

The Family Juncaceae in India

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Abstract

The paper deals with 53 species and 2 varieties belonging to *Juncus* and *Luzula* of Juncaceae in India along with their distribution, altitude, phenology, Exsiccatae etc.

Key words: Juncaceae, India.

INTRODUCTION

The family Juncaceae of Liliopsida is represented by 10 genera (Shukla *et al* 2000) and *ca* 400 species (Guofang & Clemants 2000) in the world. In India, it is represented by 2 genera *viz* *Juncus* Linnaeus & *Luzula* DC. and 53 species. Present studies reveal most of the species of these two genera of Juncaceae Jussieu occurring in India are distributed in temperate, sub-alpine and alpine regions, *i.e.* they are mostly confined to the Sino-Himalayan floristic region (Noltie 1994). In India maximum diversity recorded from Eastern–Himalayan region followed by North-Western region. Few species occur in subtropical and tropical belts including the drier parts of India like the plains of Punjab, Tamilnadu, Bihar, Gujarat, Karnataka, Kerala, Orissa, and Rajasthan. In India maximum diversity is recorded from Eastern–Himalayan region.

Contributions on Juncaceae are available from different parts of India. Those of Eastern region include Mandal (1996), Shukla *et al* (2000), Bhaumik & Pathak (2004), Lepcha *et al.* (2007), Chhetri (2010) and Chhetri *et al.* (2007b, 2007d & 2007e) and Northwest region include Aswal & Mehrotra (1994), Babu (1977), Chowdhery (1984), Dhar & Kachroo (1983), Gupta (1968), Mani (1978), Goel & Aswal (1987), Singh & Sharma (2006) and Chhetri *et al.* (2007a). Added to this, from the rest parts of India include Fyson (1974), Bhandari (1978), Shetty & Pandey (1983), Mooney (1986), Bole & Pathak (1988), Pandey (1991), and Sanyal (1994).

The present report is based on own field collections, herbarium study at different Indian herbaria, especially BSI herbaria *viz.* CAL, BSHC, BSD, ASSAM, ARUN as well as other herbaria such as DD, NBU, LBG, APFH etc. and literature consultation. A total number of 53 species and 2 varieties of 2 genera are enumerated in the present paper along with their geographical and altitudinal distribution, phenology, Exsiccatae etc., out of total 53 species, 2 species *i.e.* *Luzula campestris* (Linnaeus) DC. & *Luzula indica* Kirschner are based on literature.

ENUMERATION

Juncus allioides Franchet in Nouv. Arch. Mus. Hist. Nat. Paris Ser. 2, 10: 99. 1887.

Flowers & Fruits: June – September

Exsiccatae: Sikkim: Kupup 3800 m, 8th Aug. 2004, T.M. Hynniewta & G.M. Chhetri 27551 (BSHC).

Distribution: INDIA: Himachal Pradesh, Kashmir, Meghalaya, Sikkim, Uttarakhand; BHUTAN, CHINA, NEPAL. 2457 – 4700 m.

Juncus amplifolius A. Camus in Not. Syst. 1(10): 281. 1910.

Flowers & Fruits: May – August

Exsiccatae: Sikkim: Zuluk 8th Jun. 2006 *T.M. Hynniewta & G.M. Chhetri* 30048 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, CHINA, NEPAL, MYANMAR, TIBET. 3000 – 4900 m.

Juncus articulatus Linnaeus, Sp. Pl. 327. 1753.

Flowers & Fruits: June - September

Exsiccatae: Assam: On the way to Sadia, 1950, *K.W.* 19531 (ASSAM)

Distribution: INDIA: Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Punjab, Uttarakhand; AFGHANISTAN, BHUTAN, CHINA, MONGOLIA, NEPAL, N. AMERICA, PAKISTAN, RUSSIA (E. SIBERIA), VIETNAM, AFRICA, EUROPE. 2290 – 2570 m.

Juncus benghalensis Kunth, Enum. Pl. 3: 360. 1841.

Flowers & Fruits: June – September

Exsiccatae: Himachal Pradesh: Rohtang Pass, 4000 m, 30th July 1962, *N.P. Singh* 22949 (BSD).

Distribution: INDIA: Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir, Sikkim, Uttar Pradesh, W. Bengal (Darjeeling Dt.); BHUTAN, CHINA, NEPAL. 2900 – 4570 m.

Juncus benghalensis Kunth var. ***kyongnoslae*** G.M. Chhetri, T.M. Hynniewta & A.A. Ansari in Indian J. Forest. 30(4): 539 – 541. 2007

Flowers & Fruits: July – September

Exsiccatae: Sikkim, Kyongnosla Alpine Sanctuary, 3500 m, 24th Aug. 2004, *G.M. Chhetri* 27572.

Distribution: INDIA: Sikkim. 3500 m. Endemic

Juncus brachystigma Samuelsson in Hand. – Mazz., Symb. Sin. 7: 1236. 1936.

Flowers & Fruits: June – September.

Exsiccatae: Uttarakhand: Garhwal, on way to Hemkund, 3800 m, 17th Aug. 1963, *U.C. Bhattacharyya* 29496 (BSD).

Distribution: INDIA: Sikkim, Uttar Pradesh, Uttarakhand; BHUTAN, CHINA, NEPAL, TIBET. 3050 – 5000 m.

Juncus bryophilus Noltie in Edinburgh J. Bot. 51(2): 137. 1994.

Flowers & Fruits: July – September

Exsiccatae: Bhutan, Upper Mo Chu District, ridge above Laya, 4450 m, 21.09.1984, *J. Sinclair & D.G. Long* 5217b. (*Holotypus* – E) digital image!

Distribution: INDIA: Sikkim; BHUTAN. 4000 – 4450 m.

Juncus bufonius Linnaeus, Sp. Pl. 328.1753.

Flowers & Fruits: May – September

Exsiccatae: W. Bengal: Rung Dung Valley slope, Darjeeling, 2200 m, *AP. Das* 1427 (NBU).

Distribution: INDIA: Arunachal Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir, Kerala, Madhya Pradesh, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal (Darjeeling Dt.); AFGANISTAN, AUSTRALIA, BHUTAN, CHINA, EUROPE, JAPAN, KAZAKHSTAN, KOREA, MONGOLIA, NEPAL, PAKISTAN, RUSSIA, SRI-LANKA, THAILAND, VIETNAM, N&S AMERICA, S-W ASIA. 680 – 4570 m.

Juncus cephalostigma Samuelsson in Hand.-Mazz., Symb. Sin. 7: 1233.1936.

Flowers & Fruits: May – September

Exsiccatae: W. Bengal, Darjeeling, Sandakphu, ca3657m, 28th June 60, *A.B. Chowdhery* 47 (CAL).

Distribution: INDIA: Sikkim, W. Bengal (Darjeeling Dt.), BHUTAN, CHINA, MYANMAR, NEPAL. 2100 – 4540 m.

Juncus chrysocarpus Buchenau in Engler Bot. Jahrb. 6: 201.1885.

Flowers & Fruits: July – October

Exsiccatae: Arunachal Pradesh: Dibang Valley, Mayudia, 2400 m, 20th August 2000, *M. Bhaumik & M.K. Pathak* 2908 (ASSAM).

Distribution: INDIA: Arunachal Pradesh; Sikkim; BHUTAN, CHINA, NEPAL. 2440 – 4500 m.

Juncus clarkei Buchenau in Engler Bot. Jahrb. 6: 210. 1885.

Flowers & Fruits: July – October

Exsiccatae: Uttarakhand: Garhwal, Bhuna, 3300 m, 4th October 1963, *U.C. Bhattacharyya* 31007 (BSD).

Distribution: INDIA: Assam, Manipur, Nagaland, Sikkim, Uttarakhand; Uttar Pradesh, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, EUROPE, NEPAL. 1830 – 4700 m.

Juncus clarkei var. *marginatus* A. Camus in Lecomte, Notul. Syst. (Paris) 1(10): 279. 1910.

Flowers & Fruits: August – October

Exsiccatae: Sikkim: Way to Baba Mandir, 17th August 2004, *G.M. Chhetri, D.N. Rai & A.K. Tamang* 27505 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, CHINA. 1800 – 4000 m.

Juncus compressus Jacquin, En. Stirp. Vind. 60 & 235. 1762.

Flowers & Fruits: July – September

Exsiccatae: Jammu & Kashmir: Srinagar, 1524m, June 1905, *A. Meebold* 211 (CAL).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir; AUSTRALIA, WESTERN EUROPE; NORTHERN MONGOLIA. ca 2133 m.

Juncus concinnus D. Don, Prodr. Fl. Nepal. 44. 1825.

Flowers & Fruits: July - September

Exsiccatae: Nagaland: Jakpho Naga Hills, 3017m, 25th October 1885, *C.B. Clarke* 41276 (CAL).

Distribution: INDIA: Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Nagaland, Punjab, Sikkim, Uttar Pradesh, Uttarakhand; BHUTAN, CHINA, NEPAL. 1980 – 4300 m.

Juncus duthiei (C.B. Clarke) Noltie in Edinb. J. Bot. 51(2): 134. 1994.

Flowers & Fruits: July – September

Exsiccatae: Uttarakhand: Rhudughera, Tirhi-Garhwal, 4572 – 4876m, June 1884, *J.F. Duthie* 132 (*Isotypus* - CAL)

Distribution: INDIA: Uttarakhand; NEPAL. Above 4500 m.

Juncus effusus Linnaeus, Sp. Pl. 326.1753.

Flowers & Fruits: June - September

Exsiccatae: Tamil Nadu: Nilgiri, Kunnacombai R.F. Madras State, 2000 m, 1st Sept. 1957, *K.M. Sebastine* 3992 (CAL).

Distribution: INDIA: Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Sikkim, Tamil Nadu, West Bengal (Darjeeling Dt.); CHINA, INDONESIA, JAPAN, KOREA, LAOS, MALAYSIA, NEPAL, SRI LANKA, THAILAND, USSR, VIETNAM. 2000 – 3166 m.

Juncus glaucoturgidus Noltie in Edinb. J. Bot. 51(2): 132. 1994.

Flowers & Fruits: July – September

Exsiccatae: Sikkim: Samiti Lake (Bungmoteng Chho), 21.07.1992, *ESIK* 572 (*Holotypus* - E).
Digital image!

Distribution: India: Sikkim; BHUTAN; NEPAL. 4300 m.

Juncus gracilicaulis A. Camus in Nat. Syst. 1(10): 279. 1910.

Flowers & Fruits: June – September

Exsiccatae: Sikkim: Chamnago, 3657-3962, 3rd August 1877, *W.W. Smith* 4505 (CAL).

Distribution: INDIA: N-W Himalaya, Sikkim West Bengal (Darjeeling Dt.); BHUTAN, CHINA. 2500 – 4300 m.

Juncus grisebachii Buchenau in Abh. Naturwiss. Vereine Bremen 3: 295. 1872.

Flowers & Fruits: July – October

Exsiccatae: Arunachal Pradesh: Pange - Lower Subansiri Dt., 1st November 1980, *G.D. Pal* 72587 (ARUN).

Distribution: INDIA: Arunachal Pradesh, Sikkim, Uttar Pradesh, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, NEPAL. 2300 – 4270 m.

Juncus harae F. Miyamoto & H. Ohba, J. Jap. Bot. 68: 27. 1993.

Flowers & Fruits: July – September

Exsiccatae: Sikkim: Above Chhangu Lake, 3800 m, 8th August 2004, *T.M. Hynniewta & G.M. Chhetri* 27533 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, CHINA, NEPAL. 3500 – 3900 m.

Juncus himalensis Klotzsch in Klotzsch & Garcke, Bot. Reise Pr. Waldemar 60, t. 97. 1862.

Flowers & Fruits: June – August

Exsiccatae: Punjab: Upper Chenab, 3657m, 1879, *B.H. Baden Powell* 325 (CAL).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Punjab, Sikkim, Uttar Pradesh; Uttarakhand; BHUTAN, CHINA, NEPAL, PAKISTAN, TIBET, E.ASIA. 2100 – 4500 m.

Juncus hydrophilus Noltie in Edinb. J. Bot. 51(2): 138. 1994.

Flowers & Fruits: June – September

Exsiccatae: Sikkim: Prek Chhu Bridge, below Bakhim, 2300 m, 27th July 1992, *ESIK* 771 (*Holotypus* – E). Digital image!

Distribution: INDIA: Sikkim; BHUTAN; NEPAL. 2300 - 3510 m.

Juncus inflexus Linnaeus, Sp. Pl. 326. 1753.

Flowers & Fruits: April – September

Exsiccatae: West Bengal: Darjeeling, Llyod Botanic Garden, 7th Jun. 50, *Ghaman Bahadur s.n.* (LBG).

Distribution: INDIA: Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Kerala, Meghalaya, Manipur, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal (Darjeeling Dt.); AFRICA, BHUTAN, BURMA, CHINA, INDONESIA, MALAYSIA, NEPAL, PAKISTAN, PHILIPPINE ISLAND, SRI LANKA. 1400 - 3700 m.

Juncus khasiensis Buchenau in Engler Bot. Jahrb. Syst. 12: 407. 1890.

Flowers & Fruits: June – September

Exsiccatae: Uttarakhand: Chamoli District, Tungnath, 29th August 1978, *G. Panigrahi* 65550 (BSD).

Distribution: INDIA: Assam, Meghalaya, Nagaland, Sikkim, Uttarakhand; BANGLADESH, BHUTAN, NEPAL. 1600 – 4000 m.

Juncus kingii Rendle in J. Bot. 44: 45. 1960.

Flowers & Fruits: July – September

Exsiccatae: Sikkim: Thangu, 15th July 2006, *G.M. Chhetri* 30166 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, CHINA, NEPAL. 3600 – 5000 m.

Juncus leptospermus Buchenau in Engl. Bot. Jahrb. 6: 203. 1885.

Flowers & Fruits: June – November

Exsiccatae: Meghalaya: Shillong, Khasias, 1524m, 15th October 1867, *C.B. Clarke* 6137 (CAL).

Distribution: INDIA: Assam, Manipur, Meghalaya; BHUTAN, CHINA. 100 – 3560 m.

Juncus leucanthus Royle ex D. Don in Trans. Linn. Soc. London 18: 318. 1840.

Flowers & Fruits: June – September

Exsiccatae: Sikkim: Kupup Lake surrounding, 24th July 2005, *T. M. Hynniewta & G. M. Chhetri* 30118 (BSHC).

Distribution: INDIA: Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand, Uttar Pradesh; BHUTAN, CHINA, NEPAL. 3000 – 4600 m.

Juncus leucomelas Royle *ex* D. Don in Trans. Linn. Soc. London 18: 319.1840.

Flowers & Fruits: June – October

Exsiccatae: Uttarakhand: Tehri-Garhwal, Bander punch, ca3718m, 9th June 1960, *K. C. Sahni* 26968 (DD).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand; BHUTAN, CHINA, NEPAL, PAKISTAN, TIBET. 3200 – 4880 m.

Juncus maritimus Lamareck, Encycl. Method. 3: 264. 1789.

Flowers & Fruits: June – August

Exsiccatae: Jammu & Kashmir-Srinagar, June 1964, *Dr. V.N. Kaul* 0102 (CAL).

Distribution: INDIA: Gujarat, Jammu & Kashmir, Maharashtra, Rajasthan, Saurashtra; AFGHANISTAN, N. & S. AMERICA, AUSTRALIA, NEW-ZEALAND.

Juncus membranaceus Royle in D. Don, Proc. Linn. Soc. London 1: 10. 1839.

Flowers & Fruits: June – August

Exsiccatae: Jammu & Kashmir: Ladakh, Matyan 3200 m, 03.08.1980, *U.C. Bhattacharyya* 71295 (BSD).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand; AFGHANISTAN, CHINA NEPAL, PAKISTAN, TIBET, YUNNAN. 2700 – 4100 m.

Juncus minimus Buchenau in Bot. Zeit. 25: 145. 1867; Hook. f., Fl. Brit. India 6: 400. 1892.

Flowers & Fruits: June - August

Exsiccatae: Sikkim: Zema Valley, ca3909m, 14th July 09, *Smith & Cave* 1396 (CAL & LBG).

Distribution: INDIA: Sikkim; BHUTAN, CHINA, NEPAL. 3900 – 5800 m.

Juncus nepalicus F. Miyamoto & H. Ohba in J. Jap. Bot. 68: 28-30. 1993.

Flowers & Fruits: June- August

Exsiccatae: Sikkim: Karpam- way to Tamzey, 3910 m, 24th August 2004, *G. M. Chhetri* 27582 (BSHC).

Distribution: INDIA: Arunachal Pradesh, Sikkim; BHUTAN, CHINA, NEPAL. 3100 – 4400 m.

Juncus ochraceus Buchenau in Abh. Naturwiss. Vereine Bremen 3: 262. 1872.

Flowers & Fruits: September – May

Exsiccatae: W. Bengal: Sandakphu, ca3505m, 26. 09. 1940, *Forester Research Div.*, 56 (DD).

Distribution: INDIA: Arunachal Pradesh, Assam, Sikkim, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, NEPAL. 975 – 3660 m.

Juncus perpusillus Samuelsson in Hand. Mazz., Symb. Sin. 7: 1237 – 1238. 1936.

Flowers & Fruits: July - September

Exsiccatae: Sikkim: Meimenchu Lake surrounding, 3457 m, 10th August 2005, *G.M. Chhetri* 30129 (BSHC).

Distribution: INDIA: Jammu & Kashmir, Sikkim, Uttar Pradesh; Uttarakhand; CHINA, NEPAL. 3000 – 4600 m.

Juncus prismatocarpus R. Brown, Prodr. 259. 1810.

Flowers & Fruits: March – November

Exsiccatae: Manipur: Imphal, 20. 03. 52, *B.D. Deb* 294 (CAL).

Distribution: INDIA: Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal; BHUTAN, CHINA,

INDONESIA, JAPAN, KOREA, LAOS MALAYSIA, NEPAL, PAKISTAN, SRI LANKA, THAILAND, VIETNAM. 1000 – 1600 m.

Juncus rohtangensis Goel *et* Aswal in Indian J. Forest. 10: 262, f. 1-8. 1987.

Flowers & Fruits: June - August

Exsiccatae: Sikkim: Yakla, 3910 m, *T. M. Hynniewta & G. M. Chhetri* 27536 (BSHC).

Distribution: INDIA: Himachal Pradesh, Sikkim, Uttar Pradesh; BHUTAN, CHINA, NEPAL, SE TIBET. 3000 – 4877 m.

Juncus sherei F. Miyamoto & H. Ohba, J. Jap. Bot. 72: 293 - 296. 1997.

Flowers & Fruits: June - September

Exsiccatae: Sikkim: Memeinchu lake, 3457 m, 10th August 2005, *G.M. Chhetri* 30130 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, NEPAL. 3048 – 4300 m.

Juncus sikkimensis Hooker f., Fl. Brit. India 6: 399. 1892.

Flowers & Fruits: June – October

Exsiccatae: Sikkim: Kupup, 4000 m, 24th July 2005, *T. M. Hynniewta & G. M. Chhetri* 30106 (BSHC).

Distribution: INDIA: Arunachal Pradesh, Sikkim; BHUTAN, CHINA, NEPAL, TIBET. 3660 – 4600 m.

Juncus sphacelatus Decaisne in Jacquemont, Voy. Bot. 4: 172, 1835.

Flowers & Fruits: June - September

Exsiccatae: Jammu & Kashmir: Ladakh, Gomburanzang, 4500 m, 24th July 1973, *U.C. Bhattacharyya* 52197 (BSD).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand, W. Bengal (Darjeeling Dt.); AFGANISTAN, BHUTAN, CHINA, NEPAL, W-ASIA. 3300 – 5300 m.

Juncus spumosus Noltie in Edinb. J. Bot. 51 (2): 139. 1994.

Flowers & Fruits: June - September

Exsiccatae: Arunachal Pradesh: Dibang Valley, Chitapani Camp, 1900 m, 28th June 2002, *M. Bhaumik & M.K. Pathak* 4070 (ASSAM & CAL).

Distribution: INDIA: Arunachal Pradesh; BHUTAN, CHINA. 1900 – 3900 m.

Juncus tenuis Willdenow, Sp. Pl. 2: 214. 1799.

Flowers & Fruits: June - September

Exsiccatae: 18th August 81, 1020 m (CAL).

Distribution: INDIA: Assam; EUROPE, As., N. AMERICA, NEW ZEALAND. 700 – 2000 m.

Juncus thomsonii Buchenau in Bot. Zeit. 25: 148. 1867.

Flowers & Fruits: June – September

Exsiccatae: Himachal Pradesh: Lahaul, -Sarchu, ca3962m, 30th June 1941, *N.L. Bor* 15101 (DD).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Sikkim, Uttarakhand; BHUTAN, BURMA, CHINA, NEPAL, PAKISTAN, C-ASIA. 2800 – 4760 m.

Juncus tobdeniorum Noltie in Edinb. J. Bot. 55(1):42. 1998.

Flowers & Fruits: July – August

Exsiccatae: INDIA: Sikkim: Yakche, N of Lachung, 27°43'17½N, 88°45'02½E, 3105 m, 14th July 1996, *Long & Noltie* (EENS) 209 (*Holotypus* – CAL).

Distribution: INDIA: Sikkim. Endemic. 3105 m.

Juncus trichophyllus W.W. Smith in Rec. Bot. Surv. India 6: 103. 1914.

Flowers & Fruits: July - September

Exsiccatae: Sikkim: Chhangu Lake surrounding 3640 m, 24th July 2005, *T. M. Hynniewta & G. M. Chhetri* 30105 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, NEPAL. 3500 – 4300 m.

Juncus triglumis Linnaeus, Sp. Pl. 328. 1753.

Flowers & Fruits: June - September

Exsiccatae: W. Bengal: Darjeeling, Phaloot, ca3352m, 27th October 1875, *C.B. Clarke s.n.* (CAL).

Distribution: INDIA; Himachal Pradesh, Jammu & Kashmir, Sikkim, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, JAPAN, KOREA, MONGOLIA, NEPAL, N.AMERICA, RUSSIA, EUROPE. 2750 – 5000 m.

Juncus uniflorus W.W. Smith in Rec. Bot. Surv. India 6: 104. 1914.

Flowers & Fruits: June - October

Exsiccatae: Sikkim: Tamzey, 3850 m, 24th August 2004, *G.M. Chhetri* 27580 (BSHC).

Distribution: INDIA: Sikkim; BHUTAN, CHINA, NEPAL, S.E. TIBET. 3500 – 4820 m.

Juncus wallichianus Laharpe, Monogr. Junc. 139. 1827.

Flowers & Fruits: May – October

Exsiccatae: Tamil Nadu: Maryland R.F. Nilgiri Dist., 2000 m, 30th March 1958, *K.M. Sebastine* 5692 (CAL).

Distribution: INDIA; Assam, Arunachal Pradesh, Meghalaya, Sikkim, Tamil Nadu, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, JAPAN, KOREA, NEPAL, RUSSIA (SIBERIA), SRI LANKA. 1100 – 3300 m.

Luzula effusa Buchenau, Krit. Vezeichn. Junc. 53, 88. 1880.

Flowers & Fruits: May – August

Exsiccatae: Sikkim: Zema Valley, 10th July 09, *Smith & Cave* 1081 (LBG).

Distribution: INDIA: Arunachal Pradesh, Manipur, Nagaland, Sikkim; BHUTAN, CHINA, MALAYSIA, MYANMAR, NEPAL. 2250 – 3700 m.

Luzula campestris (Linnaeus) DC. in Lamarck & DC., Fl. France (ed.), 3(3): 161. 1805; Collett, Fl. Simlensis 538. 1971; Mandal in Hajra & Verma, Fl. Sikkim 1: 179. 1996; Shukla *et al* in J. For. 23(4): 486.2000.

Flowers & Fruits: May – July

Distribution: INDIA: Arunachal Pradesh, Jammu & Kashmir, Meghalaya; SW ASIA; EUROPE; N. AMERICA.

Luzula indica Kirschner, Taxon 50(4): 1108. 2001.

Distribution: INDIA: Tamil Nadu (Endemic to SW India).

Luzula multiflora (Retzius) Lejeune, Fl. Env. Spa. 1: 169. 1811.

Flowers & Fruits: May – August

Exsiccatae: Sikkim: Kupup, 3900 m, 8th August 2004, *T. M. Hynniewta & G. M. Chhetri* 27550 (BSHC).

Distribution: INDIA; Arunachal Pradesh, Sikkim, Jammu & Kashmir, Uttarakhand, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, JAPAN, MONGOLIA, NEPAL, RUSSIA, EUROPE, N. AMERICA, OCEANIA. 2000 – 4570 m.

Luzula oligantha Samuelsson in Hultén, Fl. Kamt. 1: 227. 1927.

Flowers & Fruits: May – August

Exsiccatae: Sikkim: Way to Shivmandir, 16th July 2006, *G.M. Chhetri* 30180 & 30181 (BSHC).

Distribution: INDIA: NE India, Sikkim; BHUTAN, CHINA, JAPAN, KOREA, NEPAL, RUSSIA. 3048 – 3700 m.

Luzula pallescens Swartz Summa Veg. Scand. 13. 1814.

Flowers & Fruits: May – August

Exsiccatae: Jammu & Kashmir: Kashmir, Agharwat, 3400 m, 22nd June 1959, *T.A. Rao* 9646 (BSD).

Distribution: INDIA: Jammu & Kashmir; JAPAN, KOREA, RUSSIA; EUROPE, NORTH AMERICA. 2000 – 3400 m.

Luzula plumosa E. Meyer in Linnaea 22: 387. 1849.

Flowers & Fruits: March – June

Exsiccatae: Arunachal Pradesh: Bomdila to Dirang Jing, Kameng, 13th April 1957, *G. Panigrahi* 6865 (CAL).

Distribution: INDIA: Arunachal Pradesh, Assam, Meghalaya, Sikkim, Uttar Pradesh, Uttarakhand, West Bengal (Darjeeling Dt.); BHUTAN, CHINA, JAPAN, NEPAL. 1500 – 3500 m.

Luzula spicata (Linnaeus) DC. in Lam. & DC. Fl. France (ed.), 3 (3): 161. 1805.

Flowers & Fruits: June – October

Exsiccatae: N.W. Himalaya *s.l.* ca 4876 m, 9th August 1878, *C.B. Clarke* 38248 (CAL).

Distribution: INDIA: Himachal Pradesh, Jammu & Kashmir, Punjab, Uttarakhand; CHINA, PAKISTAN, RUSSIA; EUROPE, N. AMERICA. 2400 – 6000 m.

DISCUSSION

A total of 53 species & 2 varieties occur in India. Of these, 47 species & both the varieties occur in Eastern Himalayan including NE region of India, 30 species in North-West Himalaya and 17 species occur in other parts of India respectively (Table I). *Juncus tobdeniorum* Noltie and *J. benghalensis* var. *kyongnoslae* Chhetri *et al* are endemic to Sikkim and *Luzula indica* Kirschner is endemic to SW India.

Table 1. Distribution pattern of Juncaceae in India

Name of the species/varieties	Distribution		
	Eastern Himalaya /NE India	North West Himalaya	Rest part of India
<i>Juncus allioides</i> Franchet	+	+	
<i>Juncus amplifolius</i> A. Camus	+		
<i>Juncus articulatus</i> Linnaeus	+	+	+
<i>Juncus benghalensis</i> Kunth	+	+	+
<i>Juncus benghalensis</i> Kunth var. <i>kyongnoslae</i> G.M. Chhetri <i>et al</i> *	+		
<i>Juncus brachystigma</i> Samuelsson	+	+	+
<i>Juncus bryophilus</i> Noltie	+		
<i>Juncus bufonius</i> Linnaeus	+	+	+
<i>Juncus cephalostigma</i> Samuelsson	+		
<i>Juncus chrysocarpus</i> Buchenau	+		
<i>Juncus clarkei</i> Buchenau	+	+	
<i>Juncus clarkei</i> var. <i>marginatus</i> A.Camus	+		
<i>Juncus compressus</i> Jacquin		+	
<i>Juncus concinnus</i> D. Don	+	+	+
<i>Juncus duthiei</i> (C.B. Clarke) Noltie		+	
<i>Juncus effusus</i> Linnaeus	+	+	+
<i>Juncus glaucoturgidus</i> Noltie	+		
<i>Juncus gracilicaulis</i> A. Camus	+	+	
<i>Juncus grisebachii</i> Buchenau	+	+	+
<i>Juncus harae</i> F. Miyamoto & H. Ohba	+		
<i>Juncus himalensis</i> Klotzsch	+	+	+
<i>Juncus hydrophilus</i> Noltie	+		
<i>Juncus inflexus</i> Linnaeus	+	+	+
<i>Juncus khasiensis</i> Buchenau	+	+	

Name of the species/varieties	Distribution		
	Eastern Himalaya /NE India	North West Himalaya	Rest part of India
<i>Juncus kingii</i> Rendle	+		
<i>Juncus leptospermus</i> Buchenau	+		
<i>Juncus leucanthus</i> Royle ex D. Don	+	+	+
<i>Juncus leucomelas</i> Royle ex D. Don	+	+	
<i>Juncus maritimus</i> Lamarck		+	+
<i>Juncus membranaceus</i> Royle	+	+	
<i>Juncus minimus</i> Buchenau	+		
<i>Juncus nepalicus</i> F.Miyamoto & H.Ohba	+		
<i>Juncus ochraceus</i> Buchenau	+		
<i>Juncus perpusillus</i> Samuelsson	+	+	+
<i>Juncus prismatocarpus</i> R. Brown	+	+	+
<i>Juncus rohtangensis</i> Goel <i>et</i> Aswal	+	+	
<i>Juncus sherei</i> F. Miyamoto & H. Ohba	+		
<i>Juncus sikkimensis</i> Hook. f.	+		
<i>Juncus sphacelatus</i> Decaisne	+	+	
<i>Juncus spumosus</i> Noltie	+		
<i>Juncus tenuis</i> Willdenow	+		
<i>Juncus thomsonii</i> Buchenau	+	+	
<i>Juncus tobdeniorum</i> Noltie*	+		
<i>Juncus trichophyllus</i> W.W. Smith	+		
<i>Juncus triglumis</i> Linnaeus	+	+	
<i>Juncus uniflorus</i> W.W. Smith	+		
<i>Juncus wallichianus</i> Laharpe	+		+
<i>Luzula effusa</i> Buchenau	+		
<i>Luzula campestris</i> (Linnaeus) DC.	+	+	
<i>Luzula indica</i> Kirschner*			+
<i>Luzula multiflora</i> (Retzius) Lejeune	+	+	
<i>Luzula oligantha</i> Samuelsson	+		
<i>Luzula pallescens</i> Swartz		+	
<i>Luzula plumosa</i> E. Meyer	+	+	+
<i>Luzula spicata</i> (Linnaeus) DC.		+	+

* endemic

From the Table I it can be seen that the North-Eastern part of India is endowed with an extremely rich and enormous diversity of Juncaceae species, which is followed by North -Western region but at the same time this diversity is being depleted. The main reasons behind their constant decline are due to destruction and disturbances of natural habitats owing to various anthropogenic activities including deforestation, agricultural expansion, road extension, urbanization. Moreover, the lack of natural propagation, forest fires, and natural calamities like earthquake, landslides, soil erosion result to the species becoming rarer and threatened.

Members of Juncaceae serve as food, fodder and nesting materials and play a vital role in wildlife conservation. The family also helps in balancing the fragile ecosystem of high altitude areas by preventing soil erosion being the good soil binders. Some species *i.e.* *Juncus effusus* Linnaeus, *J. inflexus* Linnaeus, *J. prismatocarpus* R. Brown, *J. wallichianus* Laharpe, etc. are economically important that bring immediate relief to the local inhabitants as they are used in handicrafts for making baskets, chair bottoms, hats, etc. (Anonymous 1959). Protection of natural

habitats of Juncaceae plays a fundamental role in *in-situ* conservation. Some proper habitats of family Juncaceae with enormous diversity should be selected and protect them. Conservation is possible only by generating public awareness and the need of the hour is to get the people to be involved in the programme of conservation of the family rich natural habitats. Educating them about natural resource in their vicinity and its significance would discourage such unscrupulous destruction of the natural habitats of Juncaceae. The researches on population biology and ecology of rare/endangered Juncaceae species need to be accelerated for their effective conservation. *Ex-situ* conservation can be achieved by seed collection and their propagation in suitable protected habitats as well as multiplying them through modern technology of tissue culture.

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