

**A NEW SPECIES OF *ARUNDINELLA* RADDI (POACEAE)
FROM THE WESTERN GHATS, INDIA**

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Abstract

Arundinella thirunelliensis (Poaceae), a new species from the Western Ghats in Kerala, India is described and illustrated. It closely resembles *A. nepalensis* but differs by being a rheophyte with large culms, glabrous culm nodes, leaf sheath and peduncles, effuse panicles with highly branched drooping branches, large, 3-nerved, deeply bifid smooth lemma with short twisted column of awn, and the lower glume distinctly shorter than the lower lemma.

Introduction

The genus *Arundinella* Raddi (1823) (Poales: Poaceae) is with about 55 species, having distribution in the tropical regions of the world, mainly in Asia (Clayton and Renvoize, 1986). Watson and Dallwitz (1992 onwards: <http://delta-intkey.com/grass/www/arundine.htm>) also accounted 55 species for the genus. Sun and Phillips (2006) estimated the present approximate number of species to be 60. As per Clayton *et al.* (2006 onwards: <http://www.kew.org/data/grasses-db.html>) there are 68 species of *Arundinella*. The genus is represented by 21 species in India, of which 11 are found in Kerala (Hooker, 1896; Fischer, 1934; Bor, 1960; Sreekumar and Nair, 1991; Shaju and Mohanan, 2004; Kabeer and Nair, 2009).

During a recent floristic exploration in the foot hills of Brahmagiri, Wayanad district, Kerala, India some interesting specimens belonging to the genus *Arundinella* Raddi were collected. Critical study and analysis revealed that it is distinct from the hitherto known taxa of the genus and is described here as a new species *Arundinella thirunelliensis*.

***Arundinella thirunelliensis* Sunil, Ratheesh & Sivadasan, sp. nov. (Figs 1 & 2).**

Diagnosis: *Arundinella thirunelliensis* is similar to *A. nepalensis* Trin., but differs in being a rheophyte having large culms, glabrous culm nodes, leaf sheath and peduncles, effuse panicles with highly branched drooping branches, large, 3-nerved, deeply bifid smooth lemma with short twisted awn-column, and lower glume distinctly shorter than the lower lemma.

Type: India, Kerala: Wayanad District, Thirunelli, Kalindi river bed, 900 m, 8 Dec 2012, Sunil & Ratheesh Narayanan 4854 (*Holotype*: CAL!; *Isotypes*: MH!).

Paratypes: India, Kerala: Wayanad District, Thirunelli, Kalindi, 12 Jan 2014, Sunil, Ratheesh Narayanan & Prajeesh 1872 (CABC-MSSRF Herbarium!, Wayanad).

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Tufted, perennial rheophytes; clumps up to 60 cm wide; roots wiry. Culms 80-200 cm high, 3-5 mm across; nodes glabrous. Leaves: sheath up to 27 cm long, glabrous, ribbed; ligule a narrow rim with c. 4 mm long fimbriate hairs at apex and back; blade linear or linear-lanceolate, flat, stiff, 18-42 × 0.4-1.0 cm, base rounded, margin scaberulous or smooth, acuminate at apex, glabrous or upper surface with few scattered hairs. Inflorescence terminal panicles, 16-42 cm long, 7-20 cm wide, pyramidal; branches lax to effuse, alternate, spreading, lowermost up to 25 cm long; rachis

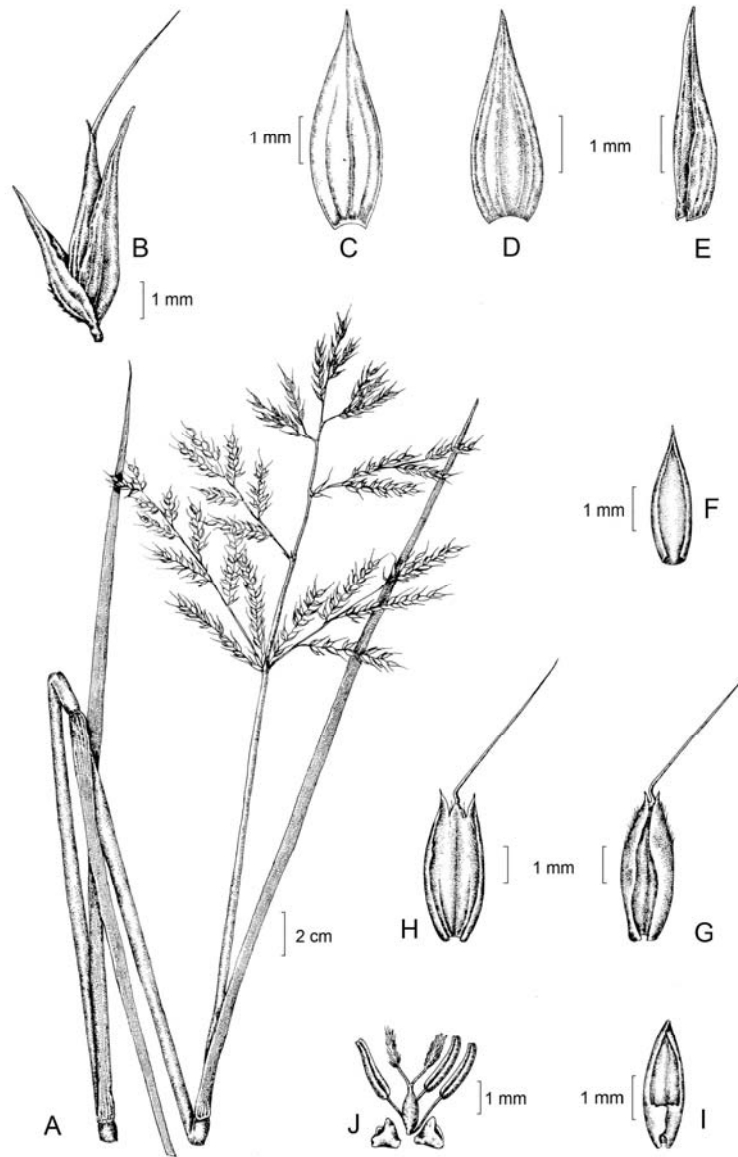


Fig. 1. *Arundinella thirunelliensis* Sunil, Ratheesh & Sivadasan, **sp. nov.** A. Habit; B. Spikelet; C. Lower glume; D. Upper glume; E. Lower lemma; F. Lower palea; G. Upper lemma; H. Upper lemma - spread open; I. Upper palea; J. Lodicules, stamens and pistil.

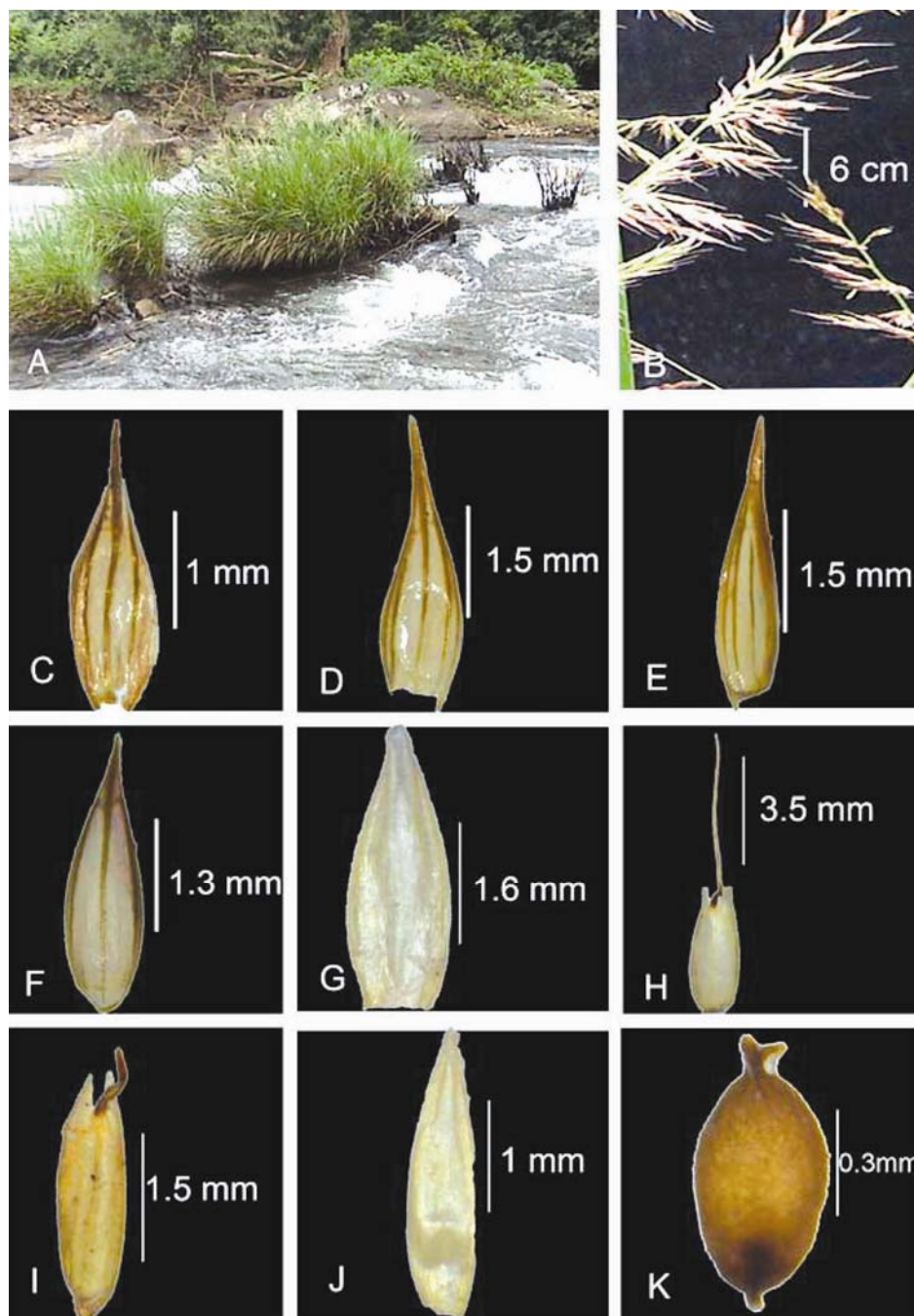


Fig. 2. *Arundinella thirunelliensis* Sunil, Ratheesh & Sivadasan, **sp. nov.** A. Habitat; B. A portion of inflorescence; C. Lower glume; D. Upper glume; E. Lower lemma – ventral view; F. Lower lemma – dorsal view; G. Lower palea; H. Upper lemma; I. Upper lemma showing bifid apex and twisted column; J. Upper palea; K. Caryopsis.

angular, scaberulous. Spikelets elliptic-lanceolate, 4.0-4.5 mm long, pale to dark purple; pedicels 0.5-4.0 mm long, angular, scabrous. Lower glume ovate-lanceolate, 3.0-3.5 × 1.0-1.5 mm, acute to acuminate at apex, 3 or 5-nerved, scabrid on mid-nerve, pale purple with green nerves, chartaceous. Upper glume ovate-lanceolate, 4.0-4.5 × 1.0-1.5 mm, acuminate at apex, margin hyaline, 5 or 7-nerved, pale purple with green nerves, chartaceous. Lower floret male or neuter. Upper floret bisexual. Callus glabrous or sparsely hairy. Lower lemma ovate-lanceolate, 3.5-4.0 × 1.2-1.5 mm, margin hyaline and ciliate towards apex, apex acute, very rarely with an up to 2 mm long awn, chartaceous, 3 or 5-nerved, green. Lower palea lanceolate to oblong-elliptic, 3.0-3.5 × 0.5-1.0 mm, acute at apex, 2-keeled, 2-nerved, membranous, hyaline. Upper lemma ovate or ovate-oblong, 2.5-3.0 × 1.0-1.3 mm, margin involute, apex 2-lobed, awned from the sinus, sub-chartaceous, hyaline, 3-nerved, puberulous, whitish in fruits, smooth; lobes c. 0.5 mm long, ciliate along margin, acute or obtuse at apex; awn 4.0-4.5 mm long, geniculate with a chestnut-coloured, flat, twisted, 0.5-1.0 mm long column. Upper palea ovate-lanceolate, 2.5-3.0 × 0.7-1.0 mm, ciliate along margin, acute at apex, hyaline, membranous, 2-keeled, 2-nerved. Lodicules 2, triangular, c. 0.3 mm long, hyaline, apex irregularly lobed. Stamens 3, anthers 1.0-1.5 mm long, oblong, yellowish-brown. Ovary ovoid, 0.3-0.5 mm long; styles 2, c. 1 mm long; stigma c. 1 mm long, feathery, purple. Caryopsis ellipsoid, 1.0-1.2 × 0.5-0.6 mm, light brown.

Phenology: Flowering and fruiting occurs during October to February.

Etymology: The specific epithet denotes the type locality – Thirunelli in Wayanad district, which is one of the floristically rich regions on southern Western Ghats.

Ecology and distribution: *Arundinella thirunelliensis* was collected from a perennial stream bed. The new species has a distribution restricted to perennial stream beds that are occasionally subjected to flash floods. The plants are often associated with *Homonoia riparia* Lour., *Rotula aquatica* Lour., *Cyperus* sp., *Equisetum* sp., etc.

Comparison of characters of *Arundinella thirunelliensis* with *A. nepalensis* is provided in Table 1.

Table 1. Comparison of characters of *Arundinella thirunelliensis* with *A. nepalensis*.

Characters	<i>Arundinella thirunelliensis</i> sp. nov.	<i>Arundinella nepalensis</i>
Habit	Rheophytic grass	Terrestrial grass
Culm node	Glabrous	Pubescent
Leaf sheath	Glabrous	Glabrous or tuberculate hairy
Peduncle	Glabrous below panicle	Pubescent below panicle
Panicle	Effuse, highly branched, branches alternate and drooping	Densely spiculate, branches simple and sub-verticillate, secund
Lower glume	Distinctly shorter than the lower lemma	About as long as the lower lemma
Upper lemma	2.5-3.0 mm long, smooth, apex deeply 2-lobed; lobes c. 0.5 mm long, acute or obtuse	1.0-1.5 mm long, granulate, apex emarginate or shallowly 2-lobed; lobes c. 0.05 mm long, obtuse
Awn	Column of awn 0.5-1.0 mm long when dry	Column of awn 2.2-3.2 mm long when dry

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