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Cover: A mesmerising Indian Luna moth *Actias selene* is dancing through the starry night (by Vincent van Gogh) moonlit sky, displaying its ballistic display of feather tail. Digital artwork by Vyshnavee Sneha Jaijar.

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ARTICLE

New records and typification in family Poaceae from western Himalaya, India

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Abstract: In the present study, authors provide the new geographical records of four species, namely *Anthoxanthum flexuosum*, *A. horsfieldii*, *Eragrostis tenuifolia*, and *Tripogon longearistatus* for the first time in the western Himalaya. A detailed taxonomic description, notes on habitat, morphology, and distribution along with a map are also provided. Additionally, we designated the lectotype for the name *Anthoxanthum horsfieldii*.

Keywords: *Anthoxanthum,* Chloridoideae, *Eragrostis,* lectotypification, morphology, Pooideae, taxonomy, *Tripogon*.

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Author contributions: ST–conceptualization-lead, field survey; Data curation—lead; Investigation—equal; Methodology—equal; Writing - original draft-lead. DP—formal analysis-supporting, field survey; Investigation—supporting; Methodology—supporting; Writing—original draft-equal. SS—data curation-equal; Formal analysis—equal; Methodology—equal; Writing—original draft-supporting. SPT—conceptualization-equal; Formal analysis—equal, writing.

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INTRODUCTION

Poaceae is the large and nearly ubiquitous family of monocotyledonous flowering plants, known as grasses. The family includes the cereal grasses, bamboos, and the grasses of natural grassland, cultivated lawns and pasture. It is the fifth largest angiosperm family with 752–855 genera, 11,300–12,379 species (Mabberley 2017; Banki et al. 2025), grows in all continents, up to 5,700 m elevation, in desert to freshwater and marine habitats (Kellogg 2015). The grass family is considered as a natural group and divided into 12 subfamilies (GPWG 2001; Soreng et al. 2017) out of which, 10 subfamilies are found in India that contain around 267 genera, and 1,501 species (Kellogg et al. 2020). Poaceae is dominant in Western Ghats with 600 species belonging to 170 genera, followed by western Himalaya with ca 583 species from 143 genera, and northeastern India with ca. 475 species from 145 genera (Shukla 1996). In western Himalaya, Collett (1902) described grasses of Shimla in his "Flora Simlensis", Stewart (1945; 1967) documented grasses of northwestern Himalaya and grasses of Kashmir Himalaya; Kachroo et al. (1977) included Poaceae and other families in his "Flora of Ladakh"; Aswal & Mehrotra (1994) provided a detailed account of the family Poaceae from Lahul & Spiti; Kandwal & Gupta (2009) listed the grasses of Uttarakhand, and Pusalkar & Singh (2012) studied Flora of Gangotri National Park, and therein documented the grass flora of that area. In recent years, field investigations have been carried out by many taxonomists in the western Himalaya. These investigations have contributed to the discovery of many new species to science and new records for Indian flora as well as for western Himalaya.

During the revisionary studies of family Poaceae from the western Himalaya, the authors gathered several fascinating specimens from various localities. After critical studies of these specimens, perusal of relevant literature, and consultation with herbarium collections, the new geographic records of *Anthoxanthum flexuosum* (Hook.f.) Veldkamp, *A. horsfieldii* (Kunth ex Benn.) Reeder, *Eragrostis tenuifolia* (A. Rich.) Hochst. ex Steud., and *Tripogon longearistatus* Hack. ex Honda in western Himalaya are reported for the first time based on specimens collected from Uttarakhand, and Himachal Pradesh. Furthermore, we resolved the ambiguity on nomenclature type of name *A. horsfieldii* and designated the lectotype.

MATERIALS AND METHODS

Several field surveys were conducted in the western Himalaya (Jammu & Kashmir, Ladakh, Himachal Pradesh, and Uttarakhand) from 2019–2024. All voucher specimens collected were herbarized following herbarium techniques as described in Jain & Rao (1976), and were deposited in the LWG herbarium. The taxonomical and nomenclatural analysis were performed through the consultation of protologues and relevant literature (e.g., Hooker 1896; Bor 1960; Schouten & Veldkamp 1985; Wu & Phillips 2006), images of type collections, and online databases such as Tropicos (2024) & JSTOR (2024). The morphological descriptions are based on collected specimens, old herbarium specimens and their images from BSD, CAL, DD, and LWG. For the critical study, specimens were dissected and observed using a Leica S8 APO stereozoom microscope equipped with MC 120 HD camera. The distribution map was prepared by using DIVA-GIS based on geo referenced data (latitudes and longitudes) that were taken during field trips and from herbarium specimens (Hijmans et al. 2001). All herbarium codes (acronyms) in this communication are according to Index Herbariorum (Thiers 2025).

RESULTS AND DISCUSSION

Taxonomy and new records

1. *Anthoxanthum flexuosum* (Hook.f.) Veldkamp, Blumea 30: 347 (1985).

≡*Hierochloe flexuosa* Hook.f., Fl. Brit. India 7: 222 (1896)

Type: [INDIA], Sikkim, Bijean, 1889, King's collector s.n. (holo. K000032281, digital image!).

Habit perennial, rhizomatous, 50–80 cm tall. Culms 60–75 cm long. Leaf sheath smooth. Leaf blade 5–10 cm long, 0.40–0.44 cm wide. Ligule 3.3–3.6 mm long, smooth; apex obtuse, erose. Panicle, 5–14 cm long, 5–8 cm wide, very lax, flexuous, branched: lower panicle branch paired, 5.0–7.5 cm long, capillary, spiculate on upper 1/3–1/2. Spikelets 6.0–6.8 mm long, 3.4–3.8 mm wide, laterally compressed, brownish; glumes subequal, first and second florets male, upper floret bisexual. Lower glumes 4.1–4.9 mm long, 1.8–2.0 mm wide, 3-nerved, 1-keeled, lanceolate, glabrous; apex acute. Upper glumes 4.7–5.5 mm long, 2.2–2.4 mm wide, 3-nerved, 1-keeled, lanceolate, glabrous; apex acute. First floret male: callus scanty hairy; hairs 0.5–0.7 mm long, lemma 4.6–5.3 mm long, 5-nerved, 1-keeled, narrowly elliptic, villous with golden-brownish hairs, shortly awned; palea

Image 1. *Anthoxanthum flexuosum*: A—Spikelet | B—Glumes | C—Florets | D—Lower florets with removed lemma, palea, anthers, and ovary | E—Middle floret with removed lemma, palea, and anthers | F—Upper floret with palea and ovary | G—Lemma of middle floret with position of awn insertion point (arrow sign) | H—Lodicule.© Dileshwar Prasad.

3.5–4.2 mm long, villous on upper 1/3; apically slightly bifid or with 2-toothed; awn 1.2–3.2 mm long, straight, inserted above the middle, proceeding above the florets and glumes; anthers 1.0–1.5 mm long. Second floret male: callus scanty hairy; hairs 0.5–0.7 mm long, lemma 4.6–5.8 mm long, 5-nerved, 1-keeled, narrowly elliptic, villous with golden-brownish hairs, awned, apically bifid; palea 2.9–4.3 mm long, villous on upper 1/3; awn 5.6–7.2 mm long, geniculate, inserted around the middle or at lower 2/3, conspicuously exceeding above the florets and glumes; anthers 1.0–1.5 mm long. Upper floret bisexual: callus glabrous, lemma 2.8–4.1 mm long, 5-nerved, 1-keeled, villous with golden-brownish hairs on upper half, not anwed; palea 2.3–3.3 mm long, villous at apex, 1-nerved; lodicules-2; ovary glabrous; stamens-3, anthers 1.0–1.2 mm long (Image 1 & Image 3A).

Flowering and fruiting: July–November.

Habitat and distribution: *Anthoxanthum flexuosum* was previously known from type locality, Bijean in Sikkim and considered an endemic species of that area (Bor 1960). Extensive investigations revealed that it is also found in western Himalaya, where it was collected from Manali, Himachal Pradesh. During the revision of specimens we have located one more specimen of *A. flexuosum*at K (K003585835), which was collected from Nepal. It is, perhaps, one of the rare species of *Anthoxanthum*, distributed from western to central and eastern Himalaya, and grows in dry, and sunny places on the *Agrostis-Festuca-Poa* grassland at 3,400–4,800 m (Image 7).

Notes: The genus *Anthoxanthum* belongs to subtribe Anthoxanthinae (Pooideae, Poeae) (Soreng et al. 2022). *Anthoxanthum* species produce coumarin, which makes them sweetly scented (Kellogg 2015). *Anthoxanthum flexuosum* was originally described as *Hierochloe flexuosa* by Hooker (1896) based on specimens collected from Bijean, Sikkim by King's collector. While searching the original material, we have located single specimens at K (K000032281), and the same was also cited as holotype (holo., n.v.) by Veldkamp (1985). It is characterised by having panicle lax & loose, lower & upper glumes 3-nerved, subequal and acuminate, first & second florets male, and upper floret bisexual, lemma villous with golden hairs, awn of second lemma geniculate and 5.6–7.2 mm long, anthers 1.0–1.2 mm long. It is similar to the *A. laxum* by having lax panicle with spreading branches and glumes subequal, but differ from later by its lower and upper glumes 3-nerved (vs 1-nerved), and awn of second lemma geniculate, and 5.6–7.2 mm long (vs straight and 2–3 mm long).

Specimens examined: *A. flexuosum*: INDIA. Himachal Pradesh, Manali, between Marhi & Rohtang, 32.354° N, 77.224° E, 3,400 m, 30.viii.2021, R.Yadav, S.Sharma & S.Tiwari 339400 (LWG!); *A. laxum*: INDIA. Uttarakhand, Bageshwar, Pindari Valley, 3 km after Dwali, 30.196° N, 79.999° E, 2,810 m, 28.ix.2021, D.Prasad & S.Sharma 339363 (LWG); *A. odoratum*: INDIA. Jammu & Kashmir, Baramulla, Nathatop, 33.078° N, 75.321° E, 2,200 m, 18.vii.2019, S.Jaiswal, R.Yadav & S.Tripathi 316393 (LWG!); Himachal Pradesh, Kullu, Kothi, 32.3186° N, 77.1936° E, 2,545 m, 04.viii.2019, D.Prasad & R.Yadav 316218 (LWG!).

2. *Anthoxanthum horsfieldii* (Kunth ex Benn.) Reeder, J. Arnold Arbor. 24: 325 (1950).

≡*Ataxia horsfieldii* Kunth ex Benn., Pl. Jav. Rar. (Bennett) 8 (1838)

=*Hierochloe clarkei* Hook.f., Fl. Brit. India 7: 223 (1896); Bor, Fl. Assam 5: 167 (1940)

≡*Anthoxanthum clarkei* (Hook.f.) Ohwi, Bull. Tokyo Sc. Mus. 18: 8 (1947); Bor, Grasses Burma, Ceylon, India, Pakistan 431 (1960); Jain & Pal, J. Bombay Nat. Hist. Soc. 72: 94 (1975). Type: India, Meghalaya, Khashi Hills, Lailan Kote, 1,675 m, C.B. Clarke s.n. (holo. K).

Type (lectotype): [INDONESIA]. Java, Loekot, Skoland jane, T. Horsfield 339 (lecto. BM000797885, isolecto. BM000797886; L0043611, digital images!), step-I designated by Schouten & Veldkamp (1985), step-II designated here.

Habit perennial, rhizomatous with creeping and branching rhizome, 60–100 cm high. Culm 40–75 cm long, simple or branched. Node glabrous. Leaf sheaths split-overlapping, smooth; margin hairy. Ligules 2.0–3.9 mm long, membranous, glabrous; apex truncate, lacerate. Leaf blades 15–25 cm long, 5–10 mm wide, flat, adaxial scabrous, abaxial glabrous or scaberulous, flaccid, aromatic, margin scabrid. Panicle 4.5–10.6 cm long, 0.7–2.2 cm wide, elliptic in outline, continuous or interrupted at basal part, branched, nodding; lower branch in whorls of 2, branch smooth, 2–3 cm long, ascending, bearing 5–15 spikelet. Rachis obscure, smooth. Spikelet 5.2–7.8 mm long, 1.9–2.4 mm wide, lanceolate, bearing 2-sterile floret and 1-fertile floret, short rachilla between sterile floret; glumes persistent, unequal; lower sterile floret dissimilar, compressed, barren, without significant palea; upper fertile floret bisexual. Lower glume 3.0–4.5 mm long, 1.0–1.2 mm wide, 1-veined, 1-keeled, elliptic, navicular; apex acute; hyaline margin, smooth. Upper glume 4.6–7.8 mm long, 1.9–2.2 mm wide, 3-nerved, 1-keeled, obovate, navicular, glabrous; apex acute; margin hyaline. First

Image 2. ***Anthoxanthum horsfieldii*****: A—Ligule | B—Lower panicle branch | C—Spikelet | D—Spikelet with removed glumes | E—Glumes | F—Glumes, lateral view | G—Floret | H—Middle floret | I–J—Upper floret | K—Ovary. © Dileshwar Prasad.**

floret sterile: lemma floret 5.0–5.7 mm long, 5-nerved, 1-keeled, membranous, compressed, conduplicate, pubescent, golden hairs on all over surface, awned; apex acute; margin narrowly hyaline, ciliate; awn 1.6–2.0 mm long, inserted above the middle on dorsal surface, straight, scabrous-antrorse. Second floret sterile: lemma 4.8–5.3 mm long, 1-nerved, 1-keeled, membranous, compressed, pubescent, golden hairs on all over surfaces, awned; apex acute; margin narrowly hyaline, ciliate; awn 7.5–8.4 mm long, geniculate, inserted from above middle on dorsal surface, scabrous-antrorse, column 2.3–2.5 mm long, twisted, subula 6.2–6.4 mm long. Upper floret bisexual: lemma 2.4–3.3 mm long, 5-nerved, without keel, lateral nerve obscure, oblong, rounded, smooth; palea 2.2–3.3 mm long, 1-nerved, linear, membranous; stamens-3, anthers 1.8–3.2 mm

long, ovary glabrous; lodicules absent. (Image 2 & Image 3B)

Flowering and fruiting: August–September.

Habitat and distribution: *Anthoxanthum horsfieldii* is a common grass of southeastern Asia, known from China, Japan, Myanmar, Malesia, Taiwan, Philippines to the Thailand (Schouten & Veldkamp 1985; Wu & Phillips 2006). Along with these, the distributional ranges are also extended to the Khasi Hills and the Western Ghats, India (Hooker 1896; Bor 1960). In the present study, we recorded the new localities of *A. horsfieldii* in the Garhwal Himalaya, Uttarakhand which expanded its distribution range to the western Himalaya. It grows mainly in sunny, dry places, *Casuarina* forest, and subalpine grassland; at 1,400–3,300 m in the Java Island, Indonesia (Schouten & Veldkamp 1985), on mountainous, grassy, and sunny or shaded places; at 2,500–3,300 m in China (Wu & Phillips 2006); forest margins, dry, and sunny places; at ca. 1,800 m in the western Himalaya (Image 7).

Notes: Kunth (1829) published the name *Ataxia horsfieldii* without any description, regarded as a descriptogenerico-specifica, based on specimens collected by Horsfield from Java (Indonesia), which was mentioned in Brown (1823) as "399.Horsfield". However, the name was invalid. Bennett & Brown (1838) then validated and confirmed as already observed by Chase (1943), even though she believed Horsefield to be the original author. Maximowicz (1888) and Mez (1921) transferred it into genera *Hierochloë* and *Anthoxanthum*, respectively. The combination, proposed by Mez (1921), was invalid as it was merely referred to Kunth for his basionym (see Veldkamp 1985). Later, it seems to be validated by Reeder (1950) as he referred to Chase (1943), and indirectly to Bennett & Brown (1838).

During the systematic study of *A. horsfieldii*, we noticed that Schouten & Veldkamp (1985) unintentionally referred two specimens and lectotypified the name *A. horsfieldii*. Thus it requires a second-step lectotypification in accordance with Art. 9.17 of ICN (Turland et al. 2018). Schouten & Veldkamp (1985) referring to the type of *A. horsfieldii* wrote "Type: *Horsfield 339* (BM, holo. (holotype), K, P) Java". There are two specimens of Horsfield 339 at BM (BM000797885 and BM000797886). According to Art. 9.17 of ICN (Turland et al. 2018), the type citation by Veldkamp & Schouten should be considered as first step of lectotypification, as they did not designate any particular specimen from both the specimen for the name *A. horsfieldii*. Therefore, for the stability of the name *A. horsfieldii*, a subsequent typification is warranted to resolve this nomenclatural ambiguity. Therefore, from the two specimens of Horsfield 339 at BM, the best-preserved specimen BM000797885 is designated here as the second-step lectotype of the name *A. horsfieldii*, and the other specimen BM000797886 as the isolectotype. Moreover, the other syntype is also traced at L, which could also be regarded as an isolectotype.

Specimens examined: INDIA. Uttarakhand, Chamoli, Nagnath-Pokhari, 30.329° N, 79.209° E, 1,800 m, 28.viii.2019, S. Jaiswal 326992 (LWG!).

3. *Eragrostis tenuifolia* (A. Rich.) Hochst. ex Steud., Syn. Pl. Glumac. 1: 268 (1854).

Poa tenuifolia A. Rich., Tent. Fl. Abyss. 2: 425 (1850–1851).

Type (lectotype): [ETHIOPIA], in locisincultis Valliumprope Adoam, 18.ix.1837, Schimper 92 (P), designated by Phillips (1995).

Habit perennial, mat forming, tufted, 10–62 cm long. Culms 6–50 cm long. Leaf sheaths 3–10 cm long, mouth bearded. Ligule's fringe of cilia. Leaf blades 6–28 cm long, 0.2–0.5 cm wide, linear to lanceolate, adaxial surface scabrid to sparsely ciliate, abaxial surface glabrous. Panicles 4–12 cm long, 2.5–5.0 cm wide, broadly ovate, open with alternate branches; axils ciliate, at maturity glandular in the axils; pedicels 3–7 mm long, glandular. Spikelets 4–12 mm long, 0.9–2.1 mm wide, 6–13 flowered, lanceolate to oblong, with serrulate margins, greenish black or grey; rachilla zigzag; florets closely imbricate, disarticulating from below upwards. Glumes ovate to lanceolate, often nerveless or nerve obscure, apex acute to obtuse. Lower glumes 0.3–0.7 mm long, 0.2–0.3 mm wide. Upper glume 0.8–1.2 mm long, 0.4–0.6 mm wide. Lemmas 1.5–2.1 mm long, 0.9–1.2 mm wide, elliptic-lanceolate, chartaceous, 3-nerved, 1-keeled, keel scabrid above middle; apex acute to mucronate. Paleas 1.4–1.8 mm long, 0.3–0.6 mm wide, persistent, elliptic to oblanceolate, 2-nerved, 2-keeled, scaberulous along keels, apex obtuse to truncate. Anthers-3, 0.6–1.0 mm long, cream-coloured. Caryopses 0.7–1.2 mm long, c. 0.8 mm wide, ellipsoid to oblongoid, ventrally flattened to grooved, truncate at ends, deep reddish. (Image 4 & Image 5)

Flowering and fruiting: March–October

Habitat and distribution: *Eragrostis tenuifolia* is native to Indochina, southern Asia, Madagascar, and tropical Africa, and was introduced in Mexico (Villasefior & Espinosa-Garcia 2004), Australia, Malesia, New Guinea, Philippines, and southern America (Veldkamp 2002). Since it is a widely spreading grass, the first author saw it in Forest Research Institute (FRI) campus, and on the way to Mussoorie, Dehradun. During the study of old

Image 3. ***Representative specimens*: A—*Anthoxanthum flexuosum* | B—*Anthoxanthum horsfieldii*. © Dileshwar Prasad.**

collections of family Poaceae, it is found that previously it was also collected from Rudraprayag in 2018. In India, it is commonly found in association with *E. nigra* (Vivek et al. 2021). At highland and montane elevations of 500–2,500 m, it is frequently growing as a weed, and ruderal in the wet zone, particularly beside roadsides, and in woods and wastelands (Moulik 1997).

Earlier in India, it was reported from Andhra Pradesh, Bihar, Daman & Diu, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal (Kellogg 2020; Prasanna et al. 2020), and recently also recorded from Telangana (Jalander & Swamy 2023) (Image 7).

Notes: *Eragrostis tenuifolia* has open panicle with bearded axils; a large, dark, serrate spikelets with a relatively short nerveless lower glume; a floret with widely divergent lemma and palea; a lemma with submarginal usually short lateral nerves; a 3-lobed palea; creamy anthers and strongly flattened caryopsis that is often exposed that distinguished it from rest of the Indian species. It shows similarity with *E. curvula* (Schrad.) Nees, *E. pilosiuscula* Ohwi and *E. pilosa* (L.) P.Beauv. by its open panicle and long axil hairs but differs from *E. curvula* by its serrate margins of the spikelets, ventrally flattened to grooved caryopsis (vs dorsal-ventrally compressed caryopses) and anthers 0.6–0.9 mm long (vs 0.9–1.25 mm long), and from *E. pilosa* by its caryopsis (laterally flattened in *E. pilosa*). *E. tenuifolia* is similar to *E. ferruginea* (Thunb.) P.Beauv. in its caryopses, however in *E. ferruginea* sheath margins and the axils of the inflorescence are glabrous, not pilose. Similar to *E. nigra* Nees ex Steud., this species often has dark green spikelets but differs by having more narrowly lanceolate spikelets and toothed lemma.

Specimens examined: INDIA. Uttarakhand, Rudraprayag, Jakholi, 30.273° N, 78.962° E, 657 m, 27.ix.2018, S. Tripathi 315817 (LWG!); same locality, 30.273° N, 78.963° E, 660 m, 27.ix.2018, S. Tripathi 315819 (LWG!); New forest (FRI campus), 30.342° N, 77.997°

Image 4. ***Eragrostis tenuifolia*****: A—Habit | B—Panicle. © Smita Tiwari.**

E, 681 m, 27 April 2024, S. Tiwari 346552 (LWG!); same locality, 30.346° N, 77.593° E, 685 m, 27 April 2024, *S. Tiwari 346553* (LWG!)**;** same locality, 30.345° N, 78.000° E, 694 m, 27.iv.2024, S. Tiwari 346554 (LWG!); way to Mussoorie, 30.443° N, 78.087° E, 1,662 m, 28.iv.2024, S. Tiwari 346555 (LWG!); same locality, 30.449° N, 78.082° E, 1,843 m, 28.iv.2024, S. Tiwari 346557 (LWG!).

4. *Tripogon longearistatus* Hack. ex Honda, Bot. Mag. Tokyo 41: 11 (1927).

≡*Tripogon longearistatus* Nakai, Veg. Isl. Quelpaert: 19: 147 (1914), nom. nud.

=*Tripogon longearistatus* Honda var. *japonicas* Honda, Bot. Mag., Tokyo 41: 12 (1927).

Type (lectotype): KOREA, Cheju-do, Quelpaert, 1908, Taquet 3425 (lecto. TI [TI00016318 digital image!], designated by Vivek et al. (2021).

Habit Perennials, 7–20 cm high. Culms 5–12 cm, erect; leaf sheaths 3–8 cm long, glabrous. Ligules ciliolate membranous. Leaf blades 3–16 cm long, *c.* 0.1 cm wide, linear, convolute, glabrous or scabrid adaxially and glabrous abaxially; apex acuminate. Panicle 5–15 cm long, slightly flexuous, spikelets loosely arranged in rachis; distant by their own length. Spikelets 4–10 mm long, 1.0–1.5 mm wide, linear to lanceolate, pale green, 4–7 flowered. Callus bearded. Rachilla 0.4–0.8 mm long, straight or zig zag. Lower glumes 2.8–4.3 mm long, 0.5–0.7 mm wide, 1-nerved, 1-keeled, linear-lanceolate, slightly toothed on one side, apex sub-acute to acute. Upper glumes 3.5–5.2 mm long 0.5–0.7 mm wide, 1-nerved, 1-keeled, lanceolate-oblong, apex acuminate or mucronate. Lemmas 2.5–4.8 mm long, 0.5–0.8 mm wide to sinus, 3-nerved, elliptic-lanceolate, apex bifid; median awn 4.5–8.3 mm long, scabrid, reflexed, teeth absent; lateral veins 0.1–0.2 mm long, awns arising from outer margins. Paleas 2.5–3.0 mm long, 0.4–0.6 mm wide, 2-keeled, lanceolate, hyaline, not winged, keels ciliolate, apex truncate. Stamen 1, anther 1–1.2 mm long. Ovary 0.2–0.5 mm long (Image 6).

Flowering and Fruiting: September–December

Habitat and distribution: The native range of *Tripogon longearistatus* is China, Japan, and Korea. In India, it was previously reported from Meghalaya and Sikkim. It is a perennial species and grows primarily on rocky slopes,

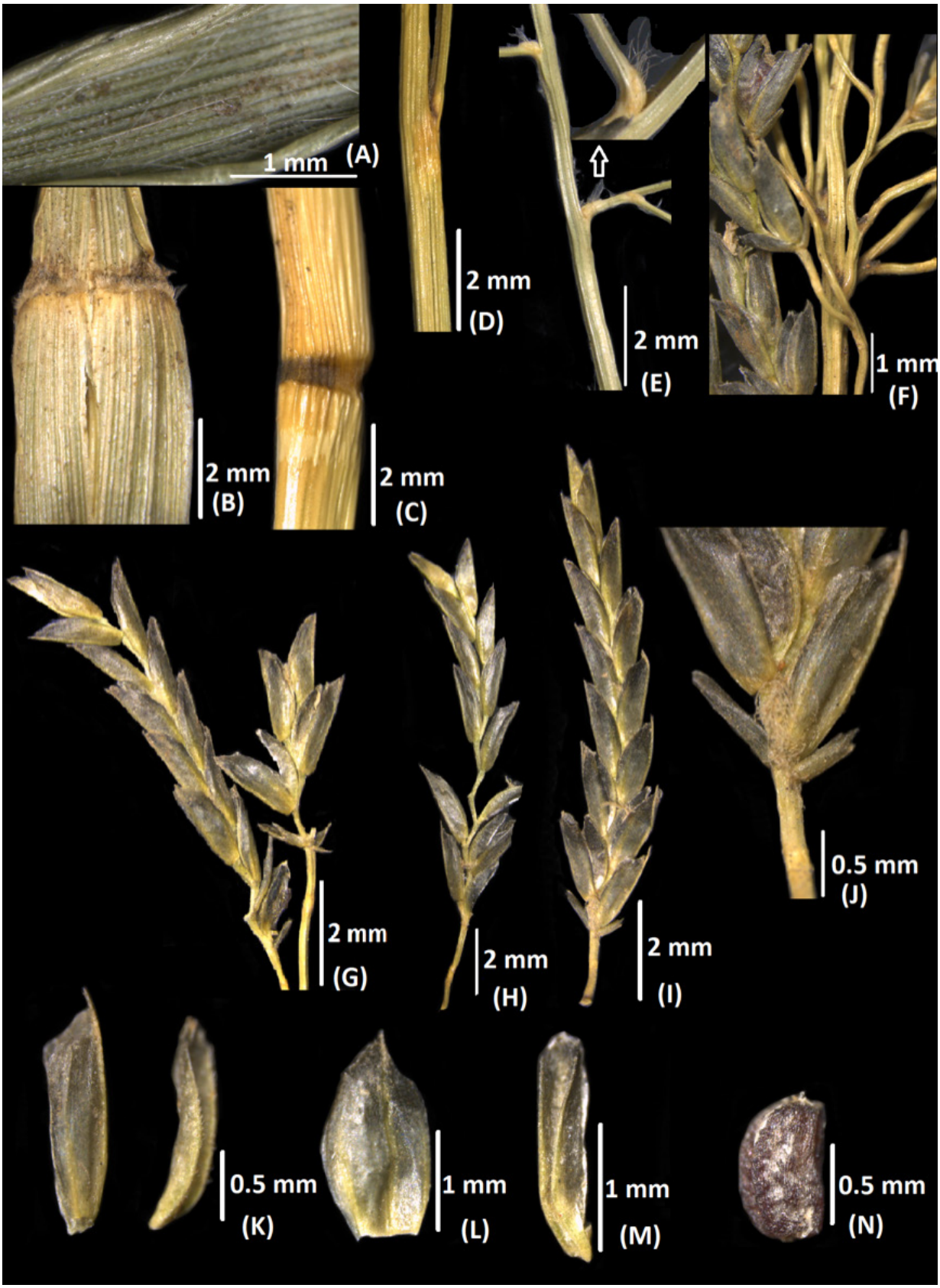

Image 5. *Eragrostis tenuifolia*: A—Leaf blade | B—Leaf sheath with ligule | C—Node | D—Lower panicle branch | E—Branch axils | F—Panicle branches | G–I—Spikelets | J—Lower half of spikelet | K—Lemma and palea (Lateral view) | L—Lemma | M—Palea | N—Caryopsis. © Smita Tiwari.

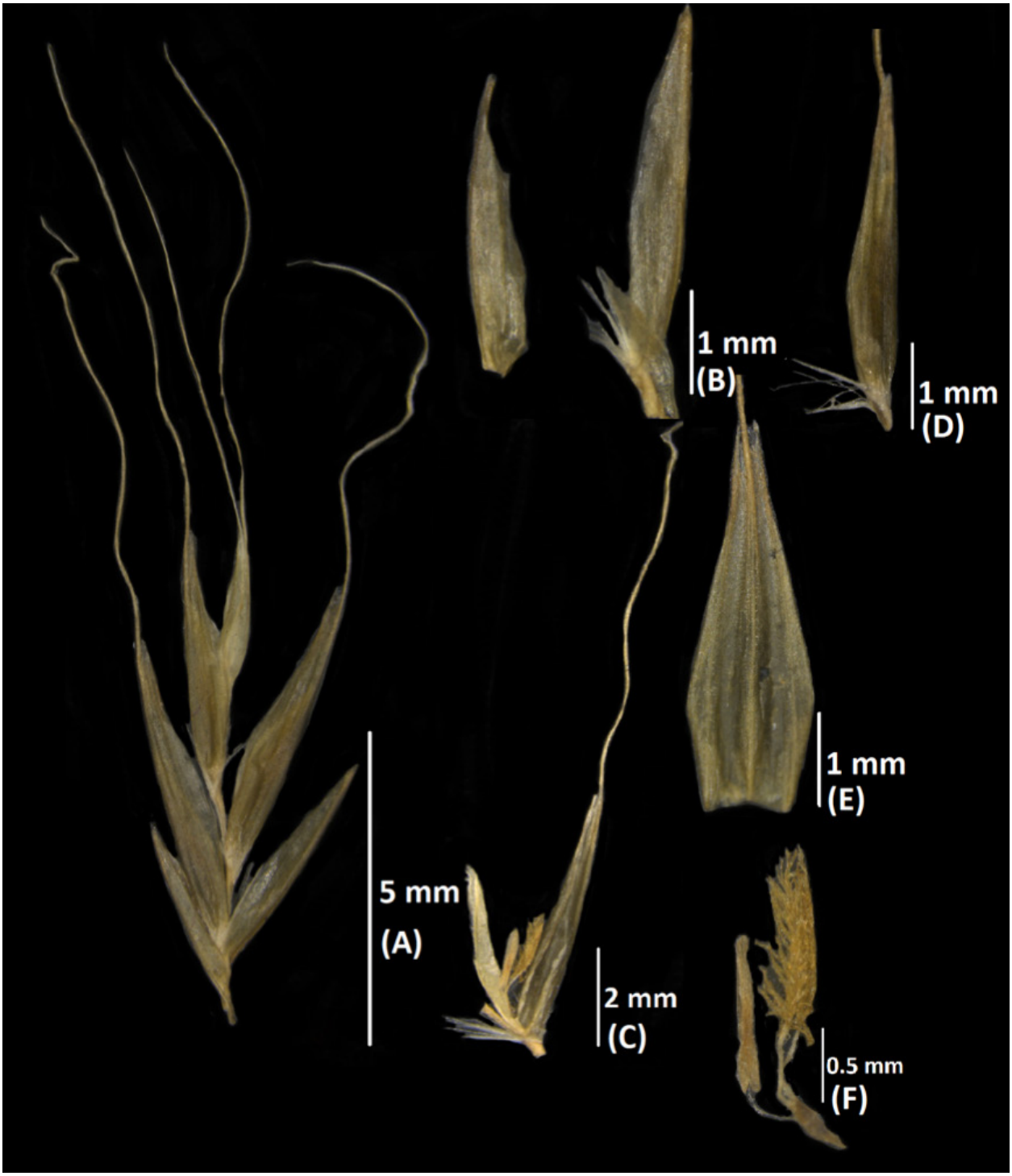

Image 6. ***Tripogon longearistatus*****: A—Spikelet | B—Glumes | C&D—Floret | E—Lemma | F—Stamens & Ovary. © Smita Tiwari.**

and also on riverbeds at an altitude of 300–1,500 m (Thoiba & Pradeep 2020). We report it from Nainital, Uttarakhand which represents the new geographic record in the western Himalaya (Image 7).

Notes: *Tripogon longearistatus* shares similarities with *T. filiformis* Nees ex Steud., in its habit but can easily be distinguished by its widely spaced long spikelets (vs closely imbricate spikelets) with stiff strongly reflexed awns, lateral awns absent or if present then only about 0.1–0.2 mm long, extension of lemma lateral nerves,

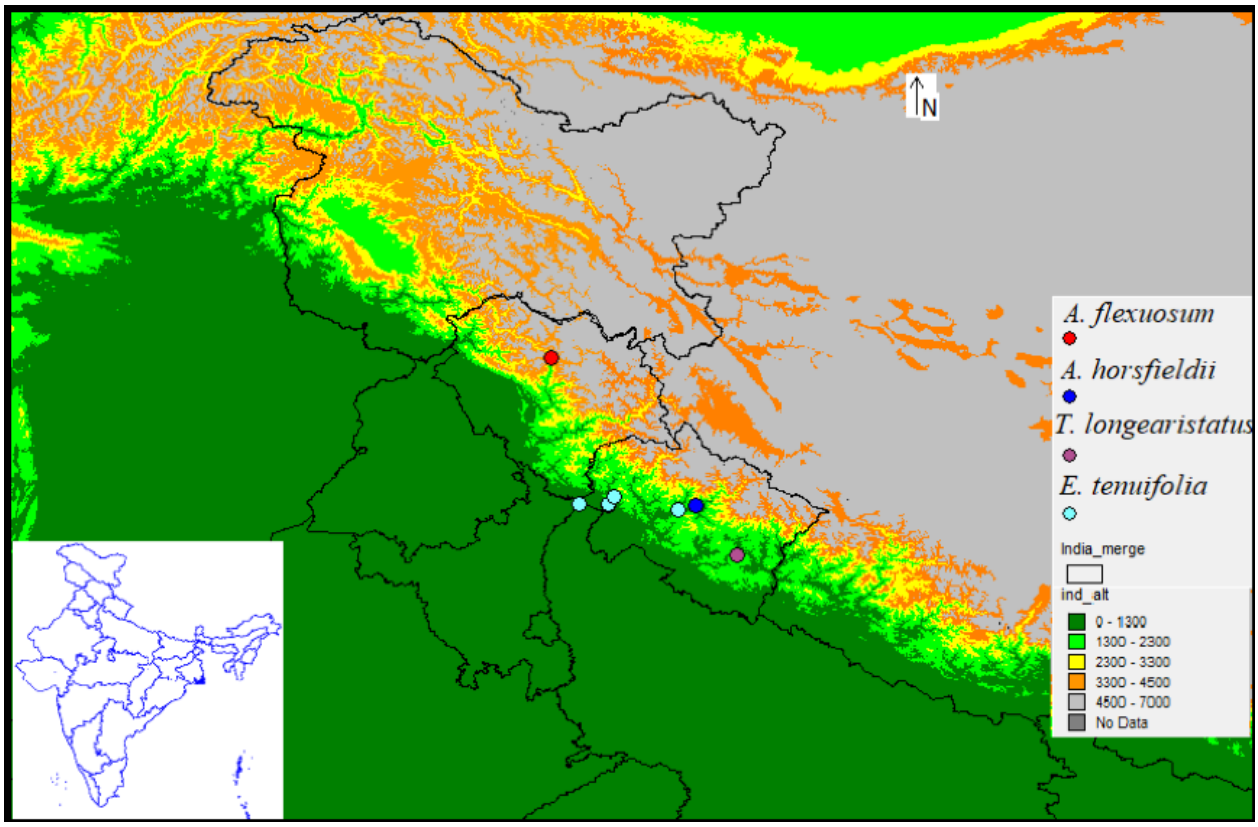

Image 7. Distribution of *Anthoxanthum flexuosum, Anthoxanthum horsfieldii, Tripogon longearistatus*, and *Eragrostis tenuifolia* in western Himalaya, India. © Sangam Sharma by QGIS.

(vs lateral awns 1–4 mm long), lemma 2- lobed with lemma teeth absent (vs lemma 4-lobed with lemma teeth 0.3–0.7 mm long), and having solitary anther. The higher altitude form of *T. filiformis* having median awn twice as long as the lemma, lateral awns half the size of median awn, and possesses only one anther (Phillips & Chen 2002) . Lower altitudes form have very short lateral awns having three anthers (Noltie 2000). There is little overlap in their geographical range. According to Phillips & Chen (2002), *T. longearistatus* is limited to the eastern lowlands, whereas *T. filiformis* is found at high elevations in China. *T. filiformis* is characterized by its filiform, lax, and densely pilose leaves on both surfaces. However, in *T. longearistatus,* leaf blade is scabrid adaxially, and glabrous abaxially.

Specimen examined: INDIA. Uttarakhand, Nainital, on way to DSB campus, 29.655° N, 79.762° E, 1,968 m, 31.ix.2018, S. Tripathi 315910 (LWG!).

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