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A note on *Radula onraedtii* Yamada, a poorly known liverwort species from the Western Ghats, India

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Abstract

In the present paper, a poorly known species of genus Radula, R. onraedtii Yamada of Marchantiophyta from Nilgiri Hills, Western Ghats, is described and illustrated in the bryo-flora of Western Ghats. This species is very little and scattered in distribution and is known only from a very few localities in Arunachal Pradesh in the Eastern Himalaya and the Western Ghats in Indian bryoflora.

Keywords: Western Ghats, Tamil Nadu, Marchantiophyta, Radulaceae, *Radula*.

1. Introduction

The Radulaceae (Dumort.) K. Müll. is a monotypic family of Marchantiophyta that includes the cosmopolitan genus *Radula* Dumort. The genus is characterized by the absence of under-leaves, rhizoids always restricted to leaf- lobules, branching and sub-floral innovation always "*Radula*-type," dorsiventrally flattened tubular perianth, and large compound oil bodies, usually one often associated with a small one also per cell[1].

Genus *Radula* was defined by Dumortier[2] and comprises 350 defined species across the world. The genus is one of the most polytypic and ubiquitous, distributed mainly in tropical and subtropical parts of the world[3].

The Nilgiri Hills of Tamil Nadu are very rich in bryo-diversity and harbor a valuable gene pool of bryophytic flora due to their climatic condition, which receives southeastern and northwestern monsoons, making the territory biologically very rich, especially those that grow as epiphytes. Recently, Verma et al.[4, 5] reported 326 taxa of bryophytes from Nilgiri Hills, which includes 157 taxa of Musci and 169 taxa of Hepaticae and Anthocerotae, including the genus *Radula*.

These are *Radula obscura* Mitt., *R. perrottetii* Gottesche ex Steph. *R. complanata*, *R. javanica* Gottesche, *R. nilgiriensis* Udar & Kumar, *R. tabularis* Steph., *R. madagascariensis* Gottesche, and *R. onraedtii* Yamada[6-11]. Out of which *R. onraedtii* was first time reported from Avalanche in Nilgiri hills by Kumar[11] in his Ph. D thesis and further collected by Verma et al.[5]. Daniels[12] has been collected it from southern Western Ghats in Muthukuzhivayal. On the basis of collection made by authors from Nilgiri hills (Gudulur from Naduvattam) in 2001, here the species is described and illustrated.

2. Materials and Methods:

The Nilgiri, or 'Blue Mountains', owe their name to the predominant and verdant blue bloom of angiosperm Strobilanthus (family Acanthaceae). Fresh specimens were collected from Nilgiri Hills (Gudulur near Naduvattam) by the authors himself in 2001 and deposited in the Hepatic Herbarium, Department of Botany, Lucknow University, Lucknow (LWU). All line drawings were drawn by the author (PKV) himself with the help of Camera Lucida (Nikken, Japan).

Observations

***Radula onraedtii* Yamada, Misc. Bryol. Lichenol. 1979: 8 (6): 113 (Fig. 1, Figs 2.1-9).**

Plants prostrate, in loose patches, yellowish green in live, yellowish brown (in herbarium), up to 23 mm long, 1.0-1.2 mm wide, branching regularly pinnate, '*Radula*-type'. Stem oval, 7-8 cells across the diameter, undifferentiated, cells quadrate, extremely thickened. Leaves sub-imbricate, widely spreading, obliquely inserted; leaf-lobe 0.58-0.76 mm long, 0.38-0.48 mm wide, deeply falcate, often caducous, apex rounded, margin entire, dorsal base partially covering the axis; leaf-cells thin-walled with trigones, apical cells 10-16×10-16 µm, median cells 16-26×15-25 µm, basal cells 18-27×10-13 µm; leaf-lobule small, quadrate, 0.26-0.39×0.35-0.42 mm, apex sub-acute, dorsal base of leaf-lobule narrowly covering the axis; keel arched, extending at an angle of 40-45º, inflated. Plants sterile.

Figure 1. *Radula onraedtii* Yamada, Plant, ventral view (Photomicrograph from LWU 13660/2001)

Type locality: Sri Lanka - Nuwara Eliya[2] (Yamada, 1979).

Range: Asia: China, India, Sri Lanka, Taiwan [3, 13-14].

Distribution in India: Eastern Himalayas: Arunachal Pradesh, West Bengal – Darjeeling (Tiger hill). South India: Tamil Nadu - Nilgiri hills [Gudulur (Naduvattam), Avalanche][15-17].

Ecology: Plants growing in smooth mats (diffuse patches) as epiphytic population (corticolous) on main trunk of trees, very rare in occurrence.

Characteristics of the species: 1. Plant greenish yellow with deeply falcate leaf-lobe, often caduceus and thin-walled cells with trigones in leaf-cells.

Specimens examined: Western Ghats: Tamil Nadu: Nilgiri hills – Gudulur (on way to Gudulur from Naduvattam); ca. 1800 m;

29.03.2001; P.K. Verma and A. Alam; 13660/2001 (LWU).

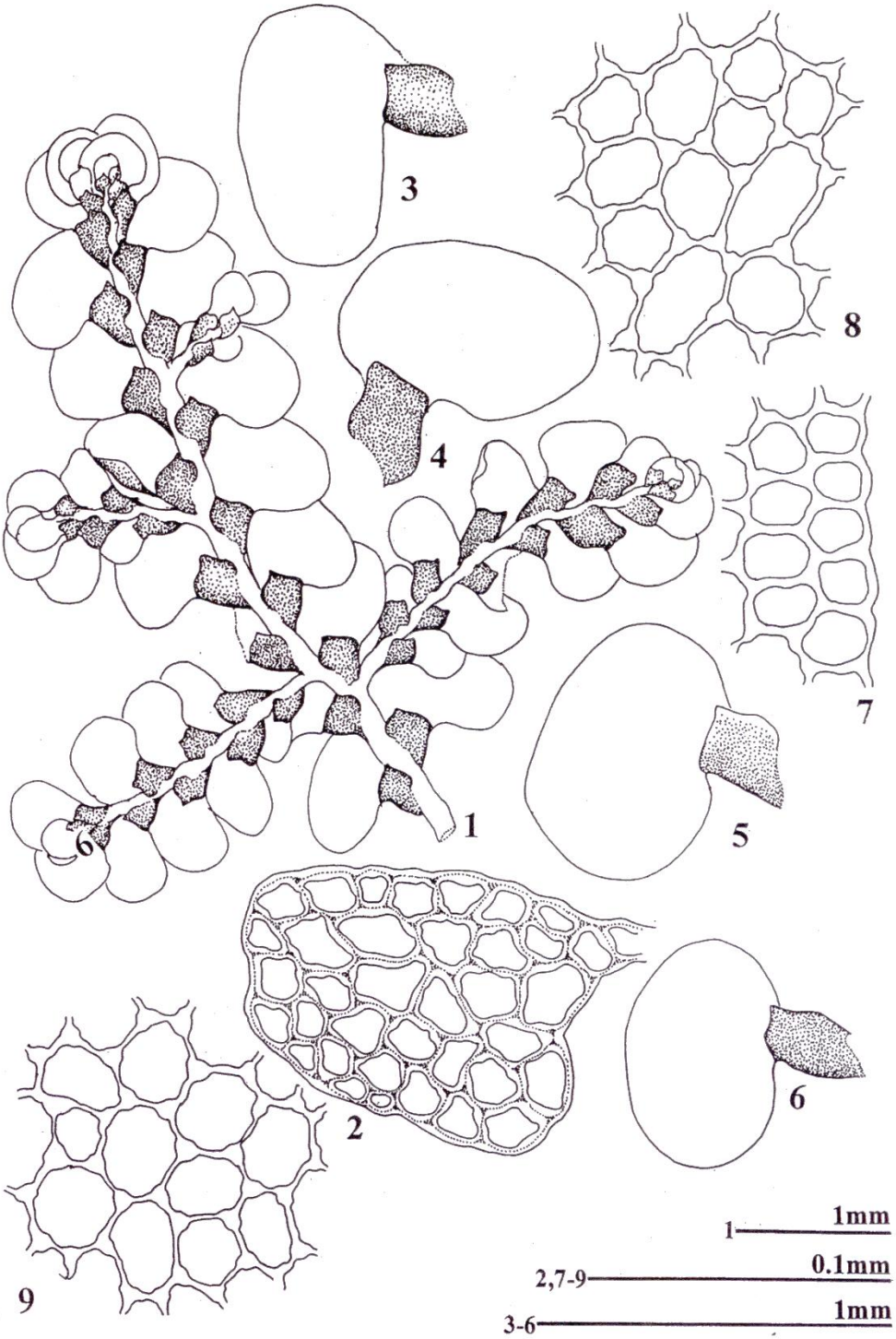

Figure 2. 1-9: *Radula onraedtii* Yamada. 1. Plant, ventral view, 2. Cross section of stem, 3-6. Leaves, 7. Apical cells of leaf-lobe, 8. Median cells of leaf-lobe, 9. Basal cells of leaf –lobe (All figures drawn from LWU 13660/2001)

3. Discussion and Conclusion

Radula onraedtii Yamada, an Asian species, was established in Sri Lanka by Yamada[3]. Kumar[11], in his unpublished account, reported this species from the Nilgiri Hills and

Eastern Himalayas, respectively, as a new record for India. The species is extremely rare, but in recent collections it has been recollected from Gudulur of the Nilgiri Hills. The species is characteristic among other species of Radula in Indian species due to its comparatively small size, thickened trigones in stem cells, fragile and falcate nature of leaves, sinuate adaxial margins, and strongly arched keels.

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Conflicts of interest

Not Applicable.

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