

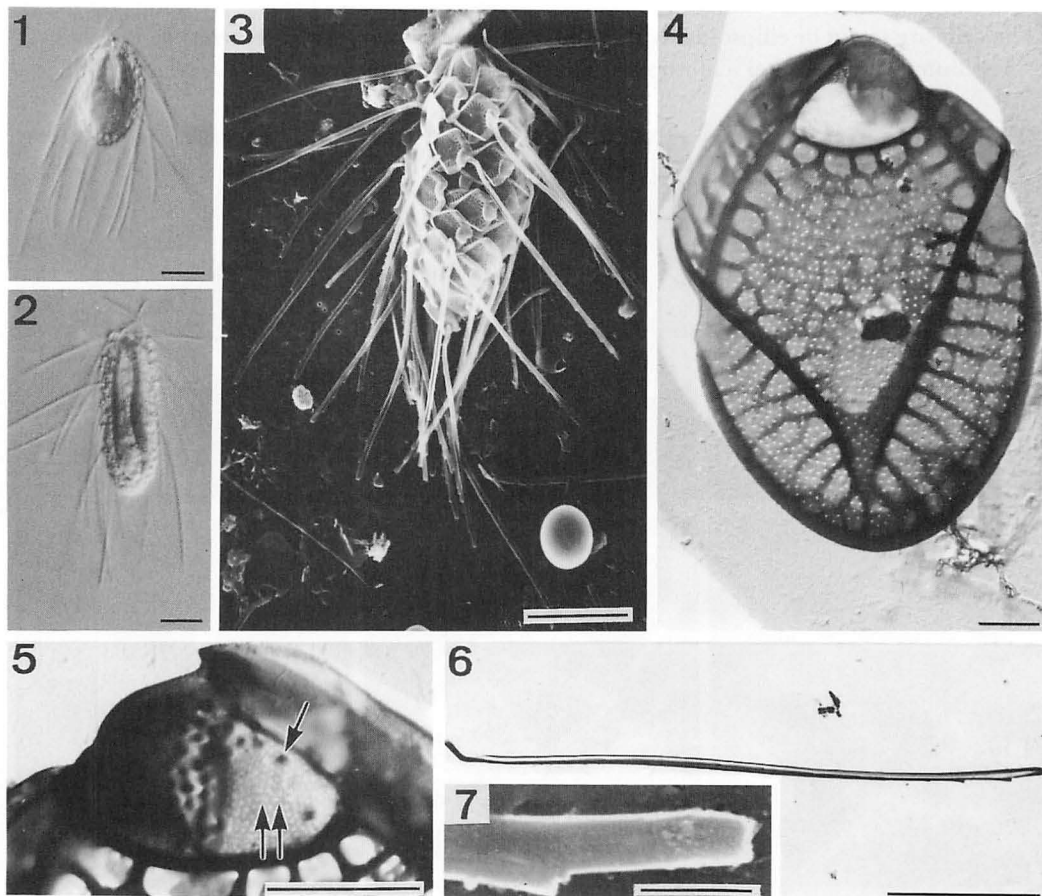
## Hiroyuki Ito: Chrysophytes in the southern part of Hyogo Prefecture, Japan (III) A new variety, *Mallomonas acaroides* var. *obtusa* (Synurophyceae, Mallomonadaceae)

*Key Index Words:* Hyogo Prefecture—Mallomonadaceae—*Mallomonas acaroides* var. *obtusa*—new variety—Synurophyceae.

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In Japan, *Mallomonas acaroides* Perty var. *acaroides* has been found in six lakes and ponds (Takahashi 1978; Ito 1988). A taxon different from the type variety occurs in Yasu-

ba-ike Pond and Sengari Reservoir located in the southern part of Hyogo Prefecture (Ito 1991). It is described below as a new variety of *Mallomonas acaroides*.



Figs. 1-7. *Mallomonas acaroides* var. *obtusa*. Figs. 1, 2. Whole cell (light microscopy). Fig. 3. Holotype, whole cell (scanning electron microscopy: SEM). Fig. 4. Scale (transmission electron microscopy: TEM). Fig. 5. Detail of dome with papillae (arrow) and a patch of minute pores (double arrow) (TEM). Fig. 6. Bristle (TEM). Fig. 7. Apex of bristle (SEM). Scale bar: 10  $\mu$ m for Figs. 1-3 and 6; 1  $\mu$ m for Figs. 4, 5, 7.

*Mallomonas acaroides* Perty var. *obtusa* var. nov.

A var. *acaroides* differt apicibus setarum obtusis et limbis anterioribus squamarum latis.

Dimensio cellulae: 21-44 × 11-21 μm; flagella: 11-19 μm; squamae: 7.4-9.5 × 5.7-7.3 μm; setae: 16.1-42.2 μm.

Holotype, Fig. 3; material collected February 5, 1982 from Yasuba-ike Pond, Takarazuka City, Hyogo Prefecture, Japan (No. 820205Y); deposited in Water Quality Laboratory, Kobe City Waterworks Bureau.

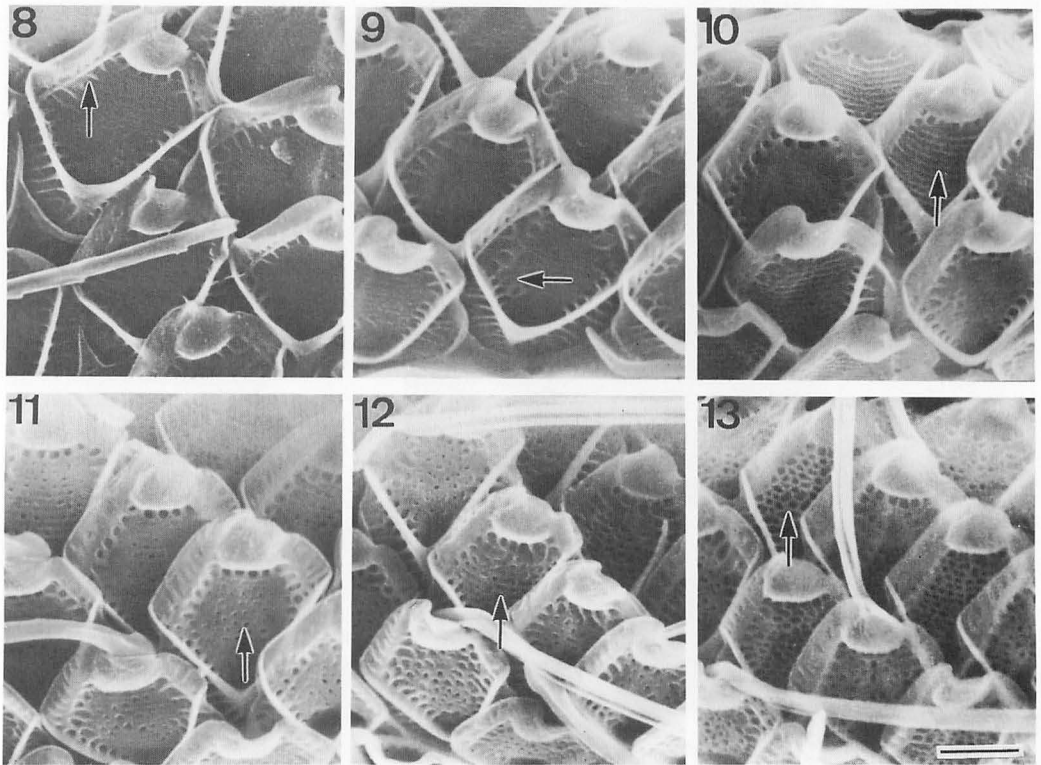
The epithet of the variety refers to the blunt tipped bristle.

*M. acaroides* var. *obtusa* differs from the type variety in having blunt tipped bristles and scales with broad anterior flanges.

The cells are ovoid or ellipsoidal with a single flagellum, one parietal chloroplast and

two posteriorly located contractile vacuoles. The cells are covered with scales; there are short bristles on the anterior part and long ones on the posterior part (Figs. 1-3). The scales are tripartite and oval. The dome has papillae and a patch of minute pores (Fig. 5). The pores of the base plate are irregularly scattered or arranged in transverse rows (Fig. 4). The shield is reticulated (Fig. 4). The anterior flange is broad, wing-like, with struts. The posterior flange also has struts. The proximal border is narrow (Fig. 4). Blunt tipped bristles are slightly curved and have 3-8 teeth in the distal half part (Figs. 6, 7).

Five varieties of *Mallomonas acaroides* have been reported (Harris and Bradley 1960, Fott 1962, Nicholls 1987). Among these, *M. acaroides* var. *galeata* Harris et Bradley, *M. acaroides* var. *striatula* Asmund and *M.*



Figs. 8-13. Variations in the shield ornamentation of scales of *Mallomonas acaroides* var. *obtusa* collected from Yasuba-ike Pond (SEM). Figs. 8, 9. Shield marked with struts and rudimentary reticulation (arrow) in addition to struts. Figs. 10, 11. Shield with weakly developed reticulation (arrow). Figs. 12, 13. Shield with well-developed reticulation (arrow). Scale bar (3 μm) in Fig. 13 applies to all figures.

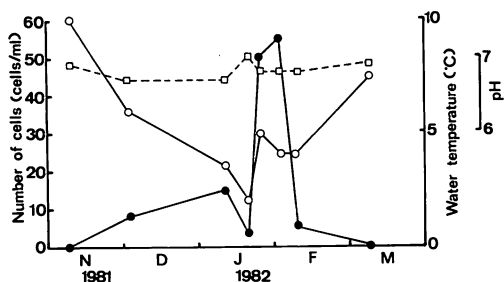


Fig. 14. Fluctuations of *Mallomonas acaroides* var. *obtusa* in Yasuba-ike Pond from November 1981 to March 1982 (solid circle), in relation to changes in surface water temperature (open circle) and pH values (open square).

*acaroides* var. *echinospora* (Nygaard) Fott are considered to fall in the variation range of var. *acaroides* (Asmund and Kristiansen 1986), and *M. acaroides* var. *inermis* Fott and *M. acaroides* var. *muskokana* Nicholls are presently recognized as taxonomic entities. *M. acaroides* var. *acaroides* often has helmet bristles, but populations consisting of cells which possess only serrated bristles have also been reported (Asmund and Kristiansen 1986). The serrated bristles of var. *acaroides* have well-developed teeth along their whole lengths and acutely pointed apices. The serrated bristles of var. *inermis* and var. *muskokana* are basically the same as those of var. *acaroides* (Fott 1962, Nicholls 1987). In contrast to these three taxa, *M. acaroides* var. *obtusa* has only serrated bristles with short teeth on the distal half part, and also has blunt apices.

Scales of *M. acaroides* var. *obtusa* collected from Yasuba-ike Pond have morphological variations of shield ornamentation. In most cells collected on December 2, 1981 and January 11, 1982, the shield was marked only with struts or rudimentary reticulation in addition to struts (Figs. 8, 9). The reticulation of the shield was weakly developed in scales of cells collected on January 20 and 25 (Figs. 10, 11), and it was well-developed in cells collected on February 5, when the maximum density was recorded (Figs. 12, 13). Such variations have

also been observed in scales of *M. acaroides* var. *acaroides*, and it is known that the shield ornamentation of scale varies within single specimens as well as between populations (Asmund and Kristiansen 1986). The reticulum of scales is rudimentary or absent in some populations, and well-developed in others (Asmund and Kristiansen 1986). Though scale variation of *M. acaroides* var. *obtusa* is within that of *M. acaroides* var. *acaroides*, it is different from the type, var. *inermis* and var. *muskokana* in having scales with the broad anterior flanges. The taxon is therefore designated as a new variety of *M. acaroides*.

In Yasuba-ike Pond, *M. acaroides* var. *obtusa* appeared from December 2, 1981 to February 8, 1982, ranging in density from 3 to 55 cells/ml. The fluctuation is shown in Fig. 14 together with the pH and water temperature. A few scales were found in Sengari Reservoir in April and August 1982 and in January and February 1983.

The author thanks Dr. J. Kristiansen (Copenhagen University) and Dr. E. Takahashi (Yamagata University) for their helpful advice and reading of the manuscript.

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伊藤裕之：兵庫県南部産黄金藻（Ⅲ）シヌラ藻綱マロモナス科の新変種：

*Mallomonas acaroides* var. *obtusa*

兵庫県南部に位置する安場池と千刈貯水池から出現した新変種 *Mallomonas acaroides* var. *obtusa* を記載した。本変種は先端が尖っていない剛刺と広い前部縁辺部のある鱗片をもつことで *M. acaroides* var. *acaroides* とは異なる。

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