 1 or 2 (–3) rays, rather loose, consisting of (3–) 4–8 spikelets, 1–2 cm across. Involucral bracts leafy, 3 or 4, longer or shorter than inflorescence, 1–2.5 cm long; rays 1 or 2 (3), up to 1.5 cm long. Spikelets solitary, narrowly elliptic or oblong ovoid (lanceolate), 4.5–6.5 × 1.5–2 mm, castaneous, angular, acute, 8–16 (–20)-flowered; rachilla broadly winged. Glumes narrowly ovate, 2.5–2.8 × 1.8–2 mm, subacute, spiral, mucronate with 3 (–5) nerved keel and with pustular (glandular) sides; mucro usually recurved, 0.3 mm long; margin hyaline. Stamens 2; anthers oblong linear, apiculate, 0.5–0.8 mm

long. Style 3-fid, triquetrous, glabrous, 1–1.5 mm long. Nutlets triquetrous, 0.8–1 × 0.6–0.8 mm, tricostulate with convex sides, smooth, rarely with pluricellular bodies or tubercles, yellowish brown to brown, shortly stipitate, hardly umbonulate, truncate, with (8)12–16 vertical ridges on each face.

Fl. & Fr.: Oct. – Nov.

Habitat: In marshy places.

Distrib.: Tamil Nadu (Coimbatore Dindigul, and Madurai). **Endemic** to Tamil Nadu.

40. *Fimbristylis quinquangularis* (Vahl) Kunth, Enum. Pl. 2: 229. 1807; C.B. Clarke in Hook.f., Fl. Brit. India 6: 644. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659 (1151). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 230. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021. *Scirpus quinquangularis* Vahl, Enum. Pl. Obs. 2: 279. 1805. *Trichelostylis quinquangularis* (Vahl) Nees in Wight, Contr. Bot. India:104. 1834. *Fimbristylis crassa* C.B. Clarke in Hook.f., Fl. Brit. India 6: 644. 1893; B.D. Sharma & al. in Biol. Mem. 2 (1&2):157. 1977; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1422. 1999.

Tufted, short rhizomatous annuals or biennials. Culms compressed, 5 angled with sharp edges, 10–70 cm high, glabrous, covered with 2–4 sheaths. Leaves basal, linear, equitant, 10–30 cm long, subacute at apex, dorsiventrally flattened, margins scabrid, more or less thickened; ligule absent; lower sheaths bladeless, 2–10 cm long, laterally compressed, subterete, straw coloured, hyaline, sharply keeled. Inflorescence compound to decomposed umbel, 4–9 cm long and wide, loose. Involucral bracts 2–5, shorter than rays, c. 1 cm long, setaceous; rays 3–7, cymose; secondary corymbs bearing 5–30 spikelets. Spikelets solitary, ovoid, 2–4 × 1–1.5 mm, obtuse at apex, rusty or yellowish brown, angular; rachilla wingless. Glumes spiral, ovate, 1.2–1.5 × c. 1 mm, shortly but distinctly mucornate, acutish, strongly keeled, 3-nerved, rusty brown, pale brownish on hyaline margins. Stamens usually 1 (2); anthers c. 0.3 mm long. Style linear, 0.5 mm long, triquetrous, dilated at base, ciliate at apex; stigmas 3-fid, as long as style. Nutlets obovoid, trigonous, 0.6–1 × c. 0.5 mm, verruculose, finely cancellated on each side with 3 or 4 rows of transversely oblong epidermal cells.

Fl. & Fr.: Sep. – Feb.

Habitat: Swampy areas and Grasslands.

Distrib.: Tamil Nadu (Coimbatore, Nilgiri, Dindigul and Madurai. Throughout India. Tropical Africa, Iraq to Tropical & Subtropical Asia and North Australia.

41. *Fimbristylis rectifolia* Govind. in Proc. Indian Acad. Sci. 80 B: 46. 1974; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 231. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 289. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021. *Fimbristylis diphylla* Vahl var. *nilagirica* C.B. Clarke in Hook.f., Fl. Brit. India 6: 637. 1893; Karthik. & al., Fl. Ind. Enum. Monocot.: 51. 1989.

Rhizomatous perennials; rhizome very short, creeping or obliquely ascending. Culms up to 30 cm high. Leaves ligulate, filiform. Inflorescence simple, with single spikelet, 1–2 cm across. Involucral bracts leafy, 3 or 4, longer or shorter than inflorescence, 1–2.5 cm long; rays 1 or 2 (3), up to 1.5 cm long. Spikelets solitary, narrowly elliptic or oblong ovoid (lanceolate), 4.5–6.5 × 1.5–2 mm, castaneous, brownish, angular, acute, 8–16 (–20) flowered; rachilla broadly winged. Glumes narrowly ovate, 2.5–2.8 × 1.8–2 mm, subacute, spiral, 4–7 distinctly nerved, spreading over whole breadth, mucronate with 3 (–5) nerved keel and with pustular (glandular) sides; mucro usually recurved, 0.3 mm long; margin hyaline. Stamens 3 rarely 2; anthers oblong linear, apiculate, 0.5–0.8 mm long. Style 3-fid, triquetrous, longer, glabrous. Nutlets triquetrous, 0.8–1 × 0.6–0.8 mm, multistriate, 14 rows of reticulately arranged outer cells, smooth, rarely with pluricellular bodies or tubercles, yellowish brown to brown, shortly stipitate, hardly umbonulate, truncate.

Fl. & Fr.: Oct. – Nov.

Habitat: In marshy areas of hills of higher altitudes.

Distrib.: Tamil Nadu (Nilgiri). **Endemic** to Tamil Nadu.

42. *Fimbristylis rigidiuscula* Govind. in Proc. Indian Acad. Sci. 78 B: 45. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 232. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021.

Rhizomatous perennials; rhizome thick, woody. Culms 5-angled, 15–30 cm high, 0.8 - 0.9 mm wide, slender. Leaves eligulate, shorter than culms, filiform, 6–20 × 0.75–1 mm, flat, glabrous, basal leaves praemorse; sheaths dark brown to black. Inflorescence simple, capitate, consisting of 3–8 spikelets, clustered, 7–8 × 11–12 mm. Involucral bracts glume like, broadly ovate-lanceolate, castaneous, broad at base with scabrid arista, longer than spikelets, 1–3.5 cm long, setaceous. Spikelets clustered, ovate, 8–9 × 2–4 mm, castaneous, terete, acute, many flowered. Glumes

oblong-obovate, 4.8–5.2 × 2.7–3 mm, obtuse, glabrous or ciliate at apex narrow hyaline pale margined, 3 or 4-nerved on each side, glabrous, glandular, muticous, keeled; keel 3-nerved; rachilla winged. Stamens 3; anthers linear, 2.4–2.5 mm long, apiculate with 1 or 2 bristles. Style 3-fid, triquetrous with slightly dilated pyramidal base, c. 3 mm long, glabrous. Nutlets obovoid, globosely trigonous, 1.3–1.5 × 1.1–1.3 mm, tricostulate, dark brown to black, minutely rounded at apex, smooth; outer cells in upper half shortly hexagonal-quadrate, tessellated, occurring in 20–22 more or less vertical ridges on each face.

Fl. & Fr.: Oct. – Nov.

Habitat: In marshy areas of hills of higher altitudes.

Distrib.: Tamil Nadu (Dindigul-Kodaikanal and Madurai. **Endemic** to Tamil Nadu.

43. *Fimbristylis rugosa* Govind. in in Proc. Indian Acad. Sci. 78 B: 48. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 232. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 283. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 362. 2021.

Rhizomatous perennials; rootstock thick, woody. Culms 5-angled, 70–80 cm high, 2.2–2.4 mm wide, leafless, woody at base, rigid, glabrous. Leaves eligulate in sterile shoot, leafless, cauline ones reduced to sheaths; sheaths dull brown, puberulous. Inflorescence decompound or supradecompound, with 60–80 spikelets, 6–8 × 5–7.5 cm. Involucral bracts filiform, much shorter than inflorescence, whorled, strigosely hairy or puberulous at base. Spikelets solitary, oblong-ellipsoid, 4.5–5.8 × 1.5–2 mm, angular, acute, 8–12-flowered. Glumes spiral, deltoid ovoid, 2.5–3 × 1.6–2.1 mm, acute, castaneous, cymbiform, with scarious glabrous margins, sparsely hairy, erect with nerveless sides, glandular, distichous in lower half and imbricate in upper half with strongly curved base, muticous, keeled; keel raised, 3–5-nerved, curved; rachilla broadly winged. Stamens 3; anthers linear, 1.1–1.3 mm long. Style 3-fid, triquetrous, 1.6–1.7 mm long, sparsely hairy at top. Nutlets turbinate, narrowly obovoid, 1.2–1.5 × 0.7–0.8 mm, densely transversely rugose, depressed or more or less truncate at top, minutely stipitate, trigonous with flat faces; outer cells in upper half distinct, transversely elongated, hexagonal occurring in 8–12 vertical rows on each face.

Fl. & Fr.: Oct. – Dec.

Habitat: In open grassy slopes of hills receiving high rainfall.

Distrib.: Kanyakumari, Dindigul (Madurai) and Nilgiri. **Endemic** to Tamil Nadu.

44. *Fimbristylis salbundia* (Nees) Kunth, Enum. Pl. 2: 230. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 646. 1893; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 232. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021. *Trichelostylis salbundiana* Nees in Wight, Contr. Bot. India:105. 1834.

Rhizomatous perennials; rhizome shortly creeping, obliquely descending. Culms uniseriate on rhizome, close together, prominently 4 or 5-angled or almost winged, 30–75 cm high, 1–3 mm wide, stiff. Leaves eligulate, reduced to 2–4 bladeless sheaths. Inflorescence compound or decompound, loose or rather dense, with many spikelets, 2–4 cm long. Involucral bracts 2–5, very short, lanceolate, with recurved setaceous point up to 1.5 cm long. Spikelets solitary or subaggregated, ellipsoid, ovoid or broadly ovoid, 3–5 × 1.5–2 mm, angular, densely many flowered. Glumes spiral, ovate, 2–3 × 1–1.2 mm, membranous, obtuse, muticous, castaneous back, with nerveless, yellowish sides and broad hyaline margins in the upper half, keeled; keel 3-nerved, ending below the apex; rachilla narrowly winged. Stamens 3; anthers oblong-linear, 0.7–1 mm long. Style 3-fid, with pyramidally thickened base, glabrous, sometimes c. 1 mm long hairy in upper half. Nutlets broadly obovoid, trigonous, 0.7–1 × 0.6–0.7 mm, shortly stipitate, not umbonulate, smooth or sparsely verruculose, reticulate-lineolate by the transversely elliptic or oblong epidermal cells in 9–13 vertical rows on each face, whitish or brownish.

Key to subspecies

1a. Spikelets 3–5 mm long; glumes with keel ending below the apex; nutlets obovoid, 0.7–1 mm long, with 9–13 vertical rows on each face; anthers 0.7–1 mm long

44.1. subsp. *salbundia*

1b. Spikelets 4–6 mm long; glumes with keel projecting beyond apex in to short mucro; nutlets orbicular or suborbicular-obovoid, 1–2 mm long, with 20–30 vertical rows on each face; anthers c. 1.5 mm long

44.2. subsp. *pentaptera*

44.1. subsp. *salbundia*

Fl. & Fr.: Oct. – Nov.

Habitat: In marshes and grasslands on hills. Rare.

Distrib.: Tamil Nadu (Kanyakumari, Dindigul and Madurai). Almost throughout India. Australia, Malesia and Sri Lanka.

44.2. subsp. *pentaptera* (Nees) T. Koyama in Bot. Mag. (Tokyo) 87: 317. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 234. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot.

Checkl. Monocot.: 284. 2020. *Trichelostylis pentaptera* Nees in Wight, Contr. Bot. India:105. 1834. *F. pentaptera* (Nees) Kunth, Enum. Pl. 2: 229. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 645. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659 (1152). 1931; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1422. 1999.

Tufted, rhizomatous perennials; rhizome knotty, horizontal, covered with brownish scales; roots thick. Culms pentaquetrous, up to 70 cm high, sides deeply grooved, angles prominent, base hairy to glabrous. Leaves bladeless. Inflorescence a compound to decomposed umbel, up to 8 × 7 cm, with many spikelets. Involucral bracts 3 or 4, scale like, ovate, up to 6 cm long, membranous, nerved; rays up to 15, slender, longer ones up to 4 cm long, scabrid, bearing secondary corymb with 10–15 spikelets. Spikelets ovoid to elliptic, 0.4–0.6 × 0.1–0.2 cm, subterete, subacute at apex, brownish to rusty brownish, up to 60 flowered. Glumes spirally imbricate, suberect, basal 2 or 3 glumes empty, smaller; fertile glumes broadly ovate, 0.25–0.3 × 0.1–0.2 cm, boat shaped, keeled, keel projecting beyond apex in to short mucro, membranous, 3–5-nerved, margins hyaline, brown, somewhat shiny or dull. Stamens 3; anthers c. 1.5 mm long. Style slender, up to 2 mm long, glabrous, slightly thickened at the base; stigmas 3, 1–1.5 mm long. Nutlets orbicular or suborbicular-obovoid, 1–2 × 0.7–0.8 mm, trigonous with convex sides, rounded or depressed at apex, contracted to short stipe like base, brownish-yellow, each side faintly canaliculate in 20–30 rows of transversely oblong epidermal cells.

Fl. & Fr.: May – Nov.

Habitat: Marshy grasslands. Open swampy areas, and hills of high altitudes.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). South India. Sri Lanka.

45. *Fimbristylis sanjappae* W. Khan & Solanke in J. Econ. Tax. Bot. 30 (3): 717. 2006; Yarrayya & al. in Indian. J. Pl. Sci. 4 (4): 58. 2015; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 234. 2015.

Perennial, with short rhizome. Culms slender, up to 40–55 cm long, 0.4–1 mm wide, trigonous. Leaves ligulate, shorter than culms. Inflorescence simple to compound; 1.4–3.2 × 1–1.5 cm; involucral bracts 4–5, foliaceous. Spikelets ovoid, 3–5 × 1.5–2.5 mm, subacute, rachilla winged, whitish brown variegated, persistent. Glumes spiral, obovate-oblong, 2–2.3 × 1–1.2 mm, not keeled, shortly mucronate, with 3–5 closely nerved keel. Stamens 1, anthers linear, 0.5 mm long. Style bifid, filiform, mostly hairy in upper half, 1–1.5 mm long. Nutlets biconvex, 0.4–0.8 × 0.3–0.4 mm, obovate, umbonulate, whitish trabeculate with transversely oblong, thick walled, concave cells in between 4–7 vertical ridges on each face.

Fl. & Fr.: Oct. – Dec.

Habitat: In wet grass land, forest clearings on hills slopes.

Distrib.: Tamil Nadu (Coimbatore (Vellingiri hills)). Karnataka, Kerala and Maharashtra. **Endemic.**

46. *Fimbristylis scabrisquama* Govind. in in Proc. Indian Acad. Sci. 91: 43. 1982; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 80. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 235. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021.

Rhizomatous perennials; rhizome short. Culms pentaquetrous, 15–25 cm high, 0.6–0.8 mm wide. Leaves eligulate, shorter than culm, 10–15 × 0.1–0.2 cm, canaliculate with incurved margins; sheaths much shorter than culms, 0.5–1 cm long, dull brown sometimes becoming black, glabrous. Spikelets usually clustered, sometimes solitary, elliptic ovate, 6–7 × 2–3 mm, sessile, subterete, 10–16-flowered. Glumes broadly ovate, 4–4.2 × 3–1.2 mm, acute-subacute, distichous in lower half or more or less throughout, obliquely and linearly scabrous in uncovered parts, narrowly scarious at margin, usually cilioate in upper half margin with nerveless sides, cymbiform, keeled; keel 3 (–5)-nerved, rather strong, scabrous; mucro usually recurved, 0.5 mm long; lateral nerves rather faint; rachilla winged. Stamens 3; anthers apiculate with somewhat setaceous apex, 1.9–2 mm long. Style 3-fid, triquetrous, hardly dilated at base, fimbriately hairy in upper half, 2.4–2.5 mm long. Nutlets narrowly oblong, ovate, globosely trigonous, 0.6–0.8 × 0.3–0.4 mm, tricostulate, whitish stramineous with slightly convex sides, non umbonulate with triangularly flat apex, somewhat rough due to minute transversely elongated tubercles in upper half; epidermal cells in upper half circular, minute, reticulate.

Fl. & Fr.: Oct. – Jan.

Habitat: In open grassy slopes of hills.

Distrib.: Tamil Nadu (Dindigul, Madurai). **Endemic.**

47. *Fimbristylis schoenoides* (Retz.) Vahl, Enum. Pl. Obs. 2: 286. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 634. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1150). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1759. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1422. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 236. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021. *Scirpus schoenoides* Retz., Observ. Bot. 5: 14. 1789.

Non-rhizomatous annuals or perennials. Culms tufted, slender, 10–45 cm high, terete or compressed, deeply grooved, smooth. Leaves basal, short to 3/4 of culm

length; blades filiform, up to 22 cm × 0.7 mm, acute at apex, margins involute; ligule a fringe of c. 0.2 mm long hairs; sheaths up to 10 cm long, brown, tight. Inflorescence generally solitary terminal spikelet, proliferates into 1 or 2 spikelet; peduncles up to 1 cm long. Involucral bracts 2, filiform, lower bract to 12 mm long, upper to 3 mm long, base triangular. Spikelet ovoid or ellipsoid, 6–12 × 3–4 mm, terete, many flowered, acute at apex, whitish or yellowish-brown; rachilla c. 0.8 mm diam., winged with pieces from glume bases, reddish-brown. Glumes spiral, cymbiform, 2.5–3 × c. 2 mm, rounded to mucronate to apex, yellowish-brown, hyaline, shiny, prominently keeled, 4–7 distinctly nerved, spreading over whole breadth. Stamens 3; anthers oblong, c. 0.8 mm long, mucronate. Style flattened, c. 1.7 mm long, dilated at base, ciliate at apex; stigmas 2. Nutlet obovoid, biconvex, 1.3–1.6 × 1.1–1.2 mm, incl. stipe of c. 0.2 mm, rounded at apex, pale yellowish, glossy, reticulate with many superposedly arranged rounded or isodiametric hexagonal cells on each face.

Fl. & Fr.: Aug. – Dec.

Habitat: Rice fields, saline muddy areas, river banks, open grasslands and sandy areas.

Distrib.: Cuddalore, Chengalpattu, Kallakurichi, Pudukkottai, Tiruchirappalli, Tirunelveli and Viluppuram. Throughout India. China, Formosa, Malesia, Sri Lanka, Thailand and tropical Australia.

48. *Fimbristylis semidisticha* Govind. in in Proc. Indian Acad. Sci. 78 B: 51. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 54. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 237. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021.

Annuals. Culms trigonous, 5–25 cm high, (–0.5) 0.9–1.3 mm thick, glabrous, scabrid or smooth towards apex. Leaves eligulate, basal, shorter than culms, 0.5–2 mm wide, erect or falcate, flat, glabrous, lowermost reduced to sheaths. Inflorescence simple, capitate, consists of 3–6 (–10) spikelets. Involucral bracts filiform, much shorter than inflorescence; rays absent or sometimes 1 or 2. Spikelets clustered, oblong-ovoid, 7–8 × 1.5–2 mm, acute or subacute, cinnamomeous-castaneous or chestnut-brown, 10–20 flowered; rachis winged. Glumes broadly deltoid-ovate, subacute, 2.8–3 mm across, distichous in lower half, imbricate in upper half, with distinct keel; keel 3 or 4-nerved, with curved, 0.2 mm long mucro, sides nerveless, with distinct scarious margins. Stamen 3; anthers ellipsoid, 0.3–0.6 mm long, apiculate. Style 3-fid, triquetrous, with slightly dilated pyramidal base, 1.2–1.3 mm long, sparsely fimbriate throughout. Nutlet globose-obovoid, trigonous, 1–1.1 × 0.75–0.9 mm, tricostulate, with convex sides, umbonulate, abruptly attenuating at base, minutely stipitate, verruculose, dark brown; epidermal cells transversely hexagonal in the upper half, in 10–14 more or less regular vertical rows.

Fl. & Fr.: Oct. – Nov.

Habitat: In open grassy slopes of hills.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). South India. **Endemic** to Tamil Nadu.

49. *Fimbristylis sieberiana* Kunth, Enum. Pl. 2:237. 1837; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1760. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 238. 2015. *Fimbristylis ferruginea* (L.) Vahl var. *sieberiana* (Kunth) Boeckeler in Linnea 37: 17. 1871.

Tufted perennials; rhizome short; roots fibrous. Culms stiff, 30–60 cm high, 1–1.8 mm thick, terete below, often compressed, grooved, glabrous at above. Leaves cauline, shorter than culms, up to 35 cm long, flat or involute, margins scabrous, especially towards apex and membranous sheaths; ligule a fringe of short hairs; basal sheaths papery and brownish. Inflorescence simple to decompose umbel, 2–7 cm long, composed of 3–6 spikelets. Involucral bracts usually 3, basal bract exceeding the inflorescence, up to 11 cm long. Spikelets solitary, terete, ovoid, acute, brownish to greyish-brown, glabrous, many flowered; rachilla winged. Glumes spiral, broadly oblong-ovate, 3–3.2 × c. 3 mm, obtuse and apiculate at apex, keeled, grey tomentose. Stamens 3; anthers linear-oblong, c. 1 mm long; filaments elongate. Ovary oblong, c. 1 mm long, stipitate; style flat, c. 2 mm long; stigmas 2. Nutlets biconvex, subrobiculate, 1.4–1.6 × 1.2 mm, obtuse or rounded at apex, white, smooth, stipitate.

Fl. & Fr.: Jun. – Mar.

Habitat: Swampy grasslands, cultivated fields, saline areas, open marshy places of plains, wet gravelly soils and often wet roadsides.

Distrib.: Tamil Nadu (Coimbatore, Ramanathapuram and Sivagangai). Peninsular India, North & Northwest India. Africa and Asia.

50. *Fimbristylis squarrosa* Vahl var. ***esquarrosa*** Makino in Bot. Mag. (Tokyo) 17: 47. 1903; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021. *F. aestivalis* (Retz.) Vahl var. *esquarrosa* (Makino) T. Koyama in J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 8: 116. 1961. *F. dichotoma* (L.) Vahl var. *villosa* C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1151). 1931. *F. squarrosa* subsp. *esquarrosa* (Makino) T. Koyama in Fl. Taiwan 5: 247. 1978. *F. elata* R.Br., Prodr. Fl. Nov. Holland.: 227. 1810. *Scirpus squarrosus* (Vahl) Poir. in Lam., Encycl. Suppl. 5: 100. 1817 non L. *F. bisumbellata* (Forssk.) Bubani var. *hirtistyla* C.E.C. Fisch. in Kew Bull. 1935: 150. 1935 & Gamble, Fl. Madras: 1658 (1151). 1931. *F. squarrosa* sensu Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3

(2): 1760. 1983; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1423. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 241. 2015.

Tufted annuals with fibrous roots. Culms slender, 10–25 cm high, setaceous, bases soft. Leaves polystichous, spreading to ascending, shorter to $\frac{1}{2}$ of culm; blades linear to filiform, 0.4–1 mm wide, acute at apex, flat or involute, scabrid, ciliate, often abaxially hirtellous; ligule absent; sheaths entire or ciliate, backs hirtellous. Inflorescence compound to decompound, mostly open, ascending to branched, usually longer than broad, 2–5 cm long, with many spikelets. Longer involucral bracts leafy, equaling or exceeding the inflorescence, dilated at base, hairy; primary rays up to 6, slender, filiform, up to 2 cm long, smooth. Spikelets solitary, lanceolate or narrowly ellipsoid to cylindric, $4-6 \times 1-1.5$ mm, angular, densely many flowered; rachilla narrowly winged. Glumes spiral, ovate or oblong-ovate, $1.5-2 \times c. 1$ mm, acute at apex, keeled, 3 nerved, margins hyaline. Stamen 1; anther oblong, c. 0.3 mm long. Style slender, dilated at base, flat, long fimbriate, hairs recurved over nutlet summit; stigmas 2, shorter than style. Nutlets biconvex, obovoid, c. 0.8×0.5 mm, with acute edges, shortly stipitate, smooth or very finely reticulate, cancellated with hexagonal epidermal cells.

Fl. & Fr.: Dec. – Mar.

Habitat: Marshy areas, wet sandy soils, high altitude lake shores.

Distrib.: (Dindigul, Madurai, Salem and Tirunelveli). South Indian hills stations. Indo-China and Northeast China, Malesia and Thailand.

51. *Fimbristylis strigosa* Govind. in Proc. Indian Acad. Sci. 78 B: 54. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 243. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 284. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 363. 2021.

Rhizomatous perennials; rhizome thick, short, woody. Culms 5-angled, 30–40 cm high, 0.8–1 mm wide, slender, leafy and thickened at base, glabrous. Leaves eligulate, many, shorter than culms, $10-25 \times 0.1-0.12$ cm; sheaths laminiferous, brown, glabrous. Inflorescence compound, patent, lax, consisting of 20–40 spikelets, $3-5 \times 2-3$ cm. Involucral bracts filiform, with scabrid margin, 1–3.5 cm long. Spikelets solitary, narrowly ellipsoid, $5-7.5 \times 1.5-2$ mm, subacute to obtuse, terete, castaneous brown, many flowered. Glumes broadly deltoid-ovoid, $2.2-2.5 \times 1.75-2$ mm, obtuse with nerveless sides, cymbiform, contorted, finely ciliate at the upper margin, densely strigose almost throughout with or without scarious margin, castaneous brown, mucronate, keeled; keel rather distinct, strigose, 3–5-nerved, mucro recurved, 0.1–0.2 mm long; rachilla wingless or narrowly winged. Stamens 3; anthers linear with

connective produced into setaceous apex, 1.1–1.2 mm long. Style 3-fid, triquetrous, 1.5–1.6 mm long, densely fimbriately villous throughout with hardly dilated base. Nutlets obovoid, 0.75–0.8 × 0.5–0.6 mm, globosely trigonous, abruptly attenuating at base, tuberculed throughout, umbonulate; outer cells in the upper half more or less distinct, transversely hexagonal occurring in 6–8 more or less regular vertical rows on each face.

Fl. & Fr.: Oct. – Dec.

Habitat: In open grassy slopes of hills.

Distrib.: Coimbatore and Ramanathapuram. **Endemic** to Tamil Nadu.

52. *Fimbristylis subtrabeculata* C.B. Clarke in Hook.f., Fl. Brit. India 6: 633. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 437. 1915; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Densely tufted perennials; rhizome absent or very short. Culms slender, obtusely angled, 10–25 cm high, glabrous or minutely hairy. Leaves many, bristle like, up to 20 cm long, c. 1 mm wide, shorter than culms, ciliate, flat or rarely channelled, acute at apex; ligule absent; sheaths membranous. Inflorescence simple with a terminal spikelet. Involucral bracts 0, at times up to 2, glumes like, short, up to 4 × 0.8 mm, keeled, hyaline at margins. Spikelet solitary, ovoid to ellipsoid, 2.3–5.8 × 1.2–3.0 mm, terete, acute at apex, chestnut brownish, many flowered; rachilla narrowly winged, internodes 0.5–0.7 mm long. Glumes densely spirally imbricate, ovate, c. 3.3 × 1.3 mm, obtuse to acute at apex, mucronate, scarcely keeled, 3-nerved, membranous, middle reddish and sides brownish, margins hyaline. Stamens 3, elongate up to 4 mm long; anthers oblong, 1.2–2 mm long; filaments c. 0.3 mm long. Style c. 1.4 mm long, ciliate towards apex; stigmas 3, 0.7–0.9 mm long, ciliate. Nutlet trigonous, obovoid, c. 1.2 × 1 mm, irregularly conspicuously trabeculate, short stipitate, stramineous.

Fl. & Fr.: Nov. – May.

Habitat: High altitude hill slopes.

Distrib.: (Coimbatore, Dindigul, Madurai and Nilgiri (Pykara)). South India (Kerala). **Endemic**.

53. *Fimbristylis tenera* Roem & Schult., Mant. Syst. Veg. 2: 57. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 6: 642. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1660 (1152). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 157. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1423. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 244. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash,

Fl. Pl. India Annot. Checkl. Monocot.: 284.2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021. *F. glabra* Steud., Syn. Pl. Glumac. 2:111. 1855. *F. oxylepis* Steud., Syn. Pl. Glumac. 2:110. 1855. *F. tenera* Schult. var. *oxylepis* (Steud.) C.B. Clarke in Hook.f., Fl. Brit. India 6:642. 1893.

Loosely tufted annuals with short rhizome and fibrous roots. Culms trigonus, 10–30 cm high, 0.3–0.5 mm thick, deeply grooved, smooth, greyish-green, glabrous. Leaves basal, ½ to as long as culm, 0.4–1 mm wide, abruptly acuminate at apex, flat, margins scabrous, incurved; ligule absent; sheaths up to 4 cm long, cylindrical, hyaline, grey or yellowish-green, soft, mouth oblique. Inflorescence simple or subcompound umbel with 3–5 spikelets, 1.5–5 × c. 3 cm. Involucral bracts 2–4, 2–13 mm long; rays up to 5, bearing 2–4 spikelets. Spikelets solitary, lanceolate, 6–8 × 1.8–2.5 mm, terete, many flowered. Glumes spirally imbricate, broadly ovate, 1.6–2.5 × 1–1.8 mm, boat shaped, glabrous, light to dark brownish, triangular, keeled, mid-nerve green, narrowed towards apex, acuminate and contracted at base, apical part finely scabrous to papillose, margin scarious, hyaline. Stamen 1 (–2); anther c. 0.5 mm long. Style up to 1 mm long, pyramidally thickened at base, glabrous; stigmas 3, 0.2–0.4 mm long. Nutlets globose to obovoid, trigonous, 0.5–0.6 × 0.3–0.5 mm, stipitate, reticulate and tuberculate, creamy white to light brown; epidermal cells transversely hexagonal with 10 vertical rows on surface

Fl. & Fr.: Jul. – Nov.

Habitat: Open grasslands, marshes in plains and wet hills and moist loamy soils.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore and Nilgiri). Western Peninsular, Central and North India. Bhutan, Pakistan, Sri Lanka and Tropical Africa.

54. *Fimbristylis tetragona* R. Br., Prodr. Fl. Nov. Holland.: 226. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 631. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1658 (1150). 1931; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1761. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 81. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 245. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Tufted annuals or perennials with short slender rhizome. Culms erect, 15–50 cm high, 1–1.5 mm thick, sharply quadrangular, glabrous, base covered with light brownish colour bladeless sheaths. Leaves reduced to bladeless sheaths, hyaline, up to 7 cm long, keeled, straw coloured, mouth oblique; ligule absent. Inflorescence a single terminal spikelet. Lower glume appears like bract in bud stage, comparatively bigger. Spikelet erect, ellipsoid to ovoid, 5–10 × 4–5 mm, terete, brown, many flowered; rachilla narrowly winged. Glumes compactly imbricate, oblong, boat

shaped, 3–3.5 × 1.5–2 mm, obtuse or acute-obtuse at apex, incurved, dark brownish keeled, many-nerved, with yellowish hyaline margins, tinged brownish colour at apex; lower 2 or 3 basal glumes empty. Stamen 1; anther 1–1.5 mm long. Style as long as nutlet, style up to 1.5 mm long, flat, linear, slightly broader at base, sparsely ciliate on margins; stigmas 2, c. 0.5 mm long; gynophore c. 0.5 mm long, flat. Nutlets oblong, cylindrical with major part parallel sided, biconvex, c. 2 × 0.8 mm, subcylindric, acute at apex, stipitate at base, trabeculate from the transversely oblong epidermal cells in between 5–8 vertical ridges, shiny, cream coloured.

Fl. & Fr.: Aug. – Jan.

Habitat: Open wetlands, swampy grasslands, shallow waters, banks of ponds and paddy fields.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Nilgiri, Tiruchirappalli and Tirunelveli). Throughout India. Formosa, Indo-China, Malesia, Nepal, South China, Sri Lanka, Thailand, Tropical North Australia.

55. *Fimbristylis tortifolia* Govind. in Proc. Indian Acad. Sci. 91: 46. 1982; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 247. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Rhizomatous perennials; rhizome thick, woody, horizontally or obliquely creeping. Culms pentagonous, 15–35 cm high, 0.75–1 mm wide, slender. Leaves curved, tortuous, shorter than culm, 8–15 × 0.1–0.15 cm, canaliculate, distinctly involute, glabrous; sheaths brown, glabrous. Inflorescence simple, capitate, rarely one rayed, consisting of 3–8 (–10) spikelets, 8–10 mm across. Involucral bracts broadly ovate lanceolate, 8–15 mm long, dark brown, broad at base with somewhat scabrid arista, as long as slightly longer than inflorescence. Spikelets lanceolate, 6–9 × 2.5–3 mm, acute, terete, castaneous, many flowered. Glumes broadly ovate, 4.5–5.5 × 3.8–4 mm, acute, glabrous, smooth at apex, patent with distinct hyaline margins and one lateral nerve on each side, distinctly mucronate, distinctly keeled; keel 5-nerved, mucro recurved or erect, 0.6–0.7 mm long; rachilla winged. Stamens 3; anthers linear, oblong, 0.75–0.8 mm long. Style 3-fid, triquetrous, 1.75–2 mm long, with slightly dilated pyramidal base, glabrous or slightly cilia behind trifurcation. Nutlets broadly obovoid, triquetrous, 1.1–1.25 × 0.75–0.8 mm, tricostulate with convex sides, dark brown ultimately tending to become black, umbonulate, distinctly tubercled in upper half, stipitate, stipe 0.1–0.2 mm long; outer epicarpic cells in upper half transversely elongated, hexagonal, tessellated, occurring in 10–12 regular vertical rows on each face.

Fl. & Fr.: Nov. – Jan.

Habitat: In open grassy rocks.

Distrib.: Tamil Nadu (Dindigul, Madurai). **Endemic** to Tamil Nadu.

56. *Fimbristylis triflora* (L.) Schum. ex Engler in Abh. Preuss. Wiss.: 14. 1894; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 248. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021. *Cyperus triflorus* L. Mant. Pl. 180. 1771. *Fimbristylis tristachya* (Vahl) Thwaites, Enum. Pl. Zeyl. 434. 1864, non R. Br. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 649. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1660 (1152). 1931. *Abildgaardia tristachya* Vahl, Enum. Pl. 2: 297. 1805.

Rhizomatous perennials, densely tufted, robust, often forming a large clumps; rhizome stout, horizontal, 4–5 cm thick; root 0.5–0.8 mm thick. Culms terete, cylindrical, 15–60 cm high, glabrous, bulbosely thickened at base, 1–3 mm thick in lower half. Leaves eligulate, more than half as long as culm, c. 2.5 mm wide, coriaceous, reduced to sheaths on some culms, glabrous, glaucous green; sheaths 5–8 cm long, cylindrical, pale-brown. Inflorescence simple, with mostly 3, rarely 4 spikelets. Involucralbracts many, shorter than inflorescence, 1–2-foliar, setiform; rays 1–3, up to 5 cm long, bearing 1 or 2 spikelets. Spikelets all solitary, large, lanceolate, or ellipsoid oblong, 1.5–3 × 0.4–0.6 cm, flattened or subturgid, acutish, stramineous brown, many flowered. Glumes irregularly distichous, broadly ovate or ovate-oblong, 6–8 × 4–5 mm, cuspidate, stramineous, brown-dotted, narrowly hyaline margined, stained with chestnut purplish on both sides of keel; keel fimbriate, pyramidally thickened at base, multi-nerved, with cusp c. 0.5 mm long. Stamens 3; anthers c. 3 mm long. Style 3-fid, flat, 4–6 mm long. Nutlet obovoid with convex faces, trigonous, 2.5–3.5 × 1.3–1.6 mm, rounded at apex, apiculate, densely verruculose, shiny with hexagonal epidermal cells, gradually attenuated at base in to c. 1 mm long stout stipe, greyish brown.

Fl. & Fr.: Almost throughout year

Habitat: Saline swamps, standing water of shallow lakes.

Distrib.: Tamil Nadu (Chengalpattu, Cuddalore, Dindigul, Kallakurichi, Madurai, Ramanathapuram, Tiruchirappalli and Viluppuram). South India. Sri Lanka and Africa.

57. *Fimbristylis tristachya* R. Br., Prodr. Fl. Nov. Holland.: 226. 1810; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot.

Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021. *F. schoenoides* sensu C.B. Clarke in Hook.f., Fl. Brit. India 6: 634. 1893 p.p., non (Retz.) Vahl 1805; C.E.C. Fisch. in Gamble, Fl. Madras:1658 (1150). 1931.

Tufted, rhizomatous perennials; rhizome hard and fully covers with old brownish coloured sheaths; roots thick, fibrous. Culms erect, up to 35 cm high, 4 angular, prominently grooved. Leaves basal, stiff, linear, shorter to $\frac{1}{2}$ of culm, up to 15×0.2 cm, margins revolute, glaucous; sheath flat to slightly curved, 2–5 cm long, base of sheath broad and covers rhizome. Ligule with a fringe of short hairs; Inflorescence a simple umbel, 2–4 cm long, consist of 1 primary solitary spikelet and 1 lateral spikelet. Involucral bracts 2 or 3, minute, lower up to 1 cm long; rays 1–5 cm long. Spikelets solitary, ovoid to lanceolate, up to 2 cm long, gradually tapering to apex; rachilla persistent. Glumes irregularly distichous to spirally imbricate, broadly ovate, c. 7×5 mm, glabrous, keeled, margins hyaline, obtuse and mucronate at apex, hyaline to dark brown. Stamens 3; anthers linear, 2–2.5 mm long. Ovary trigonous, c. 1 mm long; style c. 3.5 mm long, compressed, ciliate, slightly inflated at base; stigmas 2. Nutlets obovate, biconvex, up to 2 mm long, mucronate, ash coloured, stipitate to 1 mm long, faintly trabeculate, 3 external appendages raise from the stalk of nutlet.

Fl. & Fr.: Feb. – Sep.

Habitat: Dry deciduous forests and open scrubs.

Distrib.: Tamil Nadu (Chengalpattu, Cuddalore, Dindigul, Kallakurichi, Madurai, Ramanathapuram, Tiruchirappalli and Viluppuram). Kerala, East and Northeast India. Indo-Malesia and Australia.

58. *Fimbristylis tumida* Govind. in Rheedeia 8: 91. 1998; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 249. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Tufted annuals with thick fibrous roots. Culms 4–6, rigid, trigonous, (5–) 10–15 cm high, up to 0.5 mm broad, without thickened base, glabrous, ribbed, sulcate, smooth, leafy at base. Leaves stiff, erect, shorter than culm, c. 1 mm wide, flat, keeled, red dotted; ligule with thickened margin; sheaths all laminiferous, pale brown, red dotted, closed with ciliate curved or transversely truncate mouth, glabrous. Inflorescence simple to compound umbel, $1-2 \times c. 1$ cm, with 10–15 spikelets. Involucral bracts leafy, erect, shorter than inflorescence, stiff; primary rays 2 or 3, flat, 1–1.5 cm long, smooth. Spikelets mostly paired, pedicellate, rather congested, $3.5-3.6 \times 1.7-1.8$ mm, lance-ovoid, erect, acute, angular by keels, 8–10-flowered, ferruginous or pale brown; basal glumes 1–3 empty; rachilla winged, excavated. Glumes spiral, usually narrowly triangular, ovate or lance-ovate, $1.6-2$ (incl. mucro) $\times 1-1.2$ mm, chartaceous, pale brown, mucicous or apiculate, with mucro of 0.1–0.2 mm long, cymbiform, inflated at nutlets (tumid), adpressed, keel

very prominent, 3-nerved, sharp with sigmoidally curved nerves; nerves excurrent; cells oblong curving towards margin, dull with nerveless tumid sides, glabrous with broad hyaline margin. Stamens 2; anthers yellow, linear-oblong, c. 0.5 mm long, with translucent apex and rounded base. Style triquetrous, c. 1 mm long, glabrous with pyramidal base; stigmas 3, c. 0.5 mm long, shorter than style, glabrous. Nutlet turbinate or narrowly obovoid, triquetrous, 1.8–2 (incl. stipe) × c. 0.5 mm, symmetric, 3-consulate, faintly tubercled without pluricellular outgrowths, whitish-yellow, opaque, rounded at apex, stipitate, umbonate; epicarpic cells distinct, transversely elongated, lineolate occurring in 6–8 regular rows on each face.

Fl. & Fr.: Oct. – Jan.

Habitat: Marshy grasslands.

Distrib.: Tamil Nadu (Tirunelveli). **Endemic** to Southern Western Ghats.

59. *Fimbristylis uliginosa* Hochst. ex Steud., Syn. Pl. Glumac. 2: 109. 1855; C.B. Clarke in Hook.f., Fl. Brit. India 6: 648. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 438. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1660 (1152). 1931; Fyson, Fl. S. Ind. Hill Sta.: 640. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1762. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1423. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 250. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Tufted, rhizomatous perennials; rhizome covered with old brownish sheaths. Culms erect, triangular, 20–25 cm long, nerved, thickened at base. Leaves many, clustered near base, 4–15 cm long, c. 1.5 mm wide, filiform, acute at apex, narrowed from a broad base, scabrid; ligule absent; sheaths up to 4 cm long, margins hyaline, brownish coloured. Inflorescence simple umbel, with 3–10 spikelets. Involucral bracts 2 or 3, lower bract exceeding the inflorescence, linear, up to 3.5 cm long. Spikelets mostly clustered, few solitary, ovoid to obovoid, 6–8 × c. 2 mm, sessile, dark brown. Glumes spiral, ovate, c. 6 × 3 mm, boat shaped, mucronate, keeled, 3-nerved, lineolate with dark reddish-brown. Stamens 3; anthers oblong, c. 2 mm long, distinctly appendiculate tipped; filaments flat. Style c. 2 mm long, dilated at base, densely hairy at top; stigmas 3, as long as style, ciliate. Nutlet obovoid, c. 1.5 × 1 mm, trigonous, smooth, dark brown, stipitate.

Fl. & Fr.: Nov. – May

Habitat: Marshy grasslands, Open wetlands.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri, Tiruchirappalli and Tirunelveli). Peninsular India. **Endemic**.

60. *Fimbristylis velliangiriensis* Murugesan & al. in J. Thrt. Taxa 2 (13) :1380. 2010; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 285. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021.

Perennials; rhizome absent or often very short, woody. Culms 25– 35 cm high, 4 or 5-angled, solitary, sometimes tufted, smooth or often scabrid, much thickened at base by old leaf-sheaths. Leaves half or as long as culms, linear, 5–18 × 0.2–0.3 cm, 3–5-nerved, involute, scabrid along margins, suddenly and shortly pointed at apex; eligulate; sheaths 1.2–4 cm long, hyaline, whitish or brownish, glabrous, breaking into fibres at maturity. Inflorescence in terminal compound to decompose, anthelate, 2.5–4 × 1–2.5 cm, with 9–15 spikelets. Involucral bracts 3–5, rarely 8, equal or longer than spikelets, 0.8–2 cm long, setaceous from broad base, scabrid at base, sharply spinulose scabrid towards apex, shortly and suddenly pointed at apex. Spikelets all solitary, ellipsoid, oblong, 0.4–0.8 cm long, reddish-brown, pedicellate, rarely 1 or 2 spikelets sessile, 6–10 (13) flowered; pedicel 2.5–7.5 mm long. Glumes spirally imbricate, broadly ovate- oblong, 3.5–4 × 2.5–3.3cm, 7–9-nerved, reddish brown, keeled; keel produced into 1–1.2 mm long arista at apex, margins narrowly hyaline or scarious, minutely and scatteredly scaberulous without; rachilla narrowly winged. Stamens 3, 3–3.5 mm long; filaments broadly winged on both sides flat, subequal, 0.7–1.1 mm long, rarely reddish glandular at base; anthers linear-oblong or oblong-lanceolate, 2–3 mm long, 2–8 ciliate hairy at apex, sagittate at base, and shortly winged at base. Ovary trigonous, obovate, 0.5–0.8 mm long, slightly winged on angles. Style 3-fid, trigonous, 2.5–3.5 mm long, prominently winged on angles, glabrous at base, densely ciliate above the middle; stigmas 3, 2.5–4 mm long, densely ciliate along margins, equal to or longer than style. Nutlets obovoid, trigonous, 0.8–1.2 mm long, minutely tubercled.

Fl. & Fr.: Sep. – Nov.

Habitat: Common in open grasslands at higher altitudes above 1300m.

Distrib.: Tamil Nadu (Coimbatore (Vellingiri hills)). **Endemic** to Tamil Nadu.

61. *Fimbristylis woodrowii* C.B. Clarke in Kew Bull. 1898: 227. 1898 & in J. Linn. Soc. Bot. 34: 68. 1898; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1762. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:253. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021.

Annuals; Culms 3–5-angled, tufted, 8–20 cm high, very slender, 0.2–0.8 mm thick, compressed below the inflorescence. Leaves ligulate, shorter than culm, 0.5–1.5 mm wide, flat, abruptly acuminate at apex; sheaths striate, 0.5–2.5 cm long. Inflorescence simple or compound, 0.5–2 × 0.5–2.2 cm, with few to many spikelets.

Involucral bracts 1–3, lowest smaller than to overtopping the inflorescence, up to 2.5 cm across; rays 2–7, angular. Spikelets paired or in clusters of 3, of which one sessile and the other two short-peduncled, or all solitary, ovoid-lanceolate, 2–6 × 1–2 mm, acute, hardly angular, few flowered. Glumes spiral, broadly triangular-ovate, 1.2–1.8 × 1–1.3 mm, mucronulate, 3-nerved, keeled, with hyaline margins. Stamen 1; anthers oblong, 0.3–0.5 mm long. Style 3-fid, 0.7–0.8 mm long, glabrous, triquetrous and pyramidally thickened at base. Nutlets trigonous with prominent angles, obovoid, 0.7–0.8 × 0.4–0.7 mm, umbonulate, shortly stipitate, smooth at times sparsely verruculose, cream-white; epidermal cells in 4–6 vertical rows or transversely oblong.

Fl. & Fr.: Aug. – Dec.

Habitat: Open grasslands, open seasonally wet sandy places. Rare.

Distrib.: Tamil Nadu (Ariyalur, Chennai, Cuddalore, Dharmapuri, Erode, Kanchipuram, Karur, Krishnagiri, Nagapattinam, Namakkal and Perambalur). Peninsular India (Maharashtra, Karnataka and Kerala). **Endemic**.

9. **FUIRENA** Rottb.

Tufted annuals or perennial herbs, at times with short creeping rhizome. Culms erect, at times solitary, angular, noded, usually pubescent, leafy throughout the length. Radical leaves reduced to cataphylls. Leaves mostly cauline, elongate, linear or lanceolate; ligule membranous, hyaline; sheath usually closed, completely surrounding the culm. Inflorescence paniculate, with a terminal and few to several axillary clusters of sessile spikelets, often much reduced. Involucral bracts leafy, sheathing at base. Spikelets terete, ovoid or ellipsoid, usually greyish-green and pubescent, many flowered; rachilla persistent, not winged, with diamond shaped scars. Glumes spirally imbricate, obovate to broadly elliptic or oblong, acropetally caduceous, obtuse and awned at apex, 3-nerved, not keeled, hairy on the back at least in upper half, basal 1 or 2 empty. Flowers hermaphrodite. Perianth bristles with 3 outer bristles and 3 inner scales, rarely with 6 bristles. Stamens 2 or 3. Style not dilated at base, continuous with ovary; stigmas 3. Nutlet small, triquetrous, obovate or ovate, beaked, stipitate, smooth or trabeculate.

Warm regions of the world, mostly in tropical Africa and tropical America, c. 30 species, c. 9 in India and 6 species and one variety in Tamil Nadu.

Key to species and variety

- | | |
|--|---|
| 1a. Perennials with long creeping rhizomatous base; angles of nutlets much raised (wing like); beak of nutlets broadly conical, decurrent on angles; hypogynous scales or bristles usually absent or rudimentary | 2 |
| 1b. Annuals or Perennials; angles of nutlets acute or short, not wing like; beak of nutlets very slender, not decurrent; hypogynous scales and/or bristles present | 3 |

- 2a. Nutlet obovoid to suborbicular, c. 1×0.6 mm, with prominent angles and 3 – 5 vertical lines on faces, not covered with parchment like layer; culms glabrous **2. F. cuspidata**
- 2b. Nutlet broadly ellipsoid, $1.5\text{--}2 \times 0.8\text{--}1.2$ mm, smooth or cellularly reticulate, covered with thin, scarious parchment like layer; culms pubescent or glabrescent
3. F. pubescens var. **pergamentacea**
- 3a. Hypogynous bristles present, retrorsely barbellate, longer than nutlet; scales absent; beak of nutlets broadly conical with base slightly but distinctly decurrent on nutlet angles **4. F. swamyii**
- 3b. Hypogynous bristles and scales present; bristles subulate, much shorter than nutlets; scales suborbicular or lunate often coloured; beak of nutlets slender, if conical not decurrent on nutlet angles 4
- 4a. Perennials, rhizome creeping, decumbent; leaves usually glabrous; hypogynous scales almost sessile, their blades $1\text{--}1.3$ mm long, with more or less curved mucro; beak c. 0.4 mm long, often exerted from hypogynous scales **6. F. umbellata**
- 4b. Annuals, rhizome short with thick fibrous roots; leaves more or less pubescent; hypogynous scales subsessile or stalked, their blades $0.5\text{--}1$ mm long, with straight mucro; beak under 0.2 mm long, not exerted from hypogynous scales 5
- 5a. Glumes thick, spongy within, $5\text{--}7$ -nerved, of which 3 strong rib-like yellowish nerves; awns thick, thorn-like, recurved; hypogynous scales subsessile, broadly oblong-ovate or elliptic, not lobed at base; nutlets $0.6\text{--}0.7$ mm long **7. F. uncinata**
- 5b. Glumes thin, membranous, slenderly 3-nerved; awns slender, not thorn-like, straight; hypogynous scales stipitate (long stalked), spatulate or anchor-shaped, more or less lobed at base; nutlets $0.8\text{--}1$ mm long 6
- 6a. Leaves and peduncles pubescent; spikelets $2\text{--}3$ mm long; glumes $1\text{--}2$ mm long; hypogynous scales spatulate with blade subcordate, cordate or hastate at base; apex 3-toothed or lobed **1. F. ciliaris**
- 6b. Leaves and peduncles densely scabrous; spikelets $4\text{--}8$ mm long; glumes $2\text{--}2.5$ mm long; hypogynous scales anchor-shaped with blade semicircular to lunate with 2 lower lobes extending downwards; cuspidate at apex **5. F. trilobites**

1. Fuirena ciliaris (L.) Roxb., Hort. Bengal.: 81. 1814; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1763. 1983; Chandrab. & N.C. Nair, Fl. Coimbatore: 312. 1988; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1423. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 256. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021. *Scirpus ciliaris* L., Mant. Pl. 2: 182. 1771. *Fuirena glomerata* Lam., Tabl. Encycl. 1:150. 1791; C.B. Clarke in Hook.f., Fl. Brit. India 6: 666. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1669 (1158). 1931. *Scirpus pilosus* Retz., Observ. Bot. 6: 19. 1791.

Tufted annuals; at times rhizome short with faintly thick fibrous roots. Culms $12\text{--}45$ cm high, $0.8\text{--}1.5$ mm thick, obtuse to angular, striate to sulcate, pubescent towards apex. Leaves linear-lanceolate, $2\text{--}16$ cm long, $2.5\text{--}8$ mm wide, acute to acuminate at apex, pubescent throughout, ciliate on margins; ligule very prominent, $2\text{--}3$ mm long, membranous, truncate; sheaths $1\text{--}3$ cm long, striate, pubescent; lower

1 or 2 sheath bladeless. Inflorescence usually a terminal cluster along with 1 or 2 peduncled clusters from upper axils, at times terminal cluster only; each cluster 0.6–3 cm across, bearing 3–13 spikelets; peduncle pubescent, mostly enclosed within branchlet sheath. Involucral bracts leafy, shorter than or exceeding the inflorescence. Spikelets ovoid or obovate, 2–3 × 0.8–1 mm, obtuse at apex, pubescent throughout dorsally, pilose in centre, many flowered. Glumes obovate, 1–2 mm long, thin, membranous, obtuse at apex, faintly emarginated with 3-nerved costa excurrent into recurved 1–1.5 mm awn. Perianth biseriate, bristles 3, usually shorter than nutlet, at times as long as nutlet, scaberulous to smooth; scales subquadrate, blade spatulate with subcordate, cordate or hastate at base, 3-dentate at apex, distinctly clawed, long stipitate at base, c. 1 × 0.4 mm, glabrous or minutely hairy at apex. Stamens 3; anthers oblong, c. 0.3 mm long; filaments elongate up to 2 mm long. Styles c. 1 mm long; stigmas 3, slightly shorter than style. Nutlets triquetrous, obovate in outline, c. 1 × 0.5 mm, cuneate towards base, narrowed to a beak at apex, smooth, brownish; beak up to 0.2 mm long, not exerted from hypogynous scales.

Fl. & Fr.: Aug. – Apr.

Habitat: Open wet lands, swampy grasslands, water logged areas, river banks, along the margin of paddy fields, wet sandy and other marshy areas at low altitude.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Kanyakumari, Ramanathapuram, Salem and Tiruchirappalli). Throughout India. Pantropical.

2. *Fuirena cuspidata* (Roth) Kunth, Enum. Pl. 2:187. 1837; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020. *Scirpus cuspidatus* Roth, Nov. Pl. Sp.: 31. 1821. Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:257. 2015. *Fuirena wallichiana* Kunth, Enum. Pl. 2:182. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 665. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1669 (1158). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1764. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; Pallith., Pock. Fl. Sirumalai Hills: 270. 2001; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021.

Tufted perennials with creeping rhizome. Culms robust, closely arising from rhizome, sharply trigonous to triquetrous, 17–150 cm high, 1.7–3.5 mm thick, glabrous, puberulous towards apex. Lowest leaves reduced to bladeless sheaths or with very small lamina. Cauline leaves well developed, linear, 5–15 cm long, c. 2.5 mm wide, narrowed to acute at apex, midrib prominent, margins recurved below, ciliolate towards apex on margins and midrib below; sheaths striate, glabrous to puberulous towards mouth. Inflorescence usually a panicle of terminal cluster bearing 3 to few spikelets, often with 1 or 2 axillary peduncled clusters. Involucral bracts 2 or 3; lowest bract usually slightly exceeding inflorescence.

Spikelets terete, oblong or oblong-ovoid, 6–12 × 4–6 mm, subacute at apex, many flowered. Glumes oblong, 2.5–3 mm long, flat or slightly concave, obtuse at apex, awned, puberulous on outer surface towards apex, margins ciliolate. Perianth bristles often absent, at times 3 or 6; when 6, outer 3 very short, inner 3 shorter or longer than nutlet, hispid; scales absent. Stamens 2 or 3; anthers oblong, 1–1.5 mm long; minutely apiculate at apex, filaments elongate up to 3 mm long. Style 1.6–1.8 mm long, as long as or longer than nutlet; stigmas 3, as long as style or slightly shorter, puberulous. Nutlets trigonous, broadly obovoid to suborbicular, c. 1 × 0.6 mm, pubescent at conical apex, shortly stalked, with prominent angles and 3–5 vertical lines on faces, dark brownish; epidermal cells transversely oblong, c. 9 vertical rows on the face.

Fl. & Fr.: Oct. – Aug.

Habitat: Along water logged areas, banks of streams and marshy areas.

Distrib.: Tamil Nadu (Coimbatore and Madurai). Karnataka, Kerala, Western Peninsular India, Central India and NW India. **Endemic.**

3. *Fuirena pubescens* (Lam.) Kunth var. ***pergamentacea*** C.E.C. Fisch. in Gamble, Fl. Madras: 1669 (1158). 1931; Fyson, Fl. S. Ind. Hill Sta.: 643. 1932; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1764. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1424. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 257. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021.

Rhizomatous perennials, robust; rhizome long, creeping, woody. Culms larger, more than 50 cm high, c. 5 mm thick, noded, sharply trigonous or less triquetrous, more or less hairy. Cauline leaves longer than each node, 9–12 × 4–6 mm, flat, grooved with thickened margins, hairs absent on midnerve and groove; sheaths mouth hairy. Inflorescence a panicle, with terminal or subterminal clusters of 4–6 cm long, 1.5–2 cm broad; each cluster bearing 4–10 spikelets. Involucral bracts 2 or 3; lower one leafy, often longer than the inflorescence, upper ones setaceous, hirsute at margins and base. Spikelets ovoid, 6–10 × 2–3 mm, acute at apex, greyish or blackish-brown. Glumes ovate, rounded at apex, densely hirsute, awns 0.7–0.9 mm long, keel 3-nerved. Perianth broadly ellipsoid, 1.5–2 × 0.8–1.2 mm, sharply angled, angles much raised as wing-like above faces especially near base, smooth or cellularly reticulate, covered with thin, scarious, parchment like covering on nut surface, usually detachable; beak broadly conical, slightly or distinctly decurrent on nut angles.

Fl. & Fr.: Oct. – Aug.

Habitat: Along water logged areas, banks of streams and marshy areas.

Distrib.: Coimbatore and Dindigul (Madurai). South India. **Endemic** to Tamil Nadu.

4. *Fuirena swamyii* Govind. in Proc. Indian Acad. Sci. 94 (1):11. f. a-g. 1985; Karthik. & al., Fl. Ind. Enum. Monocot.: 55. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:258. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021. *Fuirena ponmudiensis* Ravi & Anil Kumar in Rheedea 4:102. 1994.

Rhizomatous perennials; rhizome short, woody. Culms slender, 25–50 cm high, c. 3 mm thick, noded, sharply trigonous or less triquetrous. Cauline leaves longer than each node, 6–8 × 3–4 mm, flat, grooved with thickened margins, keel and adaxial grooves hairy; sheaths mouth hairy. Inflorescence a panicle, with terminal or subterminal clusters of 3–6 cm long, 1–2 cm broad; each cluster bearing 3–10 spikelets. Involucral bracts 2 or 3; lower one leafy, often longer than the inflorescence, upper ones setaceous, hirsute at margins and base. Spikelets ovoid, 6–9 × 2–3 mm, acute at apex, greyish or blackish-brown. Glumes ovate, rounded at apex, densely hirsute, awns 0.6–0.8 mm long, keel 3-nerved. Perianth bristles 6, biseriate; outer 3 longer than nutlet, retrorsely barbellate; scales absent. Stamens 3; anthers linear, 0.6–0.8 mm long. Nutlet trigonous, broadly elliptic or suborbicular ellipsoid, 1.5–2 × 0.7–1 mm, sharply angled, smooth; beak broadly conical with base slightly but distinctly decurrent on nutlet angles.

Fl. & Fr.: Throughout the year.

Habitat: Marshy areas in grasslands and pools.

Distrib.: Tamil Nadu (Dindigul, Madurai). Southern Western Ghats (Kerala). **Endemic.**

5. *Fuirena trilobites* C.B. Clarke in Hook.f., Fl. Brit. India 6: 666. 1893; Nair & al. in Bull. Bot. Surv. India 22: 205. 1980; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1764. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 260. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020. D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 365. 2021.

Annuals, tufted, with thick fibrous roots. Culms 25–50 cm high, 1–2 mm thick, compressed, densely scabrous on the stem below inflorescence. Leaves linear, 6–15 × 0.2–0.6 cm, narrowed to an acute apex, densely scabrous on both surfaces, with 5–9 prominent veins below; sheaths striate, densely scabrous. Inflorescence usually

a terminal cluster of 3–13 spikelets, along with 1 or 2 peduncled clusters form the upper axils; peduncles densely scabrous. Involucral bracts shorter than to slightly overtopping the inflorescence. Spikelets oblong-ovoid, 4–8 × 2–3 mm, subacute at apex, squarrose, pubescent. Glumes broadly oblong or oblong-obovate, 2–2.5 × 1–1.2 mm, thin, membranous, with a long recurved bristly subapical awn, slenderly 3-nerved, pubescent outside, black tinged towards apex with bristles. Hypogynous bristles 3, shorter than nut, retrorsely barbellate; scales anchor-shaped, with a long stalk, as long as the nut, blade semicircular to lunate with 2 lower lobes extending downwards, cuspidate at apex. Stamens 3; anthers oblong, c. 0.3 mm long. Style 3-fid, c. 1 mm long. Nutlet triquetrous, obovate, 0.8–1 × 0.5–0.6 mm, cuneate towards base, beaked at apex, smooth, stramineous; beak up to 0.2 mm long, not exerted from hypogynous scales.

Fl. & Fr.: Throughout the year.

Habitat: Marshy areas in grasslands and pools.

Distrib.: Tamil Nadu (Salem). Karnataka and Maharashtra. Endemic to Peninsular India.

6. *Fuirena umbellata* Rottb., Descr. Icon. Rar. Pl.: 70. t. 19, f. 3. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 666. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1669 (1158). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 82. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 261. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 364. 2021.

Rhizomatous perennials; rhizome horizontally creeping, decumbent. Culms solitary or tufted, 40–110 cm high, 4–6 mm thick at base, much narrow towards inflorescence, somewhat stout, prominently 4 or 5 angled, sparsely hirsute hairy below inflorescence. Lowest 2 or 3 leaves reduced to bladeless sheaths, rarely with very short lamina. Upper cauline leaves well developed, subrigid, flat, linear-lanceolate, up to 24 cm long, 4–10 mm wide, acute to acuminate at apex, prominently 5-nerved, usually glabrous, sparsely scabrous on nerves below, ciliate to hirsute at base; ligule hyaline, truncate; sheaths usually glabrous, at times hirsute hairy, striate, shorter than internodes. Inflorescence panicle like, usually a terminal cluster of spikelets along with 1 to few axillary, peduncled clusters; clusters 1–2 cm wide, bearing up to 12 spikelets. Lower involucral bracts leafy, often as long as or exceeding the inflorescence, upper ones much shorter; branchlets setaceous, sheathless. Spikelets ovoid to oblong-ovoid, 6–12 × ca 4 mm, acute at apex, pubescent, more or less squarrose, many flowered, brownish-green. Glumes membranous, obovate or oblong-elliptic, 2.6–3.2 × 1.2–2 mm, obtuse at apex, with a recurved awn of c. 1.2 mm, pubescent on outer

surface, ciliate at apex. Perianth biseriate; bristles needle like, much shorter than nutlet, minutely scabrid; scales membranous, wedge shaped, almost sessile, as long as nutlet, broadly obovate, blades 1–1.3 mm long, truncate or broadly obtuse at somewhat thickened apex with short curled arista, narrowed at base, with a short curved claw, 3 -nerved, with midnerve excurrent to short curved mucro, minutely ciliolate at apex, brown; Stamens 2 or 3; anthers linear-oblong, c. 1.5 mm long; filaments elongate up to 4.6 mm long. Style c. 1 mm long; stigmas 3, shorter than style. Nutlets triquetrous, elliptic or obovate in outline, 0.8–1.2 × 0.6–0.7 mm, narrowed at apex into a beak, cuneate at base, smooth, shining, brownish at maturity; beak c. 0.4 mm long, often exerted from the hypogynous scales.

Fl. & Fr.: Jul. – Dec.

Habitat: Wet places, marshy areas near rivers and rice fields.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore and Kanyakumari). Throughout India. Pantropical.

7. *Fuirena uncinata* (Willd.) Kunth, Enum. Pl. 2: 184. 1837; C.B. Clarke in Hook.f., Fl Brit. India 6: 666. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1669 (1158). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1764. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 56. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 261. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 286. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021. *Scirpus uncinatus* Willd., Sp. Pl. 1: 300. 1798. *Isolepis uncinata* (Willd.) Roem. & Schult., Syst. Veg. 2: 111. 1817. *Fuirena capitata* (Burm.f.) T. Koyama in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 151. 1985; *Scirpus capitatus* Burm.f., Fl. Indica: 21. 1768, non L. 1753.

Tufted annuals or short lived perennials with fibrous roots. Culms angular, sulcate, 5–25 cm high, 1–2 mm thick near base, usually densely pilose. Leaves linear-lanceolate, 1.8–10 cm long, 2–4 mm wide, acute at apex, striate, more or less densely pilose on both surfaces; ligule c. 1 mm long; sheaths striate, pilose, membranous, ferruginous; 1 or 2 basal sheaths leafless, or with very short lamina. Inflorescence a dense cluster of terminal spikelets, usually with 1 or 2 axillary, peduncled clusters; clusters 1–1.5 cm across, bearing few to many spikelets; peduncle pilose. Spikelets sessile, squarrose, broadly ovoid or ellipsoid, 3–6 × 2–3 mm, few flowered. Glumes ovate or elliptic to obovate, c. 2.3 × 1.2–1.5 mm, thick, spongy within, obtuse at apex, densely pubescent dorsally, keel prominent; 5–7 nerved, of which 3 strong rib-like yellowish nerves, two of which extending to 1–1.5 mm long, thick, thorn-like recurved awn, margins pilose. Perianth bristles biseriate; bristles 3, 0.3–0.4 mm long, retrorsely scabrous; scales broadly oblong-ovate or elliptic, c. 1 × 0.6

mm, truncate to obtuse or cuneate, short awned at apex, short stipitate at base (subsessile), ciliate on margins towards apex. Stamens 3; anthers oblong, c. 0.5 mm long; filaments elongate up to 2 mm long. Stigmas 3, as long as style. Nutlets triquetrous, broadly obovoid or broadly ellipsoid, 0.6–0.7 × 0.5–0.6 mm, acute at apex and base, minutely stipitate, smooth, light brown.

Fl. & Fr.: Aug. – Feb.

Habitat: Seasonal wet areas, wet sandy soil in open grasslands; at low altitudes.

Distrib: Tamil Nadu (Chengalpattu, Coimbatore, Cuddalore, Kallakurichi, Salem and Viluppuram). Peninsular and Western India. Sri Lanka.

10. HYPOLYTRUM L.C. Rich.

Rhizomatous perennial herbs, medium or robust in size; rhizome short, stout. Culms erect, arising from centre of a tuft of radical or subradical leaves, trigonous. Leaves basal or cauline, 3-ranked; leaf blades leathery, glabrous; ligule present; basal sheath folded, adaxially open, cauline sheaths tubular. Inflorescence a terminal panicle, more or less corymbose, sometimes contracted into a head like cluster with 1 to many spikes. Spikes with many spirally imbricate bracts subtending a bisexual spikelet like unit with much reduced axis (pseudospikelet). Pseudospikelet comprising a naked apparently terminal female flower and 2 glumes, all subtending a male flower comprising 1 stamen each. Involucral bracts leafy or glume like, basal one usually longest, not sheathing. Spikelets few to numerous, terete, ovoid to ellipsoid, often globose while fruiting, many flowered. Glumes membranous or chartaceous, spirally imbricate, smooth, 1-nerved, muticous or with slightly protruding midrib, basal few empty. Flowers hermaphrodite. Hypogynous scales or basal 2 glumes hyaline, opposite, boat shaped, ciliate on the acute keel, often delicately connate on the adaxial side in early stage. Stamens 2. Ovary terminal; style slender, continuous with ovary; stigmas 2, long. Nutlets biconvex, ovate, elliptic or suborbicular, hard, outer surface smooth or irregularly wrinkled, with a long spongy beak adnate to nutlet proper.

Tropical and subtropical regions, c. 60 species, 3 in India and 1 in Tamil Nadu

Literature: Uittien, H. (1936) Studies in Cyperaceae - Mapanieae, in *Rec. Trav. Bot. Neerl.* 33:133 - 155.

Hypolytrum nemorum (Vahl) Spreng., *Syst. Veg.* 1: 233. 1825; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 83. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 57. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 263. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 286. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 366. 2021. *Schoenus nemorum* Vahl, *Symb. Bot.* 3: 8. 1794. *Hypolytrum latifolium* Rich. ex Pers., *Syn. Pl.* 1:

70. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 678. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1673 (1161). 1931. *Tunga diandra* Roxb., Fl. Ind. (ed. 1) 1: 184. 1820.

Rhizomatous perennials; rhizome woody, with many thick and wiry roots. Culms usually solitary, stout, triquetrous, 25–100 cm high, 2–4 mm thick, with 1 or 2 well developed cauline leaves. Leaves mostly crowded at base, longer than culm, broadly linear, up to 90 cm long, 8–12 mm wide, gradually narrowed to an acute apex, flat to folded near base, prominently 3-nerved, margins antrorsely serrulate towards apex; lower most leaves reduced to bladeless sheaths. Inflorescence panicle to corymbose, open or dense, broadly ovoid to hemispherical in shape, 3–7 cm wide, with few to numerous spikes. Involucral bracts 2–4; lowest 1 or 2 leafy, much exceeding the inflorescence, up to 25 cm long, not sheathing; primary rays spreading, 1–3 cm long, rigid, smooth, base covered with a bifid prophyll. Spikelets oblong-ovoid or ellipsoid before fruiting, 4–6 × 2–3 mm, acute to subobtuse at apex, densely many flowered, subglobose or ovoid at maturity; rachis and rachilla angles scabrous. Glume like bracts spirally and imbricately arranged, obovate, each subtending a pseudospikelet. Pseudospikelet c.1.5 mm long with 2 glumes, 2 male flowers and 1 female flower. Glumes membranous, obovate to orbicular or oblong-orbicular, obtuse at apex, 1.5–2 × 1–1.5 mm, densely brown to lineolate throughout, mid nerve prominent. Subtending glumes not connate, up to 2 mm long, with a spinulose keel. Anthers narrowly oblong up to 1 mm long; staminal filaments up to 2 mm long. Nutlets slightly compressed, ovoid to subglobose, 2–4 × 1.5–2 mm, conically rostrate at apex, smooth or rugulose, brownish, often brown spotted; at times with a constriction between the nutlet proper and the conspicuous beak.

Fl. & Fr.: Throughout the year.

Habitat: Marshy areas in all forests types, plains, also along streams and ponds.

Distrib.: Tamil Nadu (Coimbatore, Kanyakumari and Tirunelveli). Andaman & Nicobar Islands, South and Northeast India. Indo-Malesia to Fiji and China, Australia.

11. KYLLINGA Rottb.

Perennial or annual herbs, rhizomatous or only fibrous roots; rhizomes short or horizontally creeping, sometimes knotty, covering with scales or fibrous sheaths. Culms tufted or solitary, scattered, slender to stout, trigonous, triquetrous or 3-winged. Leaves mostly basal; leaf blade elongated or reduced; ligule absent. Inflorescence terminal, capitate, with 1- few spikes. Spikes sessile, cylindrical, ellipsoidal or globose with numerous spikelets. Involucral bracts 2–8, spreading, leafy, lower ones exceeding inflorescence. Spikelets laterally compressed, each usually with 1 or 2 bisexual flowers; rachilla articulate near base. Glumes distichous, membranous to chartaceous, persistent on rachilla and deciduous with it, keeled,

keel at times winged, basal 2 glumes smaller and without a flower, uppermost glume rarely with male flower, remaining ones each with bisexual flower. Flowers without perianth bristles or scale like perianth parts. Stamen 1, 2 or 3. Hypogynal structures absent. Pistil digynous; style continuous with nutlet, base not swollen, deciduous; stigmas 2. Nutlet compressed, biconvex, ovate to oblong, at times apiculate, one angle towards rachilla.

Tropical, subtropical and warm temperate regions in worldwide, c. 75 species, 9 in India, 7 species, 2 subspecies and 2 varieties in Tamil Nadu

Notes: The genus is characterized by capitate inflorescence of compressed spikelets with deciduous rachillae, distigmatic styles and laterally compressed achenes with one edge towards the rachilla

Key to species and subspecies

- | | |
|---|---|
| 1a. Rhizome creeping or long stoloniferous | 2 |
| 1b. Rhizome vertical, stout, not creeping, not stoloniferous | 5 |
| 2a. Nutlet bearing fertile glumes distinctly winged along the keel | 4. K. nemoralis |
| 2b. Nutlet bearing fertile glumes not winged along the keel | 3 |
| 3a. Rhizome slender, covered by brown or brownish-red scales; culms of small sized plants, up to 30 cm high; involucre bracts short, up to 12 cm long; nutlet 1–1.5 mm long | 1. K. brevifolia |
| 3b. Rhizome thick, covered by dense purplish scales; culms of robust sized plants, up to 80 cm high; involucre bracts elongated, up to 25 cm long; nutlet 1.5–2 mm long | 4 |
| 4a. Involucre bracts 3; leaf sheaths fuscous to blackish to purplish; nutlet ellipsoid-oblong to obovate, fulvous-black to brownish at maturity | 3. K. melanosperma |
| 4b. Involucre bracts usually 4, rarely 3 or 5; leaf sheaths dull brown; nutlet narrowly ellipsoid, white to yellowish at maturity | 6. K. polyphylla subsp. babiensis |
| 5a. Inflorescence large, 10–15 mm long with 3–5 spikes; spikelets 3–4 mm long, often 2-fruited; wing of keel perfectly smooth | 7. K. pseudoalata |
| 5b. Inflorescence small, 4–8 mm long with 1–3 spikes; spikelets 1.8–3 mm long, one fruited; wing of keel if present toothed, crested or serrulate-spinulose | 6 |
| 6a. Culms triquetrous or 3-winged; keel of glumes winged; wings toothed or serrulate; fruiting glumes mucronate to aristate at apex | 8. K. squamulata |
| 6b. Culms trigonous; keel of glumes wingless, smooth; fruiting glumes muticous at apex | 7 |
| 7a. Culm with bulbous thickened at base; central spike globose to ovoid to globose, 0.5 – 0.8 cm long | 2. K. bulbosa |
| 7b. Culm hardly enlarged at base; central spike ovate-oblong to cylindrical, 0.6–1.4 cm long | 8 |
| 8a. Spike usually single, cylindrically elongate; spikelets elliptic, 2–2.5 mm long, turgid; nutlet obovate to elliptic at maturity, 1 mm wide, biconvex, brown to blackish at maturity | 5. K. odorata subsp. cylindrica |
| 8b. Spikes 1–3; spikelets oblong to lanceolate-oblong, 1.7–2 mm long; nutlet oblong at maturity, 0.4–0.5 mm wide, brownish at maturity | 9. K. triceps |

1. *Kyllinga brevifolia* Rottb., Descr. Icon. Rar. Pl.: 13. t. 4, f. 3. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1624 (1130). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1765. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 357. 1987; Karthik. & al., Fl. Ind. Enum. Monocot.: 60. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1425. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 266. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 287. 2020. *Cyperus brevifolius* (Rottb.) Endl. ex Hassk., Cat. Hort. Bot. Bogor.: 24. 1844; B.D. Sharma & al. in Biol. Mem. 2 (1&2):155. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:68. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021.

Erect, rhizomatous perennials; rhizome elongated, stoloniferous horizontally, 2-3 mm thick, slender, covered with brownish scales. Culms arranged in a single row along the rhizome, well spaced, up to 30 (50) cm high, 1–1.5 mm wide, triquetrous, smooth. Leaves well developed, mostly basal, narrowly linear to linear-lanceolate, 1.5–17 × 0.1–0.4 cm, usually shorter than culm, flat or canaliculated, acuminate at apex, scabrid on margins in the upper part; sheaths membranous, 1.5–5 cm long, purplish-brown, lower ones bladeless. Inflorescence a terminal single spikate head, broadly ovoid or globose, 5–10 mm long and wide, greenish to straw coloured at maturity. Involucral bracts 3 or 4, leafy, one erect and other spreading, very unequal in length and width, the lowest bract up to 12 cm long. Spikelets oblong to elliptic-lanceolate, 2.5–3.5 × c. 1 mm, compressed, compact, single flowered. Glumes 4, distichous; lower two glumes sterile, small, up to 1 mm long; 3rd glume fertile, ovate to elliptic, 2–2.8 × c. 1 mm, cuspidate or mucronate, 1–3 -nerved in each side, keeled; keel sparsely spinulose or ciliate from middle towards apex, not winged; 4th glume sterile, c. 3 mm long, 3 -nerved in sides, keeled, not winged. Stamens 1 or 2, at times 3; filaments up to 2.5 mm long. Style bifid, c. 1.5 mm long; stigmas 2. Nutlets oblong to elliptic, at times obovate, 1–1.5 × c. 0.7 mm, apiculate, biconvex, stipitate, brownish-yellow.

Key to varieties

- 1a. Nutlet bearing fertile glume 2–2.8 mm long with spinulose or ciliate keel
1.1. var. *brevifolia*
- 1b. Nutlet bearing fertile glume up to 2 mm long with smooth and glabrous keel
1.2. var. *stellulata*

1.1. var. *brevifolia*

Fl. & Fr.: Almost throughout the year.

Habitat: Common in Marshy areas, plains, wastelands and roadsides; also in grasslands and sandy streams.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri and Tirunelveli). Throughout India. Pantropical.

1.2. var. *stellulata* (Valck. Sur.) Ohwi, Bot. Mag. (Tokyo) 56: 199. 1942; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 267. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 287. 2020. *Cyperus brevifolius* (Rottb.) Hassk. var. *stellulatus* Valck. Sur., Geslacht Cyperus Mal. Archipel.:48, pl. 2, f.5. 1898.

Rhizomatous perennials; rhizome large, creeping horizontally, covered with brownish scales. Leaves usually shorter than culm. Inflorescence spikate, simple, greenish. Involucral bracts usually 2 or 3, reflexed, unequal, lowermost bract usually erect, stiff, short. Spikelets few in number. Glumes c. 2 mm long, keeled; keels smooth and glabrous; fertile glumes equaling the nutlet.

Fl. & Fr.: May – Dec.

Habitat: Along forest margins and in moist open grasslands.

Distrib.: Tamil Nadu (Nilgiri). South India. Indo-Malesia and Australia.

2. *Kyllinga bulbosa* P. Beauv., Fl. Oware 1: 11. t. 8. f. 1. 1804; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1425. 1999; Pallith., Pock. Fl. Sirumalai Hills:271. 2001. *K. triceps* Rottb., Desc. Icon. Rar. Pl.: 14. t. 4, f. 6, 1773, nom. illeg.; C.B. Clarke in Hook.f., Fl. Brit. India 6: 587. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1623 (1130). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1768. 1983; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 275. 2015. *Cyperus triceps* (Rottb.) Endl., Cat. Horti Vindob. 1: 94. 1842; B.D. Sharma & al. in Biol. Mem. 2 (1&2):156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:75. 1989. *Kyllinga tenuifolia* Steud., Syn. Pl. Glumac. 2:69. 1855; Karthik. & al., Fl. Ind. Enum. Monocot.:61. 1989. *Cyperus bulbosus* Vahl, Enum. Pl. 2: 342. 1805; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 344. 2021.

Erect perennials; rhizome short, erect, not stoloniferous. Culms densely tufted, 4–25 (30) cm high, 0.5–1.5 mm thick, slender, trigonous, usually smooth, culm with bulbous thickened bases. Leaves linear, usually shorter, at times longer than culm, up to 10 (18) cm long, 1–3 mm wide, acuminate at apex, flat or folded, scabrid; sheaths membranous, 1–1.5 cm long, light brown to pale yellow; lower sheaths disintegrating into fibres, brownish. Inflorescence a head with 3–5-lobed spikes, sessile, white to pale greenish; central spike globose to ovoid-globose, 5–8 × 3–7 mm; lateral ones globose, smaller. Involucral bracts 3 or 4 (6), leafy, linear, unequal in length, up to 12 cm long, much exceeding the inflorescence, reflexed, spreading, margins scabrid. Spikelets many, oblong to oblong-lanceolate, 1.5–2.5 × 0.5–1 mm, acute at apex, strongly compressed, 1-flowered. Glumes 4, distichous; lower 2 glumes smaller, c. 0.5 mm long, empty,

1–3-nerved; fertile glumes ovate-oblong to oblong-lanceolate, 1.5–2.5 mm long, acute to acuminate at apex, at times mucronulate, 5–7-nerved, keeled; keel smooth, plicate, hyaline near above middle, not winged. Stamens 2; anthers linear; filaments elongated. Style c. 0.5–1 mm long; stigmas 2. Nutlet oblong, 1–1.4 × c. 0.5 mm, apiculate at apex, biconvex, compressed, stipitate, yellowish to brownish at maturity.

Fl. & Fr.: Almost throughout the year.

Habitat: Along marshy areas and low lands, open grasslands, plains, wet fields and moist deciduous forests.

Distrib.: Tamil Nadu (Almost all districts). Throughout India except Northeast. Paleotropics.

3. *Kyllinga melanosperma* Nees in Wight, Contr. Bot. India: 91. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 434. 1915; C.E.C. Fisch. in Gamble, Fl. Madras: 1624 (1130). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1767. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 358. 1987; Karthik. & al., Fl. Ind. Enum. Monocot.: 60. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1426. 1999; Pallith., Pock. Fl. Sirumalai Hills: 271. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 268. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 287. 2020. *Cyperus melanospermus* (Nees) Valck. Sur., Geslacht Cyperus Mal. Archipel.: 50. t. 2, 8. 1898; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 72. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 349. 2021.

Robust, rhizomatous perennials; rhizome short or long and thick, stoloniferous, covered with purplish sheaths or scales. Culms solitary, close together, 30–80 cm high, 2–4 mm thick, trigonous to triquetrous, winged, smooth. Leaves reduced to sheath, uppermost one or two with short bladed, 3–15 × c. 0.6 cm, flat or folded, acuminate at apex; sheaths membranous, transversely corrugate dorsally, fuscous to blackish to purplish, lower sheaths bladeless. Inflorescence a single spikelet head, ovoid to globose, 0.8–1.4 × 0.6–1 cm, greenish. Involucral bracts usually 3, at times 2–4, unequal, up to 25 cm long, spreading, reflexed. Spikelets many, densely arranged, elliptic-oblong to elliptic-lanceolate, 0.3–0.5 × 0.1–0.2 cm, compressed, usually 1-flowered, rarely 2-flowered, falling off as a whole. Glumes mostly 4, distichous; lower two glumes up to 2.5 mm long; fertile glumes ovate-elliptic to ovate-lanceolate, 2.5–3 mm long, membranous, mucronulate to mucronate at apex, 2–4-nerved in each sides, keeled; keels smooth or nearly spinulose, at times ciliate, not winged. Stamens 3; anthers linear, c. 1 mm long. Style up to 2 mm long; stigma 2-fid. Nutlets ellipsoid-oblong to obovate, 1–2 × 6–7 mm, laterally compressed, apiculate at apex, biconvex, stipitate, fulvous-black to brownish at maturity.

Key to subspecies

1a. Leaves all reduced to sheaths or upper 1 or 2 with short blades up to 15 cm long

3.1. subsp. melanosperma

1b. Leaves fairly well developed, up to 30 cm long

3.2. subsp. bifolia

3.1. subsp. melanosperma

Fl. & Fr.: Sep. – May.

Habitat: Marshy areas in grasslands, swamps and in open areas, as weed in elsewhere.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Kanyakumari, Nilgiri, Salem, Tiruchirappalli and Tirunelveli). Peninsular India, Central and Eastern India. Tropical and subtropical Asia and Africa.

3.2. subsp. bifolia (Miq.) Karthik. in Karthik. & al., *Fl. Ind. Enum. Monocot.*: 60. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 269. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 287. 2020. *K. bifolia* Miq., *Fl. Ned. Ind.* 3: 293. 1856. *Cyperus melanospermus* (Nees) Valck. *Sur. subsp. bifolius* (Miq.) J. Kern in *Reinwardtia* 3:62. 1954; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 72. 1989; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.*: 349. 2021.

Rhizomatous perennials; rhizome thick, creeping, woody with short internodes, covered with many -nerved, purplish sheaths or scales. Culms solitary on each node of rhizome, triquetrous, 25–75 cm high, 2–2.5 mm wide. Leaves well developed, 15–30 cm × 4–6 mm, acuminate at apex, margins sparsely scabrid; lower sheaths bladeless, purplish. Inflorescence a solitary spike, ovate to cylindric, 9–10 × 7–8 mm, greenish-white. Involucral bracts 3, unequal, 4–20 × c. 0.4 cm, reflexed or spreading. Spikelets densely arranged, ovate-elliptic, (–3) 4.5–5 × 1–1.5 mm, brownish at maturity. Prophyll broadly ovate-elliptic, 1.7–2 × c. 1 mm. Glumes 3, distichous; lowest glume oblong to obovate, 1.2–1.5 × c. 1 mm, without a keel; second glume elliptic to ovate, 3–3.5 × c. 1 mm, mucronate at apex, 3-nerved in sides, keeled; keel with conspicuous serrulate to spinulose nature; third glume 4–4.5 × 1–1.2 mm, similar to second one. Stamens 3; anthers linear, yellowish-brown; filaments 2 – 3 mm long. Style up to 2 mm long. Nutlet broadly elliptic-obovate to oblong, 1.3–1.7 × c. 0.75 mm, minutely transversely punctate dorsally, yellowish-brown in young, blackish at maturity.

Fl. & Fr.: Jan. – Mar.

Habitat: Along banks of streams.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Kanyakumari, Nilgiri, Pudukkottai and Tiruchirappalli). South and North India. Indo-Malesia.

4. *Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Dandy ex Hutch. & Dalziel, Fl. W. Trop. Afr. 2: 486, 487. 1936; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1767. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 358. 1987; Chandrab. & N.C. Nair, Fl. Coimbatore: 313.1988; Karthik. & al., Fl. Ind. Enum. Monocot.:60. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1426. 1999; Pallith., Pock. Fl. Sirumalai Hills: 272. 2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 270. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 288. 2020. *Thryocephalon nemorale* J.R. Forst. & G. Forst., Char. Gen. Pl.: 65. 1775 & 129. t. 65. 1776. *Kyllinga monocephala* Rottb., Descr. Icon. Rar. Pl.: 13. t. 4, f. 4. 1773, non Roxb. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588.1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1624 (1130). 1931. *Cyperus kyllingia* Endl., Cat. Horti Vindob. 1: 94. 1842; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 71. 1989.

Erect, rhizomatous perennials; rhizome slender, flexuous, horizontally long creeping, stoloniferous, stolens with tubers at intervals, covered with brown scales. Culms close or distance along the rhizome, up to 40 cm high, up to 1.5 mm thick, triquetrous, smooth. Leaves many, linear-lanceolate, 2–15 (30) × 0.2–0.6 cm, longer than culm, flat or canaliculated, acuminate at apex, margins scabrid on upper part; sheaths 1– 3 cm long, purplish-brown, lower one with reduced blades. Inflorescence a head of globose spikes with one central and 2 or 3 lateral ones; the central spike oblong, 0.8–1.2 × 0.7–1 cm, longer than lateral spikes, whitish. Involucral bracts 3 or 4, leafy, the lowest up to 17 cm long, exceeding the inflorescence, unequal, deflexed or spreading. Spikelets many, ovate-elliptic to lanceolate, 2.5–3.5 × 1–1.5 mm, compressed, 1 or 2-flowered; rachilla wingless. Glumes usually 4 or 5, distichous; lower two glumes smaller, up to 1.3 mm long, empty; upper fertile glumes boat shaped, 2–3.5 mm long, compressed, apiculate to mucronulate at apex, 3-nerved in sides, strongly keeled; keel serrulate, broadly membranous winged, wings spinulose to ciliate, keel ending in a short recurved cusp. Stamens 3; filaments long up to 2.5 mm long. Style up to 1 mm long; stigmas 2. Nutlet obovate or oblong-elliptic, 1–1.5 × 0.5–0.7 mm, suborbicular, biconvex, apiculate, laterally compressed, stipitate, brownish-yellow.

Fl. & Fr.: Almost throughout the year.

Habitat: Along waste places, plains, roadsides, degraded forest areas, grasslands, streams, waste lands and moist open areas.

Distrib.: Tamil Nadu (All districts). Throughout India. Pantropical.

5. *Kyllinga odorata* Vahl subsp. ***cylindrica*** (Nees) T. Koyama in Gard. Bull. Singapore 30: 161. 1977 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 244. 1985; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):

1767. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 61. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1426. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:271. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 288. 2020. *K. cylindrica* Nees in Wight, Contr. Bot. India: 91. 1834, incl. var. *subtriceps* Nees; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1624 (1130). 1931. *Cyperus sesquiflorus* (Torr.) Mattif. & Kuek. var. *cylindricus* (Nees) Kuek. in Engler, Pflanzenr. 101: 593. 1936; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 354. 2021. *K. odorata* sensu T.S. Nayar & al., Fl. Pl. Kerala: 689. 2006 non Vahl 1805.

Erect, rhizomatous perennials; rhizome short, thick, non-stoloniferous, at times creeping, covered with brown scales or fibres. Culms tufted, 12–40 cm high, 1–2 mm thick, triquetrous, slightly enlarged at base. Leaves few, linear, 3–18 (30) × 0.2–0.4 cm, acute to acuminate at apex, scabrid on upper margins; sheaths 2–5.5 cm long, pale brown, lower sheath bladeless. Inflorescence a head with 1–3 spikes, 1–1.4 cm long, c. 1 cm wide, whitish-green; central spike oblong to cylindrical, 1–1.4 cm long; lateral spikes globose, much shorter than central spike. Involucral bracts 3–5, leafy, the lowest up to 12 cm long, reflexed. Spikelets many, elliptic, 2–2.5 mm long, flattened, 1 or 2 flowered. Glumes 4, distichous; lower two glumes small, c. 1.5 mm long; upper two glumes broadly ovate, 2–2.5 mm long, acute to apiculate at apex, folded with green, 5–9 -nerved, keeled, keel smooth to spinulose, not winged, margins more or less hyaline. Stamens 2; anthers oblong. Style short; stigmas 2. Nutlets oblong in young, obovate to elliptic at maturity, c. 1.5 × 1 mm, truncate at apex, apiculate, biconvex, brown to blackish at maturity.

Fl. & Fr.: Apr. – Jan.

Habitat: Marshy areas in degraded deciduous forests, also in plains, moist open areas and elevated shady palces.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). Throughout India but not common. Paleotropics.

6. *Kyllinga polyphylla* Willd. ex Kunth subsp. ***babiensis*** W. Khan & Lakshminarismhan, Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 273. 2015.

Rhizomatous perennials; rhizome stoloniferous, stolons strongly aromatic, 2–4 mm thick, covered with 1–1.5 cm long, dull brown, purplish nerved scales. Culms 100–150 cm high, slender, trigonous, obtusangular in lower greater part. Leaves flat, 10–35 × 0.18–0.2 cm, acuminate at apex, glabrous; some are reduced to bladeless or shortly laminate sheaths; sheaths dull brown. Inflorescence a single head with

lateral smaller spikes in the axils of involucre bracts. Involucre bracts usually 4, rarely 3 or 5, up to 15 cm long, 1–2 mm broad, all erect, rarely 1 or 2 suberect the lowest one seemingly continuation of stem, pushing aside the inflorescence. Spikelets 1–4, terminal one oblong, 6–13 × 4–6 mm, rarely subglobose when young, obtuse to acutish, greenish. Lateral spikes ovoid, 2–4 mm across, with many spikelets; spikelets ellipsoid, 2.8–3 × 0.8–1 mm, 5 or 6 nerved, compressed numerous. Glumes folded, hyaline with green keel, with c. 0.2 mm long mucro, nerves whitish to greenish; keel sparsely serrulate or smooth. Stamen 1; anthers 0.8–1 mm long. Style 2-fid, 1.5–2 mm long, filiform, as long as to slightly longer than stigma. Nutlet narrowly ellipsoid, 1–1.2 × 0.5–0.8 mm, white to yellowish, smooth.

Fl. & Fr.: Almost throughout year.

Habitat: Along margins of stream, sugarcane fields. Rare

Distrib.: Tamil Nadu (Coimbatore). Native of Tropical Africa, Madagascar, introduced elsewhere.

7. *Kyllinga pseudoalata* W. Khan & R.D. Taur, Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 274. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 288. 2020. *Cyperus pseudoalatus* (Wad.Khan & R.D.Taur) Kottaim., Int. J. Curr. Res. Biosci. Pl. Biol. 6(10): 38. 2019; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 352. 2021.

Rhizomatous perennials, tufted; rhizome short, vertical. Culms 15–40 cm high, trigonous, somewhat bulbous at base, glabrous. Leaves flat, 2–4 mm wide, shorter than culms, acuminate at apex. Inflorescence of 3–5 spikes, 10–15 × 10–12 mm, dull white to pale yellowish; lateral spikes subglobose, central spike oblong. Involucre bracts 3–5, foliar, up to 10 cm long, spreading to deflexed. Spikelets many, compressed, narrowly ellipsoid, 2.8–3 × 0.7–0.8 mm, tapering at both ends, pale yellowish, 2 flowered, 3 or 4 nerved. Glumes 4, ovate-lanceolate, 2.8–3 × 0.7–0.8 mm, very acute, mucous, 2 or 3 nerved on sides, pale yellowish, wing of keel broad, 0.2–0.3 mm wide, sometimes red brown, dotted but not spongy. Stamens 1 or 2; anthers linear, c. 0.5 mm long, non-appendiculate. Style 2-fid, c. 1 mm long, subflat; stigma much shorter than style. Nutlet narrowly oblong, ellipsoid, 1.5–1.6 × 0.4–0.5 mm, tapering at both ends, yellowish, punctulate, apiculate, shortly stipitate.

Fl. & Fr.: Oct. – Nov.

Habitat: Occasional in wet-rocky situations, marshes along road sides.

Distrib.: Tamil Nadu (Chennai and Tiruchirappally). Andhra Pradesh. Endemic to South India.

8. *Kyllinga squamulata* Vahl, Enum. Pl. Obs. 2: 381. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 589. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1624 (1130). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 61. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 275. 2015.

Tufted annuals with fibrous roots, non-stoloniferous. Culms 2–5 together, 20–36 cm high, 0.7–1 mm thick, triquetrous, smooth. Leaves usually longer than culm, linear, up to 2.5 mm wide, margins scabrid. Inflorescence a spikate head, solitary, at times with 1 or 2 laterally; spike subglobose to ovoid, c. 0.9 × 0.7 cm. Involucral bracts 3 or 4, leafy, c. 20 × 0.3 cm long. Spikelets few to many, strongly compressed, ovate-lanceolate, 3–3.5 × 1.2–1.5 mm, curved. Glumes 4, distichous; lower two glumes smaller, up to 1 mm long; 3rd and 4th glumes boat shaped, c. 2.5 mm long, mucronate to aristate at apex, excurrent and recurved, 3–5-nerved on each sides, keeled, keel prominently winged with a toothed crest shaped like a cockscomb. Stamens 2; anthers oblong; filaments c. 2 mm long. Nutlet elliptic-oblong, c. 1.5 × 0.6–1 mm, shortly cuspidate, yellowish to dark brownish at maturity.

Fl. & Fr.: Nov. – Jan.

Habitat: Degraded semi-evergreen and deciduous forests.

Distrib.: Tamil Nadu (Nilgiri). Almost throughout India. Tropical Asia and Africa.

9. *Kyllinga triceps* Rottb. Descr. Icon. Rar. Nov. Pl. 14. t. 4.f. 6. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 587. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1624 (1130). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1768. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 61. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 270. 2015. *Cyperus triceps* (Rottb.) Endl., Cat. Horti Vindob. 1: 94. 1842; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 75. 1989.

Rhizomatous perennials; rhizome short, vertical, without stolons. Culms densely tufted, 5–15 cm high, 0.5–1 mm wide, with bulb or corm like base. Leaves flat to plicate, 1–2 mm wide, shorter than culms. Involucral bracts spreading or reflexed, the lowest up to 10 cm long. Spikes usually 1–3, globose to ovoid-globose, 4–9 × 4.5–5 mm, pale green to greyish white. Spikelets oblong to lanceolate-oblong, 1.7–2 × 0.5–0.6 mm. Glumes ovate-oblong to lanceolate-oblong, 1–2 mm long, hyaline, 5–7 nerved, apiculate or mucous, smooth. Stamens 2. Nutlet oblong, 1–1.5 × 0.4–0.5 mm, brownish.

Fl. & Fr.: Jan. – Mar.

Habitat: Along banks of streams and occasional in marshes along road sides.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, , Nilgiri, Pudukkottai, South Arcot, Tiruchirappalli and Tirunelveli, Tiruvannamalai and Vellore). Throughout India. Old tropics from Africa to North Australia.

12. LEPIRONIA L.C. Rich

Rhizomatous perennials; culms erect with transverse septate. Leaves basal without leaf blade. Inflorescence a pseudolateral spike with many glume like bracts spirally arranged. Pseudolateral spikelets with 2 strongly keeled outer glumes and many non-keeled glumes, subtending 1 stamen and a solitary terminal female flower. Nutlet planoconvex.

Tropical Asia, Australia, Madagascar and Pacific islands, 1 species in the world.

Lepironia articulata (Retz.) Domin in Biblioth. Bot. 85: 486. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1674 (1161). 1931 & in Bull. Misc. Inform. 1932: 70. 1932; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 61. 1989; Shaji & al. in Rheedeia 19: 41. 2009; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 276. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 288. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021. *Restio articulatus* Retz., Observ. Bot. 4: 14. 1786. *Lepironia mucronata* Rich. in Pers., Syn. Pl. 1: 70. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 684. 1894.

Rhizomatous perennials; rhizome horizontally creeping, woody. Culms in a row from rhizome, erect, 50–200 cm high, cylindrical, hollow and transversely septate, greyish-green. Leaves reduced to bladeless sheaths, stramineous. Inflorescence a pseudolateral, many flowered spike, ovoid-obovoid or ellipsoid, c. 2 cm long, yellowish-brown to dark brown at maturity. Involucral bract single, erect, looking like continuation of culm. Rachilla fleshy, conical, persistent. Glumes spirally arranged, broadly ovate or suborbicular, rounded at apex, 4–6 mm long, chartaceous, glabrous, chestnut brown to dark reddish-brown, not nerved; lower few glumes empty, others with axillary bisexual cymule. Outer glume opposite, linear-lanceolate, 3–5 mm long, membranous. Stamens 2; anthers c. 0.5 mm long with dark extended connective. Style 2-fid, shorter than stigma. Nutlet dorsiventrally planoconvex, obovoid to suborbiculate, longitudinally striate on both sides, abruptly contracted at base, rounded to mucronate at apex, glabrous, entire or spinulose at apex.

Fl. & Fr.: Dec. – Mar.

Habitat: Along backwater in low lying areas, connected inland water channels. Sometimes cultivated.

Distrib: Tamil Nadu (Tharangampadi (Tranquebar)). Kerala. Indo-China, East Australia, New Guinea, Madagascar, Malay Peninsula, South China, Sri Lanka and Thailand.

13. LIPOCARPHA R. Br.

Annual or perennial herbs. Culms tufted, erect, smooth. Leaves mostly from base, flat, with incurved margins; ligule absent. Inflorescence terminal with 1–8

sessile spikes fascicled into a capitulum or rarely single, with many spirally arranged branchlets and spikelets. Involucral bracts leafy. Spikelets terete, with 2 glumes and 1 bisexual flower; rachilla articulate at base, at times persistent, not winged. Glumes spirally imbricate to alternate, membranous, acropetally caduceous, not keeled. Basal glume without a flower, apical glume with a bisexual flower. Perianth bristles absent. Stamens 1 or 2; anthers small, linear-oblong, with a shortly produced connective. Style short, not dilated at base, continuous with ovary, glabrous; stigmas 3. Nutlet dorsiventrally compressed, trigonous or planoconvex, oblong-obovate to narrowly oblong, smooth, reticulate, often slightly curved, enclosed by the subtending glume; epidermal cells isodiametric.

Mostly in tropical Africa, also in South and Southeast Asia, tropical America and South Africa, c. 154 species, 5 in India and 4 in Tamil Nadu.

Key to species

- 1a. Spikelets squarrose; spike branchlets obovate, truncate and abruptly contracted and formed into recurved mucro at apex; glumes absent 4. **L. squarrosa**
- 1b. Spikelets and spike branchlets not as above; glumes present 2
- 2a. Glumes whitish; nutlet rounded to apiculate at apex, not beaked, not constricted at base 1. **L. chinensis**
- 2b. Glumes reddish or purplish-brown; nutlet with beak at apex, constricted at base 3
- 3a. Stamen 1; glumes 1.4–1.9 mm long; nutlets 0.8 - 1.2 mm long; beak conical 2. **L. gracilis**
- 3b. Stamens 2; glumes 2–2.4 mm long; nutlets 1.3–1.6 mm long; beak not conical 3. **L. raynaliana**

1. *Lipocarpa chinensis* (Osbeck) J. Kern in *Blumea Suppl.* 4:167. 1958; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 158. 1977; Britto & K.M. Matthew in *K.M. Matthew, Fl. Tamilnadu Carnatic* 3 (2): 1769. 1983; Bhargavan in *A.N. Henry & al., Fl. Tamil Nadu Anal.* 3: 83. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 61. 1989; K.T. Mathew in *K.M. Matthew, Fl. Palni Hills* 3: 1428. 1999; Pallith., *Pock. Fl. Sirumalai Hills*:272. 2001; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 279. 2015; V.P. Prasad & al. in *A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.*: 288. 2020; *Scirpus chinensis* Osbeck, *Dagb. Ostind. Resa*: 220. 1757. *Lipocarpa argentea* (Kunth) R.Br. in *J.H. Tuckey, Narr. Exped. Zaire*: 477. 1818; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 667. 1893; Fyson, *Fl. S. Ind. Hill Sta.*: 440. 1932; C.E.C. Fisch. in *Gamble, Fl. Madras*:1670 (1158). 1931.

Annuals or short lived perennials with or without a short rhizome. Culms usually tufted, flat or compressed triquetrous, 25–30 cm high, 1.5–2 mm thick, striate to sulcate, uniformly thick throughout the length. Leaves mostly basal, shorter than culm; blades flat or canaliculated, 2–4 mm wide, slightly thick, gradually narrowed to subobtuse to acuminate apex, loosely surrounding the culm, margins revolute; sheath tubular, basal one leafless, apical one with a blade. Inflorescence

a terminal head of ovoid to broadly ovoid 2–7 fascicled spikes, 5–12 × 5–15 mm, with numerous branchlets and spikelets. Involucral bracts 2 or 3, quite unequal, exceeding the inflorescence, horizontal or reflexed in later stage, dilated at base, longest bract leafy, up to 6 cm long. Spikelets terete, ovoid to oblong-ovoid, obtuse at apex, 4–7 × 3–5 mm, whitish, with 2 glumes and 1 bisexual flower. Basal glume membranous, spatulate to oblong-obovate, 2–3 × c. 1 mm, triangular at apex, cuneate towards base, with a short midnerve and purplish-lineolate sides. Apical glume oblong or oblong-lanceolate, c. 1.5 × 0.3 mm, 3–6 nerved, much longer than nutlet. Stamen 1; anther linear, 0.5–1 mm long; filament hyaline, elongate up to 2 mm. Style 0.4–0.8 mm long; stigmas 3, as long as style. Nutlet trigonous, oblong or oblong-obovate, 1–1.4 × c. 0.2 mm, at times curved, rounded to apiculate at apex, with a short discoid stipe at base, brownish at maturity; epidermal cells very minute, in many vertical rows on each face.

Fl. & Fr.: May – Nov.

Habitat: Marshy places, swamps, cultivated fields, shallow waters and stagnant pools.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Kanyakumari, Nilgiri and Salem). Throughout India. Pantropical.

2. *Lipocarpa gracilis* (Rich. ex Pers.) Nees in Linnaea 9: 287. 1834; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 288. 2020; *Hypolytrum gracile* Rich. ex Pers., Syn. Pl. 1: 70. 1805. *Lipocarpa sphaelata* (Vahl) Kunth, Enum. Pl. 2: 267. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 667. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1769. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 62. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1428. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 280. 2015. *Hypaelytrum sphaelatum* Vahl., Enum. Pl. 2:283. 1805. *Hypolytrum sphaelatum* (Vahl) J. Presl. & C. Presl, Reliq. Haenk. 1:184. 1828. *Tunga triceps* Roxb., Fl. Ind. 1:187. 1820. *Hypolytrum triceps* (Roxb.) A. Dietr., Sp. Pl. 2:363. 1832. *Lipocarpa triceps* (Roxb.) Nees in Wight, Contr. Bot. India: 92. 1834; C.E.C. Fisch. in Gamble, Fl. Madras: 1670 (1158). 1931.

Tufted annuals; roots fibrous. Culms slender, obtusely trigonous or subterete, 8.5–33 cm high, 0.4–1 mm thick, smooth. Leaves shorter than culm, 5–14 cm long, 1–2 mm wide, linear, canaliculated, slightly thick, gradually narrowed to subobtusate at apex, smooth; sheaths 1.2–4.5 cm long, subloosely surrounding the culm. Inflorescence a terminal head of 1–3 fascicled spikes, 2–6 × 4–10 mm. Involucral bracts 1 or 2, quite unequal, usually exceeding the inflorescence, lowest one 2.5–9 cm long, horizontal or reflexed in later stage, dilated at base. Spikelets terete, broadly ovoid to oblong-ovoid, 2–6 × 2–3 mm, obtuse at apex, purplish-brown, usually with 2 glumes and 1 bisexual

flower. Basal glume membranous, spatulate or oblong-obovate, 1.4–1.9 × c. 1 mm, triangular near apex, slightly narrowed towards base, incurved at above, with a prominent midnerve and purplish-lineolate sides. Apical glume oblong, c. 1.2 × 0.3 mm, sulcate at apex, translucent, 3–5 nerved, not much longer than nutlet. Stamen 1; anther linear-oblong, c. 0.3 mm long; filament up to 1.3 mm long. Style short, c. 0.1 mm long; stigmas 3, c. 0.2 mm long, longer than style. Nutlets trigonous, oblong, 0.8–1.2 × 0.2–0.4 mm, with a conical beak at apex, minute discoid stipe at base, brownish at maturity; epidermal cells very minute, in many vertical rows on each face.

Fl. & Fr.: Sep. –Jan.

Habitat: Marshy, wet areas and paddy fields.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Pudukkottai, Ramanathapuram, Salem, Tiruchirappalli and Tirunelveli). Throughout India. Pantropical.

3. *Lipocarpa raynaliana* Govind. in *Adansonia* 20(4): 369. 1981; (*raynaleana* orth. mut.) Goetgh. & V. den Borre in *Wageningen Agric. Univ. Pap.* 89-1:62. 1989; Karthik. & Sharma in *J. Bombay Nat. Hist. Soc.* 80: 77. 1983; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 61. 1989; W. Khan & R.D. Taur, *Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra*: 280. 2015; V.P. Prasad & al. in *A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.*: 289. 2020.

Annuals; roots thin. Culms slender, 5–30 cm high, 0.5–0.9 mm wide. Leaves c. 2 mm wide. Inflorescence terminal 4–7 × 3–3.5 mm with 1–3 spikelets. Involucral bracts 2, longest one up to 10 cm long, spreading to reflexed. Spikelets ovoidal. Glumes spatulate, 2–2.5 × 0.6–0.9 mm, with 0.6–0.9 mm long apical part, triangular, acute subhyaline, tinged with red-brown stripe, sometimes with 2-lateral red-brown patches; scales 2, 1.8–2.1 mm long. Stamens 2; anther c. 0.4 mm long. Style 3-fid, c. 0.4 mm long. Nutlet oblong, subtriquetrous, 1.3–1.6 × 0.3–0.4 mm, with a short beak, constricted at the base.

Fl. & Fr.: Oct. – Nov.

Habitat: Occasional in wet-rocky situations, marshes along road sides.

Distrib.: Tamil Nadu (Coimbatore (Sholayar, Kerala border)). Karnataka and Kerala. **Endemic** to South India.

4. *Lipocarpa squarrosa* (L.) Goetgh. in *Wageningen Agric. Univ. Pap.* 89: 71. 1989; V.P. Prasad & al. in *A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.*: 289. 2020. *Scirpus squarrosus* L., *Mant. Pl.* 2: 181. 1771; C.B. Clarke in *Hook.f., Fl. Brit. India* 6: 663. 1893; C.E.C. Fisch. in *Gamble, Fl. Madras*: 1666 (1156). 1931; Bhargavan in *A.N. Henry & al., Fl. Tamil Nadu Anal.* 3: 85. 1989; Wad. Khan, *Cyperaceae W. Ghats,*

W. Coast & Maharashtra:346. 2015. *Isolepis squarrosa* (L.) Roem. & Schult. in Spreng., Syst. Veg. 2: 111. 1817. *Rikliella squarrosa* (L.) J. Raynal in Adansonia 13:154. 1973; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1782. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 68. 1989.

Tufted, non-rhizomatous annuals; roots fibrous, purplish. Culms erect, 5–15 cm high, c. 0.7 mm thick, obtusely trigonous or subterete, smooth, whitish-green. Leaves few, basal, 1–6 cm long, 0.5–1 mm wide, filiform, acute at apex, canaliculate, glabrous, margins involute, whitish-green; ligule absent; sheaths tubular, 1–2.5 cm long, membranous, glabrous, faintly reddish-brown, lower sheaths bladeless. Inflorescence a pseudolateral head bearing 1-3 spikelets, reddish-brown. Involucral bracts 1 or 2, lowest bract leafy, erect, up to 4 cm long. Spikelets sessile, ovate-elliptic to oblong-elliptic, 3–5 × 2.5–3.5 mm, squarrose, obtuse at apex, deeply reddish-brown with pale green awns. Spike branchlets spirally imbricate, obovate, 1–1.5 × c. 0.5 mm, truncate and abruptly contracted and formed into recurved mucro at apex, 3–5-nerved. Glumes absent. Stamens 1 or 2; anthers 0.2–0.3 mm long. Style slender; stigmas 3, recurved. Nutlets narrowly obovate, c. 0.5 mm long, trigonous, mucronate at apex, yellowish to brownish, densely punctulate.

Fl. & Fr.: Sep. – Dec.

Habitat: Marshy areas in grasslands and wet sandy areas.

Distrib.: Tamil Nadu (Almost all Districts). South Asia.

14. PYCREUS P. Beauv.

Tufted annuals or perennials; rhizomes present or absent. Culms erect to decumbent, 3-angled, rarely triquetrous. Leaves basal; leaf blades usually present, linear, flat to canaliculate; ligule absent; sheaths present and variously coloured. Inflorescence terminal, a simple or rarely compound anthela or inflorescence capitate. Involucral bracts 2–6, leaflike, rarely very thin; rays several, long or very short. Spikelets few to many, grouped into a short spike or capitulum at apex of rays, or fascicled, laterally flattened; rachilla winged or wingless, persistent. Glumes distichous, few to many, usually with nerveless sides, gradually falling from base to apex of rachilla at maturity, basal 1 or 2 glumes empty, others bearing a bisexual flower. Flowers without hypogynous bristles or scale like perianth parts. Stamens 1–3. Style base not swollen; stigmas 2, deciduous at maturity. Nutlets biconvex, slightly compressed or slightly turgid, bilaterally flattened with one margin facing rachilla, punctulate and reticulately striate or transversely undulately striate.

In temperate, subtropical and tropical parts of the world, c. 70 species, 33 in India and 17 species, 2 subspecies, 3 varieties and 1 forma in Tamil Nadu.

Key to species and forma

- 1a. Culms decumbent at base; glumes with often a white hyaline elliptic depression or distinctly furrowed on either side of keel; culms few to many noded below the middle 2
- 1b. Culms not decumbent at base; glumes without a depression or furrowed on either side of keel; culms not noded below the middle 3
- 2a. Culms 4–7.5 cm high; leaves 0.5–1 mm wide; inflorescence capitate, consisting of 2–5 spikelets; stamens 2; glumes ferruginous; nutlets 0.6–0.75 × 0.5–0.6 mm
4. P. rubrigulosus
- 2b. Culms up to 50 cm high; leaves 2–4 mm wide; inflorescence with 4–10 or more spikelets congested into a short spike or nearly a capitulum; stamens 3; glumes bright sanguineous (blood-red), nutlets 1.1–1.3 × c. 1 mm **15. P. sanguinolentus**
- 3a. Nutlets rugolose from the transversely undulate markings; epidermal cells usually longitudinally oblong 4
- 3b. Nutlets punctulate, granulated or reticulate, not with undulate markings; epidermal cells usually isodiametric 12
- 4a. Inflorescence simple, spiciform; rachis of spikes elongated, 5–15 mm long 5
- 4b. Inflorescence of capitate heads on culms or rays; rachis of spikes short, 1–3 mm long or obscure 9
- 5a. Stamens 2 or 3; spikelets stramineous-white, yellowish or yellowish-brown with cataneous tinged colour 6
- 5b. Stamens only 2; spikelets reddish-brown or chestnut black, castaneous tinged with brown 7
- 6a. Culms not curved at base; leaf blades usually shorter than culms; involucre bracts 2 or 3, 10–20 cm long, spreading; nutlets globose or ellipsoid, 1–1.2 mm long
3. P. flavescens
- 6b. Culms often curved at base; leaf blades as long as culms; involucre bracts 3–5, up to 10 cm long, erect; nutlets orbicular-obovate or broadly elliptic, 0.8–1 mm long
16. P. stramineus
- 7a. Inflorescence compound with 10–30 spikelets; spikelets spreading at right angles to rays; rachilla flexuose; glumes not hyaline margined **7. P. mahadevanii**
- 7b. Inflorescence simple with 3–8 spikelets; spikelets suberect; rachilla straight; glumes distinctly hyaline margined 8
- 8a. Annuals, not stoloniferous; leaves shorter than culms, 1.0–1.5 mm wide; inflorescence rayless or with 1 ray; spikelets 10–12 mm long **6. P. lurida**
- 8b. Perennials, stoloniferous; leaves as long as or longer than culm, 0.8–1.0 mm wide; inflorescence 1–3 rayed; spikelets 0.75–9 mm long
8. P. malabaricus forma **stricticulmis**
- 9a. Involucre bracts curved or divergent; spikelets 1.5–2.5 mm wide; glumes 1.2–1.7 mm long; nutlets subtrigonal, symmetric and asymmetric **1. P. curvibracteatus**
- 9b. Involucre bracts not curved or divergent; spikelets 3–4 mm wide; glumes 1.8–3 mm long; nutlets turgid-biconvex, often symmetric 10
- 10a. Tufted dwarf perennials; roots woolly usually in younger stage; leaves falcate; sheaths 3–5 mm broad, strongly brown nerved; glumes fuscous or sanguineous
5. P. latovaginatus

- 10b. Annuals or rhizomatous perennials; roots not woolly; leaves not falcate; sheaths narrow; glumes not above 11
- 11a. Rhizomatous perennials; leaves setaceous, as long as culms; culms capillary; spikelets chestnut black or dark brownish, 20-flowered; nutlet dark brownish to black
2. P. debilissimus
- 11b. Annuals; leaves not setaceous, much shorter than culms; culms slender, not capillary; spikelets reddish brown or sanguineous to fuscus, 30 – 40-flowered; nutlet plumbeus or greyish black
10. P. plumbeonuceus
- 12a. Plants robust; culms 2–4 mm thick; leaves 4–8 mm wide; inflorescence large, 7–25 cm long; glumes with broadly hyaline, whitish, scarious margins, all tightly overlapping; often keel ending conspicuously below scarious apex
13. P. puncticulatus
- 12b. Plants filiform to slender; culms 1–2.5 mm thick; leaves 2–4 mm wide or canaliculate; inflorescence with rays if present, 1–8 cm long; glumes not or very narrowly hyaline margined, keel not as above 13
- 13a. Glumes awned or distinctly mucronate, mucro 0.3–0.5 mm long 14
- 13b. Glumes muticous or inconspicuously apiculate 15
- 14a. Rachilla exposed between glumes, flexuous; spikelets pale to bright brown; stamens 1 or 2; glumes 5-nerved; nutlets 0.5–0.7 × c. 0.3 mm, exposed between glumes
9. P. membranaceus
- 14b. Rachilla completely enclosed within glumes, persistent; spikelets white or silvery white; stamens always 2; glumes 3–5 nerved; nutlets c. 1 × 0.8 mm, not exposed between glumes
12. P. pumilus
- 15a. Stamens 3; spikelets spreading, subtergoid; glumes 2.5–3 mm wide
18. P. uniolooides
- 15b. Stamens 2 or 1; spikelets compressed; glumes 0.8–1 mm wide 16
- 16a. Nutlet with both surfaces concave sulcate; primary rays often capillary; stamen always 1
17. P. sulcinux
- 16b. Nutlet with both surfaces not concave sulcate; primary rays not capillary, slender; stamens 2, rarely 1 17
- 17a. Spikelet rachilla 4-angled, straight, wingless; glumes obtuse at apex
4. P. flavidus
- 17b. Spikelet rachilla strongly flexuous, narrowly winged; glumes acute at apex
11. P. polystachyos

1. *Pycreus curvibracteatus* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 468. 1984; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 291. 2015. *Cyperus curvibracteatus* Govind. in Proc. Ind. Acad. Sci. 88B: 231. f. 2. 1979; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 69. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 44. 1989.

Rhizomatous perennials; rhizome with creeping stolons. Culms few-many, 4–7.5 cm high, 0.4–0.5 mm wide, trigonous. Leaves 1 or 2, shorter than culm, 2–3 × 0.05–0.1 cm, flat or canaliculate, the lowermost leaves with reduced blades; sheaths purple. Inflorescence simple, rayless, capitate, consisting of 2–4 spikelets, 1–1.5 cm long and broad. Involucral bracts 1 or 2, leafy, shorter than as long as inflorescence, usually curved or divergent. Spikelets oblong with parallel sides, 4–7 × 1.5–2.5 mm, lax, obtuse, 16–40-flowered; rachilla straight, wingless. Glumes

ovate, 1.2–1.7 × 1–1.6 mm, subacute or obtuse, mucous, castaneous or dark brown, closely distichous even in fruits, keeled with distinct hyaline margins; keel 3–5-nerved, sides nerveless. Stamens 2, 0.2–0.3 mm long. Style 2-fid, 0.7–0.8 mm long, glabrous. Nutlets subtrigonal, symmetric and asymmetric, obovate, subglobose, 0.8–0.9 × 0.4–0.5 mm, transversely undulated markings, upper ones sometimes smooth.

Fl. & Fr.: Oct. – Nov.

Habitat: Open areas in higher altitudes.

Distrib.: Tamil Nadu (Nilgiri). Maharashtra. **Endemic** to Western Ghats.

2. *Pycreus debilissimus* C.B. Clarke in Journ. Bot. 224. 1896 & in Thi. Dyer, Fl. Trop. Africa 8: 291. 1901; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 292. 2015. *Pycreus plicatus* Govind. in Proc. Ind. Acad. Sci. 10 (6): 417. f. 3. 1990.

Rhizomatous perennials, slender weak habit; Culms 5–15 cm high, capillary. Leaves few, as long as the stems, setaceous, flaccid. Inflorescence single head, consists of a cluster of 8, sessile spikelets. Involucral bracts 2, leafy, up to 5 cm long. Spikelets 9–10 × 2–2.5 (–3) mm, chestnut brown, compressed to somewhat turgid, 20-flowered, chestnut black or dark brownish. Glumes ovate, 2–2.2 mm long, obtuse, keel chestnut brown. Nutlets nearly half length of glumes, 1.4–2 mm long, dark brownish to black, rugulose with transversely undulated markings; epidermal cells longitudinally oblong.

Fl. & Fr.: Oct. – Dec.

Habitat: Open grass lands. Rare.

Distrib.: Tamil Nadu (Dindigul, Madurai). Maharashtra. **Endemic** to Western Ghats.

3. *Pycreus flavescens* (L.) P. Beauv. ex Rchb., Fl. Germ. Excurs. 1: 72. 1830; C.B. Clarke in Hook.f., Fl. Brit. India 6: 589. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1776. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 64. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 297. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 291. 2020; *Cyperus flavescens* L., Sp. Pl. 1: 46. 1753; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 71. 1989.

Annuals or at times perennials. Culms 5–60 cm high, trigonal, smooth. Leaf blade flat, shorter than culm, acute at apex, margins slightly involute; sheaths reddish-brown. Inflorescence a globose cluster of spikes. Involucral bracts 2 or 3, leafy, 10–20 cm long. Spikelets compressed, lanceolate or oblong-lanceolate, 5–15 × 2–2.5 mm, 10–30-flowered; rachilla not winged. Glumes distichous, elliptic or

ovate, 1.5–2.2 × 1–1.5 mm, blunt, mucronate at apex, keel greenish, sides yellowish-brown. Stamens 2 or 3; anthers linear. Style 2-fid, flat, glabrous. Nutlet compressed, globose or ellipsoid, 1–1.2 mm long, stipitate at base, yellowish-brown to dark brown at maturity, rugulose with transversely undulated markings; epidermal cells longitudinally oblong-elliptic dorsally.

Fl. & Fr.: Sep. – Jan.

Habitat: Wetlands and in open places.

Distrib.: Tamil Nadu (Salem and Tiruchirappalli). Peninsular and Northwest India.

4. *Pycreus flavidus* (Retz.) T. Koyama in J. Jap. Bot. 51 (10): 316. 1976 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 222. 1985; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1777. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.:65. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1434. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 297. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 291. 2020; *Cyperus flavidus* Retz., Observ. Bot. 5: 13. 1788; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 71. 1989. *Cyperus flavidus* Retz. var. *nilagiricus* (Hochst. ex Stued.) Korla in Bull. Bot. Surv. Ind. 9: 237. 1967 (1968); B.D. Sharma & al. in Biol. Mem. 2 (1&2): 155. 1977. *Pycreus globosus* (All.) Rchb., Fl. Germ. Excurs.:140. 1830; C.E.C. Fisch. in Gamble, Fl. Madras:1627 (1132). 1931; Fyson, Fl. S. Ind. Hill Sta.:634. 1932; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 360. 1987. *P. capillaris* (J. Koenig ex Roxb.) Nees ex C.B. Clarke in Hook.f., Fl. Brit. India 6: 591. 1893. *P. capillaris* (J. Koenig ex Roxb.) Nees ex C.B. Clarke var. *nilagiricus* C.B. Clarke in Journ. Linn. Soc. 21: 49. 1884; Hook.f., Fl. Brit. India 6: 592. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 435. 1915.

Tufted annuals with fibrous roots or short rhizomatous perennials. Culms erect, 10–35 cm high, 1–2 mm thick, trigonous, smooth and spreading from base. Leaf blades narrowly linear, shorter than culm, 1–2 mm wide, acuminate at apex, flat to canaliculate; sheath reddish-brown towards culm base. Inflorescence simple or subcompound, at times reduced to single terminal head with radially spreading spikelets. Involucral bracts 2–4, basal 1 or 2 longer than inflorescence, leafy, lower most sometimes erect; primary rays 2–6, very unequal, slender, smooth; secondary rays at times present. Spikes subglobose; rachis short. Spikelets linear-oblong to linear, 6–20 × 1.5–3 mm, compressed, purplish-brown, congested at apex, up to 55-flowered; rachilla 4-angled, straight, wingless, persistent. Glumes lax or dense, oblong-ovate, 1.4–2.8 × 1–1.6 mm, obtuse and mucicous at apex, chartaceous, keel 3-nerved, margin narrowly hyaline, yellowish to reddish-brown. Stamens 2; anthers oblong, c. 0.5 mm long; filaments up to 1 mm long. Style of medium length; stigmas 2, slender, longer than style. Nutlets obovoid to oblong-elliptic, 0.9–1.2 × 0.5–0.7 mm, apiculate to mucronate at apex, slightly compressed, biconvex, brown to dark brown at maturity; epidermal cells isodiametric, faintly punctulate.

Fl. & Fr.: Oct. – Apr.

Habitat: Marshy areas in grasslands and open wetlands.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Nilgiri, North Arcot, Salem, South Arcot and Tiruchirappalli). Throughout India. Africa, China, Japan, Malesia and South Europe.

5. *Pycreus latovaginatus* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 467. 1984; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 299. 2015. *Cyperus latovaginata* Govind. in J. Indian Bot. Soc. 52: 74. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:71. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 45. 1989.

Tufted dwarf perennials forming cushions; roots woolly especially in younger stage. Culms few, thickened and woody at base, 4–8 cm high, 0.7–0.8 mm wide, rigid, smooth, trigonous with many leaves at base. Leaves many, shorter than culm, falcate, 1.5–2 mm wide; sheaths many, prominent, distinctly many nerved, brown or reddish brown, 3–5 mm broad. Inflorescence simple, contracted, consisting of (-3)5–9 spikelets, rayless, 1.5–2 cm broad. Involucral bracts 3 or 4, obliquely erect (spreading), rather stiff, lower ones longer than inflorescence, the longest up to 3 cm long. Spikelets approximate, capitate, ovate or oblong lanceolate, 1–1.2 × 0.2–0.3 cm, subacute, compressed, 12–14(24–30) flowered; rachilla straight, wingless, excavated. Glumes ovate, 1.75–2 × 1.5–1.75 mm, obtuse, muticous, subdensely or loosely distichous, fuscus or sanguineous with very narrow white hyaline margin and nerveless sides; keel prominent, 3-nerved, green or yellowish green. Stamens 2, anthers oblong, 0.5 mm long, yellow; filaments persistent. Style flat, glabrous, 0.5–0.6 mm long; stigma 2, shorter than or as long as style. Nutlets suborbicular, 0.9–1 × 0.8–0.9 mm, shining, greyish black or black, turgid, biconvex, prominently apiculate, shortly and broadly stipitate, transversely muriculate rugose; epicarpic cells fine, vertically oblong in each face.

Fl. & Fr.: Oct. – Dec.

Habitat: Open areas in higher altitudes of high wavy mountains.

Distrib.: Tamil Nadu (Dindigul-Vattaparai, Madurai). **Endemic** to Tamil Nadu.

6. *Pycreus lurida* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 467. 1984. *Cyperus lurida* Govind. in Proc. Ind. Acad. Sci. 81 B:189. f. 2. 1975; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 72. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989. *Pycreus macrostachyos* (Lam.) J. Raynal forma. *lurida* (Govind.) W. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:302. 2015.

Annuals. Culms tufted, 10–22 cm high, 0.7–0.8 mm wide, rigid, dirty brown-grey. Leaves shorter than culm, 1.0–1.5 mm wide; sheaths purplish. Inflorescence simple,

consisting of 3–8 spikelets, rayless or with 1 ray, 2–4 cm long. Involucral bracts 2 or 3, leafy, lower one erect, longer than inflorescence up to 5 cm long. Spikelets linear, oblong or oblong ovate, 1–1.2 × 0.2–0.25 cm, acute, suberect, 16–22 flowered; rachilla straight, wingless. Glumes broadly triangular ovate, 2–2.2 × 1.6–1.8 mm, acute, mucronulate with 3-nerved keeled. Stamens 2, anthers 0.5–0.6 mm long. Style 2-fid, 1–1.2 mm long, flat, glabrous. Nutlet broadly elliptic, 1–1.1 × 0.6–0.7 mm, turgid, biconvex, more or less symmetric, apiculate, transverse zonate, dark brown-blackish, shining, epidermal cells longitudinally oblong.

Fl. & Fr.: Oct. – Jan.

Habitat: Swampy places near streams and along roadsides marshes.

Distrib.: Coimbatore. Maharashtra. **Endemic.**

7. *Pycreus mahadevanii* Govind. in J. Econ. Tax. Bot. 20 (2): 299. 1984; Prasad & Singh, Sedg. Karnataka in J. Econ. Taxon. Bot. Add. Ser. 21: 275. 2002; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 300. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 291. 2020; Annuals with brown or yellowish roots. Culms triquetrous, 10–20 cm high, c. 1 mm wide, rigid. Leaves shorter than culm, flat, broad, c. 1.5 mm wide, almost cordate at apex; sheaths brown with purplish-brown or red nerves. Inflorescence compound, distinctly spicate at ends of rays, consisting of 10–30 spikelets; rays 1–3, 1–2 cm long, each consisting of 5 or 6 spikelets. Spikelets oblong or narrowly elliptic-ovate, 6–8 × 2–2.5 mm, 10–14-flowered, spreading at right angles to rays; rachilla flexuose. Glumes ovate obtuse, 1.8–2 × 1.6–1.8 mm, brown or cinnamonaceous; keel green, tannin dotted, 3-nerved. Stamens 2. Style 2-fid, short, c. 0.25 mm long. Nutlet sessile, suborbicular, 0.9–1 × 0.8–0.9 mm, biconvex, zonate, transversely undulated faintly tuberculate; epidermal cells finely longitudinally striate.

Fl. & Fr.: Oct. – Nov.

Habitat: Open marshy grasslands. Rare.

Distrib.: Nilgiri. Karnataka. **Endemic.**

8. *Pycreus malabaricus* C.B. Clarke forma ***stricticulmis*** (Govind.) W. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 302. 2015. *Cyperus stricticulmis* Govind. in Proc. Ind. Acad. Sci. 81 B: 194. 1975; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 75. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989. *Pycreus stricticulmis* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 467. 1984.

Perennials, stoloniferous. Culms 3-noded at base, 10–12 cm high, 0.6–0.7 mm wide. Leaves flat or canaliculate, as long as or longer than culm, 0.8–1.0 mm wide, curved at apex; sheaths purplish. Inflorescence simple, consisting of 3–6 spikelets, 1–3 rayed,

1.5–1.7 cm broad; lateral ray very short with 1 or 2 spikelets. Involucral bracts 3, leafy, erect-divergent, longer than inflorescence up to 5 cm long. Spikelets linear, oblong or elliptic ovate, $7.5-9 \times 2-2.5$ mm, acute-suberect, somewhat approximate, strongly compressed, 12–18 flowered; rachilla straight, wingless. Glumes ovate, $1.8-2.2 \times 1.6-2$ mm, acute, mucronulate, brown or castaneous with broad hairy line wavy margins, 3-nerved green keel and nerveless sides. Stamens 2, anthers 0.5–0.75 mm long. Style 2-fid, flat, 1–1.1 mm long, glabrous. Nutlets elliptic-subglobose, $1-1.1 \times 0.75-0.8$ mm, turgid, biconvex, more or less symmetric, apiculate, transversely undulate and zonate, dark brown black, shining.

Fl. & Fr.: Oct. – Nov.

Habitat: Open marshy grasslands.

Distrib.: Tamil Nadu (Coimbatore). **Endemic** to Tamil Nadu.

9. *Pycreus membranaceus* (Vahl) Govind. in Proc. Ind. Acad. Sci. (Pl. Sci.) 100 (6): 424. 1990. *Cyperus membranaceus* Vahl., Enum. Pl. 2: 330. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 591. 1893. *Pycreus pumilus* (L.) Nees ex C.B. Clarke subsp. *membranaceus* (Vahl) T. Koyama in Gard. Bull. Singapore 30: 151. 1977 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 225. 1985; K.T. Mathew in K.M. Mathew, Fl. Palni Hills 3: 1434. 1999.

Tufted, non-rhizomatous annuals. Culms erect, triquetrous, up to 15 cm high, c. 0.5 mm thick, smooth. Leaf blades few, basal, shorter than culm, flat, linear, 1–2 mm wide; sheaths purple brown. Inflorescence compound with 5–10 spikelets. Involucral bracts 3–5, lower 2 or 3 bracts exceeding the inflorescence; primary rays 3–5, well developed. Spikelets lax, oblong, $4-6 \times 1.5$ mm, compressed, pale to bright brown, up to 35-flowered; rachilla straight, exposed between glumes, wingless. Glumes distichous, oblong-elliptic to obtuse, $1.2-1.5 \times c. 0.8$ mm, truncate to emarginate at apex, membranous, 5-nerved, midnerve excurrent into a recurved mucro at apex, mucro 0.3–0.5 mm long, sides nerveless, keeled, hyaline. Stamen 2; anther oblong, c. 0.3 mm long. Style c. 0.5 mm long; stigmas 2, longer than style. Nutlet exposed between glumes, oblong, $0.5-0.7 \times c. 0.3$ mm, biconvex, apiculate, dark brown.

Fl. & Fr.: Oct. – Apr.

Habitat: Dry sandy soils.

Distrib.: Tamil Nadu (Dindigul, Madurai). Throughout India. Sri Lanka and Thailand.

10. *Pycreus plumbeonuceus* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 467. 1984; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 305. 2015.

Cyperus plumbeonucea Govind. in J. Indian Bot. Soc. 52: 76. 1973; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 73. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 47. 1989.

Annuals. Culms trigonous, 10–30 cm high, 1–1.3 mm wide, with or without leaves at base. Leaves if present, much shorter than culms. Inflorescence simple, contracted, capitate 1–3 cm broad with 3–9 spikelets. Involucral bracts 3, leafy, longer than inflorescence, obliquely erect, up to 4, the longest 8–9 cm long; lower 2 or 3 bracts exceeding the inflorescence. Spikelet ovate lanceolate, 1–1.5 × 0.3–0.5 cm, congested, 30–40 flowered, reddish brown or sanguineous to fuscus. Glumes ovate-oblong, 2.2–2.5 × 1.7–2 mm, obtuse, mucous, with 3-nerved keel; sides nerveless. Stamens 2; anthers linear, 0.7–0.8 mm long. Style 2-fid, 0.7–0.8 mm long, glabrous. Nutlets suborbicular, ellipsoid, 1–1.2 × 0.7–0.8 mm, biconvex, turgid with muricately undulations, plumbeous or greyish black, marked with fine, elongated cells, apiculate.

Fl. & Fr.: Oct. – Jan.

Habitat: Swampy places near streams and along roadsides marshes.

Distrib.: Tamil Nadu (Dindigul, Madurai). Kerala. **Endemic**.

11. *Pycreus polystachyos* (Rottb.) P. Beauv., Fl. Oware 2: 48. t. 86. f. 2. 1816; C.B. Clarke in Hook.f., Fl. Brit. India 6: 592. 1893; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1777. 1983; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 361. 1987; Karthik. & al., Fl. Ind. Enum. Monocot.: 65. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 306. 2015. *Cyperus polystachyos* Rottb., Descr. Icon. Rar. Pl.: 39. t. 11. f. 1. 1773. *Pycreus odoratus* (L.) Urb., Symb. Antill. 2: 164. 1900; C.E.C. Fisch. in Gamble, Fl. Madras: 1627 (1132). 1931.

Tufted annuals or short lived perennials with short rhizome. Culms slender or rigid, compressed to trigonous, 20–60 cm high, 1–2.7 mm thick, smooth. Leaf blades shorter than culm, 2–4 mm broad, canaliculate to flat, linear, slightly rigid; sheaths membranous, brown at basal part. Inflorescence a simple, subcompound or contracted to capitate head with spikelet clusters. Involucral bracts 3–6, lowest one longer than inflorescence, leafy; primary rays 3–8, mostly up to 3.5 cm long, at times short. Spikelets numerous, suberect, congested and clustered at maturity, linear-lanceolate to linear-oblong, 8–20 × 1.5–2 mm, acute at apex, up to 50-flowered, rusty brown; rachilla strongly flexuous, persistent, narrowly winged. Glumes densely imbricate, ovate-lanceolate to ovate-oblong, 1.5–2.5 × 0.7–1 mm, acute to mucous, chartaceous, 3-nerved, keeled, sides nerveless, reddish-brown to abaxially green, margins narrow, hyaline. Stamens 2 rarely 1; anthers linear, 0.5–1 mm long, connective prominent beyond anthers. Styles long, deeply bifid; stigmas 2, slender. Nutlets linear-oblong,

1–1.5 × c. 0.5 mm, c. ½ as long as subtending glume, lenticular, reticulate, with almost truncate at apex, apiculate, brownish at maturity; epidermal cells isodiametric, puncticulate.

Key to varieties

- 1a. Spikelets clustered even at maturity **11.1. var. polystachyos**
 1b. Spikelets rectangularly spreading at maturity **11.2. var. laxiflorus**

11.1. var. polystachyos

Fl. & Fr.: Throughout.

Habitat: Marshy areas in grasslands.

Distrib.: Tamil Nadu (Almost all districts). Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Goa, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Pondicherry, Tamil Nadu and Tripura. Throughout the warmer parts of the whole world.

11.2. var. laxiflorus (Benth.) C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 592. 1893; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2):1778. 1983; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 66. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 306. 2015. *Cyperus polystachyos* Rottb. var. *laxiflorus* Benth., *Fl. Austral.* 7: 261. 1878; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3:73. 1989.

Tufted annuals or short lived perennials with short rhizome. Culms compressed, 15–40 cm high, 3-angled, stiff, smooth. Leaf blade shorter than culm, 2–3.5 mm wide, flat, sometimes folded; sheath brown at basal part. Inflorescence subcompound to compound. Involucral bracts 3–5; primary rays 5–7. Spikelets oblique, rectangularly spreading at maturity, purplish-brown. Glumes oblong-ovate, 1.5–2.5 × 0.8–1 mm, acute and at times mucronulate at apex, 5-nerved, keeled. Stamens 1 or 2. Nutlets oblong to obovate, 1–1.5 × c. 0.5 mm, dark brown at maturity.

Fl. & Fr.: Sep. – Dec.

Habitat: Marshy areas in grasslands.

Distrib.: Tamil Nadu (Tirunelveli). Tropical and subtropical regions.

12. *Pycnus pumilus* (L.) Nees in *Linnaea* 9: 283. 1835; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 591. 1893; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1627 (1132). 1931; Britto & K.M. Matthew in K.M. Matthew, *Fl. Tamilnadu Carnatic* 3 (2): 1778. 1983; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 66. 1989; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1434. 1999; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 307. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 292.

2020; *Cyperus pumilus* L., Cent. Pl. 2: 6. 1756; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 73. 1989. *Pycreus nitens* Nees Nov. Act. Nat. Cur. 19. Suppl. 1: 53. 1834.

Tufted annuals, non-rhizomatous with fibrous roots. Culms erect, up to 15 cm high, slender, triquetrous, smooth. Leaf blades few, shorter or as long as culm, canaliculated, linear, 1–2.5 mm wide, acuminate towards apex, scaberulous; sheaths 1–2.5 mm long, purplish-brown towards base. Inflorescence simple or subcompound, contracted to a head like cluster of spikelets. Involucral bracts 3–5, exceeding the inflorescence; primary rays 3–5, up to 2.5 cm long, or at times absent. Spikelets clustered to spreading, strongly compressed, linear-oblong, 5–10 × c. 1.5 mm, subacute at apex, white or silvery white; rachilla straight, slender, completely enclosed within glumes, persistent, wingless. Glumes distichous, closely or half imbricate, ovate to elliptic, 1–1.5 × c. 1.2 mm, truncate or emarginate with 0.3–0.5 mm long mucro at apex, 3–5 nerved, midnerve extended as recurved mucro at apex, keeled, abaxially green, laterally membranous. Stamens 1 or 2; anthers oblong, c. 0.2 mm long; filaments up to 1 mm long; Style slender, c. 1 mm long, bifid; stigmas 2, longer than style. Nutlets obovoid to oblong-elliptic, c. 1 × 0.8 mm, biconvex, apiculate at apex, not exposed between glumes, densely punctulate, greyish-brown at maturity; epidermal cells isodiametric, faintly punctulate.

Fl. & Fr.: Oct. – Apr.

Habitat: Open marshy areas, paddy fields and wetlands.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Nilgiri, North Arcot, Pudukkottai, Salem, South Arcot, Tiruchirappalli and Tirunelveli). Throughout India. Australia, Indo-China, Malesia, Sri Lanka and Tropical Africa.

13. *Pycreus puncticulatus* (Vahl) Nees in Mart., Fl. Bras. 2 (1): 10. in Obs. 1842; C.B. Clarke in Hook.f., Fl. Brit. India 6: 593. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1628 (1133) 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1779. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 66. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1435. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 308. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 292. 2020. *Cyperus puncticulatus* Vahl, Enum. Pl. Obs. 2: 348. 1805; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989.

Annual herbs with yellowish-brown fibrous roots, robust. Culms usually solitary, erect, 20–40 cm high, 2–4 mm thick, triquetrous, often enlarged at base, smooth. Leaf blade 15–40 cm long, 4 - 8 mm wide, slightly exceeding the culm, acuminate at apex, flat to plicate, smooth or distantly scabrid at margins; sheaths purplish-red. Inflorescence lax, compound, 7–25 cm long and as broad. Involucral bracts 3–5, spreading, mostly longer than inflorescence; rays 4–11, unequal,

slender, smooth; bractoeles scale like. Spikes lax, 2–7 cm long, distantly bearing 7–20 spreading or reflexed spikelets; rachis sharply angled, glabrous. Spikelets compressed, ovate to oblong-lanceolate, acute at apex, 6–15 × 2–3.5 mm, up to 30-flowered; rachilla weakly flexuous, hardly winged. Glumes ovate-orbicular, folded, 2–2.5 × 1.5–2 mm, shallowly acute to subacute with mucronulate at apex, 3–5-nerved, keeled, green, sides nerveless, membranous, margins broadly hyaline, whitish, scarious, all tightly overlapping. Stamens 2; anthers linear-oblong, 0.7–1 mm long; filaments up to 2.2 mm long. Style 1.2–2 mm long; stigmas 2, shorter than to as long as style. Nutlets laterally compressed, broadly ovate to orbicular, 1–1.5 × 0.8–1 mm, biconvex, apiculate at apex, stipitate at base, brownish to blackish at maturity; epidermal cells isodiametric, punctulate or finely reticulate.

Fl. & Fr.: Sep. – Feb.

Habitat: Marshy areas in grasslands, margins of water tanks and paddy fields.

Distrib.: Tamil Nadu (Dindigul, Madurai, Erode and Karur). Andhra Pradesh, Karnataka, Pondicherry and Tamil Nadu. Sri Lanka and Vietnam.

14. *Pycreus rubriglomosus* (Govind.) Singh & Singh in J. Econ. Tax. Bot. 5(2): 468. 1984. *Cyperus rubriglomosus* Govind. in Proc. Ind. Acad. Sci. 88 B: 229. 1979; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 46. 1989. *Pycreus sanguinolentus* Vahl subsp. *teysmanii* (Boeckeler) W. Khan var. *rubriglomosus* (Govind.) W. Kahn, Cyperaceae W. Ghats, W. Coast & Maharashtra: 311. 2015.

Perennials, stoloniferous or not. Culms 1 or 2-noded at base, 4–7.5 cm high, 0.4–0.5 mm wide, rigid, trigonous, smooth, stramineous. Leaves flat or canaliculate, shorter than culms, 2–3 × 0.05–0.1 cm, acuminate with smooth margin throughout; the lowermost leaves with reduced blades; sheaths purple. Inflorescence simple, rayless, capitate, consisting of 2–5 spikelets, 1–1.5 cm broad. Involucral bracts 1 or 2, leafy, oblique, shorter than or as long as inflorescence. Spikelets oblong with parallel sides, 4–7 × 2.5–2.6 mm, obtuse, lax, much compressed, 16–20 and 32–40-flowered; rachilla straight, excavated, wingless. Glumes ovate, 1.8–2 × 1.4–1.8 mm, obtuse, ferruginous, muticous, keeled with distinct hyaline margin; keel prominent, green, acute, 3-nerved, sides nerveless, castaneous with hyaline longitudinal depression next to keel on each side. Stamens 2, anthers linear, oblong, 0.4–0.5 mm long. Style slender, 1.2–1.8 mm long, glabrous. Nutlets elliptic-suborbicular, 0.6–0.75 × 0.5–0.6 mm, 1/3 length of glume, yellow becoming brown, umbonulate, biconvex.

Fl. & Fr.: Oct. – Jan.

Habitat: Swampy places near streams and along roadsides marshes.

Distrib.: Tamil Nadu (Chengalpattu). Maharashtra. **Endemic.**

15. *Pycreus sanguinolentus* (Vahl) Nees ex C.B. Clarke in Hook.f., Fl. Brit. India 6: 590. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1627 (1132). 1931; Fyson, Fl. S. Ind. Hill Sta.: 634. 1932; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1780. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 66. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1436. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 309. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 292. 2020. *Cyperus sanguinolentus* Vahl, Enum. Pl. Obs. 2: 351. 1805; B.D. Sharma & al. Biol. Mem. 2 (1&2): 156. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989.

Tufted annuals or short lived perennials with short rhizome. Culms erect or decumbent at base, up to 50 cm high, compressed, slender, trigonous, 1–2 mm thick, 1–4 noded, rooting and branching at nodes. Leaf blade several clustered at base, shorter than to equaling the culm, linear, flat or canaliculated, 2–4 mm wide or less, gradually narrowed to acute apex, margins scabrid towards apex; sheaths glabrous, reddish-brown. Inflorescence simple or with 4–10 or more spikelets congested into a short spike or nearly a capitulum. Involucral bracts 2–5, spreading, lowest bract 5–10 cm long, leafy; rays 1–5. Spikelets radially spreading, narrowly ovoid to oblong-ovoid, 5–18 × 2–3.5 mm, compressed, subacute at apex, 10–30 flowered; rachilla straight, persistent, wingless. Glumes slightly imbricate, ovate, 2–3 × 1–2.5 mm, obtuse and muticous at apex, membranous, 3–5 nerved, keeled, often distinctly furrowed on both sides, sides nerveless, bright sanguineous (blood-red), margins dark brown. Stamens 3; anthers linear, 0.7–1 mm; filaments up to 2.5 mm long. Style 1.5–2 mm long, longer than nutlet, bifid; stigmas 2, slender. Nutlets broadly obovoid to suborbicular, 1.1–1.3 × c. 1 mm, apiculate at apex, biconvex, blackish-brown at maturity; epidermal cells isodiametric, faintly punctulate.

Fl. & Fr.: Jan. – Mar.

Habitat: Marshy fields and open wet palces.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri and Tiruchirappalli). Throughout India. Widely distributed in warmer parts of Central and Eastern Asia to Japan, tropical Africa and Australia.

16. *Pycreus stramineus* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 6: 589. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1627 (1132). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 66. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 312. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 293. 2020; *Cyperus stramineus* Nees in Wight, Contr. Bot. India: 74. 1834; *Cyperus substramineus* Kuek. in Engl. Pflanzenr. 101: 398. 1936; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 74. 1989.

Tufted annuals with yellowish fibrous roots. Culms erect, rigid or slender, 10–60 cm high, 0.5–1 mm thick, weakly curved, trigonous, smooth. Leaf blades few, as long

as culm, linear, flat to canaliculated, gradually acuminate towards apex, scaberulous; sheaths up to 5 cm long, reddish-brown. Inflorescence simple or congested in single spike like cluster. Involucral bracts 3–5, suberect, leafy, lower much exceeding the inflorescence, up to 10 cm long; rays at times 1–3. Spikelets nearly erect, 5–16 in numbers, oblong-lanceolate to linear-oblong, 5–25 × 1.5–2 mm, flat, acute at apex, stramineous-white; rachilla straight, narrowly winged or wingless. Glumes distichous, ovate, c. 2 × 1.5 mm, acute and mucronulate at apex, membranous, 3-nerved, keeled, yellowish, nerveless, margins broadly hyaline. Stamens 2; anthers linear-oblong, c. 0.5 mm long; filaments up to 1.5 mm long. Style up to 1 mm long; stigmas 2, as long as style. Nutlet orbicular-obovate or broadly elliptic, 0.8–1 × 0.5–0.7 mm, biconvex, laterally flattened, apiculate at apex, transversely rugulose dorsally, purplish-brown or blackish at maturity; epidermal cells oblong, longitudinally arranged.

Fl. & Fr.: Aug. – Jan.

Habitat: Marshy places.

Distrib.: Tamil Nadu (Coimbatore and Dindigul, Madurai). Throughout India (except in drier region). Indo-China, Malesia, Myanmar and Sri Lanka.

17. *Pycreus sulcinux* C.B. Clarke in Hook. f. Fl. Brit. India 6: 593. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1627 (1132). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 66. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 315. 201; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 293. 2020. *Cyperus sulcinux* C.B. Clarke in J. Linn. Soc. Bot. 21: 56. 1884; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 75. 1989.

Tufted annuals with fibrous roots. Culms slender, 5–30 cm high smooth, 3-angled. Leaf blades mostly clustered at base, shorter than culm, 1–2 mm wide; sheaths glabrous, purplish. Inflorescence simple, slender, spike with 5–15 spikelets. Involucral bracts 3–5, spreading, usually basal 1 or 2 longer than inflorescence, up to 15 cm long; primary rays 3–6, often capillary, up to 7 cm, spreading, sometimes very short. Spikelets spreading, broadly ovoid, 5–15 × 1–1.5 mm, 8–30 flowered; rachilla glabrous, narrowly winged. Glumes lax, ovate to oblong-ovate, c. 2 × 1.5 mm, obtuse and mucous at apex, membraneous, 3-nerved, keel fuscous, margins narrowly hyaline. Stamen 1; anther oblong, 0.2–0.4 mm long. Style c. 0.5 mm long; stigmas 2, slender. Nutlet oblong, 1.2– 1.5 × c. 0.5 mm, slightly compressed, both surfaces concave sulcate and punctulate, blackish-brown.

Fl. & Fr.: Jul. – Nov.

Habitat: Marshy areas in grasslands.

Distrib.: Tamil Nadu (Coimbatore (Anamalais)). Throughout India. **Endemic.**

18. *Pycreus uniolooides* (R.Br.) Urb., *Symb. Antill.* 2: 164. 1900; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 66. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra*: 315. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 293. 2020. *Pycreus uniolooides* (R.Br.) Urb. var. *angulatus* (Nees) Domin, *Biblioth. Bot.* 85: 417. 1915; C.E.C. Fisch. in Gamble, *Fl. Madras*:1628 (1132). 1931; Fyson, *Fl. S. Ind. Hill Sta.*:635. 1932; K.T. Mathew in K.M. Matthew, *Fl. Palni Hills* 3: 1436. 1999. *Cyperus uniolooides* R.Br., *Prodr.* 216. 1810; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2):156. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 75. 1989. *P. angulatus* Nees in *Linnaea* 9: 283. 1835; C.B. Clarke in Hook. f., *Fl. Brit. India* 6: 591. 1893.

Perennials with robust rhizomes. Culms solitary, 50–70 cm high, triquetrous. Leaf blade linear-lanceolate, 35–42 × c. 0.4 cm, canaliculate; sheaths tubular, mouth splitted. Inflorescence simple. Involucral bracts 4 or 5, 20–30 cm long, leafy; primary rays 3–8. Spikelets oblong or lanceolate, 10–15 × c. 2 mm, acute, spreading, subturgid; rachilla wingless. Glumes ovate or ovate-oblong, 3.5–4 × 2.5–3 mm, acute at apex, muticous, 3-nerved, keeled, side nerveless, yellowish-green to brown, shining. Stamens 3; anthers c. 2 mm long. Style 2-fid, 1.5–3.5 mm long. Nutlet obovate, 1–1.5 × 0.8–1 mm, biconvex, prominently punctulate dorsally, blackish at maturity.

Fl. & Fr.: Aug. – Jan.

Habitat: Wet rocky areas in moist deciduous forests and in open wetlands.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). South India. **Endemic.**

15. *QUEENSLANDIELLA* Domin

Tufted, non-rhizomatous annuals. Culms 4–25 cm high, few to many, triquetrous. Leaves many, basal, longer than culm, flat, acuminate, margins scabrid towards apex, distinctly keeled; eligulate. Inflorescence umbelliform, anthelate. Primary bracts leaf like, not sheathing. Spikelets strongly compressed with few to several distichous, persistent glumes, each subtending a flower; rachilla broadly winged, deciduous as a unit. Flowers bisexual. Bristles absent. Stamens 2. Stigmas 2. Nutlet subcordate, laterally compressed, finely punctulate.

Monotypic genus distributed in Paleotropics.

Queenslandiella hyalina (Vahl) Ballard in Hooker's *Icon. Pl.* 33: t. 3208. 1933; Karthik. & al., *Fl. Ind. Enum. Monocot.*: 67. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.*: 293. 2020; *Cyperus hyalinus* Vahl, *Enum. Pl. Obs.* 2: 320. 1805; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 71. 1989. *C. pumilus* Nees in Wight, *Contr. Bot. India*: 74. 1834, non L. 1756. *Pycreus pumilus* C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 591. 1893, non (L.) Nees 1833 (concern.

descripn.). *P. hyalinus* (Vahl) Domin, Biblioth. Bot. 85: 417. 1916; C.E.C. Fisch. in Gamble, Fl. Madras: 1627 (1132). 1931; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 298. 2015. *Kyllinga hyalina* (Vahl) T. Koyama in J. Jap. Bot. 51 (10): 313. 1976 & in Dassan. & Fosb., Rev. Hand. Fl. Ceylon 5: 242. 1985.

Aromatic annuals with purplish fibrous roots. Culms tufted, triquetrous, 4–25 cm high, 0.5–1.5 mm thick, smooth. Leaves many, shorter than to exceeding the inflorescence, weak, flat, acuminate, 10–25 cm × 1–4 mm, scabrid on margins towards apex; sheaths stramineous or reddish-brown tinged. Inflorescence umbelliform, rarely contracted to a head like cluster. Involucral bracts 3–6, obliquely erect or spreading, longer than inflorescence; rays 3–6, patent, up to 6 cm long. Spikes 8–14 × 5–10 mm, loosely to subdensely bearing 5–15 spikelets; rachis 4-winged, glabrous. Spikelets spicately arranged, spreading at right angles, strongly compressed, ovate to oblong-ovate, subacute at apex, 3–7 × 1.5–3 mm, 4–12-flowered, pale greenish; rachilla flexuous, broadly winged, disarticulating at base. Glumes distichous, ovate to broadly ovate, 2–3 × c. 2 mm, membranous, strongly keeled, mucronate; keel prominently 3-nerved, serrate to scabrous on back, greenish. Stamens 2; anthers linear, oblong-lanceolate, 0.6–1 mm long; filaments up to 2 mm long. Style glabrous, flat, 0.5–1 mm long; stigmas 2, 1–1.5 mm long. Nutlets biconvex, planocompressed, 1.1–1.5 × 0.8–1.1 mm, shortly stipitate, brown to dark brownish-black, punctulate.

Fl. & Fr.: Jul. – Dec.

Habitat: Sandy soil, near sea coast, among mangroves, dry grasslands and wetlands.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dharmapuri, Erode and Nilgiri). Peninsular India and Eastern India. Australia, Indo-China, Madagascar, Malesia, Sri Lanka and tropical East Africa.

16. RHYNCHOSPORA Vahl

Tufted annuals or perennial herbs. Culms erect, 3-angled or terete, rarely solitary. Leaves linear, basal or cauline, flat or canaliculated; ligule absent; sheaths of cauline leaves long, closed. Inflorescence usually paniculate, at times capitate or spike like; when paniculate with a terminal and a few axillary corymbiform anthelae. Involucral bracts leafy, sheathing. Spikelets solitary or in clusters, lanceolate or oblong-lanceolate, terete or compressed, sessile or pedicelled, usually few flowered; rachilla straight. Glumes 5–8, spirally imbricate or subdistichous, 1-nerved; lower 3 or 4 empty, much smaller than apical glumes; upper most often empty. Flowers hermaphrodite or the lowest hermaphrodite and fertile, upper ones staminate or sterile, sometimes lowest flowers female and upper ones male. Perianth bristles absent or 6, antrorsely or retrorsely scabrous. Stamens 2 or 3; anthers linear,

with shortly produced connective. Style slender, articulated with ovary, almost undivided or deeply bifid, dark brown, dilated at base; style base persistent on nutlet, mostly conical. Nutlet sessile or shortly stipitate, 2 sided, obovate, elliptic or oblong, smooth or transversely rugulose.

Cosmopolitan, mostly in tropical and subtropical regions of New world, c. 200 species, 10 in India and 4 species and 1 subspecies in Tamil Nadu

Key to species and subspecies

- 1a. Inflorescence a single terminal globose or subglobose head bearing densely arranged spikelets; involucre bracts not sheathing; culms leafy at base; annuals or rarely short lived perennials 2
- 1b. Inflorescence of panicle with compound or decompound corymbiform umbels with laxly arranged spikelets; involucre bracts sheathing; culms leafy throughout; rhizomatous perennials 3
- 2a. Nutlet obovoid, laterally compressed; leaves and involucre bracts with strongly keeled mid-rib **3. R. rubra**
- 2b. Nutlet oblong or obovate-oblong, dorsiventrally compressed; leaves and involucre bracts not with strongly keeled mid-rib **5. R. wightiana**
- 3a. Culms filiform, leaves setaceous; nutlet setulose to almost glabrous; perianth bristles shorter than nutlet, within the glume **2. R. gracillima**
- 3b. Culms not filiform; leaves flat; nutlet finely transversely wrinkled; perianth bristles longer than nutlet 4
- 4a. Leaf blades broadly linear, 4–14 mm wide; style shortly or hardly bilobed at apex; nutlet 2–2.5 × c. 1.5 mm; persistent style conspicuously furrowed on both sides **1. R. corymbosa**
- 4b. Leaf blades narrowly linear, up to 4 mm wide; style bifid halfway; nutlet 1–1.8 × 1–1.5 mm; persistent style not furrowed **4. R. rugosa** subsp. **brownii**

1. *Rhynchospora corymbosa* (L.) Britton in Trans. New York Acad. Sci. 11: 84. 1892; C.E.C. Fisch. in Gamble, Fl. Madras:1672 (1160). 1931; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1781. 1983; Bhargavanin A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 83. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 67. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 318. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 292. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021. *Scirpus corymbosus* L., Cent. Pl. 2: 7. 1756. *Rhynchospora aurea* Vahl, Enum. Pl. Obs. 2: 229. 1805; C.B. Clarke in Hook.f., Fl Brit. India 6: 670. 1893.

Rhizomatous perennials. Culms solitary or a few together, 90–100 cm high, 2–6 mm thick, stout, triquetrous, many noded, leafy. Leaves radical as well as cauline; lowest 2 or 3 reduced to bladeless sheaths; cauline leaves up to top of culm; blades broadly linear, 85–90 cm long, 4–14 mm wide, flat, long acuminate at apex, margins scabrous; ligule at mouth; sheaths of cauline leaves with a scarios

appendage on orifice. Inflorescence of 2–5 corymbiform anthelas, subtended by involucre bracts. Anthelas compound or decomposed, many branched, 7–12 cm long with numerous spikelets. Involucre bracts unequal, leafy, up to 10 cm long, shorter than inflorescence; secondary rays up to 2 cm long. Spikelets subterete, many in clusters of 2–5, erect, narrowly ovoid to fusiform, lanceolate, 4–7 mm long, acute at apex, rusty brown or chestnut brown, 2 or 3-flowered, basal flower bisexual, upper one male. Glumes 3–6, subdistichous, membranous, 2–5 mm long, acute or mucronate at apex; basal 4 glumes and apical most glume empty; lower ones ovate; upper ones oblong-ovate. Perianth bristles in bisexual flowers unequal, 4–5 mm long, exceeding the nutlet, antrorsely scabrous; bristles 1–3 in male flowers, shorter. Stamens 3; anthers 1.5–2 mm long. Style shortly or hardly bilobed at apex. Nutlets compressed, obovate or oblong-obovate, 2–2.5 × c. 1.5 mm, truncate at apex, finely transversely wrinkled in middle portion, brownish; persistent style base conical, c. 5 mm, compressed, as broad as nutlet, conspicuously furrowed on both sides, usually smooth.

Fl. & Fr.: Jul. – Feb.

Habitat: Marshy areas, open swamps and wet grasslands.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri, Salem, Tiruchirappalli and Tirunelveli). Throughout India. Pantropical.

2. *Rhynchospora gracillima* Thwaites, Enum. Pl. Zeyl. 435. 1864; C.B. Clarke in Hook.f., Fl. Brit. India 6: 589. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1672 (1160). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 67. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 318. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 293. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021.

Annuals. Culms 20–60 cm high, 0.8–1 mm wide, slender, trigonous, smooth. Leaves 3–5, 1/5 to 1/2 or as long as culms, 0.5–1.2 mm wide, setaceous, canaliculate; sheaths 1–4 cm long, light green, the basal ones subphyllous, light brown. Inflorescence simple to subcompound, 8–20 cm long, bearing 3–5 capillary rays, up to 4 cm long; rays terminated by 1 or 2 spikelets. Involucre bracts setaceous, 2–4 cm long, the sheathing base up to 15 mm long, 1.5–2 mm wide, 3 or 4-flowered, 2-fruited, brown. Glumes 6 or 7, spirally disposed, ovate to broadly ovate, rather suddenly narrowed to subacute or mucronulate apex, light ferruginous, lineolate with purplish-brown, 1-nerved. Stamens 2; anthers 1.5–2 mm long. Nutlets obovate-orbicular, 1–1.5 mm across, rounded to short-stipitate base, truncate at apex, obcompressed, light grey, undulate-rugose with 6–8 ridges, finely longitudinally lineolate; style base depressed conical.

Fl. & Fr.: May – Aug.

Habitat: In moist places.

Distrib.: Tamil Nadu (Tirunelveli). Andaman & Nicobar Islands, Southeast and Northeast India. Indo-China, Malesia, Myanmar and Sri Lanka.

3. *Rhynchospora rubra* (Lour.) Makino in Bot. Mag. Tokyo 17: 180. t. 7. f. 1 a & b. 1903; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 67. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 320. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 294. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021. *Schoenus ruber* Lour. Fl. Cochinch. 1: 41. 1790. *Rhynchospora wallichiana* Kunth, Enum. Pl. 2: 289. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 668. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1672 (1160). 1931.

Annuals or sometimes short lived perennials. Culms 20–80 cm high, c. 2 mm thick, slender, trigonous below, triquetrous in upper half. Leaves basal, shorter than culms, c. 3 mm wide, sparsely scabrous on upper margins, gradually attenuate to subacute at apex; midrib with strongly keeled midrib, sheaths pale, straw-brownish. Inflorescence a single terminal head, globose, 10–20 mm across, with densely many spikelets, brown to orange-brown. Involucral bracts 4–8, leafy, 2–8 cm long, with strongly keeled midrib, not sheathing at base, the base dilated, ciliate on margins. Spikelets lance-ovate, 6–8 × 1.5–2 mm, gradually narrowed from below the middle to acuminate apex, 3 or 4-flowered, the lowest flower pistillate or very rarely with one stamen, the remainder staminate. Glumes 6–8, ovate to elliptic, acute. Hypogynous bristles 5 or 6, shorter than nutlets, barballate. Style filiform, almost undivided c. 5 mm long. Nutlet obovoid, 1.3–1.8 × 1–1.5 mm, cuneate at base, contracted at apex, laterally flattened, obscurely spotted with isodiametrical cells.

Fl. & Fr.: May – Aug.

Habitat: In moist places.

Distrib.: Tamil Nadu (Kanyakumari). Throughout India (Except Northwest India). Indo-China, Malesia, Myanmar and Sri Lanka.

4. *Rhynchospora rugosa* (Vahl) Gale subsp. ***brownie*** (Roem. & Schult.) T. Koyama in Hara & al., Enum. Fl. Pl. Nepal. 1: 118. 1978 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 335. 1985; Sangita Dey & P.V. Prasanna in Rheedea 20: 16. 2010; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 322. 2015. *R. brownii* Roem. & Schult., Syst. Veg. 2: 86. 1817. *Schoenus rugosus* Vahl, Eclog. Amer. 2: 5. 1798. *Rhynchospora glauca* Vahl, Enum. Pl. Obs. 2: 233. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 671. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1672 (1160). 1931; Fyson, Fl. S. Ind. Hill Sta.: 644. 1932. *R. glauca* Vahl var. *chinensis* C.B. Clarke in Hook.f., Fl. Brit.

India 6: 672. 1893. *R. aurea* Vahl, Enum. Pl. Obs. 2: 229. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 670. 1893. *R. rugosa* sensu B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1781. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 67. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1437. 1999; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 294. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021.

Rhizomatous perennials with short rhizome. Culms densely tufted, erect, 10–55 cm high, 1–1.5 mm thick, slender, trigonous, smooth or slightly scaberulous towards above. Leaves many, mostly in basal and few in cauline and distant, usually shorter than culm, rigid, flat or canaliculated; blades narrowly linear, up to 4 mm wide, long acuminate at apex, midrib prominent, margins scaberulous; ligule very short at mouth; sheaths closed, glabrous, brownish. Inflorescence of panicle with 2 or 3 distant corymbiform anthelas; lateral panicles solitary or 2 together, compressed, often long exerted from sheaths; branches very unequal. Involucral bracts erect, leafy as long as inflorescence, basal ones sheathing, apical ones sheathless. Spikelets solitary or in small clusters, pedicelled shortly, ovate or ovate-lanceolate, 3–7 mm long, terete, acute at apex, obtuse at base, 2–4 flowered. Glumes 5–8, elliptic-ovate to broadly ovate, spiral, membranous, short mucronate at apex, lower 3 or 4 glumes empty. Flowers bisexual; upper ones reduced. Perianth bristles 5 or 6, unequal, longer than nutlet, antrorsely scabrous. Stamens 1–3; anthers 1–1.5 mm long. Style filiform, bifid halfway. Nutlets biconvex, dorsiventrally compressed, obovate to broadly obovate, 1–1.8 × 1–1.5 mm, finely transversely wrinkled, light brown to castaneous; epidermal cells longitudinally oblong; persistent style base conical, half to as long as nutlet, glabrous.

Fl. & Fr.: Aug. – Feb.

Habitat: Marshy areas, open wetlands and rice fields.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai and Nilgiri). Peninsular India, central India, NE India and Eastern Himalayas. Widely distributed in tropics and subtropics.

5. *Rhynchospora wightiana* (Nees) Steud., Syn. Pl. Glumac. 2: 148. 1855; C.B. Clarke in Hook.f., Fl. Brit. India 6: 669. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 441. 1915; C.E.C. Fisch. in Gamble, Fl. Madras: 1672 (1160). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.: 68. 1989; Sangita Dey & P.V. Prasanna in Rheedea 20: 13. 2010; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 322. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 294. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021. *Haplostylis wightianus* Nees, Nov. Actorum Acad. Caes. Leop. - Carol. Nat. Cur. 19 (Suppl. 1): 101. 1843. *Rhynchospora discolor* Hochst. ex Steud., Syn. Pl. Glumac. 2: 148. 1855.

Annuals; roots fibrous. Culms solitary or tufted, 8–30 cm high, 0.2–1 mm thick, slender, striate, glabrous. Leaves linear, 2–4 mm wide, radical to cauline, much shorter than culm, gradually narrowed to apex. Inflorescence subglobose to globose head in terminal, 1.2–1.6 cm wide, yellowish-brown, with numerous densely arranged spikelets. Involucral bracts 4–7, unequal, longest bract up to 4.5 cm long, much exceeding the inflorescence, ciliate on margins towards dilated base. Spikelets linear-lanceolate, 4–6 mm long, compressed, 2-flowered (lower female, upper male). Glumes 6, distichous, acute at apex, keeled or with a prominent midnerve; lowest broadly ovate, c. 1 mm long; fertile glumes oblong-ellipsoid, boat shaped, c. 3 mm long; fifth glume oblong-lanceolate, c. 4 mm long, longer than all others; upper most glume linear-lanceolate, c. 3 mm long, hyaline, not very prominent. Perianth bristles in male flowers absent to 4 in numbers. Stamens 2; anthers linear, c. 1 mm long; filaments elongate up to 4 mm. Perianth bristles in female flowers 6, 3–6 mm long, antrorsely scabrous, much longer than nutlet. Style very shortly bilobed, c. 1×0.5 mm, compressed at base, persistent. Nutlets oblong or obovate-oblong, $1.5\text{--}2 \times 0.3\text{--}0.6$ mm, dorsiventrally compressed, tuberculate; epidermal cells isodiametric.

Fl. & Fr.: Aug. – Nov.

Habitat: Grasslands and marshy areas.

Distrib.: Tamil Nadu (Nilgiri). Western Peninsular India. Indo-Malesia.

17. **SCHOENOPLECTIELLA** Lye

Tufted, amphicarpous or non-amphicarpous annual, or rhizomatous, non-amphicarpous perennial; emergent or submerged, or on wet ground. Rhizome hidden among the culm bases or elongate and creeping. Roots fibrous. Culms erect or spreading, tufted, subterete or trigonous or several angled, nodeless or 1–3-noded at above. Leaves reduced to basal sheath; sheaths glabrous, lower ones mostly scale like; upper one tubular, mouth obliquely truncate; Inflorescence pseudolateral. Involucral bracts continuous from culm, culm like, subterete or trigonous, or obtusely several angled, transversely septate or aseptate. Spikelets sessile or pedunculate; rachilla persistent, not winged; flowers bisexual. Glume spirally arranged around rachilla, cymbiform, apex entire, membranous, subtends a flower, caducous or persistent, margin smooth or ciliate. Perianth bristles absent or present. Stamens 2 or 3. Nutlets trigonous or planoconvex or biconvex, smooth or transversely rugulose to sharply ridged, beaked at apex. Basal female flower absent or present at culm bases in axil of leaf sheath; if present, sessile, 2 or 3-fid long style overshooting the leaf sheath; basal nutlet larger than the spikelet nutlet.

Tropical and temperate regions of the world, c. 51 species, c. 8 in India and 4 in Tamil Nadu.

Key to species

- 1a. Perianth bristles present; hypogynous scales absent; basal solitary (amphicarpic) flowers absent 2
- 1b. Perianth bristles and hypogynous scales absent; basal solitary (amphicarpic) flowers usually present 3
- 2a. Culms terete or obtusely many angled; style 2-fid **2. *S. juncoides***
- 2b. Culms triquetrous with more or less concave sides; style 3-fid **4. *S. mucronata***
- 3a. Culms prominently transversely septate; glumes 3.5–5 mm long, margins not ciliolate at apex; nutlet smooth **1. *S. articulata***
- 3b. Culms solid, terete, not septate; glumes 1.5–2.5 mm long, margins ciliolate at apex; nutlet transversely wavy ridged **3. *S. lateriflora***

1. *Schoenoplectiella articulata* (L.) Lye in Lidia 6: 20. 2003; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021; *Scirpus articulatus* L., Sp. Pl.: 47. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 655. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 439. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1437. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 331. 2015. *Isolepis articulata* (L.) Nees in Wight, Contr. Bot. India:108. 1834. *Schoenoplectus articulatus* (L.) Palla in Engl., Bot. Jahrb. Syst. 10: 299. 1889; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1783. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 68. 1989. *Scirpus subarticulatus* Roxb., Fl. Ind. 1: 215. 1820.

Non-rhizomatous annuals or sometimes short lived perennials; roots fibrous. Culms densely tufted, terete, 15–45 cm high, smooth, glabrous, transversely septate, hollow. Leaves reduced to 1–3 basal sheaths; lower sheaths scale like, brownish; upper sheath 4–15 cm long, cylindrical, obliquely truncate at apex, margins membranous. Inflorescence a pseudolateral, dense head bearing several to numerous spikelets. Involucral bract longer than culm, continuous with culm, subacute at apex, septate, smooth, glabrous. Spikelets sessile, oblong-ovoid to ovoid, terete, 6–18 × 3–6 mm, acute at apex, densely many flowered; rachilla wingless, persistent. Glumes spiral, deltate to broadly ovate, 3.5–5 × 3–4 mm, acute and mucronate at apex, with a less prominent keel, many nerved. Perianth bristles and hypogynous scales absent. Stamens 3; anthers oblong, apiculate at apex, c. 1.2 mm long; filaments up to 4 mm long. Style c. 2 mm long; stigmas 3, much shorter than style, c. 0.5 mm long. Nutlets triquetrous, c. 1.8 × 1.2 mm, smooth, blackish-brown.

Fl. & Fr.: Jul. – Dec.

Habitat: Around shallow water logged areas, especially near coast, tanks and marshy places.

Distrib.: Tamil Nadu (Chengalpattu, Dindigul, Madurai, Ramanathapuram, , Tiruchirappalli and Tirunelveli). Throughout India. Mediterranean region and Paleotropics.

Notes: Solitary female flower sometimes develop at the base of culms in the axils of leaf sheath. These flowers have long unbranched styles and large globular fruits. This is a highly polymorphic species.

2. *Schoenoplectiella juncooides* (Roxb.) Lye in Lidia 6: 25. 2003; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021; *Scirpus juncooides* Roxb., Fl. Ind. 1: 218. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 6: 656. 1893; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 331. 2015; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021. *Schoenoplectus juncooides* (Roxb.) Palla in Engl., Bot. Jahrb. Syst. 10: 229. 1889; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1784. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 69. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1438. 1999. *Hymenochaeta juncooides* (Roxb.) Nakai in Bull. Natl. Sci. Mus., Tokyo 31: 133. 1952. *Scirpus erectus* acut. non Poir. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 656. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1666. 1931.

Erect annuals or short lived perennials; rhizomes present or absent. Culms tufted, subterete or obtusely several angled, 15–60 cm high, 1–2 mm thick, smooth or ribbed. Leaves reduced to 2 or 3 membranous sheaths; upper ones 5–10 cm, mucronate at apex, mucro 0.5–1 cm long. Inflorescence a pseudolateral head, bearing 2–10 sessile spikelets. Involucral bract single, 5–15 cm long, erect, subacute at apex, furrowed on inner side, usually shorter than culm. Spikelets ovoid or oblong-ovoid, 5–18 × 2–4 mm, subobtusate at apex, terete, brownish, densely many flowered; rachilla persistent, wingless. Glumes spiral, broadly ovate, cymbiform, 2.5–3.5 × 1.8–2.5 mm, mucronulate at apex, faintly many nerved, purplish, apex margins minutely hairy, slightly keeled. Perianth bristles 4 - 6, up to 2.5 mm long, unequal, retrorsely scabrous, shorter than or slightly longer than nutlet. Hypogynous scales absent. Stamens 3; filaments up to 3 mm long; anthers linear, c. 1.3 mm long, acute and purplish-brown at apex. Style 1.5–2 mm long, ciliolate; stigmas 2, c. 1 mm long, rarely a third inconspicuous stigma present. Nutlet broadly obovoid, unequally biconvex, 1.8–2 × 1.5–1.8 mm, mucronate at apex, shining, blackish-brown, transversely wrinkled.

Fl. & Fr.: Almost throughout the year.

Habitat: Often in shallow water, wet places, inundated rice fields, along streams and ponds.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri and Ranipet, Tiruvannamalai and Vellore). Throughout India. Australia, Japan and Madagascar.

3. *Schoenoplectiella lateriflora* (J.F. Gmel.) Lye in Lidia 6: 25. 2003; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021. *Scirpus lateriflorus* J.F. Gmel., Syst. Nat. 2, 1: 127. 1791; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85.

1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 338. 2015. *Scirpus supinus* L. Sp. Pl. 49. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 659. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Fyson, Fl. S. Ind. Hill Sta.: 361. 1932. *Schoenoplectus supinus* (L.) Palla in Engl., Bot. Jahrb. Syst. 10 (4): 299. 1888, subsp. *lateriflorus* (J.F. Gmel.) Soják in Cas. Nár. Mus., Odd. Prír. 141:62. 1972. *Schoenoplectus lateriflorus* (J.F. Gmel.) Lye in Bot. Not. 124: 290. 1971; Chandrab. & N.C. Nair, Fl. Coimbatore: 319. 1988; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1784. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 69. 1989. *Scirpus supinus* L. var. *laterifolius* (J.F. Gmel.) T. Koyama in Hara, Fl. East Himalaya: 393. 1966.

Tufted, non-rhizomatous annuals. Culms slender, subterete or obtusely angled, 10–30 cm high, smooth, nodes 1 or 2 above the base. Leaves reduced to 1 or 2 bladeless sheath; blades flattened, 1–10 cm long, subtends a solitary female flower from the axils with very long trifid style; ligule membranous; sheaths 5–15 cm long, membranous, mucronate or with a short blade at apex. Inflorescence pseudolateral, head like or corymbose, with 2–10 spikelets. Involucral bract 1 or 2; lower bract erect, 2–15 cm long, continuous to culm, culm like, shorter than culm; second bract, if present much shorter, up to 4 cm long; rays 1–4, up to 3 cm long. Spikelets congested, ovate to oblong, 4–10 × 2–3 mm, densely many flowered; rachilla persistent, not winged. Glumes spiral, broadly ovate, acute, 1.5–2.5 × 1.5–2 mm, mucronate, 3-nerved, keeled, brownish variegated on sides, margins hyaline, ciliolate. Perianth bristles and hypogynous scales absent. Stamens 3; anthers oblong, c. 0.5 mm long, connective bristly at tip; filaments up to 2.5 mm long. Style 0.5–0.8 mm long; stigmas 3, as long as style. Nutlets trigonous, broadly obovoid, 1–1.5 × c. 1 mm, apiculate, transversely wavy ridged, black.

Fl. & Fr.: Jul. – Jan.

Habitat: Wet regions of swamps, ponds and canals.

Distrib.: Tamil Nadu (All districts). Throughout India. Paleotropics.

Note: Solitary female flowers develop sometimes at base in the axils of leaf sheaths. This is a highly polymorphic species.

4. *Schoenoplectiella mucronata* (L.) J. Jung & H.K. Choi in J. Pl. Biol. 53 (3):230. 2010; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021. *Scirpus mucronatus* L., Sp. Pl.:50. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 657. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 439. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Fyson, Fl. S. Ind. Hill Sta.: 642. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2):158. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 342. 2015. *Schoenoplectus mucronatus* (L.) Palla in Engl., Bot. Jahrb. Syst. 10 (4): 299. 1889; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1785. 1983;

Karthik. & al., Fl. Ind. Enum. Monocot.: 69. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1438. 1999; Pallith., Pock. Fl. Sirumalai Hills: 273. 2001.

Erect, rhizomatous perennials without stolons. Culms tufted, triquetrous, 50–100 cm high, 3–7 mm thick, with more or less concave sides, smooth. Leaves reduced to 1–3 yellowish-brown sheaths at base; lowest sheath small, scale like, brown; uppermost cylindrical, 3-angled, 10–20 cm long, mucronate. Inflorescence a pseudolateral, congested, hemispherical head, 2–3 cm wide. Involucral bract 1, stem like, erect, triquetrous, 1.5–10 cm long. Spikelets sessile, 2–10, ovoid or oblong-ovoid, 7–10 × c. 3 mm, stramineous brown, densely many flowered; rachilla persistent, not winged. Glumes tightly appressed, ovate, 3–3.5 × 2.5–3 mm, membranous, mucronate at apex, midrib prominent, many nerved on both sides, shortly keeled at apex, margin shortly ciliolate towards tip. Perianth bristles 5 or 6, as long as nutlet, retrorsely scabrous. Hypogynous scales absent. Stamens 3; anthers oblong, 1.7–1.8 mm long, apiculate, purplish at apex; filaments up to 4 mm long. Style c. 2 mm long, minutely papillose; stigmas 3. Nutlet obovate, dorsiventrally flattened, planoconvex, 1.7–2.2 × c. 1.8 mm, rugulose, black.

Fl. & Fr.: Oct. – Dec.

Habitat: Grasslands, wet fallow fields, marshy places, tanks, lakes, banks of streams and pools.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Nilgiri, Salem, Tiruchirappalli and Tirunelveli). Throughout India. Warmer parts of old world.

18. SCIRPUS L.

Annuals or perennials, stoloniferous or caespitose, glabrous or only minutely hairy in the inflorescence; culms erect or procumbent, sometimes floating or submerged, terete to acutely angled, usually smooth. Leaves either with more or less developed blades, or reduced to bladeless sheaths; ligule membranous or absent. Inflorescence terminal, but often pseudolateral, capitate or anthelate, or consisting of a single spikelet. Involucral bracts one to several, in pseudolateral inflorescence seemingly a continuation of the culm, in 1-spiculate inflorescence usually reduced and glume like. Spikelets solitary or clustered, terete or angular, usually many flowered; rachilla persistent, not winged. Glumes spirally arranged, acropetally caducous, the lower 1–3 often empty. Flowers usually hermaphrodite. Stamens 1–3; anthers linear or oblong, with shortly produced, smooth or bristly connective. Styles caducous, continuous with the ovary, glabrous or very rarely sparsely fimbriate, hardly or not dilated at the base; stigma bifid or trifid. Nutlets 2 or 3 sided, obovate or elliptic to oblong in outline, often apiculate, smooth or rugulose; epidermal cells hexagonal or vertically oblong to linear.

Throughout the world, c. 150 species, c. 20 in India and 4 in Tamil Nadu.

Key to species

- 1a. Leaves well-developed; culms floating or submerged or procumbent, branched, fascicled; branches bearing a single terminal spikelet **1. *S. fluitans***
- 1b. Leaves reduced to sheaths, rarely shortly laminate; culms not as above; inflorescence pseudolateral, spikelets 2 to many in clusters, capitate or anthelate 2
- 2a. Spikelets peduncled, anthelate; hypogynous scales present **3. *S. littoralis***
- 2b. Spikelets sessile in capitate heads; hypogynous scales absent 3
- 3a. Annuals, culms usually 1.5–3 mm broad; stamens 2; nutlet 1–1.2 × 0.8–1 mm, undulate from transversely, conspicuously spaced wavy lines on each face **2. *S. jacobii***
- 3b. Perennials, culms usually 6–8 mm broad; stamens 3; nutlet 2–2.3 × 1.5–1.8 mm, smooth or obscurely rugose **4. *S. multisetus***

1. *Scirpus fluitans* L., Sp. Pl.: 48. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 653. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 439. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Fyson, Fl. S. Ind. Hill Sta.: 641. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 84. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3:1439. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 334. 2015. *Isolepis fluitans* (L.) R. Br. Prod. Fl. Nov. Holl: 221. 1810; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 366. 2021; *Eleogiton fluitans* (L.) Link, Hort. Berol. Descr. 1:284. 1827. *Eleogiton curvulus* Nees in Wight Contr. Bot. India:110. 1834. *Schoenoplectus fluitans* (L.) Palla in Koch, Syn. Deutsch. Fl. ed. 3: 2539. 1906; Karthik. & al., Fl. Ind. Enum. Monocot.: 68. 1989.

Annuals, aquatic with roots in under water. Culms floating on water or somewhat terrestrial, branched, 8–80 cm high, 0.5–1.5 mm thick, slender, terete, soft, densely leaved. Leaves cauline, narrowly linear, 1.5–7 × 0.03–0.1 cm, flattish or weakly incurved-margined, smooth, glabrous, blunt at apex; sheaths shorter than the internodes, 5–15 mm long, pale or reddish brownish. Inflorescence of a single, terminal erect spikelets. Spikelets ovate, 3–5 × 1.7–2.3 mm, acute at apex, up to 15-flowered, greenish. Involucral bracts 1, scale-like, $\frac{1}{2}$ to $\frac{3}{4}$ length of the spikelets. Glumes elliptic, 1.7–2.5 × 0.8–1.5 mm, obtuse, flattish, thickly membranous, sides green or tinged with fuscous-purple, 4–6-nerved. Stamens 2; anthers 0.5–0.7 mm long. Style 2-fid, almost as long as nutlets. Nutlets obovate, 1.3–1.5 × 0.5–1 mm, plano-convexed, abruptly contracted into long stipe, distinctly beaked at apex, whitish to purple-brown, smooth, epidermal cells isodiametric, minute.

Fl. & Fr.: Oct. – Dec.

Habitat: Margins of river in marshes and in brackish water on hills. Rare.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiri). South and Northeast India. Sri Lanka and Malesia.

2. *Scirpus jacobii* C.E.C. Fisch. in Kew Bull. 1931: 163. 1931 & in Gamble, Fl. Madras:1666 (1156). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal.

3: 84. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:335. 2015. *Schoenoplectus senegalensis* (Steud.) Palla ex Raynal in P. de Fabregues & J.P. Lebrum, Cat. Pl. Vasc. Niger 344. 1976 & *Adansonia* ser. 2. 16: 149. 1976; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1786. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.: 70. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 367. 2021; *Isolepis senegalensis* Steud. Syn. Pl. Glumac 2: 96. 1855 non *S. senegalensis* Lam. 1791.

Annuals, densely tufted, with often thick bases. Culms 15–30 cm high, 1.5–3 mm wide, septate, ending in brown tips. Leaves very short, acuminate; sheaths membranous. Inflorescence pseudolateral, sessile, with capitate clusters of 2–12 spikelets near the base of the sheaths. Involucral bract solitary, culm-like, much longer and continuation of culm. Spikelets sessile, ovoid or oblong-ovoid, 5–7 × 2.5–3 mm, stramineous, often tinged with brown, radiating; rachilla wingless, very slender. Glumes broadly ovate or suborbicular, 2.8–3 mm across, closely imbricated, carinate, keel with a strong mid-nerve side not or faintly striate, fuscous or white-hyaline, minutely ciliolate near mucicous or apiculate apex. Stamens 2; anthers elliptic, c. 0.8 mm long, mucicous. Style 3-fid; bristles or scales absent. Nutlet obovoid, 1–1.2 × 0.8–1 mm, trigonous, undulate from transversely wavy lines on each face.

Fl. & Fr.: Oct. – Jan.

Habitat: In semidried marshes and margins of water tanks and lakes.

Distrib.: Coimbatore, Dindigul (Madurai), Salem and South Arcot. Peninsular India. Mediterranean region and Paleotropics.

3. *Scirpus littoralis* Shrad., Fl. Germ. 1: 142. t. 5. f. 7. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6:659. 1893; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:85. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:68. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:339. 2015. *Schoenoplectus littoralis* (Shrad.) Palla in Verh. K.K. Zool.-Bot. Ges. Wien. 38. Sitzb.:49. 1888; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2):1785. 1983; Karthik. & al., Fl. Ind. Enum. Monocot.:69. 1989; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 368. 2021.

Rhizomatous perennials, robust; rhizome stout, c. 3 mm wide, often creeping. Culms 50–150 cm high, 3–8 mm wide, terete. Leaves very short or obscure; sheathsglabrous. Inflorescence simple, anthelate, pseudolateral, little distance below the apex. Involucral bract solitary, culm-like, much shorter and continuation of culm; primary rays 2–4 with several to many spikelets; the longest 4–6 cm long. Spikelets ovoid-oblong, 5–10 × 4–5 mm, solitary, peduncled, stramineous below, brownish in the upper half, subacute; rachilla wingless. Glumes elliptic oblong, 3–4.2 × 1.8–2 mm, closely imbricated, white-hyaline in lower half, brownish and

wrinkled on the back; the midnerve very strong and prominent, sides nerveless, with short but distinct erect or recurved mucro at obtuse apex. Stamens 3; anthers linear, c. 2 mm long, with distinct, papillose membranous appendage at the tips. Hypogynous scales 3–5, plumose from the moniliform hairs, white to bright-red, longer than the nutlets. Style 2-fid, much longer than the nutlets. Nutlet broadly obovoid to suborbicular, 1.8–2 × 1.5–1.7 mm, biconvex, pale yellow to brownish, smooth, apiculate.

Fl. & Fr.: Dec. – Mar.

Habitat: In marshes of water courses and swamps.

Distrib.: Chengalpattu, North Arcot and Thanjavur. Throughout India. From Mediterranean through South Asia to Australia, Africa and Malesia.

4. *Scirpus multisetus* (Hayasaka & Sato) W. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 343. 2015. *Schoenoplectus multisetus* Hayasaka & Sato in J. Jap. Bot. 79 (5): 323. 2004.

Rhizomatous perennials; rhizome stout, 4–5 mm thick, creeping, brownish, dark. Culms up to 70 cm high, 6–8 mm wide, triquetrous in upper half, sharply trigonous below, gradually narrowed upwards approximate along the creeping rhizome, 1–1.5 cm distant; nodeless. Leaves reduced to sheaths or rarely present; sheaths 15–20 cm long, dark brownish to black. Inflorescence of pseudolateral, sessile, capitate head of 10–15 sessile spikelets. Involucral bract solitary, culm-like, seemingly continuation of culm, 1–1.5 cm long. Spikelets ovoid-oblong, 0.5–1.5 × 0.4–0.6 cm, acute, terete; rachilla wingless. Glumes broadly ovate, 3.5–4 × 2.5–3 mm, acute, distinctly many nerved, dark brownish to black near apex, stramineous below, mucronate, as long as to slightly longer than broad. Bristles 6 or 7, almost as long as the nutlets, retrose barbellate. Stamens 3; anthers c. 1.5 mm long, reddish-brown, appendiculate. Style 3-fid, 2–3 mm long, sparsely hairy. Nutlet compressed, trigonous with one face flat, broadly obovoid, 2–2.3 × 1.5–1.8 mm, slightly longer than broad; stramineous to finally blackish, smooth or obscurely rugose, slightly cuneate at base, distinctly up to 0.3 mm long beaked at rounded apex.

Fl. & Fr.: Oct. – Jan.

Habitat: In streams and other water courses. Rare.

Distrib.: Nilgiris. **Endemic** to Tamil Nadu.

19. **SCLERIA** Berg.

Annual herbs with reddish, fibrous roots or perennials with short, creeping, often nodose rhizome, monoecious. Culms solitary or more or less tufted, mostly

erect, sometimes scrambling over bushes, trigonous or triquetrous, many noded, leafy in lower part or throughout, smooth or scabrid. Leaves tristichous, linear, sheathing the culm, smooth or very scabrous on margins and main nerves, lower ones reduced to bladeless sheaths or with a very short lamina; sheaths closed, often 3-winged, apex of ventral side truncate or produced into a tongue like contraligule. Inflorescence paniculate, consisting of a terminal and few lateral panicles from apical nodes, subtended by leafy involucral bracts, at times reduced to dense clusters or glomerate to spiciform with glumiform bracts. Spikelets all bisexual, or bisexual and unisexual (male), or female and male; bisexual spikelets with 1 terminal female flower and 1 to several lateral male flowers; female spikelets with 1 female flower and often with 1 or 2 lateral empty glumes (the reduced male flowers); male spikelets with several flowers. Glumes distichous (except upper ones of male spikelets and reduced male parts of bisexual flowers) in lateral spikelets at right angles to the pertinent bract and prophyll, lower 2–4 glumes empty. Flowers unisexual, achlamydeous; male ones with 1–3 stamens; anthers oblong to linear, with more or less produced connective; filaments free, rarely connate; female flowers with 3 carpellate ovary; style continuous with ovary, caducous, style base often persistent on nutlet; stigmas 3, filiform. Nutlet ovoid, globose to subglobose, depressed globose, ellipsoid, broadly ellipsoid or obovoid, trigonous to obtusely trigonous or terete, smooth or variously sculptured, glabrous or sparsely to densely hairy, with crustaceous pericarp, usually white, brownish or greyish-purple, borne on a gynophore. Gynophore persistent on nutlet, disk or cup like, usually trilobate, at times much reduced and obsolete, adhering to the base of nutlets.

Pantropics, some are extending to subtropical and warm temperate regions, c. 200 species, c. 32 in India and 9 in Tamil Nadu.

Key to species

- | | |
|--|--------------------------------|
| 1a. Culms robust, up to 3 m high, usually scrambling over bushes | 2 |
| 1b. Culms not robust, almost up to 125 cm high, usually erect | 3 |
| 2a. Nutlet smooth, contracted at base with 3 shallow depressions; disk obsolete, reduced | |
| | 2. <i>S. corymbosa</i> |
| 2b. Nutlet reticulate, without any depressions at base; disk shallowly 3-lobed | 9. <i>S. terrestris</i> |
| 3a. Annuals, usually non-rhizomatous | 4 |
| 3b. Perennials, with woody rhizome | 7 |
| 4a. Inflorescence elongate, terminal panicle with 1–4 lateral panicles; contraligule present | 5 |
| 4b. Inflorescence head like, axillary or terminal clusters of spikelets; contraligule absent | 6 |
| 5a. Lateral panicles 1 or 2; contraligule membranous, semi-orbicular; nutlets lacunae rather deep in longitudinal rows; disk lobes oblong | 5. <i>S. mikawana</i> |
| 5b. Lateral panicles 2–4, occupying most of the length of culm; contraligule rounded or truncate; nutlets deeply cancellated with transverse rectangular lacunae; disk lobes ovate to elliptic | 7. <i>S. parvula</i> |

- 6a. Leaves 2–8 cm long, glabrous except margins; clusters of spikelets in axillary; female glumes deeply 3-lobed at apex, glabrous; nutlet irregularly ribbed with 3 prominent longitudinal ribs, faintly hispidulous at apex **1. *S. caricina***
- 6b. Leaves 9–18 cm long, densely pubescent or pilose; clusters of spikelets only in terminal; female glumes not lobed at apex, densely pilose; nutlet not ribbed, densely tuberculate, with stellate hairs **6. *S. neesii***
- 7a. Disk obsolete, reduced to a narrow, brown, minutely glandular annular ring; peduncles capillary; stamens 1 (–2) **4. *S. lithosperma***
- 7b. Disk well developed, shallowly or deeply 3-lobed; peduncles not capillary; stamens 3–8
- 8a. Leaf sheaths narrowly to broadly winged; lateral axillary panicles 1 or 2; female spikelets 4–6 mm long; nutlet pubescent to glabrescent; disk lobes ovate-lanceolate, almost half or as long as nutlet **3. *S. Levis***
- 8b. Leaf sheaths not winged; lateral panicles absent; female spikelets 2.5–3 mm long; nutlet prominently rostrate, rugulose; disk lobes oblong, rounded, 0.5–0.7 mm long **8. *S. swamyii***

1. *Scleria caricina* (R. Br.) Benth., Fl. Austral. 7: 426. 1878; C.B. Clarke in Hook.f., Fl. Brit. India 6: 688. 1894; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 357. 2015. *Diplacrum caricinum* R. Br., Prodr. Fl. Nov. Holland. 1: 241. 1810; C.E.C. Fisch. in Gamble, Fl. Madras: 1678 (1164). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.:48. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020. *D. zeylanicum* Nees in Wight, Contr. Bot. India: 119. 1834.

Non-rhizomatous annuals; roots fibrous, slender, purplish to reddish. Culms tufted, diffuse or procumbent, triquetrous, 3–20 cm high, 0.5–1 mm thick, noded, glabrous, base clothed with leaf sheaths. Leaves cauline, linear, 2–8 × 0.2–0.5 cm, subabruptly acute at apex, 3 conspicuous costate, flat, soft, glabrous, scaberulous on upper margins; contraligule absent; sheaths triquetrous, 0.4–1.5 cm long, not winged, slightly dilated upwards. Inflorescence of 7–15 head like, clusters of spikelets in axillary, 3–4 mm in diam. Involucral bracts short, leafy, 2–3 cm long, much exceeding the inflorescence; secondary bracts glumiform, more or less winged on back; peduncles very short, usually exerted from bract sheaths, slightly winged. Spikelets unisexual, terminal one female, lateral ones male. Male spikelet sessile, few flowered, 1–2 mm long; glumes broadly lanceolate, 0.8–1 mm long. Stamen 1; anther oblong, 0.3–0.5 mm long. Female spikelets sessile or shortly pedicelled, broadly ovoid, 2–3 mm long, often with 2 glumes; glumes subopposite, ovate-lanceolate or obovate-oblong, 1–1.5 mm long, boat shaped, deeply 3-lobed at apex, middle lobe cuspidate, lateral lobes shorter than middle lobe, membranous, 5–10 or many nerved, glabrous, greenish, hyaline. Style 3-fid. Nutlets globose to subglobose, 0.7–1 mm in diam., faintly hispidulous at apex, minutely apiculate, irregularly ribbed with 3 prominent longitudinal ribs, white to greyish-purple, enveloped tightly in 2 subtending glumes. Disk obsolete, 0.5–0.6 mm in diam., obtusely triangular, adnate to base of nutlet.

Fl. & Fr.: Throughout the year.

Habitat: Marshy areas and in open wet places.

Distrib.: Tamil Nadu (Chengalpattu and Coimbatore). Throughout India. Australia and Tropical Asia.

2. *Scleria corymbosa* Roxb., Fl. Ind. 3:574. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 6:686. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1677 (1163). 1931; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:71. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 358. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021; *S. androgyna* Nees in Wight, Contr. Bot. India: 117. 1834. *S. corymbifera* Boeckeler in Linnaea 38: 537. 1874. *S. ridleyi* C.B. Clarke in Hook.f., Fl. Brit. India 6: 686. 1894.

Perennials; rhizome woody, horizontal, covered with reddish scales. Culms stout, often robust, erect, usually scrambling over bushes, up to 2 m high, 0.5–2 mm thick, acutely triquetrous, solitary, many noded, glabrous, scaberulous in upper part. Leaves evenly distributed throughout the culm, linear, 30–70 × 0.6–2.5 cm, abruptly narrowed into obtuse apex, coriaceous, rigid, flat, glabrous, scabrous on margins at apex; contraligule broadly ovate to triangular or depressed-deltoid, 3–6 mm long, brown, margins broadly hyaline; sheaths 5–16 cm long, trigonous, slightly loosely enveloped, not winged, rough or smooth, brown, basal sheaths leafless, reddish-brown. Inflorescence few to several distant fascicles of panicles, 25–75 cm long, copious, leafy; lateral panicles 2–4 at each node, rarely solitary, dense, decompose, corymbiform. Involucral bracts leafy, 10–30 cm long, erect, lower ones much exceeding the inflorescence; secondary bracts setaceous, 3–6 cm long; peduncles long exserted, up to 8 cm long, unequal in length, acutely triquetrous or compressed. Spikelets bisexual and male, intermingled, solitary or in groups of 2–5. Male spikelets sessile when grouped or on up to 2 mm long pedicels, lanceolate, 4–4.5 mm long; glumes ovate to ovate-lanceolate, 3–4 mm long. Stamens 3; anthers linear, up to 2.5 mm long, apiculate, connective with a subulate appendage; filaments up to 3 mm long. Bisexual spikelets sessile or subsessile, broadly ovoid, 4–5 mm long, bearing a sessile male spikelet at axil of uppermost glume; glumes broadly ovate, 3–4.5 mm long, acute with mucronate at apex, glabrous, dark brown. Style 3-fid. Nutlets ovoid or ellipsoid, 3–4 × 2–2.5 mm, obtusely trigonous, acute at apex, contracted at base with 3 shallow depressions, smooth, white, shining, exceeding the subtending glumes. Disk obsolete, triangular, adnate to the base of nutlet, usually reduced, brown or reddish, glandular.

Fl. & Fr.: Throughout the year.

Habitat: Evergreen forests and in damp shady places at low altitudes.

Distrib.: Tamil Nadu (Dindigul, Madurai. Throughout India (except Northwest). China, Malesia and Sri Lanka.

3. *Scleria levis* Retz., *Observ. Bot.* 4: 13. 1786; C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 694. 1894; C.E.C. Fisch. in Gamble, *Fl. Madras:1678* (1163). 1931; B.D. Sharma & al. in *Biol. Mem.* 2 (1&2): 158. 1977; Bhargavan in A.N. Henry & al., *Fl. Tamil Nadu Anal.* 3: 86. 1989; Karthik. & al., *Fl. Ind. Enum. Monocot.:* 71. 1989; Wad. Khan, *Cyperaceae W. Ghats, W. Coast & Maharashtra:* 358. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, *Fl. Pl. India Annot. Checkl. Monocot.:* 297. 2020; D. Naras. & S.J. Irwin, *Fl. Pl. Tamil Nadu Compend.:* 368. 2021. *S. zeylanica* Poir., *Encycl.* 7:3. 1806. *S. hebecarpa* Nees in Wight, *Contr. Bot. India:* 117. 1834; C.E.C. Fisch. in Gamble, *Fl. Madras: 1678* (1163). 1931. *S. pubescens* Steud., *Syn. Pl. Glumac.* 2: 168. 1855. *S. hebecarpa* Nees var. *pubescens* (Steud.) C.B. Clarke in Hook.f., *Fl. Brit. India* 6: 689. 1894.

Perennials; rhizomes stout, woody, horizontally short creeping, noded, covered with purplish-brown scales. Culms erect, slender, solitary and approximate, triquetrous or sharply trigonous, 30–100 cm high, 1–3 mm thick, glabrous to softly villose, scabrous on angles. Leaves phyllopodic, evenly distributed throughout the culm, linear, 17–40 × 0.3–0.7 cm, gradually narrowed into acute apex, densely pubescent with long white hairs to glabrous, margins scabrid; contraligule suborbicular, 1.5–3 mm long, with triangular or ovate scarious appendage at apex, pubescent or hirsute on upper part; sheaths 4.5–10 cm long, narrowly to broadly winged, margins retrorsely scabrous; lower sheaths tinged with reddish or purplish-brown, hardly or not winged. Inflorescence paniculate, terminal and 1 or 2 smaller in axillary; terminal panicle oblong, 5–12 cm long, with loose, obliquely erect branches; lateral panicles solitary at each node, few branched, often almost spike-like. Involucral bracts leafy, 8–10 cm long, exceeding the inflorescence; secondary bracts setaceous or linear, 1.5–4 cm long; peduncles exerted from bract sheath, 2–6 cm long, compressed, scabrous. Spikelets unisexual, in clusters of 2–4, at times mostly males. Male spikelets pedicelled, oblong-lanceolate, 3 - 4 mm long, pedicel up to 4 mm long. Glumes ovate, 3–4 mm long, acute or mucronate at apex. Stamens 3; anthers linear-oblong, 0.8–1 mm long, connective with short purplish appendage. Female spikelets sessile, borne towards the base of branchlets, ovate or obovate, 4–6 mm long, often with sterile glume. Glumes broadly ovate, 3–4.5 mm long, acute or mucronate at apex, greenish. Style 3-fid. Nutlets globose or globose-ovoid, 1.5–2.5 mm wide, nearly terete or obscurely trigonous, not exerted from glumes, rounded to apiculate at apex, smooth or slightly transversely rugulose, pubescent to glabrescent, whitish, shining. Disk deeply 3-lobed, appressed to nutlet; lobes ovate-lanceolate, rarely suborbicular, almost half as long as nutlet, brownish, acute or often bidentate at apex.

Fl. & Fr.: May – Aug.

Habitat: Degraded and open forests, fallow fields and roadsides.

Distrib.: Nilgiri and Tirunelveli. Throughout India. Australia, China and Indo-Malesia.

4. *Scleria lithosperma* (L.) Sw., Prodr.: 18. 1788; C.B. Clarke in Hook.f., Fl. Brit. India 6: 685. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1677 (1163). 1931; K.K.N. Nair & M.P. Nayar, Fl. Courtallum 2: 362. 1987; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic 3 (2): 1787. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 71. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1440. 1999; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra:359. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021. *Scirpus lithosperma* L., Sp. Pl.: 51. 1753. *Schoenus lithosperma* (L.) L., Sp. Pl. (ed. 2): 65. 1762. *Scleria tenuis* Retz., Observ. Bot. 4:13. 1786.

Rhizomatous perennials; rhizome woody, horizontal, shortly creeping, nodulose. Culms slender, erect, loosely tufted or not, triquetrous, 50–90 cm high, 1–2 mm thick below, smooth and glabrous. Leaves aphyllopodic, often aggregated towards the middle of culm, narrowly linear, 18–45 × 0.2–0.4 cm, gradually narrowed into obtuse apex, canaliculate, rigid, glabrous to puberulous, revolute, margins scabrous, glaucescent, dark green; contraligule ovate, rounded or triangular, 1–2 mm long, obtuse, hirsute or ciliate; sheaths narrow, triquetrous, 9–14 cm long, not winged, pubescent when young, glabrous at mature, basal ones bladeless, reddish-purplish. Inflorescence a terminal panicle and 2 or 3 (–4) in lateral, distantly borne axillary panicles, narrow, very loose, 7–14 cm long, sometimes becoming almost spiciform; terminal panicle up to 25 cm long. Involucral bracts leafy, 9–19 cm long, exceeding the inflorescence; secondary bracts setaceous, 2–5 cm long, minutely scabrid on margins; peduncles capillary, 3.5–7 cm long, 0.2–0.6 mm thick, sometimes inclosed in bract sheath. Spikelets bisexual, solitary or 2–5 together, with one female flower and a few to several male flowers, 2.5–4.5 mm long, laxly arranged, ovate to turbinate. Glumes ovate to lanceolate, 3–5 mm long, keeled, cuspidate or mucronate at apex, 1-nerved, rusty brown; glume immediately below fruiting structure bears an axillary male spikelet. Male spikelet as long as subtending glume, sessile, with a few male glumes. Stamens 1 (–2); anthers linear 1–1.5 mm long; filaments 3–3.5 mm long. Style 3-fid. Nutlet broadly ellipsoid or obovoid, 2–2.6 × 1.5–2 mm, obtusely trigonous, obtuse or rounded at apex, minutely umbonulate, cuneate with 3 shallow depressions at base, smooth, white shining. Disk obsolete, reduced to a narrow, brown, minutely glandular annular ring, adnate to extreme nutlet base.

Key to subspecies

- | | |
|---|---------------------------------------|
| 1a. Nutlet smooth and glabrous, shining white | 4.1. subsp. <i>lithosperma</i> |
| 1b. Nutlet rugulose with transverse wavy ridges, densely ferruginous viscid pubescent | 4.2. subsp. <i>linearis</i> |

Key to varieties

- 1a. Nutlet smooth and glabrous, shining white; sheath margins glabrous at maturity
4.1.1. var. lithosperma
- 1b. Nutlet muricate above the base; sheath margins hirsute hairy
4.1.2. var. multispiculata

4.1.1. subsp. **lithosperma** var. **lithosperma**

Fl. & Fr.: Jun. – Oct.

Habitat: Degraded, fringes of forests and hill slopes, open places, also in the plains.

Distrib.: Tamil Nadu (Chengalpattu, Coimbatore, Dindigul, Madurai, Kanyakumari, Tiruchirappalli and Tirunelveli). Throughout India. Pantropical.

4.1.2. subsp. lithosperma var. **multispiculata** Govind. in Proc. Ind. Acad. Sci. Sect. 71 B: 221. 1970; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 72. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 361. 2015.

Fl. & Fr.: Sep. – Oct.

Habitat: Marshy areas in grasslands.

Distrib.: Tamil Nadu (Kanyakumari). **Endemic** to Tamil Nadu.

4.2. subsp. linearis (Benth.) T. Koyama in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 353. 1985. *Scleria lithosperma* (L.) Sw. var. *linearis* Benth., Fl. Austral. 7: 430. 1878; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 71. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 361. 2015. *S. lithosperma* (L.) Sw. var. *roxburghii* C.B. Clarke in Hook.f., Fl. Brit. India 6: 686. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1677 (1163). 1931. *S. roxburghii* (C.B. Clarke) Domin, Biblioth. Bot. 85: 487. 1915.

Rhizomatous perennials. Culms woody, 60–80 cm high, triquetrous, smooth and glabrous. Leaves aphyllopodic, often aggregated towards the middle of culm, narrowly linear, 25–35 × 0.3–0.4 cm, glaucous, glabrous to slightly hairy beneath. Inflorescence paniculate, lax. Spikelets bisexual, 10–14 in fascicle, dense, congested. Nutlet ovoid or ellipsoid, obtusely trigonous, rugulose with transverse wavy ridges, densely ferruginous viscid pubescent.

Fl. & Fr.: Almost throughout the year.

Habitat: Marshy areas in grasslands and hills

Distrib.: Dindigul (Madurai) and Tirunelveli. Bihar, Chhattisgarh and Peninsular India. Indo-China to Australia.

5. *Scleria mikawana* Makino in Bot. Mag. (Tokyo)27: 57. 1913; Kern in Blumea 11: 199. 1961 & in Steenis, Fl. Males. ser. 1. 17: 744. 1974; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3:86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 72. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 368. 2021. *Scleria tessellate* auct. non Willd. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6: 686. 1893 p.p.; C.E.C. Fisch. in Gamble, Fl. Madras:1677 (1163) p.p.; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977.

Tufted annuals; roots fibrous, dark red. Culms slender, firm, erect, triquetrous, up to 80 (–100) cm high, 2–3 mm, glabrous, sometimes slightly scaberulous. Leaves linear, rigid, flat or plicate, abruptly narrowed to the obtusish or acutish apex, glabrous, scaberulous on the margins and main nerves in upper half; contraligule short, membranous, semi-orbicular, ciliate; sheaths narrow, triquetrous, not winged, glabrous or sparsely pubescent on anterior side, the lower ones almost bladeless. Inflorescence elongate, terminal panicle with 1 or 2 lateral panicles. Involucral bracts leafy, erect, longer than panicle in their axils, upper and secondary ones subulate. Spikelets Male spikelets distinctly peduncled, lanceolate, 4–5 mm long, pale or stramineous. Stamens 3; anthers linear, c. 1.5 mm long, with conical, sabrid appendage of connective. Female spikelets c. 5 mm long. Glumes oblong-ovate, acute or mucronulate, more or less reddish with green keel; often sterile glume beside female flower. Nutlet globose or ovoid-globose, obscurely trigonous, minutely umbonulate, scrobiculate, 2–2.5 mm in diam., lacunae rather deep, oblong to ovate, in longitudinal rows. Disk thickish, deeply 3-lobed, yellowish or greenish, lobes oblong, acute, sinuses obtuse.

Fl. & Fr.: Feb. – Mar.

Habitat: In open wetlands on hills.

Distrib.: Tamil Nadu (Nilgiris). **Endemic** to Tamil Nadu.

6. *Scleria neesii* Kunth, Enum. Pl. 2: 358. 1837; C.B. Clarke in Hook.f., Fl. Brit. India 6: 688. 1894; C.E.C. Fisch. in Gamble, Fl. Madras:1677 (1163). 1931; Karthik. & al., Fl. Ind. Enum. Monocot.:72. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 362. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021. *Hypoporum capitatum* Nees in Edinburgh New Philos. J. 17 (34): 267. 1834.

Tufted annuals; roots fibrous, dark red; at times rhizome very short, knotty, covered with purple scales. Culms slender, acutely triquetrous, up to 40 cm high, 0.5–1 mm thick, 1 or 2-noded above the base, pilose to glabrous. Leaves basal and subbasal, much shorter or as long as culms, linear, 9–18 × 0.1–0.3 cm, blunt at apex, soft, densely pubescent or pilose with whitish or greyish divaricate hairs all

over; contraligule absent; sheaths 1–5 cm long, obtusely trigonous, densely pilose, lower sheaths tinged with dark red or purplish-red, orifice truncate. Inflorescence 1 or 2 head like, in terminal globose clusters, 1–1.5 cm in diam., axillary clusters absent in the axils of leafy bracts. Involucral bracts leafy, 1–2 cm long, equaling or exceeding the inflorescence, lower one become ordinary leaf due to reduction of lower cluster of inflorescence; secondary bracts setaceous; peduncles exserted, slender, pubescent. Spikelets sessile, male and female spikelets congested in cluster of 5–20. Male spikelets shorter than female, up to 4.5 mm long. Glumes ovate, 0.8–1 mm long, densely pilose. Stamens 3; anthers oblong, 1–1.5 mm long; filaments 0.4–0.5 mm long. Female spikelets ovoid, 6–8 mm long. Glumes 4, ovate, 5–7 mm long, membranous, mucronulate at apex, densely pilose, midrib extended into 0.5–1 mm long, erect or recurved awn. Style 3-fid, 1.5–2 mm long. Nutlet globose, 1.5–1.8 mm in diam., rounded at apex, white or brownish, densely tuberculate, tubercules crowned by stalked or sessile tufts of stellate hairs. Disk reduced to a columnar, triquetrous, with a strong rib on each side, forming 0.5–0.7 mm long stipe under the nutlet.

Fl. & Fr.: Jan. – Apr.

Habitat: Marshy areas in grasslands.

Distrib.: Tamil Nadu (Tiruchirappalli). Andaman & Nicobar Islands and Kerala. Indo-Malesia and Sri Lanka.

7. *Scleria parvula* Steud., Syn. Pl. Glumac. 2: 174. 1855; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.:72. 1989; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 297. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021. *S. tessellata* Boeckeler in Linnaea 38: 470. 1874; C.B. Clarke in Hook.f., Fl. Brit. India 6: 686. 1894 p.p.; C.E.C. Fisch. in Gamble, Fl. Madras:1677 (1163). 1931 p.p., non Willd. 1805. *S. uliginosa* Hochst. ex Boeckeler in Linnaea 38: 471. 1874.

Tufted annuals; roots fibrous, dark red or reddish-purple; rhizome very short, woody. Culms erect, slender, triquetrous, 30–90 cm high, 1–3 mm thick, smooth and glabrous, scabrid on angles, distantly 5 or 6-noded. Leaves basal, linear-lanceolate, 10–30×0.2–0.4 cm, suddenly narrowed into obtuse apex, flat, greenish, glabrous, main nerves and margins in upper part scabrid; contraligule short, rounded or truncate, 0.5–1 mm long, ciliate on membranous margin; sheaths loosely covered the culms, 4–8 cm long, triquetrous, glabrous or sparsely pubescent, acute to narrowly winged, wings retrorsely scabrid. Inflorescence a terminal panicle and 2–4 lateral panicles, occupying almost throughout the culm, 1–2.5 cm long, 1–3 at each node, erect or lower ones pendulous, terminal panicle oblong, 2–3 cm long. Involucral bracts leafy, 4–9 cm long, erect, equally or slightly exceeding the inflorescence; secondary bracts setaceous, 1.5–3 cm long; peduncles slender, flattened, more or less exserted from sheaths, usually lower lateral panicles with long exserted peduncles,

4–9 cm long. Spikelets unisexual. Male spikelets shortly pedicelled, lanceolate, 4–5 mm long, pedicel 1–2.5 mm long. Stamens 3; anthers linear, 1–1.5 mm long, connective with conical reddish appendage. Female spikelets obdeltoid, 4–5 mm long, without barren or male flower at axil of base. Glumes ovate, 3–3.5 mm long, acute or mucronulate at apex, membranous, pale or stramineous, margin purplish. Style 3-fid. Nutlets globose or ellipsoid, 2–2.5 × 1.5–2 mm, shorter than subtending glumes, obtusely trigonous, mucronate, deeply cancellated with transverse rectangular lacunae, walls between lacunae narrow, puberulous or glabrescent, white, shining. Disk deeply 3-lobed, lobes ovate to elliptic, subcoriaceous, 0.7–1 mm long, acuminate or bidentate at apex, appressed to nutlet, greenish or yellowish.

Fl. & Fr.: Jun. – Dec.

Habitat: Deciduous forests, in swamps and wet open grasslands.

Distrib.: Tamil Nadu (Nilgiri). Throughout India. Paleotropics.

8. *Scleria swamyii* Govind. in Proc. Ind. Acad. Sci. 94: 19. f. 5. a-e. 1985; Karthik. & al., Fl. Ind. Enum. Monocot.: 72. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 366. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 298. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021;

Rhizomatous perennials; rhizome non-creeping. Culms 40–70 cm high, 2–2.5 mm wide, rather slender, acutely triquetrous with flat faces, retrorsely scabrid. Leaves 3–4 mm broad, glabrous with serrulate margin in upper 1/3 of leaf; sheaths narrow, wingless. Inflorescence rather broad, elongate, consisting of usually single panicle, 2–3 × 1–1.5. Involucral bract solitary, leafy, longer than inflorescence. Spikelets unisexual, in clusters of 2 (-3). Male spikelets shortly peduncled, oblong ovate, 4–5 mm long; stamens 3; anthers c. 1 mm long. Female spikelets elliptic ovate, 2.5–3 mm long. Glumes 3, broadly ovate, acute, glabrous. Disk distinctly shallowly 3 lobed; lobes oblong, rounded, 0.5–0.7 mm long with broad sinuses, more or less appressed to nutlet, entire, pale. Nutlet subglobose, marble white, shining, shorter or longer than glumes, prominently rostrate, rugulose by transverse undulate ferruginous or yellowish attractive viscid ridges with 3 depressions at base, with 0.2–0.3 mm long beak at acute apex.

Fl. & Fr.: Sep.– Oct.

Habitat: In open wetlands and grassy places.

Distrib.: Tamil Nadu (Coimbatore). **Endemic.**

9. *Scleria terrestris* (L.) Fassett in Rhodora 26: 159. 1924, incl. var. *latior* (C.B. Clarke) Fassett & var. *decolorans* (C.B. Clarke) Fassett; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Britto & K.M. Matthew in K.M. Matthew, Fl. Tamilnadu Carnatic

3 (2):1788. 1983; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 86. 1989; Karthik. & al., Fl. Ind. Enum. Monocot.: 72. 1989; K.T. Mathew in K.M. Matthew, Fl. Palni Hills 3: 1441. 1999; Pallith., Pock. Fl. Sirumalai Hills: 273.2001; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 366. 2015; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 298. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021. *Zizania terrestris* L., Sp. Pl. 2: 991. 1753. *Diaphora cochinchinensis* Lour., Fl. Cochinch. 2: 578. 1790. *Scleria radula* Hance in Ann. Sci. Nat., Bot. Ser. 4, 18: 232. 1862; C.B. Clarke in Hook.f., Fl. Brit. India 6: 691. 1894. *S. elata* Thwaites, Enum. Pl. Zeyl.: 353. 1864; C.B. Clarke in Hook.f., Fl. Brit. India 6:690. 1894. incl. var. *latior* C.B. Clarke & var. *decolorans* C.B. Clarke. *S. melanostoma* Nees ex Boeckeler in Linnaea 38: 514. 1874. *S. rinkiana* Boeckeler, Beitr. Cyper. 2: 30. 1890. *S. chinensis* Kunth var. *biauriculata* C.B. Clarke in Hook.f., Fl. Brit. India 6:690. 1894. *S. cochinchinensis* (Lour.) Druce in Rep. Bot. Soc. Exch. Club. Brit. Isles 4 (Suppl. 2): 646. 1917; C.E.C. Fisch. in Gamble, Fl. Madras:1678 (1163). 1931; Fyson, Fl. S. Ind. Hill Sta.: 645. 1932.

Rhizomatous perennials; rhizome stout, woody, shortly creeping. Culms erect or scrambling over bushes, triquetrous, up to 2 m high and up to 1 cm thick, glabrous to puberulous, retrorsely scabrous on sharp angles. Leaves equally densely distributed on culms, linear, 20–55 × 0.7–1.5 cm, gradually tapering into long acuminate apex, rigid, subcoriaceous, glabrous, margins scabrous and recurved when dry; contraligule lunate, triangular or rounded, 2–3.5 mm long, brown, with scarious membranous margins, ciliate or glabrous; sheaths 4.5–16 cm long, at times longer than blades, triquetrous, overlapping, glabrous or pubescent, scabrid on angles, reddish or purplish-brown, often winged, rarely wingless. Inflorescence of 2–4 compound distant lateral panicles, very variable in size, 10–45 cm long, solitary, ovate to pyramidal in outline, dense, branches ascending, scabrid. Involucral bracts leafy, 8–20 cm long, equaling or slightly exceeding the inflorescence; secondary bracts elongated, linear or setaceous, 1–5 cm long, scabrid, ciliate at base; peduncles single, rarely 2 at each node, long exerted, 7–15 cm long, triangular, 1–1.5 mm thick, glabrous or scabrous. Spikelets unisexual, solitary or in groups of 2 or 3, both male and female intermingled. Male spikelets pedicelled, oblong-lanceolate, 3.5–4 mm long, deeply reddish-brown. Stamens 3; anthers linear-oblong, 1.5–2 mm long, connective with short whitish to purplish appendage. Female spikelets sessile, broadly ovoid or obovoid, 3.5–4.5 mm long. Glumes 5, lowest 2 very short, upper ones longer, broadly ovate-lanceolate, abruptly acute at apex, keeled, reddish-brown, glabrous. Style 3-fid. Nutlet broadly obovoid to globose or subglobose, 2.5–3.6 mm diam., longer than two subtending glumes, tereteto obtusely trigonous, apiculate, reticulate, cancellate or obscurely warted, puberulous to glabrous, shining white, greyish or dark purplish to blackish at maturity. Disk shallowly 3-lobed, 1.8–2 mm in diam., appressed to base of nutlet; lobes rounded or obtuse, slightly denticulate at apex.

Fl. & Fr.: Mar. – Dec.

Habitat: Semi-evergreen, deciduous forests and partial shady areas of secondary forests.

Distrib.: Tamil Nadu (Coimbatore, Dindigul, Madurai, Namakkal, Nilgiri, Salem and Tirunelveli). Throughout India. Tropical and Subtropical Asia and Northern Australia.

20. TRICHOPHORUM Pers.

Annuals or perennial herbs; rhizomes creeping. Culms scapose. Leaves reduced to bladeless sheaths, at times well developed; ligule membranous or reduced. Inflorescence a single spikelet, rarely corymbiform anthela with few spikelets. Involucral bracts small, leafy, lowermost suberect. Spikelets many flowered. Glumes spirally arranged, deciduous, each subtending a flower. Flowers bisexual. Perianth bristles absent to 6, setaceous, as long as to much longer than nutlet, falling along with nutlet. Stamens 3. Style 3-fid, base not distinct, slightly thickened, more or less persistent. Nutlet obovate, trigonous or dorsiventrally compressed, faintly beaked, smooth.

Tropical Asia and South America, c. 10 species, 1 in Tamil Nadu

Trichophorum subcapitatum (Thwaites & Hook.) D.A. Simpson in Kew Bull. 53: 227. 1998; V.P. Prasad & al. in A.A. Mao & S.S. Dash, Fl. Pl. India Annot. Checkl. Monocot.: 298. 2020; D. Naras. & S.J. Irwin, Fl. Pl. Tamil Nadu Compend.: 369. 2021. *Scirpus subcapitatus* Thwaites & Hook., Enum. Pl. Zeyl.: 351. 1864; C.B. Clarke in Hook.f., Fl. Brit. India 6: 661. 1893; Fyson, Fl. Nilgiri and Pulney Hills: 440. 1915; C.E.C. Fisch. in Gamble, Fl. Madras:1666 (1156). 1931; Fyson, Fl. S. Ind. Hill Sta.:642. 1932; B.D. Sharma & al. in Biol. Mem. 2 (1&2): 158. 1977; Bhargavan in A.N. Henry & al., Fl. Tamil Nadu Anal. 3: 85. 1989; Wad. Khan, Cyperaceae W. Ghats, W. Coast & Maharashtra: 347. 2015. *Baeothryon subcapitatum* (Thwaites) T. Koyama, Fl. Taiwan 5: 205. 1978 & in Dassan. & Fosberg, Revis. Handb. Fl. Ceylon 5: 166. 1985.

Densely tufted, rhizomatous perennials; rhizome woody, creeping shortly. Culms slender to rigid, 8–50 cm high, c. 0.5 mm thick, erect, terete to more or less distinctly triangular, grooved, smooth or faintly scaberulous below inflorescence. Leaves usually reduced to basal sheaths, tightly clothed the culm base, brownish, bearing a blade up to 2.5 cm long or with a short scabrid cusp; sheaths orifice obliquely truncate, margins hyaline. Inflorescence terminal, consisting of 1–5 spikelets in a cluster, rarely solitary. Lower spikelet sessile, others on short smooth pedicels. Involucral bract glume like, sheathing the culm, 5–10 mm long, lanceolate, shorter than spikelet, smooth or scabrid, up to 4 mm long mucro at apex. Spikelets oblong-lanceolate, terete, 5–15 × c. 2 mm,

acute at apex, 5–10- flowered. Glumes membranous, oblong-lanceolate, 1.2–1.5 × 0.5–1 mm, slightly keeled, outermost glume obtuse at apex, others acuminate at apex, ferruginous-brown, with 3 yellowish nerves and hyaline margins. Perianth bristles 6, very slender, 4–7 mm long, flexuous, scabrid towards apex, much longer than nutlet. Stamens 3; anthers 1–3 mm long, apiculate. Style glabrous; stigmas 3, papillose. Nutlets compressed to trigonous, elliptic to oblong, 0.6–1 mm wide, apiculate at apex, smooth, fuscous; epidermal cells minute, rounded to hexagonal.

Fl. & Fr.: Feb. – Mar.

Habitat: Marshy areas in grasslands and open wetlands on hills.

Distrib.: Tamil Nadu (Dindigul, Madurai and Nilgiris). Kerala. Indo-Malesia and China.

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About the book

The book on Cyperaceae of Tamil Nadu is an outcome of intensive field surveys undertaken in different localities in Tamil Nadu. This book is the first and exclusive taxonomic study on Cyperaceae for the State. A total of 219 taxa under 20 genera are documented and studied comprehensively. Of the total recorded sedge species, 9 species are restricted to Indosrilanka, 11 species are endemic to India, 19 species are endemic to the Western Ghats and 31 species are endemic to Tamil Nadu. Detailed descriptions, illustrations, phenology, distribution, and colour photographs of the species have been provided in the work. This book will contribute as a good reference source for researchers, students and policymakers.

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