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Lolium multiflorum Lam. (Poaceae: Poeae) from Kashmir Himalaya: First record to flora of Jammu & Kashmir.

Saha Kuntal[1], Chandran Manoj [2], Negi Ranjana[3]*, Malik Akhtar H.[4]

[1]Department of Botany, Shri Guru Ram Rai University, Patel Nagar, Dehradun, Uttarakhand 248001.
[2]Indian Forest Service, Uttarakhand Forest Department, Dehradun, Uttarakhand 248001, India.
[3]Systematic Botany Discipline, Forest Botany Division, Forest Research Institute (FRI), Dehradun, Uttarakhand 248006, India.
[4]Centre for Biodiversity & Taxonomy, Department of Botany, University of Kashmir, Srinagar 190006, Jammu & Kashmir, India.
*Corresponding Author's Email ID: ranjananegi.icfre@gmail.com.

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ABSTRACT

During recent fieldwork in Srinagar, Kashmir, we collected *Lolium multiflorum* Lam., commonly known as annual ryegrass, or Italian rye grass, near Dachigam National Park. This marks the first recorded instance of this species in Jammu and Kashmir. We provide a detailed description, habitat information, and illustrations of *L. multiflorum* Lam., along with a geo-coordinate map of the collection site. This discovery increases the number of *Lolium* L. taxa in Jammu and Kashmir to three, with most species commonly found in Europe.

Keywords: Dachigam National Park, Festuceae, New records, Pooideae, Western Himalayas.

INTRODUCTION

Among the various ecological challenges faced today, such as biodiversity loss, habitat degradation, and over-grazing, the Himalayas are recognized as a global biodiversity hotspot (Mittermeier *et al*., 1999). Despite this, vital taxonomic information about the flora in many of its regions remains lacking. A prime example is the Kashmir Himalaya, part of the Western Himalayas, where we discovered *Lolium* multiflorum Lam., an annual or biennial grass species native to Europe, the North Atlantic Islands, temperate Asia, and North Africa (Terrell, 1968). This species, however, has been widely distributed to other regions, including Russia and the Middle East, and introduced to temperate areas worldwide (Sunil and Jaleel, 2013) due to its suitability as pasture grass in high rainfall areas (Kloot, 1983). The genus *Lolium* L. is recognized as an important group of forage grasses suited for cool temperate climates, encompassing 32 species (WCVP, 2024).

Characterized by specific traits such as being hermaphroditic, having a straight and simple spike inflorescence with similar spikelets containing more than one floret, an absent lower glume, and a well-developed upper glume (Bor, 1960; Chen *et al*., 2006). These features place this particular genus in the subtribe Loliinae within the supersubtribe Loliodinae (Soreng *et al*., 2017) of the tribe Poeae (Clayton and Renvoize, 1986; Chen *et al*., 2006), tribe Festuceae (Bor, 1960) in the subfamily Pooideae of the Poaceae family.

MATERIALS AND METHODS

During our investigation of grasses in Jammu and Kashmir, specifically in the Kashmir Himalaya during the summer of 2024, we recorded a novel grass population along the roadside of Srinagar, near Dachigam National Park. Fresh specimens were identified through an extensive review of taxonomic literature (Bor, 1960; Terrell, 1968; Kloot, 1983; Wu *et al.*, 2006). To aid in identification, we have provided a detailed species description, including a color photograph of plant specimens in their natural habitat (Fig 1 A - C) and illustrations (Fig 2). The collection locations were mapped using QGIS Version 3.36.2 (Fig 1 D). The freshly collected specimens have been submitted to the herbarium of the Forest Research Institute, Dehradun (DD).

RESULTS AND DISCUSSION

Previous regional floras (Singh and Kachroo, 1976; Sharma and Kachroo, 1981; Dhar and Kachroo, 1983; Kaul, 1986; Kapur and Sarin, 1989; Navchoo and Kachroo, 1995; Swami and Gupta, 1998; Sharma and Jamwal, 1998; Dar *et al.*, 2014; Mehraj *et al.*, 2016; Dar and Khuroo, 2020; Dar *et al.*, 2022) as well as national floras (Prasanna *et al.*, 2020; Kellogg *et al.*, 2020) did not report the presence of *L. multiflorum* Lam. in Jammu and Kashmir. Therefore, this study marks the first documentation of *L. multiflorum* Lam. in the grass flora of Jammu and Kashmir. In India, there are a total of eight taxa of *Lolium* L. distributed throughout the country (Prasanna *et al.*, 2020; Kellogg *et al.*, 2020). Besides *L. multiflorum* Lam., only two other taxa, *Lolium perenne* L. and *Lolium temulentum* var. *temulentum*, have been recorded in the flora of Jammu & Kashmir.

3.1. **Taxonomic treatment*:***

Lolium multiflorum Lam., Fl. Franç. (Lamarck) 3: 621 (1779); Hook.f., Fl. Brit. India 7: 364. 1896; Bor, Gras. Burma, Ceyl., Ind. & Pak. 545. 1960.
Fig .1. & 2.

Annual or biennials. Culms 50 – 150 × 0.2 – 0.5 cm, tufted, erect, glabrous, 3 – 4 noded. Leaf sheaths 10 – 20 cm, smooth. Leaf blades 13 – 25 × 0.5 – 1 cm, linear-lanceolate, many-nerved, flat, glabrous, shiny, base rounded, margin scabrid, apex acuminate, young blades.

Flowering & fruiting: October – June.

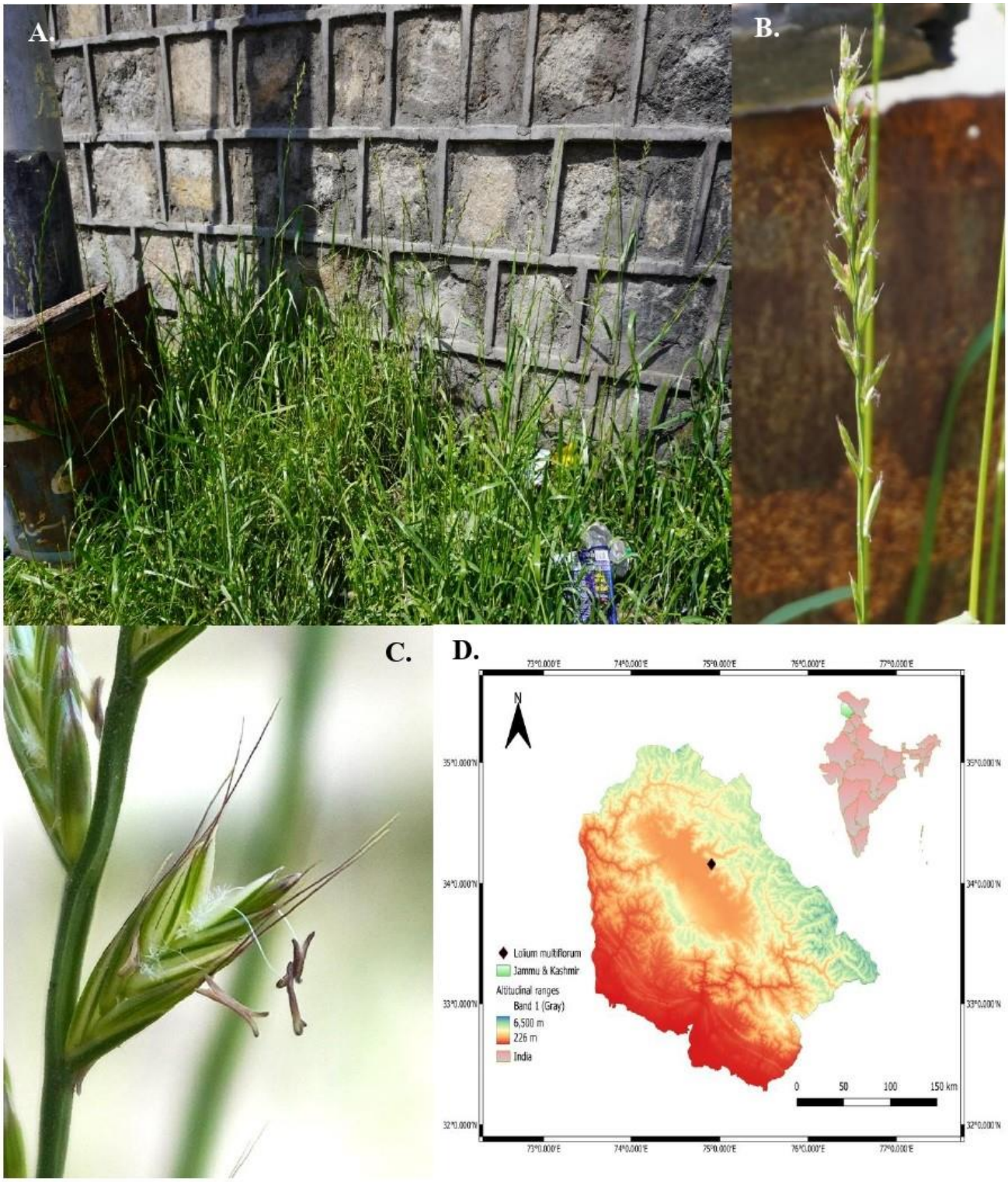
Habitat: Along open, sunny roadside areas.

Distribution: INDIA: Himachal Pradesh, Tamil Nadu, Uttarakhand, West Bengal, Jammu & Kashmir (present report). Europe, to NW Africa and some part of Asia.

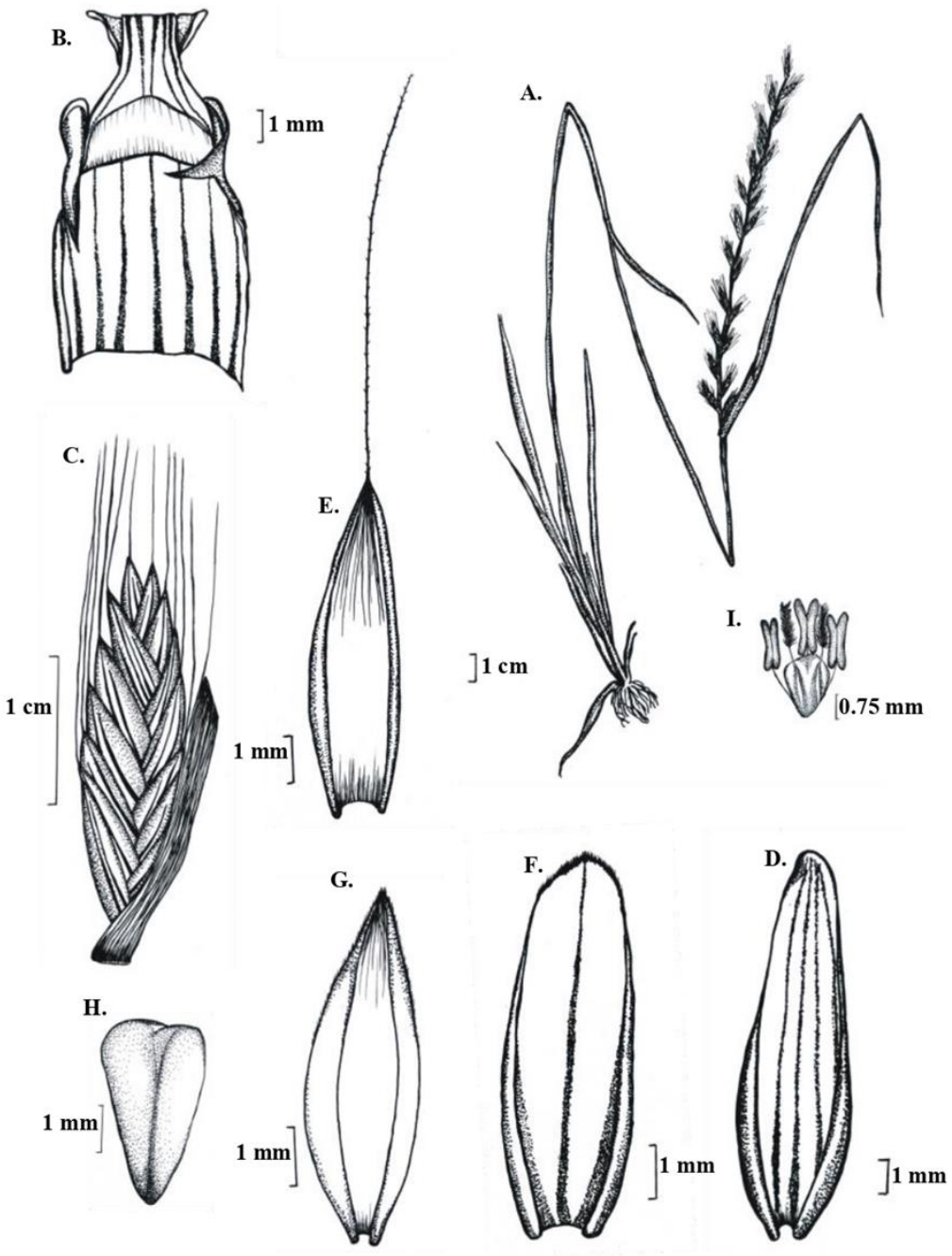
Etymology: The genus name "*Lolium*" originates from a Latin term traditionally used to describe weedy grasses, specifically ryegrass. The species epithet "*multiflorum*" is derived from two Latin words: "*multi-*" meaning "many" and "*florum*" meaning "flowers." Thus, "*multiflorum*" translates to "many-flowered," indicating the plant's trait of bearing numerous florets.

Specimens examined: INDIA, Jammu & Kashmir, Srinagar district, Harwan, near Dachigam National Park gate (34°09′41.787″N, 74°54′33.076″E), 1690 m, 21/04/2024, Kuntal Saha & Tafazul Ahmad, *K.Saha* 213 (DD).

Note: *Lolium multiflorum* and *L. perenne* can interbreed and are morphologically very similar. *Lolium multiflorum* is distinguishable from *L. perenne* by a taller, biennial or annual plant with wider leaves that are rolled in the bud, unlike the folded leaves of *L. perenne*. Additionally, *L. multiflorum* features spikelets containing 12–20 florets, with glumes less than half the spikelet length and lemmas with awns near the tips.



Figures 1: *Lolium multiflorum*: **A** – Natural Habit; **B** – Close up of Inflorescence; **C** – Single spikelet; **D** – Map depicting place of collection.



Figures 2: Illustration of *Lolium multiflorum*.: **A** – Habit; **B** – Ligule; **C** – Spikelet; **D** – Upper glume; **E** – Lemma with awn; **F** – lower lemma (awnless); **G** – Palea; **H** – Caryopsis; **I** – Pistil.

convolute; auricle 1.5 – 3 mm; ligule 2 – 3 mm, membranous, rounded, truncate at apex. Inflorescence 20 – 40 cm, erect or slightly curved, slender, green, terminal spike with 20 – 35 spikelets; rachis 1 – 1.8 mm, fistular, scabridulous, overlapping or up to their own length. Spikelets 1 – 3.5 × 0.7–1.2 cm, 12–20-floret, sessile, green, elliptic-lanceolate, compressed; callus glabrous; 1 rudimentary floret. Rachilla 1 – 1.5 mm, flattened. Lower glume absent. Upper glume 7 – 19 × 1.2 – 2 mm, narrow-oblong, glabrous, apex obtuse, boat-shaped, sub coriaceous, 5–9-nerved, scabrid dorsally, green, margins hyaline. Lemma 8 – 9 × 1 – 2.4 mm, oblong-lanceolate, obtuse to acute at apex, rounded on the back, subcoriaceous, green, margins hyaline, 5–6-nerved; awned, 4 – 11 mm, attached 0.3 – 0.5 mm below the apices, subterminal, barbellate ; lower 2–3 lemma awnless. Palea 3 – 5.5 × 2 – 3.5 mm, elliptic-lanceolate, acute at apex, chartaceous, hyaline, 2-keeled, keels with teeth, green, 2-nerved. Florets bisexual. Lodicules 2, 0.9 – 1.4 × 0.3 – 0.4 mm, lanceolate. Stamens 3; filaments 2 – 3 mm long; anthers 3 – 5 mm, linear, yellow, reddish-brown. Ovary 1–1.5 mm, obovate; style short; stigma 1 – 1.3 mm, plumose. Caryopsis 3 – 4 × 0.7 – 1 mm, oblong, compressed, truncate at apex, wrinkled.

CONCLUSION

Lolium multiflorum, a European species, is found at altitudes ranging from 800 m to 2000 m and has been introduced as a cover crop and temporary lawn grass in various parts of the world due to its value as nutrient-rich fodder and its role in soil and forage enrichment. In India, particularly in Jammu & Kashmir, it has naturalized and is commonly found along roadsides.

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Conflict of interest: The authors declare that they have no conflict of interest.

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