

## The position of the hyaline papilla and the genus concept of *Cheilolejeunea* (Spruce) Schiffn. (Lejeuneaceae)

CID JOSÉ PASSOS BASTOS<sup>1</sup>

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**ABSTRACT** – (The position of the hyaline papilla and the genus concept of *Cheilolejeunea* (Spruce) Schiffn. (Lejeuneaceae)). In this paper, the genus concept of *Cheilolejeunea* is discussed and revalued based upon the concept of the real position of the hyaline papilla, as well as upon the definition of apical tooth of the lobule in the genus.

Key words - apical tooth, *Cheilolejeunea*, hyaline papilla, Lejeuneaceae, taxonomy

**RESUMO** – (A posição da papila hialina e o conceito do gênero *Cheilolejeunea* (Spruce) Schiffn. (Lejeuneaceae)). Neste trabalho, o conceito do gênero *Cheilolejeunea* é discutido e reavaliado à luz do real conceito da posição da papila hialina, bem como da definição de dente apical do lóbulo no gênero.

Palavras-chave - *Cheilolejeunea*, dente apical, Lejeuneaceae, papila hialina, taxonomia

The genus *Cheilolejeunea* (Spruce) Schiffn. has been defined by the position of hyaline papilla, which is distal to the apical tooth (second tooth), large and segmented oil bodies of *Calypogeia*-type, small and slightly or strongly mammillose cells, and rosettes on the surface of spores (Zhu & Reiner-Drehwald 2004). However, as pointed out by He (1996), the position of hyaline papilla shows less taxonomic importance than the lobule's structure in Lejeuneaceae. Therefore, the genus concept of *Cheilolejeunea* needs to be revalued. The aim of this paper is to discuss the genus concept of *Cheilolejeunea* considering the real position of the hyaline papilla and the concept of the apical tooth in the genus. The taxonomic discussion was based on specialized literature, such as Mizutani (1961), Schuster (1980), He (1996), Zhu & So (1999), Zhu & Reiner-Drehwald (2004) and Zhu (2006).

The circumscription of the genus *Cheilolejeunea* is still controversial. Oil bodies are not exclusively of the *Calypogeia*-type, (some species have *Jungermannia*-types); some species present strongly mammillose, papillose cells or slightly mammillose cells. However, the position of the hyaline papilla related to the lobule structure seems to be more critical.

According to He (1996), the lobule tooth in Lejeuneaceae has been a significant character in the

taxonomy of the family. In Ptychanthoideae, the free margin bears 1-11 teeth, with the first or apical tooth situated near the lobule apex. In Lejeuneoideae, all genera of the tribe Brachiolejeuneae (except *Neurolejeunea*) share position of the lobule teeth with the Ptychanthoideae. In the remaining Lejeuneoideae, the free margin bears one or two lobule teeth, which are separated or rarely lightly associated (*e.g.*, *Trachylejeunea*) (He 1996). In some taxa, however, one or both lobule teeth can be reduced.

Most of the genera of Lejeuneaceae present lobules with a single 1-celled, well developed tooth, which is usually considered the first tooth; in this case, the second tooth is reduced and usually inconspicuous. In *Cheilolejeunea laevicalyx* (I. B. Jack & Steph.) Grolle, the first tooth is usually the most developed one (Zhu 2006). Nevertheless, in several species of *Cheilolejeunea* and *Leucolejeunea* A. Evans, as demonstrated by Mizutani (1961), the second tooth is well developed while the first tooth is reduced, obsolete or inconspicuous. The same can be observed in other related genera, such as *Aureolejeunea* R. M. Schust., *Omphalanthus* Lindenb. and *Oryzolejeunea* (R. M. Schust.) R. M. Schust.

He (1996) recognized two types of hyaline papilla position in Lejeuneaceae: hyaline papilla on the free margin, proximal to the first tooth (present in most of the taxa), and hyaline papilla on the inner side of the lobule, near the proximal base of the first tooth. Thus, the hyaline papilla is always proximal to the first tooth, when present. Upon this consideration, characters that

1. Universidade Federal da Bahia, Instituto de Biologia, Departamento de Botânica, Laboratório de Taxonomia de Briófitas, câmpus de Ondina, 40170-280 Salvador, BA, Brasil. cjbasto@ufba.br

limit *Cheilolejeunea*, as well as the related genera of the *Aureolejeunea-Omphalanthus* clade (Groth-Maloneck *et al.* 2004, tribe *Cheilolejeuneae* sense Schuster 2001) must be revalued. Therefore, one of the most important characters that circumscribes *Cheilolejeunea* is not the hyaline papilla position, but the presence of a well developed second tooth, since hyaline papilla is always distal to the second tooth and proximal to the first tooth. Nevertheless, in *Cheilolejeunea*, the hyaline papilla is always positioned exactly at the distal base of second tooth.

Recently, Zhu (2006) provided descriptions and illustrations for *Cheilolejeunea krakakammae* (Lindenb.) R. M. Schust. and *Cheilolejeunea laevicalyx* (J. B. Jack & Steph.) Grolle. Concerning to *Cheilolejeunea laevicalyx*, the hyaline papilla is situated at the proximal base of the first tooth, which is poorly developed, being the second tooth smaller. Its lobule resembles the one of *Lejeunea boliviensis* (Steph.) R. L. Zhu & E. Reiner (see Zhu & Reiner-Drehwald 2004).

The genus *Cheilolejeunea* may be better delimited by the following set of characters: a) second lobule tooth well developed, first lobule tooth obsolete or not developed; b) oil-bodies of the *Calypogeia*-type or *Jungermannia*-type; c) strongly or slightly mammillose cells, or strongly papillose cells on the dorsal leaf surface lobe; d) small lobule cells; e) lejeuneoid or pycnolejeuneoid innovations; f) rosettes on the spore surface.

Therefore, a revision of the genus *Cheilolejeunea* and its relatives (tribe *Cheilolejeuneae*, sense Schuster 2001) is urgently needed.

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