

# *Conocephalum salebrosum*: a new liverwort to the bryophyte flora of Bulgaria

Rayna Natcheva

Institute of Botany, Bulgarian Academy of Sciences, Acad. Georgi Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: renimoss@bio.bas.bg

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**Abstract.** *Conocephalum salebrosum* is reported as a new liverwort to the bryophyte flora of Bulgaria. A revision of the material of *Conocephalum* at SOM is presented, as well as comments on the ecology of *C. salebrosum* and *C. conicum* in Bulgaria.

**Key words:** bryophyte, Bulgaria, *Conocephalum conicum*, *Conocephalum salebrosum*, liverwort, new species

## Introduction

*Conocephalum salebrosum* Szwejkowski, Buczkowska & Odrzykoski (*Conocephalaceae*, *Marchantiophyta*) is a recently described species related to the widespread *C. conicum* (L.) Dumort. Initially, the two species were considered to be sibling species, having been distinguished only on a genetic basis (Odrzykoski 1987, 1995; Odrzykoski & Szwejkowski 1991). A detailed morphological study coupled with allozyme and DNA analyses, however, revealed that they are not only genetically distinct but also morphologically distinguishable (Szwejkowski & al. 2005). The current distribution of *C. salebrosum* is still poorly known. According to Szwejkowski & al. (2005), *C. salebrosum* is a holarctic species occurring in Europe, East Asia and North America. In Europe the species is found in Poland, Great Britain, Germany, Belgium, Norway, Sweden, Denmark, Luxembourg, the Czech Republic, Slovakia, the Ukraine, France, Switzerland, Austria, and Hungary. In the Balkans the species is known from two locations in Romania and one in Bosnia (Szwejkowski & al. 2005).

## Description

During field work in 2006 in Mt Vrachanska, Vratsa district, Bulgaria, a *Conocephalum* was found with

smaller thalli (ca. 3-6 cm long and 9-11 mm wide), dull-green surface, 4-5 rows of air chambers between the costa and the margin of the thallus, and uneven thallus surface (Fig. 1a) due to inserted air chamber walls (Fig. 2a). The plants were found at two sites. At one of the sites some thalli were fertile, bearing young archegoniophores. A closer examination of these plants revealed further characters typical for *C. salebrosum*: a narrow hyaline border of 1-2 rows of cells (Fig. 3a), and bulging outer cell walls (Fig. 2a). A typical *C. conicum* was also collected in Mt Vrachanska, growing along a river bank at lower elevation.

This finding was followed by a careful examination of the herbarium specimens labeled *C. conicum* in SOM (10 specimens) and of the author's personal gatherings (seven specimens) in search of other plants conforming to the description of *C. salebrosum*. After slow moistening, all specimens revealed the characters of typical *C. conicum*: shining and smooth thallus surface (the limits of the air chamber walls lying almost at the same level as the rest of the epidermis, and relatively flat outer cell walls, Figs 1b, 2b), 6-7 rows of air chambers between the costa and thallus margin, and hyaline thallus margin of 3-4 rows of cells (Fig. 3b). All gatherings are listed below and their locations are shown in Fig. 4. The literature-based distribution of *C. conicum* is al-

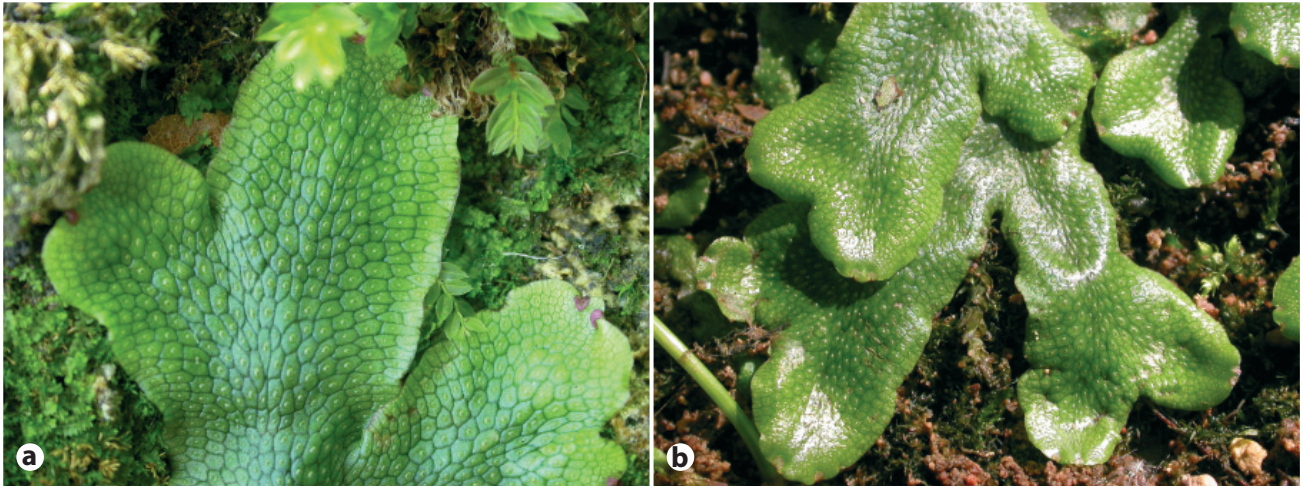


Fig. 1. General view of: **a** – *C. salebrosum*; **b** – *C. conicum*.

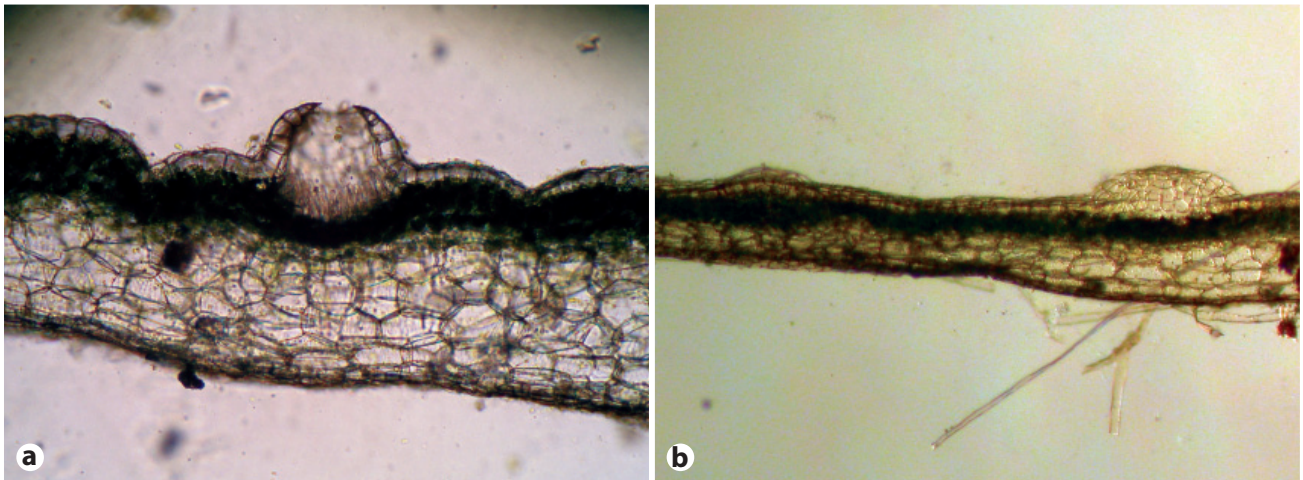


Fig. 2. Cross sections of the thalli of: **a** – *C. salebrosum*; **b** – *C. conicum*.

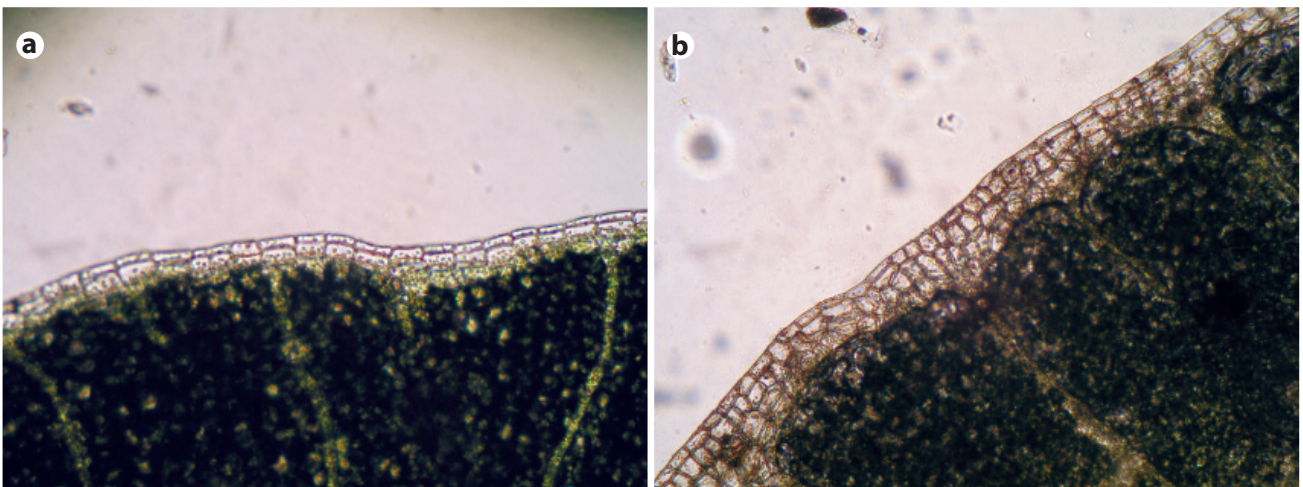
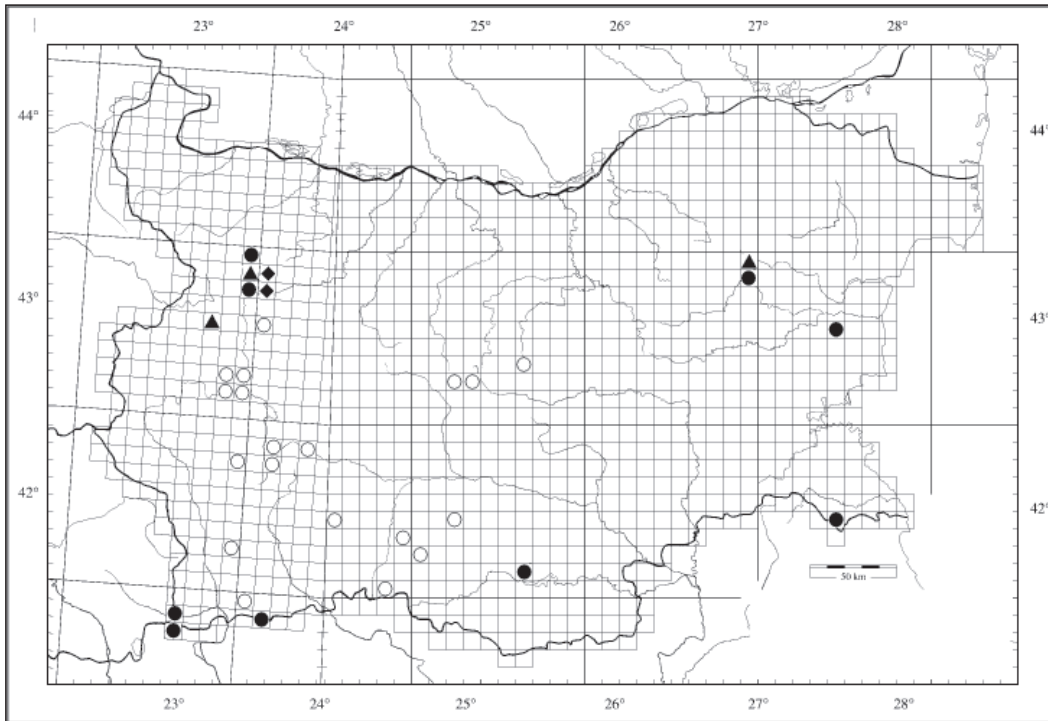


Fig. 3. Border area of the thalli of: **a** – *C. salebrosum*; **b** – *C. conicum*.



**Fig. 4.** Map of Bulgaria showing the distribution of *C. salebrosum* and *C. conicum*:  
 ○ – *C. conicum*, literature data;  
 ● – *C. conicum*, herbarium data;  
 ◆ – *C. salebrosum*;  
 ▼ – both species present.

so presented in Fig. 4 (Petkoff 1908; Arnaudoff 1909, 1911; Podpéra 1911; Szepesfalvi 1932; Ade & Koppe 1955; Petrov 1962a, b, 1963, 1966; Stefanoff & Petrov 1962; Kuc & al. 1965; Váňa & Duda 1965; Mickiewicz & al. 1966; Ganeva & Düll 1999; Natcheva 2003; Papp & al. 2006), but it has to be born in mind that some of the records are not supported by herbarium vouchers and, therefore, it is unclear which species the record refers to.

During the seasons 2007 and 2008, special attention was paid to all *Conocephalum* in the field. This revealed several additional locations of *C. salebrosum* in the Western Balkan Range (at the Lakatnik train station) and in Northeast Bulgaria (Shumen Plateau). It would be premature to draw conclusions regarding the ecology of *C. salebrosum* in Bulgaria only on the basis of a few gatherings. Nevertheless, it seems to be confined to slightly drier sites, with relatively irregular levels of air humidity as compared to *C. conicum*, as has been pointed out by Szweykowski & al. (2005). So far *C. salebrosum* has been found mostly on damp limestone and tufa rocks, in the lower mountainous areas (up to 1000–1200 m). In Bulgaria, *Conocephalum conicum* is common on both basic and acidic substrates in the mountainous areas, from ca. 500 m up to 2000 m, usually between 800–1800 m above the sea level. It could be expected that more locations of *C. salebrosum* will be found in the country, considering

that its close relative *C. conicum* is large and conspicuous, and therefore systematically underrecorded, having been considered usual and “uninteresting”.

#### List of examined specimens

*Conocephalum salebrosum*. **Northeast Bulgaria:** Shumen Plateau, Bigora locality, along river Poroyna, S of Shumen town, on damp calcareous soil in a humid ravine, *Carpinus betulus-Fagus sylvatica* forest, 346 m, 23.10.2007, coll./det. R. Natcheva (SOM B-9390); **Forebalkan:** Mt Vrachanska, at Borov Kamuk waterfall, Vratsa district, on damp shaded limestone rocks, 1087 m, 18.07.2006, coll./det. R. Natcheva (SOM B-9398, B-9399); Mt Vrachanska, between the roads to Parshevitsa loc. and Lyutadzhik village, on damp shaded calcareous rocks in a beech forest, 1186 m, 18.07.2006, coll./det. R. Natcheva (SOM B-9392); Mt Vrachanska, on calcareous stones and soil along river Krushova Bara, below peak Krushovitsa, along the road from Pavolche village to Vratsa town, 618 m, 15.08.2006, coll./det. R. Natcheva (SOM B-9391).

*Conocephalum conicum*: **Northeast Bulgaria:** Shumen Plateau, Harachiboaz locality, south of Shumen town, on damp calcareous soil in a humid ravine, in a *Carpinus betulus-Fagus sylvatica* forest, 293 m, 24.10.2007, coll./det. R. Natcheva (SOM B-9385); Shumen Plateau: Bigora locality, along river Poroy-

na, S of Shumen town, on damp calcareous soil in a humid ravine, *Carpinus betulus-Fagus sylvatica* forest, 346 m, 23.10.2007, *coll./det.* R. Natcheva (SOM B-9386); Shumen Plateau: in the Zandana (Biser-na) cave, S of Shumen town, on damp calcareous soil at a tufa spring, *C. betulus* forest, 406 m, 23.10.2007 (SOM B-9387); **Danubian Plain**: the valley of river Chernelka, close to Kapchuka tourists house, on wet soil on the riverbank, ca. 100 m, 27.03.2005, *coll./det.* R. Natcheva (SOM B-9248); **Forebalkan**: Mt Vrachanska, on calcareous stones and soil along a river SE of Dolno Ozirovo village, 304 m, 08.07.2006, *coll./det.* R. Natcheva (SOM B-9388); **Balkan Range (Western)**: at Skaklya waterfall at the Bov train station, on damp shaded calcareous soil along the river, ca. 600 m, 24.03.2005, *coll./det.* R. Natcheva (SOM B-8743); Lakatnik, along river Petra (right tributary of river Proboynitsa), on damp tufa rocks, 461 m, 16.09.2006, *coll./det.* R. Natcheva (SOM B-9389); **Balkan Range (Eastern)**: on damp calcareous rocks, 160 m, 18.07.1955, *coll./det.* S. Petrov (SOM B-76); **Mt Belasitsa**: along river Klyuch, 350 m, 21.03.1960 *coll./det.* S. Petrov (SOM B-81, B-82, B-83, B-84); **Mt Slavyanka**: along the road between Petrovo and Goleshovo villages, 14.03.03., *coll.* R. Natcheva & A. Ganeva, *det.* A. Ganeva (SOM B-8090); **Rhodopi Mts (Eastern)**: in the protected area of *Adiantum capillus-veneris*, S-SW of Kardzhali town, the valley of river Kyosh Dere, on wet tufa rocks, 250 m, 12.07.2008, *coll.* D. Ivanova, *det.* R. Natcheva (SOM B-9397); **Mt Strandzha**: along a river, 300 m, 02.07.1958, *coll./det.* S. Petrov (SOM B-77, B-78, B-79, B-80); along Rezovska river at Valchanov bridge, 27.07.2007, *coll.* Ch. Gushev, *det.* R. Natcheva (SOM B-9803).

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