

## ***Mallomonas actinoloma* var. *maramuresensis* (Synurophyceae) – a new species in algal flora of the Czech Republic**

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### ABSTRACT

The scale-bearing chrysophyte *Mallomonas actinoloma* Takahashi in Asmund & Takahashi var. *maramuresensis* Péterfi & Momeu was recorded for the first time in the Czech Republic. Distribution of the species is discussed.

**Keywords:** Chrysophytes, distribution, *Mallomonas actinoloma*, Synurophyceae

### INTRODUCTION

In 2000, the phycological research of the Sněžka Mt. (1602 m a.s.l.) and the Růžová hora Mt. (1390 m a.s.l.) in the Krkonoše Mts. was performed as a part of EIA (Environmental Impact Assessment), which was accomplished to evaluate the effect on the environment of a planned cableway construction to the top of the Sněžka Mt. Only few water biotopes, suitable for growth of algae, occurred in the area and the algal flora was poor. However, in one pool a rich population of silica-scaled chrysophyte *Mallomonas actinoloma* Takahashi in Asmund & Takahashi var. *maramuresensis* Péterfi & Momeu (Synurophyceae) was found. Rare scales of this species were also found two years later in an alluvial pool in Southern Bohemia.

### MATERIAL AND METHODS

The species in question was found in samples from two different biotopes:

1. Shallow moss-grown pool in the spring area of the Křížový potok creek on the slope of the Růžová hora Mt. in the Krkonoše Mts., at an altitude of about 1320 m; pH = 4.5, conductivity = 36  $\mu\text{S}\cdot\text{cm}^{-1}$ .

2. Pool "T2"; mesotrophic to eutrophic alluvial pool in the floodplain of the Lužnice river, at an altitude of about 460 m; pH = 6.7, conductivity = 208  $\mu\text{S}\cdot\text{cm}^{-1}$ .

The sample from the Krkonoše Mts. was obtained by collecting water and surface sediments and by squeezing submerged mosses as well. The sample from alluvial pool was collected by a plankton net. Both samples were oxidised in peroxide and prepared for transmission electron microscopy (for detail methodology see Kalina et al., 2000). The grids were examined with the transmission electron microscope Phillips 300.

## OBSERVATIONS

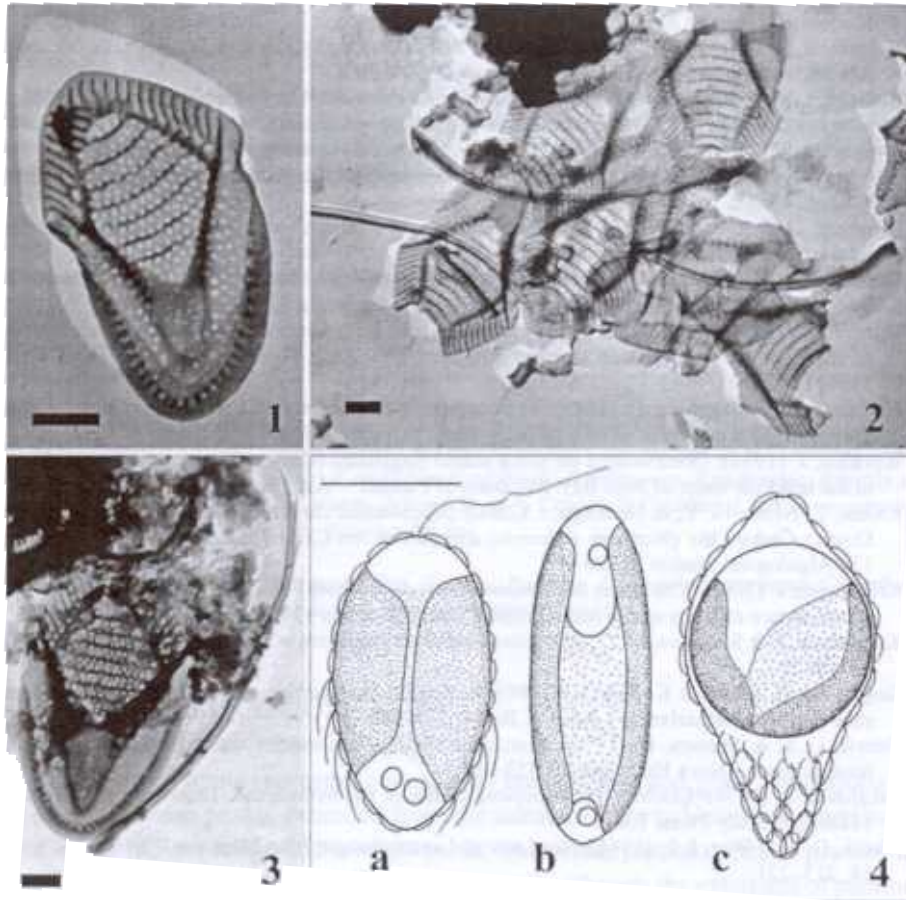
The scales of *Mallomonas actinoloma* (Figs. 1–3) are broadly suboval, with lateral incurvings on both sides, and sometimes asymmetric. The shield of var. *maramuresensis* is marked with 5–10 transverse ribs in addition to rows of pores typical for var. *actinoloma*. Another difference between varieties are broader anterior wings ornamented with more closely spaced struts in var. *maramuresensis*. Slightly curved bristles are smooth (Fig. 2) or serrated (Fig. 3). Found scales fit well with the original description of *Mallomonas actinoloma* var. *maramuresensis*.

The cells from the Krkonoše Mts. observed in a light microscope (Fig. 4) were ellipsoidal to cylindrical, 20–26 mm long and 8–11 mm broad. The cyst was spherical and smooth, about 13 mm in diameter, in contrast to Péterfi & Momeu (1976) who observed ellipsoidal cyst with dimensions 19×10 mm.

## DISCUSSION

*Mallomonas actinoloma* is distributed worldwide. However, the three varieties have different distribution patterns. The nominal variety and var. *maramuresensis* are both northern temperate distribution types (Kristiansen, 2002). The var. *actinoloma* was recorded sparsely in Japan (e.g. Asmund & Takahashi, 1969; Takahashi, 1978) and USA (Asmund & Takahashi, 1969; Wujek & Wee, 1984). It was recorded just once in Europe so far (Roijackers & Kessels, 1986). On the other hand, var. *maramuresensis* seems to have the centre of its distribution in Europe. It was reported in Romania (Péterfi & Momeu, 1976), central Russia (Balonov & Kuzmin, 1975; Balonov, 1978; both originally identified as *Mallomonas striata* Asmund), Sweden (Cronberg & Kristiansen, 1980), the Netherlands (Roijackers & Kessels, 1986), Germany (Hartmann & Steinberg, 1989), Finland (Ikävalko, 1994) and Bulgaria (Kristiansen & Stoyneva, 1998). However, it was also found in Japan (Takahashi, 1978; originally determined as var. *actinoloma*). The var. *nadiensis* was recorded only in Chile (Dürschmidt, 1980, 1982).

Although the species has not been reported frequently, it has been found in a wide range of ecological conditions, from bogs and oligotrophic high-mountain lakes (Péterfi & Momeu, 1976; Kristiansen & Stoyneva, 1998) to eutrophic lakes (Cronberg & Kristiansen, 1980; Hartmann & Steinberg, 1989; Kristiansen & Stoyneva, 1998). Thus the occurrence of *M. actinoloma* var. *maramuresensis* in the Czech Republic in two ecologically different biotopes is consistent with previous findings.



**Figs. 1–4.** *Mallomonas actinoloma* var. *maramuresensis*. Fig. 1: Domeless scale. Fig. 2: Scales and smooth bristles. Fig. 3: Scale and serrated bristle. Figs. 4a, 4b: Live cells under LM. Fig. 4c: Cyst in a scale-armour under LM. (Bar in Figs. 1–3 = 0.5  $\mu$ m, bar in fig. 4 = 10  $\mu$ m. Specimens in Figs. 1, 2, 4 are from the Krkonoše Mts., specimen in Fig. 3 is from the Lužnice pool.)

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