Bioscience Discovery, 11(4):199-207, Oct - 2020

Open Access, Peer Reviewed, Refereed Research Journal

Print & Online available on https://jbsd.in
ISSN: 2229-3469 (Print); ISSN: 2231-024X (Online)

Research Article

Nine species of Pleurocarpous Mosses, additions to Bryoflora of Andhra Pradesh, India.

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Article Info

Received: 14-08-2020,
Revised: 16-09-2020,
Accepted: 22-09-2020

Keywords: Nine species, Pleurocarpous mosses, New Records, Andhra Pradesh.

Abstract

Nine species of pleurocarpous mosses viz., *Macromitrium moorcroftii* (Hook. & Grev.) Schwägr, *Macromitrium sulcatum* (Hook.) Bird. (Orthotrichaceae); *Racopilum orthocarpum* Wilson ex Mitt. (Racopilaceae), *Pterobryopsis flexipes* (Mitt.) M. Fleisch. (Pteropbryaceae), *Meteoriopsis ancistrodes* (Renauld & Cardot) Broth., *Meteoriopsis squarrosa* (Hook.) M.Fleisch. (Meteoriaceae); *Stereophyllum confusum* Ther. (Stereophyllaceae), *Ectropothecium buitenzorgii* (Bél.) Mitt. and *Ectropothecium manii* Broth. (Hypnaceae) are collected from different districts and various forests in Eastern Ghats of Andhra Pradesh, are being new distributional records to Andhra Pradesh.

INTRODUCTION:

Andhra Pradesh is the seventh largest state in Indian union, it covers an area about 162, 970 sq. kilometers and lies between 12°37′ and 19° 25′ Northern latitude and 76° 45′ and 84° 72′ Eastern longitude. The state comprises 13 districts, there are two areas namely called Rayalaseema and Costal Andhra. The state is having about 17.86 percentage of forest cover (FSI 2019), major portion of Eastern Ghats hill ranges, it is also having different types of vegetation's, nearly more than 180 waterfalls (seasonal and perennial) and different types of altitudinal variations from sea level to 1680 meters of above mean sea level.

Part of bryophyte inventory during 2016 to 2019, we could collect curious bryophytes specimens from the forest tracks of Eastern Ghats hill ranges in different localities and different districts of the state of Andhra Pradesh. Critical examination of the specimens revealed their identification to *Macromitrium moorcroftii* (Hook. & Grev.) Schwägr, *Macromitrium sulcatum* (Hook.) Bird., *Racopilum orthocarpum* Wilson ex Mitt., *Pterobryopsis flexipes* (Mitt.) M. Fleisch., *Meteoriopsis ancistrodes* (Renauld & Cardot) Broth., *Meteoriopsis squarrosa* (Hook.) M.Fleisch., *Fabronia assamica* Dixon., *Stereophyllum confusum* Ther., *Ectropothecium buitenzorgii* (Bél.) Mitt. and *Ectropothecium manii* Broth. Perusal of literature (Rao *et al*., 1999; Sowghandika, 2010; Dandotiya *et al*., 2011; Sandhya Rani *et al*., 2011a & 2011b; Sowghandhika *et al*., 2011; Sandhya Rani *et al*., 2012; Sandhya Rani *et al*., 2014; Pande *et al*., 2019; Asthana & Srivastava 2020; Sreenath & Ravi Prasad Rao 2020 and Sreenath *et al*., 2020) revealed that above mentioned species are new records for the state of Andhra Pradesh.

MATERIALS AND METHODS:

Extensive field explorations were conducted during 2016 – 2019. All the bryophyte specimens were collected with research curiosity. The corticolous plant material was collected by using sharp edged knife and terrestrial specimens were scraped by using manually bent and sharped flat spoon.

The collected specimens were placed in zip lock polythene cover with labeled field number. Field observations were recorded in the field notes and live photographs were taken using DSLR-Camera (Nikon D3300). Collected material brought to the laboratory, made it air dried at room temperature and preserved them in brown paper packets (12 × 18 cm) with detailed label (10 × 17cm). Critical examination of the specimens was done by using temporary slides and plant parts were separated by using micro forceps (Varin) VR-15 curved, VR-11 straight with fine sharp edges. Slides were observed under light microscope (Olympus CH20i), light stereo microscope (Olympus SZ61) and micro measurements were taken by using ocular micro meter (ERMA) 19 mm, 100 segments in 1 cm. Photographs were taken by using Moto g3 turbo and Samsung on6 equipped with 13 MP camera with 4x wide digital zoom, different dimensions were measured and identification of the specimens by using standard floras. Descriptions, Habitat & Ecology, Voucher specimens' information, field photographs were provided for the species. Voucher specimens are deposited in Sri Krishnadevaraya University Bryophyte Herbarium (SKU) Ananthapuramu. Abbreviated names used for the collectors are: AS (Ananthaneni Sreenath) and BR (Boyina Ravi Prasad Rao). The species are systematically enumerated family-wise.

Result and Disussion

Orthotrichaceae

Macromitrium moorcroftii (Hook. & Grev.) Schwägr. in Sp. Musc. Suppl. 2(2): 67. 1826; Gangulee, Mosses. E. India2 (5): 1180. 1976. *Orthotrichum moorcroftii* Hook. and Grev., Edinburgh J. Sci. 1: 116. 1824, *Leitheca moorcroftii* (Hook. & Grev.) Bird., Bryol. Univ. 1: 727. 1826. *Orthodon moorcroftii* (Hook. & Grev.) Grif., Icon. Pl. As. 1: 76. 1849. *Macromitrium pileatum* Wils., KewJ. Bot. 9: 327. 1857, *nom nud M. tortuosum* Wild., ibid. 1857. Manju. Eco-systematic studies on bryophytes of Wayanad, Kerala. 238. 2005.

Plants yellowish-brown, main stem creeping, curled inwards when dry, erectopatent when moist, branches up to 1 cm long; leaves linear-lanceolate, 2 – 2.5 × 0.4 – 0.6 mm, margin entire below, serrated apex; costa brownish, ends below the apex; cells small, rounded to elongate, upper cells 5 – 8 µm diagonally, single large papillae, middle cells 8 – 10 µm, lower cells elongated, 25 – 33 × 2 – 5 µm, cells minutely pegged outwards in two sides at basal half, marginal cells at extreme base rectangular elongated; seta apical, erect; capsule erect, ovoid, calyptra hairy, covering entire capsule; spores rounded, 18 – 25 µm in diameter.

Habitat and ecology: Found as corticolous, near water areas, mostly mono-dominant plant or sometimes associated with *Hyophila involuta* (Pottiaceae), *Fissidens crenulatus* (Fissidentaceae)

Specimens examined: VSKP Dt., on the way of Galikonda from Ratnagiri, 28 November 2016, 52210 & 52221, SKU, BR & AS; VSKP Dt., Vantamamidi reserve forest, near Lambasingi, 28 November 2017, 53863, SKU, AS.

Distribution: **World**: Bangladesh, Bhutan, China, Myanmar, Nepal and **India**: Andaman and Nicobar Islands, Karnataka, Kerala, Manipur, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand, Western Himalaya, Western Ghats.

Macromitrium sulcatum (Hook.) Bird., Bryol. Univ. 1: 319. 1826; Mitt., Musc. Ind. Orient. 52. 1859; Broth., Rec. Bot. Surv. India. 1(12): 318. 1899; Sedjwick, J. Bombay Nat. Hist. Soc. 19: 940. 1910; Dixon, Rec. Bot. Surv. India. 10: 346. 1968; Gangulee, Moss. E. India 2(5): 1181. 1976; Mohamed et al., J. Bombay Nat. Hist. Soc. 83: 690. 1986; *Schlotheimia sulcate* Hook., Musc. Exot. 2: 156. 1819; *Macromitrium neelgheriense* C.Muell., Synp. Musc. Frond. 1: 737. 1849; *M. nilghiriense* C. Muell. & Mitt., Ind. Orient. 52. 1859; *M. ceylanicum* Mitt., Musc., Ind. Orient. 52. 1859. *M. ramentosum* Thwait. & Mitt., J. Linn. Soc. Bot. 13: 301. 1873; Manju. Eco-systematic studies on bryophytes of Wayanad, Kerala. 240. 2005.

Plants dark greenish to brownish, robust, in sense tufts; stem long prostrtate, erect, fasciculately branched secondary shoot system; leaves dense, spirally twisted when dry, stiff, erect to spreading when moist, lanceolate to oblong-lanceolate, 0.5 × 0.0.4 mm; costa strong, ending below apex or percurrent; cells towards the apex rounded or quadrate, 4 – 8 × 3 – 6 µm, with irregularly rounded or ovate lumen, rich in chlorophyll, papillose, median cells 6 – 10 × 4 – 7 µm, basal cells elongate, 20 – 40 × 10 – 12 µm, sometimes rounded, hyaline, with thick walls, above basal cells elongate, surrounded by thin walled hexagonal cells, margin bordered with 5 – 6 smooth thin walled cells; seta erect, rough, capsule spherical to oblong-ovoid, sulcate peristome absent; spores large of uneven size, 12 – 25 µm diagonally, papillose, green.

Habitat and ecology: Plants found as corticolous or racopilous, on moist surfaces, associated with *Racopilim cuspidigerum* (Racopilaceae).

Specimens examined: VSKP Dt., Ananthagiri hill ranges, hills of Galikonda, near Sunkarimetta, 21 October 2018, 55213A, SKU, AS.

Distribution: **World**: Borneo, Kampuchea, Madagascar, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam **India**: Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu and Western Ghats.

Racopilaceae

Racopilum orthocarpum Wilson ex Mitt. J. Soc. Bot. Suppl., 1: 136. 1859; Gangulee, Mosses E. India, 2(5): 1199 -1200. 1976.

Plants small to medium sized, yellowish green, in tufts, main stem creeping or ascendant branches up to 2 cm long. Leaves in three rows on branches, lax dimorphic, two lateral and one dorsal, lateral leaf spreading, larger, ovate, acute tipped, long aristate; 1.5 – 2 × 0.5 – 0.75 mm, margin flat, entire, dentate at apex, but not strong. Costa strong, excurrent, as an arista, up to 0.45 mm long, dorsal and amphigastrial row much smaller, appressed, erect or drooping with proportionally longer arista, up to 0.55 mm long. Leaf cells wall thickened, smooth, irregularly quadrate-rectangular, leaf apical cells 14 – 16 × 6 – 8 µm; becoming narrower at margin and on border there are some larger spine cells causing dentation; in lower half cells are similar, a little more elongated near costa. Sporophyte present on main stem. Seta erect, (spirally twisted when dry, up to 1.4 cm long. Capsule erect, cylindrical, 2.4 – 2.6 mm long × 0.6 – 0.7 mm in diameter wide, furrowed when dry, operculum conic rostrate, peristome distinctly double, hypnoid, endostome with cilia. Calyptra cucullate, sparsely hairy. Spores rounded pellucid, greenish brown, up to 10 µm in diameter.

Habitat and ecology: Found as terricolous or corticolous or racopilous, mostly mono-dominant plants or sometimes associated with *Fissidens involutus* (Fissidentaceae).

Specimens examined: CTR Dt., Horsley hills 23 August 2016, 51613A, SKU, BR & AS; Horsley hills, 16 September 2016, 51637A & 51655A, SKU, BR &AS; KNL Dt., NLM, GBM WLS, Gundlabrahmeswaram, near beside Gundlakamma ricver, 18 April 2017, 53357, SKU, BR & AS.

Distribution: World: Myanmar, Nepal, Sri Lanka, Vietnam and India: Assam, Kerala, Tamil Nadu, Western Ghats and Western Himalaya.

Pteropbryaceae

Pterobryopsis flexipes (Mitt.) M. Fleisch. in Hedwigia, 45: 62. 1905; *Meteorium flexipes* Mitt. in Musci Ind. Or.: 85. 1859; *Endotrichum flexipes* (Mitt.) Jaeg. in Ber. S. Gall. Naturw. Ges., 1875-76: 233. 1877; *Garovaglia flexipes* (Mitt.) Per. in Ind. Broyl.: 508. 1896; Gangulee, Mosses. Eas. India, 2(5): 1267 – 1268. 1976.

Plants small to medium sized, main stem creeping up to 5 cm long. Branches stout with leaves, curved erect, yellowish green above, brown below, flagelliform branches absent. Leaves dense, imbricate, oblong-ovate, 3.5 – 4 × 1.2 – 1.5 mm, apex apiculate – crenulate; margin recurved above, flat below, may or may not be fairly denticulate above. Costa ending much below the tip, a very short second vein often presents at base, leaf cells with thick poros walls, elongate linear, leaf apical cells 65 – 70 × 5 – 7 µm, middle cells 75 – 80 × 6-8 µm. leaf attachment cells colored with the two alar regions red-brown, alar cells rectangular, 20 – 25 × 12 – 17 µm, shorter below and longer above. Sporophytes are not seen.

Habitat and ecology: Found as corticolous on large tree above the branches, mostly mono-dominant plants or sometimes associated with *Herpetineuron toccoae* (Thudiaceae).

Specimens examined: VSKP Dt., Ananthagiri hill ranges, hills of Galikonda, near Sunkarimetta, 21 October 2018, 55212A, SKU, AS.

Distribution: **World**: Thailand and **India**: Maharashtra and Tamil Nadu.

Meteoriaceae

Meteoriopsis ancistrodes (Renauld & Cardot) Broth. in Nat. Pfl., 1(3): 826. 1906; *Meteorium ancistrodes* Ren. & Card. in. Bull. Soc. R. Bot. Bleg., 34(2): 72. 1896; *Meteorium himalyense* Par. in Ind. Bryol.:797. 1897; *M. squarrosulum* Fleisch. in Syd.: Bot. Jahresher, 30(1): 253. 1903 nom. nud.; Gangulee, Mosses E. India, 2(5): 1352 – 1353. 1976.

Plants medium to large sized, slightly robust, yellowish green, glossy plants. Secondary branches pendulous, irregularly pinnately branched, up to 10 cm long. Leaves dense, patent (squarrose when dry) with tips not much deflexed, ovate-lanceolate, usually canaliculate and folded from a semi-sheathing, cordate base, folded hare and there, slowly narrowed down into an aristate tip, 1.6 – 2.2 × 0.6 – 0.9 mm; margin sharply denticulate at tip, mildly at base. Costa single, vanishing at mid-leaf. Leaf cells linear to linear rhomboid, thick-walled, lumen 34 – 38 × 4 – 5 µm at tip, 35

– 38 × 4 - 6 µm in lamina, with 2 to 3 small papillae except at tip and extreme base; basal cells in auricular region hyaline, rectangular, 30 – 35 × 5 – 8 µm and slightly shorter, gradually elongating and getting narrower above. Sporophytes not seen.

Habitat and ecology: Found as corticolous or lignicolous or terricolous in moist deciduous forest, mostly mono-dominant plants and sometimes associated with *Philonotis mollis* (Bartramiaceae).

Specimens examined: VSKP Dt., on the way of Galikonda from Ratnagiri, 28 November 2016, 52223, SKU, AS.

Distribution: **World**: Bhutan, Java, Myanmar, Nepal, North Borneo, Taiwan and **India**: Eastern Ghats (Shervaroy Hills), Tamil Nadu, Uttarakhand, West Bengal.

Meteoriopsis squarrosa (Hook.) M.Fleisch. in Broth., Nat. Pflanzenfam. 1 (3): 826. 1906; Gangulee, Moss. E. lndia 2(5): 1349. 1976; Mohamed et al., J. Bombay Nat. Hist. Soc. 83: 689. 1986. *Neckera squarrosa* Hook., Icon. PI. Rar. 1: 22. 1836. *Pilotrichum squarrosum* (Hook.) C.Muell., Syn. Musc. Frond. 2: 154. 1850. *Meteorium squarrosum* (Hook.) Mitt., Musci. Ind. Orient. 87. 1859. Bryophytes of Wayanad in W. Ghats, 270. 2005.

Plants found as dense mats, yellowish-green in color, primary stems creeping, secondary shoots pendulous, irregularly branched; leaves densely arranged, squarrose with deflexed tip, not twisted, 1 – 1.2 × 1.2 – 1.4 mm, ovate-lanceolate, folded, base semi-sheathing, cordate, quickly narrowed to sharp point; leaf cells linear rhomboid, basal cells 30 – 40 × 7 – 10 µm, middle cells 50 - 60 × 5 – 8 µm, apical cells 90 – 110 × 5 – 8 µm, more rhomboid with two small papillae, cells on the auricle smooth, rectangular in the alar region. Costa single, ending or reaches the above mid leaf. Sporophytes not seen.

Habitat and ecology: Found as corticolous or terricolous in moist deciduous forests, associated with *Frullania tamarsci* (Frullaniaceae)

Specimens examined: VSKP Dt., on the way of Paderu, near Sampangigondi reserve forest, 10 October 2019, 57013B, SKU, AS.

Distribution: **World**: Bhutan, Java, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam, Yunnan and **India**: Arunachal Pradesh, Assam, Himalaya, Karnataka, Kerala, Manipur, Sikkim, Tamil Nadu, Uttarakhand and Western Ghats.

Stereophyllaceae

Stereophyllum confusum Ther. in Ann. Cons. Jard. Bot. Geneve, 20: 17. 1916; Gangulee, Mosses E. India 3 (8): 1814. 1980.

Plants medium to large sized, yellowish green, not very glossy, stems creeping, up to 12 cm long, with flattened down by tufts of rhizoids, branching sparsely and irregularly. Leaves complanate to erectopatent when moist, shrunk and appressed to stem when dry, symmetrical, oblong, tip broad with a small acute point, 1.6 – 1.95 × 0.52 – 0.58 mm, margin entire, often reflexed on one side at base of lateral leaves. Costa single, rather strong, ending below tip covering more than 2/3 of leaf length. Leaf cells rhomboid, leaf apical cells rhomboid, 19 – 24 × 11 – 13 µm; leaf middle cells elongated rhomboid 28 – 35 × 9 – 11 µm; basal leaf cells and juxacostal region, 35 – 40 × 9 – 11 µm; alar differentiated by rounded to quadrate cells up to 16 × 15 µm. Perichaetial leaves erect, narrower. Seta erect, reddish, smooth, up to 1.8 cm long. Capsule erect or slightly inclined, ovate, 1.4 – 1.8 mm long × 0.6 – 0.8 mm in diameter. Operculum conic-rostrate, up to 0.6 mm long, rostrum curved. Spores yellowish brown, rounded, up to 16 µm in diameter wide.

Habitat and ecology: Found as corticolous or lignicolous, in moist deciduous forests under deep shady areas, mostly mono-dominant plant sometimes associated with other leafy liver worts.

Specimens examined: CTR Dt., Horsley hills, 23 August 2016, 53606B; 53607 & 53614, SKU, BR & AS; CTR Dt., Horsley hills, 16 September 2016, 51637B, 51647 & 51655B, SKU, BR & AS; CTR Dt., Horsley hills, 15 November 2016, 51681 & 51684, SKU, BR & AS; CTR Dt., Horsley hills, 31 March 2017, 53349B, SKU, BR & AS; KNL Dt., NLM, GBM WLS, Gundlabrahmeswaram near on trees beside the Gundlakamma stream, 18 April 2017, 53362, SKU, BR & AS; CTR Dt., Talakona waterfalls, 29 October 2017, 53672; 53680; 53691B & 53707B, SKU, BR & AS; VSKP Dt., hills of Paderu reserve forest, 25 November 2017, 53823D, SKU, AS; VSKP Dt., hills of Chintapalli reserve forest, 25 November 2017, 53827A, SKU, AS; VSKP Dt., hills of Gudem reserve forest, 27 November 2017, 53851A, SKU, AS; VSKP Dt., hills of Vantamamidi reserve forest, near Lambasingi, 28 November 2017, 53872, SKU, AS; VSKP Dt., hills of Vantamamidi reserve forest, near Lambasingi, 13 December 2017, 53899C & 53900A, SKU, AS; VSKP Dt., Ananthagiri hill ranges, hills of Galikonda near Sunkarimetta, 21 October 2018, 55214B, SKU, AS; EG Dt.,

Rampachodavaram, Rampa village, Rampa waterfalls, 21 November 2018, 55282B, SKU, AS; EG Dt., PKNP, Jalatarangini waterfalls, 23 November 2018, 55851 & 55852A, SKU, AS.

Distribution: **World**: **Endemic to India** (Maharashtra, Orissa, Tamil Nadu and Western Ghats).

Hypnaceae

Ectropothecium buitenzorgii (Bél.) Mitt. in J. Linn. Soc. Bot., 10: 180. 1868; *Hypnum buitenzorgii* Bell, in Voyag. Ind. Oc. Bot., 2(Crypt.) 2: 94. 1846; *Stereodon buitenzorgii* (Bel.) Mitt. in Musci Ind. Or.: 99. 4859; *Ectropothecium subintroquantum* Broth. in Philipp. J. Sc., 3: 27. 1908; *E. brachyphyllum* Broth. in Phillpp. J. Sc., 13: 216. 1928. hom. illeg.; Gangulee Mosses, E. India, 3(8): 1984 – 1985. 1980.

Plants large sized, robust, yellow-green to brownish green, glossy plants in extensive mats, main stem creeping up to 12 cm long, with regularly pinnately branching, generally in one plane, blunt at tips. Leaves may or may not be falcate, erectopatent when moist, appressed to stem when dry, concave, ovate-lanceolate, narrow acute at tip, 1 – 1.5 × 0.5 – 0.7 mm; margins sharply dentate at top and less so to a little above base. Costa short double, sometimes indistinct. Leaf cells elongate, narrow rhomboid, leaf apical and middle 52 – 56 × 5 -7 µm. Alar distinguished by a row of irregular rectangular, tinted cells at extreme base 32 – 36 × 7 -9 µm, and some shorter irregular cells above. Sporophytes on main stems. Seta slender, erect wavy, up to 3.5 cm long, hooked at tip. Capsule horizontal to nodding, cylindrical, 3.1 – 3.3 mm long × 1.1 – 1.3 mm inn diameter wide, inclined a short apophysis, operculum conic, short rostrate. Spores rounded, yellowish brown, up to 25 µm wide in diameter.

Habitat and ecology: Found as lignicolous on soil covered rock substratum, beside the water stream, associated with *Pallavicinia levieri* (Pallaviciniaceae).

Specimens examined: KNL Dt., NLM, GBM WLS, Gundlabrahmeswaram, near beside Gundlakamma stream, 18 April 2017, 53364 & 53366B, SKU, BR & AS.

Distribution: **World**: Indo-Malesia, Amboina, Borneo, Celebes, Java, Sumatra and **India**: Arunachal Pradesh, Assam, Tamil Nadu and West Benghal.

Ectropothecium manii Broth. in Nat. Pfl., 1(3): 1066. 1908; Gangulee, Mosses, E. India 3(8): 1990. 1980.

Plants small to medium sized, slender, yellowish green, glossy plants, forming tufts, main stem creeping up to 4 cm long, with pinnately branched. Leaves somewhat complanate but not distichous. Leaves erectopatent, more or less falcate when moist, appressed to stem with outspreaded tips when dry; ovate-lanceolate, concave, 0.8 – 0.86 × 0.25 – 0.29 mm; apex acute, margin dentate at tip. Costa indistinct. Leaf cells linear rhomboid, leaf apical cells 35 – 39 × 5 - 7 µm, some cells broader at centre and shorter at margin; middle leaf cells 34 – 38 × 4 – 6 µm; extreme leaf basal cells rectangular 15 – 18 × 9 – 11 µm; alar not distinct. Sporophyte on main stem. Seta slender, erect, up to 1.9 cm long. Capsule horizontal to dropping, ovate 0.5 – 0.7 mm long × 0.3 – 0.35 mm in diameter, narrow at neck expanding in to a bushy peristome. Spores yellowish brown, rounded up to 18 µm in diameter wide.

Habitat and ecology: Found as lignicolous on wet rocks under waterfalls in moist deciduous forests, associated with *Riccardia levieri* (Annuraceae).

Specimens examined: CTR Dt., Kailasakona waterfalls near village, 25 February 2017, 53337A; 53338; 53342; 53344; 53345 & 53346B, SKU, BR & AS; VSKP Dt., Seleru (Ice) Waterfalls, 26 November 2017, 53838, SKU, AS; EG Dt., Maredumilli reserve forest, 12 October 2019, 57079, SKU, AS.

Distribution: **World**: **Endemic to India** (Andaman and Nicobar Islands and Tamil Nadu).

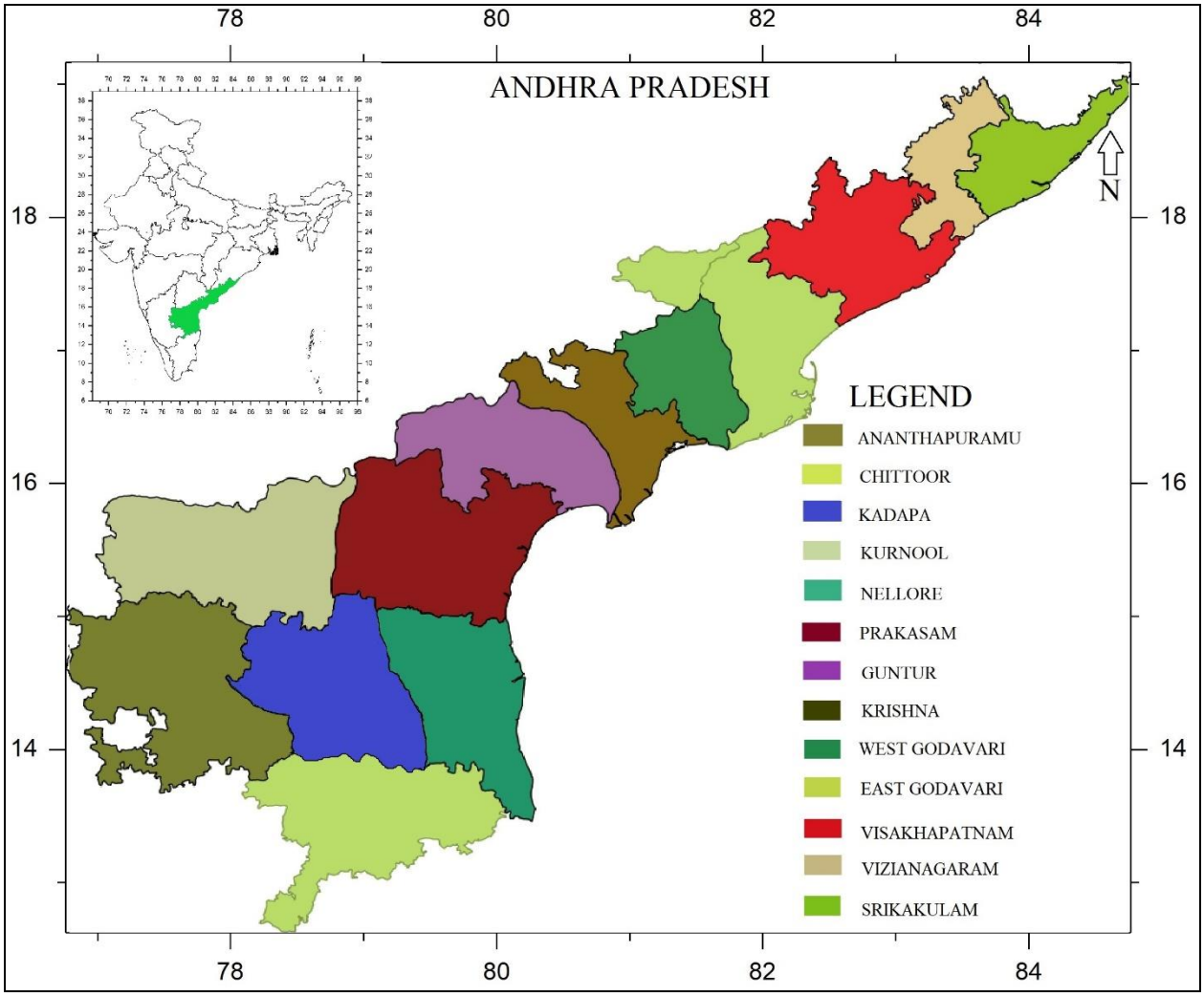
Discussion:

Past literature on Bryoflora of Andhra Pradesh have reported 150 taxa belonging to 147 species, 84 genera and 39 families. Of these, 150 taxa, Rao *et al*. (1999) to Sandhya Rani *et al*., (2014) reported 95 taxa and 94 species; Manjula and Manju 2016, added four species of *Fissidens* to Bryoflora of Andhra Pradesh; Pande *et al*., 2019, added two species of pleurocarpous mosses to Bryoflora of South India from Andhra Pradesh; Sreenath and Ravi Prasad Rao (2019 a) added four species *Fissidens* to Bryoflora of Eastern Ghats from Andhra Pradesh; Sreenath and Ravi Prasad Rao (2019,b) added one species of *Riccia* to Bryoflora of South India from Andhra Pradesh; Sreenath and Ravi Prasad Rao (2020a), added two acrocarpous mosses to Bryoflora of Main Land India from Andhra Pradesh; Sreenath and Ravi Prasad Rao (2020b), added a new generic record to peninsular India from Andhra Pradesh; Sreenath and Ravi Prasad Rao (2020c) added 14 taxa belonging to 13 species and 12 genera as new

distributional records to Andhra Pradesh; Sreenath *et al.* (2020) added three families (representing threes species) of bryophytes as new distributional records to Andhra Pradesh; Asthana and Srivastava (2020), added one species, *Riccia bolivinsis* Jovet-Ast, as a new record to Asia. Sreenath and Ravi Prasad Rao (2020d) added 11 species of liverworts as new distributional records to Bryoflora Andhra Pradesh, India. according to above mentioned literature 21 species of pleurocarpous mosses were recorded from Andhra Pradesh. The present report is adding further nine species of pleurocarpous mosses to the Bryoflora of Andhra Pradesh, India.

Acknowledgements:

We are sincerely thanking to Andhra Pradesh forest department according permission for field works in different forests in Andhra Pradesh and thank to Research Scholars of Biodiversity and conservation division laboratory, department of Botany, Sri Krishnadevaraya University: Dr. M. Anil Kumar, Mr. Anjaneyulu and Mr. S. M. Nagesh and also thank to home University, Department and Laboratory for providing research facilities.



Map. 1: Map of Andhra Pradesh.

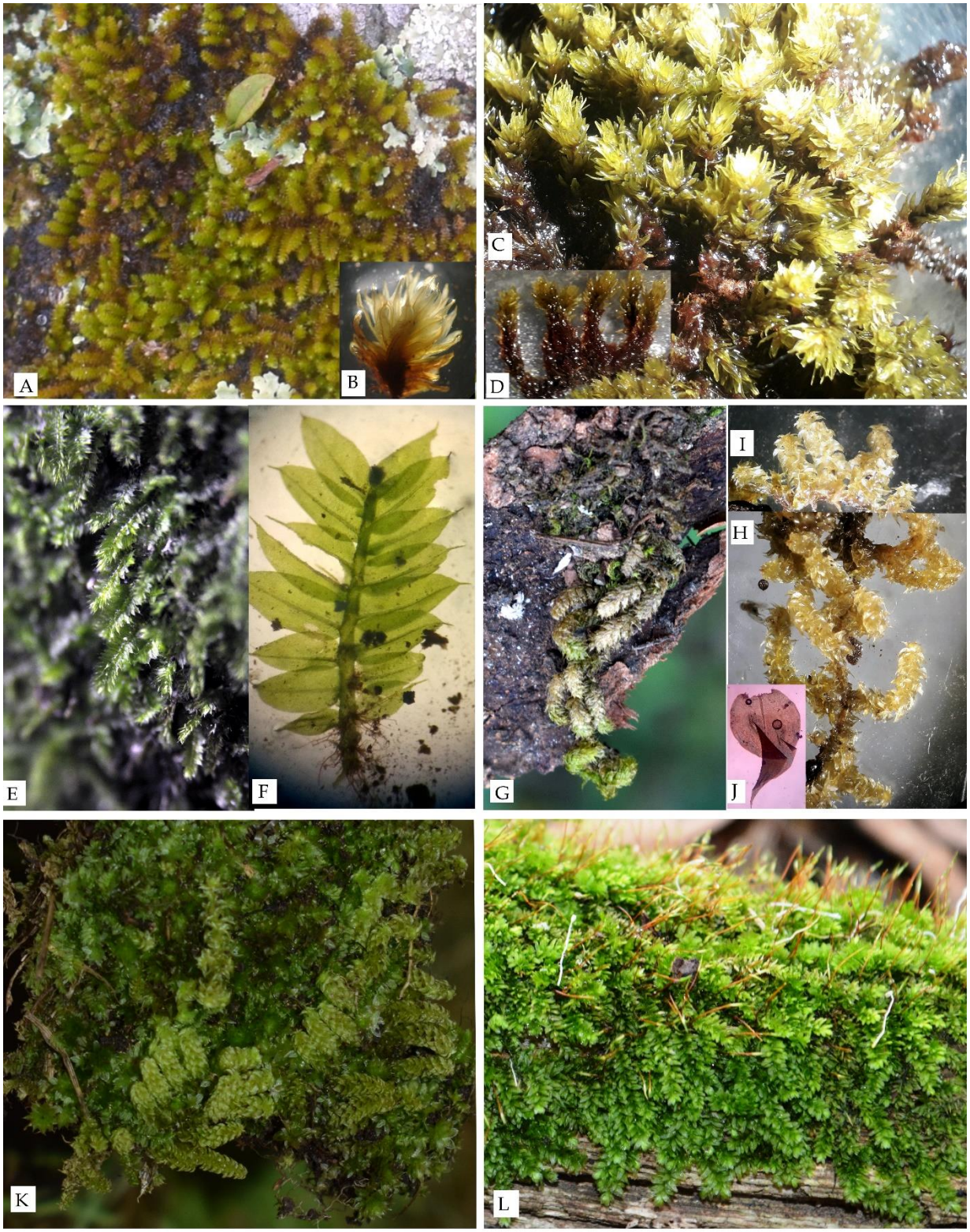


Plate. 1: A & B. *Macromitrium moorcroftii* (Hook. & Grev.) Schwägr, C & D. *Macromitrium sulcatum* (Hook.) Bird., E & F. *Racopilum orthocarpum* Wilson ex Mitt., G. *Pterobryopsis flexipes* (Mitt.) M. Fleisch., H, I & J. *Meteoriopsis ancistrodes* (Renauld & Cardot) Broth., K. *Meteoriopsis squarrosa* (Hook.) M.Fleisch. and L. *Stereophyllum confusum* Ther.

Plate. 2: A, B & C. *Ectropothecium buitenzorgii* (Bél.) Mitt. and D & E. *Ectropothecium manii* Broth.

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How to cite this article

Ananthaneni Sreenath and Boyina Ravi Prasad Rao, 2020. Nine species of Pleurocarpous Mosses, additions to Bryoflora of Andhra Pradesh, India. *Bioscience Discovery***, 11**(4):199-207.

Google Scholar citation: https://scholar.google.co.in/citations?user=vPzEyC8AAAAJ&hl=en