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**Schoenoplectiella erecta (Poir.) Lye ssp. raynalii
(Schuyler) Beentje (Cyperaceae) – a new record to India
from Ossudu Bird Sanctuary, Villupuram District, Tamil
Nadu**

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Cover: Pseudo-flying animals and wind-dependent seed & spore dispersers – made with digital painting in Krita. © Melito Prinson Pinto

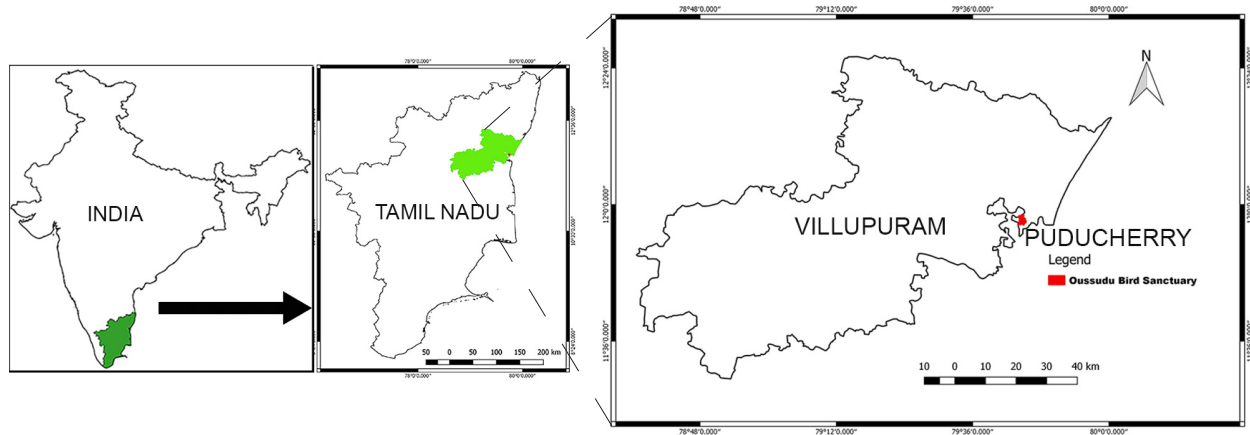


Figure 1. Study area – Ossudu Bird Sanctuary.

perusal of literatures (Cook 1998; Panda et al. 2002; Prasad & Singh 2002; Ansari et al. 2016; Kar et al. 2016; Mao & Dash 2020; Narasimhan & Sheeba 2021) we come to know that this taxon was not yet recorded in Asia, India, and regional floras; however, *Schoenoplectiella erecta* ssp. *erecta* was recorded from northern India. In the Lake Ossudu Bird Sanctuary, three *Schoenoplectiella* species also occur: *S. atriculata* (L.) Lye, *S. lateriflora* (J.F.Gmel.) Lye, and *S. juncooides* (Roxb.) Lye.

MATERIALS AND METHODS

Botanical exploration and ecological studies were conducted from September 2018 to August 2021 in Ossudu (Figure 1) along the Coromandel Coast, Villupuram district of Tamil Nadu. Ossudu Bird Sanctuary falls in two political boundaries, viz., Union Territory of Pondicherry and Villupuram district of Tamil Nadu. During the survey an unfamiliar sedge was found and collected from the eastern shores of Ossudu Lake and the collected specimen was processed and deposited at Herbarium, French Institute of Pondicherry (HIFP) for further studies. Camera attached light microscope was used to examine the morphological features of glume and nutlets to understand the morphological differences. Recent publications (Mao & Dash 2020; Narasimhan & Sheeba 2021) and consultation of herbaria (Madras Herbarium (MH), Rapinath Herbarium Tiruchirapalli (RHT), Deccan Regional Centre (DRC), Auroville Herbarium (AURO)) for the occurrence and international datasets (GBIF- the Global Biodiversity Information Facility—<https://www.gbif.org>, COL- Catalogue of Life—<https://www.catalogueoflife.org>, POWO- Plants of the World Online—<https://powo.science.kew.org/> and USDA- United States Department of Agriculture—<https://plants.usda.gov>) were referred for the global distribution

range of this species.

RESULTS

The inflorescence of *Schoenoplectiella* is capitata or anthellate. The anthella of spikelets are simple to decompound due to the presence of branched or unbranched peduncles with few to numerous sessile spikelets and they are densely crowded. This characteristic feature was recorded in both the inflorescence of *S. lateriflora* and *S. erecta*. On critical examination of the herbarium specimens deposited at AURO (4751, 10317, 11940), *S. lateriflora* was 10–20 cm high with decompound inflorescence, peduncles 3–15 mm high, style 3-branched, achene trigonous whereas *S. erecta* is more than 30 cm high, inflorescence decompound, peduncles 15–65 mm long, secondary peduncles to 8–12 mm long, style 2-branched and nutlet plano-convex.

The two known subspecies, *Schoenoplectiella erecta* ssp. *raynalii* is similar to *S. erecta* ssp. *erecta* but differs by its style and nutlets. Following key can be used to differentiate them:

- 1. Nutlet biconvex, style 2-fid, slightly wrinkled
..... *S. erecta* ssp. *erecta*
- 1. Nutlet plano-convex, style 3-fid, distinctly rugose *S. erecta* ssp. *raynalii*

Taxonomic treatment

Schoenoplectiella erecta (Poiret) Lye ssp. *raynalii* (Schuyler) Beentje Fl. Trop. E. Africa, Cyperaceae, 34, 2010. (Image 1)

Schoenoplectus erectus (Poiret) Palla ex J. Raynal ssp. *raynalii* (Schuyler) Lye, Nordic J. Bot. 3(2): 243. 1983.

Scirpus raynalii Schuyler, Notul. Nat. Acad. Nat. Sci.



Image 1. *Schoenoplectiella erecta* subsp. *raynalii*: A—The present collection | B—Isotype image from KEW | C—inflorescence in close view | D—plant in natural condition | E—dorsal, ventral and lateral view of glumes | F—gynoecium with 3—fid stigma | G—young and matured nutlet. © Balachandran & Uma Maheswari.

Philadelphia 438: 1, figs. 1, 3, 6. 1971.

Type: BOTSWANA, Maun district, 6.2.1964, *Yalala* 425 (K-K000416875!-Isotype-digital image seen)

Description

Annual herbs, culms densely tufted, 30–43 cm (including inflorescence bract), cylindrical, ridged when dry, 1.6–2 mm thick. Leaves 1–3, 2.5–13 cm long, rarely equalling the culm; sheaths brown, 5–9 cm long, ribbed, disintegrating to fibres. Inflorescence, pseudolateral, anthella-decompound in 2–5 pedunculate corymb, primary peduncle 0.5–6 cm long, secondary rachis 8–12 mm long; overtopped by lower bract, involucre bract stem like, erect, 4.5–13 cm long, secondary bract 0.5–4 cm long. Spikelets, in clusters, 1–5, 5–7 × 2–3 mm; green-cream, reddish brown when matured; ovoid-oblong, 3(5)–13(18) × 2–3.5 mm; glume straw-coloured, with brown mosaic, central region often greenish when fresh, ovate-obovate, 2.53.4(5) × 1.5 mm, smooth, mucronate, margins scarious. Perianth absent, stamens 3, style 3-fid. Achenes almost blackish brown when ripe, planoconvex when matured, obovoid, 1.2–1.6 × 1.1–1.5 mm, with sharp ridges along the margins, distinctly and transversely rugose.

Flowering and fruiting: from January–April.

Habitat: Along the shores of the fresh water lake at the elevational range between 30 and 40 m. It was found growing along with *S. lateriflorus* and *S. juncooides* of Cyperaceae, *Persicaria glabra* (Willd.) M.Gomez of Polygonaceae, *Ludwigia perennis* L. of Onagraceae, *Dinebra polystachyos* (R.Br.) E.A.Kellogg of Poaceae, *Aponogeton natans* (L.) Engl. & K.Krause of Aponogetonaceae.

Distribution: Africa, Asia, Australia, Mexico, and South America.

Specimen examined: India, Tamil Nadu, Villupuram district, Ossudu Bird Sanctuary, 11.9577° N, 79.7456° E, 18 m, 8 February 2020, Pradeep & Balachandran 27514 (HIFP!, two sheets).

Conservation status

Considered as 'Least Concern' on the IUCN Red List of Threatened Species (Mesterházy 2020), and in recent days the range of distribution has been extended from Africa, America to Asia, and Australia. Probably the migratory granivorous ducks (Mallards/the whistling ducks) might have played a major role in extending the distribution of this species. This study also proves the report of Kleyheeg et al. (2019) that the granivorous water birds disperse viable seeds of wetland plants over long distance during their migration. The censuses

of large flocks of such migratory granivorous wintering or breeding ducks were recorded during this study and previous ones (Perennou 1990; Davidar 2011; Mathevet et al. 2020).

Notes: As per the revision of Hayasaka (2012) and Xanthos & Browning (2015) the subspecies '*raynalii*' could be easily distinguished by having 3-fid stigmas, planoconvex nature of nutlet with distinct rugose surface, while its typical subspecies '*erecta*', has 2-fid stigma, biconvex nutlet with moderate wrinkled surface. The surface of *S. lateriflora* nutlet is otherwise same that of *S. erecta* ssp. *raynalii* but the former species has trigonous nutlet with 2-fid stigmas.

In *Schoenoplectiella*, interspecific natural hybridization exhibits range of variations in plant height, culm width below the inflorescence, shape and length of overtopping inflorescence, glume dimensions at apex, anther crest length, style branch and length, achene dimensions and surface sculpturing were very well studied (Browning 1992; Hayasaka 2012). Meanwhile the variation in the shape of inflorescence was overlooked by previous taxonomic accounts (Ohwi 1944; Koyama 1958). Though, in India we observed that the length of primary and secondary peduncles of the inflorescence is much longer than the (iso)type specimen from KEW image and specimen from the University of South Florida Herbarium (20709).

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Communications

Sunda Clouded Leopard *Neofelis diardi* (Cuvier, 1823) (Mammalia: Carnivora: Felidae) occupancy in Borneo: results of a pilot vehicle spotlight transect survey
– Jephthe Sompud, Sze Lue Kee, Kurtis Jai-Chyi Pei, Paul Liao, Collin Goh & Anthony J. Giordano, Pp. 22559–22566

On the occurrence of Eurasian Otter *Lutra lutra* (Carnivora: Mustelidae) in Neeru stream of Chenab catchment, Jammu & Kashmir, India
– Dinesh Singh, Anil Thakar & Neeraj Sharma, Pp. 22567–22573

Distribution of avifauna on twenty-one islands of the Gulf of Mannar Biosphere Reserve, India
– H. Byju, N. Raveendran & S. Ravichandran, Pp. 22574–22585

Habitats of House Sparrow *Passer domesticus* (Linnaeus, 1758) in Rameswaram Island, Tamil Nadu, India
– M. Pandian, Pp. 22586–22596

Seasonal diversity and dietary guild structure of birds in two Vindhyan gorge forests of Rajasthan, India
– Ashvini Kumar Joshi, Pp. 22597–22605

Differential kleptoparasitic interactions of Himalayan Vulture *Gyps himalayensis* with conspecifics and heterospecifics during various stages of breeding
– Hameem Mushtaq Wani, Pp. 22606–22610

Range extension of *Isthmoheros tuyenensis*, a threatened species of fish (Cichlidae) in Panama: including new ecological and morphological data
– Arturo Dominici-Arosemena, Arturo Angulo, Haydee Osorio-Ugarte, Quiriatjaryn Ortega-Samaniego, Andrés Fraiz, Arminda Guerrel, Edgar Araúz, Jennyfer Montiel, Beatriz Medina, Yehudi Rodríguez-Arriatti, Yessenia González, Javier Pardo, Karly Urriola & Adrián Ramos-Merchante, Pp. 22611–22622

Tadpole morphology of Jerdon's Narrow-mouthed Frog *Uperodon montanus* (Jerdon, 1853) with a range and elevation extension report from Western Ghats, India
– Amit Hegde, Girish Kadadevaru & K.P. Dinesh, Pp. 22623–22631

An annotated checklist of the economically important family of moths (Lepidoptera: Heterocera: Noctuidae) of the northern Western Ghats, India, with notes on their type species, diversity, distribution, host plants, and an unusual new faunistic record
– Aparna Sureshchandra Kalawate, Prachee Surwade & S.N. Pawara, Pp. 22632–22653

Report of a tussock moth genus *Maeoproctis* (Lepidoptera: Erebiidae: Lymantriinae: Nygmiini) from India
– Gagan Preet Kour Bali & Amritpal Singh Kaleka, Pp. 22654–22660

Butterflies of Silent Valley National Park and its environs, Western Ghats of Kerala, India
– Kalesh Sadasivan, P.C. Sujitha, Toms Augustine, Edayillam Kunhikrishnan, Vinayan P. Nair, M. Divin Murukesh & Baiju Kochunarayanan, Pp. 22661–22676

Notes on morphology and bionomics of *Urolabida histrionica* (Westwood) (Heteroptera: Urostylididae) from Assam, India
– Sachin Ranade & Hemant V. Ghate, Pp. 22677–22685

Andromonoecy functional through heterostyly and large carpenter bees as principal pollinators in *Solanum carolinense* L. (Solanaceae)
– Suvarna Raju Palathoti & Aluri Jacob Solomon Raju, Pp. 22686–22694

An inventory of endemic and near endemic angiosperm flora of Biligiri Rangaswamy Temple Tiger Reserve, peninsular India
– J. Jayanthi, Pp. 22695–22717

Multidimensional time-lapse of a relict species *Canarium strictum* Roxb. from a sacred landscape in Pune District, India
– Mukul Mahabaleshwarar, Nivedita Ghayal, Supriya Mahabaleshwarar & Vinaya Ghate, Pp. 22718–22725

Rediscovery of *Sewardiella tuberifera* Kash., a long-lost monotypic endemic Indian liverwort
– Sapana Pant, S.D. Tewari, Prachi Joshi, Manisha Bhandari & Richa Arya, Pp. 22726–22730

***Physcomitrium eurystomum* Sendtn. (Funariaceae: Bryophyta) and *Splachnobryum obtusum* (Brid.) Müll. Hal. (Splachnobryaceae: Bryophyta), two rare moss species from the Western Ghats of Kerala**
– C. Nair Manju, P.M. Vineesha, B. Mufeed & K.P. Rajesh, Pp. 22731–22736

Short Communications

First record of the Great Seahorse *Hippocampus kelloggi* Jordan & Snyder, 1901 (Actinopterygii: Syngnathiformes: Syngnathidae) from the northwestern coast of Bay of Bengal
– Anil Kumar Behera, Biswajit Mahari & Amrit Kumar Mishra, Pp. 22737–22740

***Schoenoplectiella erecta* (Poir.) Lye ssp. *raynalii* (Schuyler) Beentje (Cyperaceae) – a new record to India from Ossudu Bird Sanctuary, Villupuram District, Tamil Nadu**
– Chandrasegrane Pradeep, Paneerselvam Umamaheswari, Natesan Balachandran & Raphael Mathevet, Pp. 22741–22745

Notes

Status of the Sumatran Striped Rabbit *Nesolagus netscheri* in Isau-Isau Wildlife Reserve, South Sumatra Province, Indonesia
– Arum Setiawan, Muhammad Iqbal, Octavia Susilowati, Doni Setiawan, Martialis Puspito Khristy Maharsi & Indra Yustian, Pp. 22746–22748

Photographic record of the butterfly ray *Gymnura cf. poecilura* (Myliobatiformes: Gymnuridae) from the Bhagirathi-Hooghly River in West Bengal, eastern India
– Priyanka Chakraborty, Pp. 22749–22751

First report of the fairyfly *Schizophragma mitai* Triapitsyn (Hymenoptera: Mymaridae) from India with notes on *S. indica* Rehm & Anis
– Anandhan Rameshkumar, Nazarius Anand, Sayan Sardar & Sarfrazul Islam Kazmi, Pp. 22752–22756

Occurrence of *Ranunculus sceleratus* L. (Ranunculaceae) from the Nilgiri District, Tamil Nadu, India
– J. Shashikanth, S. Mugendhiran & Digvijay Verma, Pp. 22757–22760

First report of *Meliola panici* on *Ottochloa nodosa* (Kunth) Dandy (Poaceae)
– Gopinathan Nair Gokul & Jacob Thomas, Pp. 22761–22763

New record of an usneoied lichen *Usnea hirta* (L.) Weber ex F.H.Wigg. from India
– K.S. Vinayaka, Archana R. Mesta & N. Rajeshwari, Pp. 22764–22766

On the occurrence of two species of rare cyanobacterial genus *Petalonema* M.J.Berkeley ex Wolle, 1887 (Cyanophyceae: Nostocales: Scytonemataceae) from eastern Himalaya, India
– Jai Prakash Keshri, Narendra Nath Koley & Jay Mal, Pp. 22767–22770

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