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Mini Review

Review of the family Jubulaceae in India

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Abstract

A review of the family Jubulaceae in India reveals a single genus *Jubula*, represented by four species and two infraspecific taxon.

Keywords: India; *Jubula*; Jubulaceae

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Introduction

According to [1], the family Jubulaceae H.Klinggr. is represented by three genera worldwide, viz. *Jubula* Dumort., *Neohattoria* Kamim. and *Nipponolejeunea* S.Hatt. In India the family is represented by a single genus only [2]. [1] listed five distinct species and seven infraspecific taxon of *Jubula* in the world checklist whereas, in India the genus is represented by four species and two infraspecific taxon. Out of six taxon occurring in India, three are endemic to the country, viz. *Jubula hattorii* Udar & Vir.Nath var. *hattorii*, *Jubula hattorii* Udar & Vir.Nath var. *muthukuzhiana A.E.D.Daniels* & P.Daniel and *Jubula himalayensis* S.C.Srivast. & D.Sharma. [3], first reported *Frullania hutchinsiae* var. *β* Nees (now *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd. from Kodaikanal, Nilgiri 'Neel-Gherries', India. Subsequently, in years to follow the number of *Jubula* was added in the bryophytic flora of India reaching the number to six.

The genus *Jubula* is chiefly characterized by creeping, glossy, deep green, non-reddish plants with regularly pinnate branching; branches *Frullania*-type or *Lejeunea*-type; leaves incubous; lobule almost free from the lobe, attached to the lobe at some distance from the stem; stylus absent; leaves cells thin-walled, with minute trigones; underleaves bifid, with long decurrent bases and deeply arched insertion; monoicous; androecia on tiny, elongate branches; gynoecia on elongated shoots, with 1–2 *Radula*-type innovations; perianth with 3 sharp keels (2 lateral, 1 ventral), perianth mouth beaked; seta thin, of only 20 rows of cells, 4 inner rows and 16 outer rows; spores without rosettes; vegetative reproduction absent.

Jubula has close resemblance with *Frullania* Raddi but lacking in reddish pigmentation, absence of stylus, gynoecia with innovations, thin seta, of only 20 rows of cells and spore surface without rosettes [4, 5, 6]. [28] and [8] reported *J. hutchinsiae* from Tamil Nadu and West Bengal respectively without mentioning the subspecies, so we could not assign the distribution here (Table 1).

Table 1: Distribution of species and infraspecific taxa of *Jubula* in India.

Taxa	Distribution within India											Reference
	ML	WB	TN	UT	AR	AS	KL	SK	MN	KA	NG	
Jubula hattorii Udar & Vir. Nath var. *hattorii*	+	+										[7-10]
Jubula hattorii Udar & Vir.Nath var. *muthukuzhiana* A.E.D. Daniels & P. Daniel			+									[11 as *J. hattorii*]; [12]
Jubula himalayensis S.C.Srivast. & D.Sharma				+								[13]
Jubula hutchinsiae (Hook.) Dumort. subsp. *hutchinsiae*					+							[14]
Jubula hutchinsiae (Hook.) Dumort. subsp. *javanica* (Steph.) Verd.		+	+		+	+	+	+		+		[3] as *Frullania hutchinsiae* var. β Nees; [11,15] as *J. sikkimensis* [16-24] as *J. javanica*, 25]
Jubula pennsylvanica (Steph.) A.Evans								+	+		+	[2, 26, 27]

Conclusion

The distribution of *Jubula hutchinsiae* subsp. *javanica* is maximum in India followed by *Jubula pennsylvanica* and *Jubula hattorii* var. *hattorii*. Out of the three-taxon endemic to the country, *Jubula hattorii* var. *muthukuzhiana* and *Jubula himalayensis* are still now known from its type locality only. *Jubula* is mostly distributed in the East Himalayan bryogeographical region and least by a single distribution as represented in West Himalayan bryogeographical region in India. For global distribution of *Jubula* kindly refer to [2].

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