Research Communication

Cololejeunea microscopica var. exigua (A. Evans) Pócs: new to Asia

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Abstract

Cololejeunea microscopica var. exigua (A. Evans) Pócs has been discovered from Kodaikanal, Tamil Nadu, South India, which is a new record for the country as well as for Asia showing extended distribution of the taxon from Europe, America and Africa to Asia.

Keywords

Cololejeunea; Aphanolejeunea; new record; India; Asia

Introduction

During a survey of bryophyte collection from Kodaikanal (Palni hills), Tamil Nadu, South India, an interesting tiny leafy liverwort was identified. On critical investigation and comparison with known species, it was identified as Cololejeunea microscopica var. exigua (A. Evans) Pócs which belongs to the subgenus Aphanolejeunea (Evans) Benedix of the genus Cololejeunea (Spruce) Schiffn. (Lejeuneaceae). A thorough review proved it to be a new continental record of the Liverwort (Evans, 1911; Pócs, 2009 in Gradstein and Ilkiu-Borges 2009; Pócs and Bernecker, 2009). The species was previously known from Europe, America and Africa (Pócs and Bernecker, 2009). The discovery of this taxon from India constitutes a new liverwort record for the country (India) as well as for the continent (Asia).

Earlier, Evans (1911) segregated the genus Aphanolejeunea (A. Evans) from Cololejeunea and instituted the taxon Aphanolejeunea exigua A. Evans. But the recent molecular – phylogenetic studies revealed that Aphanolejeunea cannot be separated from Cololejeunea at generic rank (Ahonen 2004; Wilson et al., 2006; Gradstein et al., 2006; Pócs, 2009 in Gradstein and Ilkiu-Borges 2009; Pócs and Bernecker, 2009) as earlier considered by Benedix (1953), Mizutani (1961, 1996), Stotler and Crandall-Stotler (1977), Tixier (1979) and Asthana and Srivastava (2003). Now all the known species of the genus Aphanolejeunea have been transferred under the genus Cololejeunea and thus Aphanolejeunea exigua A. Evans has also been treated as Cololejeunea microscopica var. exigua (A. Evans) Pócs (Pócs, 2009 in Gradstein and Ilkiu-Borges 2009; Pócs and Bernecker, 2009, Söderström et al., 2012).

Materials and Methods

The plants were collected from Coasan Road, Kodaikanal (Palni Hills) South India by the authors themselves in the month of February 2011 and have been deposited in Lucknow University Herbarium (LWU). The plants were critically examined under Stereoscopic Zoom Binocular Microscope (Carl Zeiss, M140, Germany) and Compound Microscope (Olympus OIC 72653). The line drawing illustrations were made with the help of Camera Lucida.
Taxonomic Description:


Plants prostrate, delicate, fragile, green to whitish green, extremely small, 2-3 mm long, 0.15-0.30 mm wide with leaves, branches without collar. Cross-section of the stem 18-30 μm in diameter with five cortical and single medullary cell. Leaves dimorphic, distant, alternate, obliquely spreading, narrowly attached and not appressed to the substratum; leaf-lobes of the fully developed leaves ovate, arched along the keel near the base, dorsal surface papillose due to projecting cells, margin of the lobe crenulate and the keel roughened due to conical projections, 88-171 μm long (10-13 cells) and 70-149 μm wide (8-10 cells), apex either subacute due to the presence of single projecting cell at the tip of the lobe or obtuse due to the presence of two projecting cells, leaf-cells angular, quadrate to rectangular, thin walled, without trigones and intermediate nodular thickenings, 11-18 x 7-11 μm, cells dorsally elevated due to single conical projection, papillae 3-11 x 3-7 μm, ocelli absent; leaf-lobules of fully developed leaves ovate, inflated, 2/3 to 4/5 of the lobe length, first tooth usually two celled, slightly projecting and falcate while the second tooth single celled and slightly covered by the first tooth, hyaline papilla

present at the base of first tooth; reduced leaves few, ligulate or diamond shaped, with dorsal papillosity, apex often acute due to the presence of single projecting cell, 45-82 μm long (4 to 6 cells) and 18-48 μm wide (3-4 cells), eulobulate. Rhizoids few, scattered on the ventral surface of the stem. Plants sterile.

**Habitat:** Corticolous, found growing on the surface of the bark of angiospermic tree admixed with other bryophyte species such as *Cololejeunea pseudoflaccosa* (Horik.) Benedix, *Drepanolejeunea ternatensis* var. *lancispinosa* Herz., *Metzgeria* sp. and some mosses.

**Type Locality:** Puerto Rico (America).

**Range:** Europe, America, Africa (Evans, 1911; Pócs and Bernecker, 2009), Asia (India).

**Distribution in India:** South India: Tamil Nadu-Palni Hills.

**Specimen examined:** South India: Tamil Nadu - Palni hills (Kodaikanal) - On Coasan Road, altitude ca. 2310 m a.s.l., G. Asthana & Party, 14 February 2011, 21293/11(LWU).

**Discussion**

*Cololejeunea microscopica* var. *exigua* (A. Evans) Pócs is a unique and interesting species. Being very small in size, the plants were first overlooked but after a careful examination of the dry herbarium specimen, they were recognized due to their habit and fragile nature of the plants. The leaves are characteristic being dimorphic having normal inflated lobulated leaves and reduced eulobulate leaves (Figs. 1-3). The leaves are not appressed to the substratum.

*Cololejeunea microscopica* var. *exigua* (A. Evans) Pócs, shows somewhat resemblance with *Cololejeunea gросепапиллоса* (Horik.) Pócs. in having small sized plants, distantly arranged leaves and presence of dorsal papillosity on the leaf cells. But these two taxa are quite distinct in having dimorphic leaves (i.e. fully developed leaves with inflated lobules and reduced leaves which are almost eulobulate) in *Cololejeunea microscopica* var. *exigua* while in *Cololejeunea gросепапиллоса* (Horik.) Pócs., the dimorphic leaves are not reported (Zhu and So, 2001; Dey and Singh, 2012).

*Cololejeunea microscopica* var. *exigua* shows some similarities with *Cololejeunea truncatifolia* (Horik.) Mizutani in having small size of plant, distantly arranged dimorphic leaves and dorsal papillosity on the leaf cells. *Cololejeunea microscopica* var. *exigua* distinctly differs in having ovate leaves while they are elongated, elliptical in *Cololejeunea truncatifolia* (Zhu and So, 2001; Asthana and Srivastava, 2003).

*Cololejeunea microscopica* var. *exigua* may also be confused with *Cololejeunea papillosа* (Goebel) Mizutani. Both the species are more or less similar in appearance and dimorphic nature of leaves. But these two taxa can be easily differentiated as in *Cololejeunea microscopica* var. *exigua* developed leaves are frequent and the reduced leaves are few, ligulate or diamond shaped, 4-6 cells long and 3-4 cells wide (Figs. 1-3,5) while in *Cololejeunea papillosа* fully developed leaves are rare and reduced leaves are frequent, narrowly linear or ribbon like, 3-10 cells long and 2-4 (6) cells wide. Besides, the apex of the leaf lobe in *Cololejeunea microscopica* var. *exigua* is subacute to obtuse while in *Cololejeunea papillosа* the leaf lobe apex is usually rounded to truncate. The papillosity (conical projections) is more prominent along the keel in *Cololejeunea microscopica* var. *exigua* (Figs. 1-3,5) in comparison to *Cololejeunea papillosа* (Pócs, 2009 in Gradstein & Ilkiu-Borges, 2009 & Fig. 43: A-E on page 76).

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**References**


