

**Hiroyuki Ito and Eiji Takahashi: Chrysophytes in the southern part
of Hyogo Prefecture, Japan (IV) Two new species,
Spiniferomonas hamata and *S. nichollsii*
(Chrysophyceae, Paraphysomonadaceae)**

Key Index Words: Chrysophyceae—Hyogo Prefecture—new species—Paraphysomonadaceae—Spiniferomonas hamata—Spiniferomonas nichollsii—taxonomy.

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Fourteen freshwater species have been described in the genus *Spiniferomonas* Takahashi (1973) (Siver 1988, Kristiansen and Tong 1989, Nicholls 1989). In Japan, eleven species and two undescribed taxa of *Spiniferomonas* have been identified by electron microscopy (Takahashi 1973, Preisig and Takahashi 1978, Ito and Takahashi 1982, Ito 1988, 1990). These two previously reported undescribed taxa in Ito (1990) are formally described as new species.

Water samples were collected from Doro-ike Pond and Yasuba-ike Pond. Detailed descriptions of these ponds and procedures of sample collection, preparation and examination were given in a previous paper (Ito 1990). The cell number per ml of *Spiniferomonas hamata* was estimated by the methods of Ito and Takahashi (1982).

Spiniferomonas hamata sp. nov.

Cellulae sphaeroides, 5-7 μm diametro, squamis et spinis tectae. Squamae elliptis, 1.3-1.7 \times 0.9-1.3 μm , una lacuna elliptica, cum vel sine spicula in labro lacunae. Squamae spina, 3.2-4.0 μm longae, spiculo carinato quod flacans foras in 1/3 parte terminale dimidiata ad formantas tres apices; apex longissimum terminans in apicem infractum. Cystae ignotae. Holotypus: Fig. 1.

LECTA ab H. Ito in stagno Doro-ike in monte Rokko, Praef. Hyogo, Japonia (March 26, 1976).

Cells spherical, 5-7 μm in diameter, covered with plate scales and spine scales (Fig.

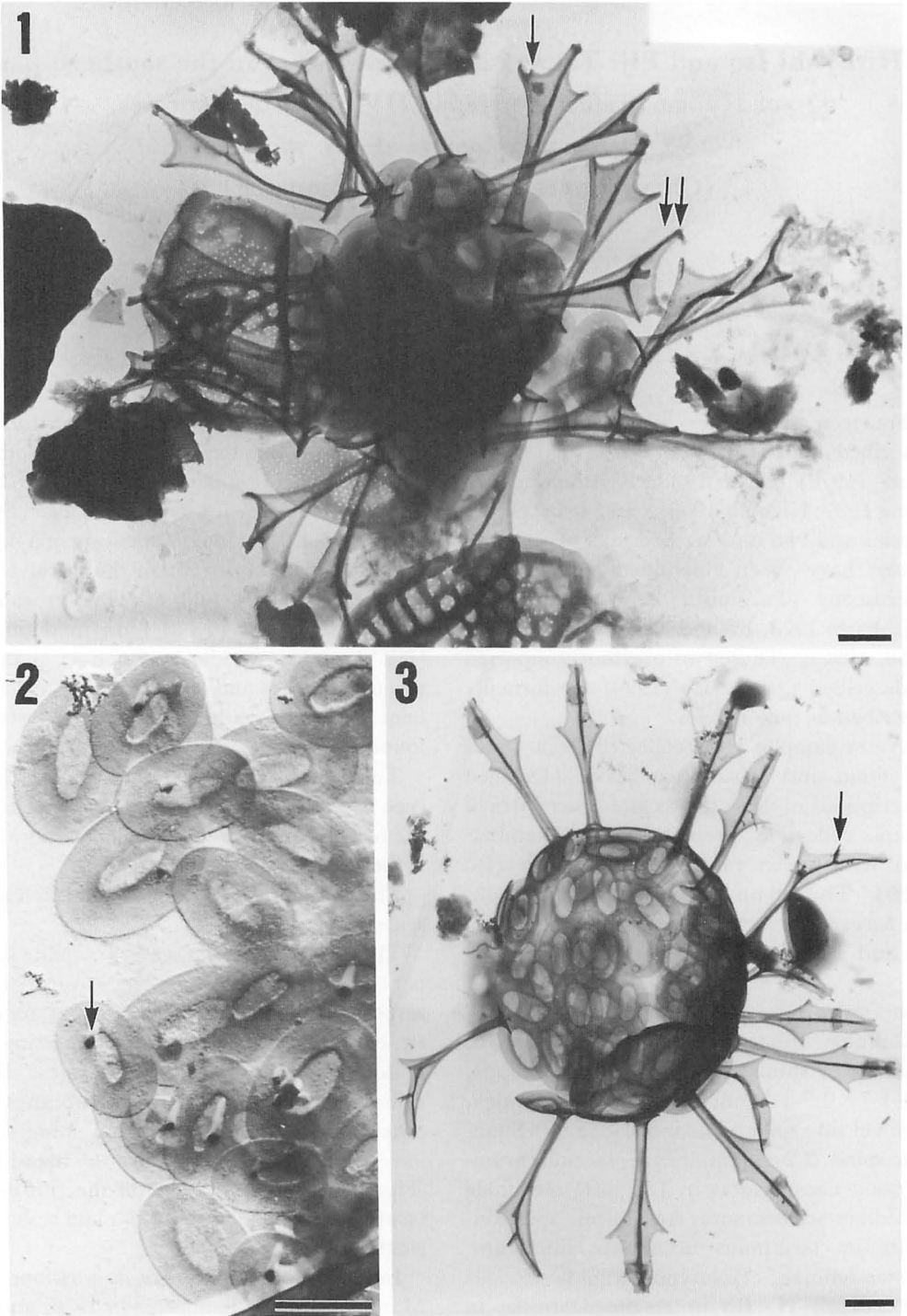
1). Plate scales elliptical with a centrally located single elliptical lacuna and with or without a minute spike on the rim of the lacuna, 1.3-1.7 \times 0.9-1.3 μm (Fig. 2). Spine scales, 3.2-4.0 μm long, consisting of a keeled shaft that flares outward in the distal 1/3 to form three apices and a plane or saucer-shaped basal disc (0.7-0.8 μm in diameter) (Fig. 1). The middle apex longer than the two other apices and terminating in a sharply bent tip forming a hook (Fig. 1). Cysts not found.

The fixed water sample that contains holotype specimen (No. 760326D) is deposited in the herbarium of Water Quality Laboratory, Kobe City Waterworks Bureau.

The epithet refers to a hooked apex of spine scale.

The number of spine scales and plate scales per cell varies from 15 to 22 and from 40 to 60 respectively. Almost all spine scales are constructed by two membranes connecting the middle ridge with the two other ridges. But a spine scale possessing three membranes was observed once (Fig. 1). Some spine scales have a tooth on the margin of the membrane (Fig. 1). A minute spike on the rim of the lacuna occurs in 10 to 40% of plate scales of a single cell.

In Doro-ike Pond, *S. hamata* was found on March 26 and September 24 in 1976, and the density was 59 and 3 cells/ml respectively. In Yasuba-ike Pond, the species was found on January 6, 1981 and the density was 25 cells/ml.



Figs. 1 & 2. *Spiniferomonas hamata* sp. nov.. 1. Whole mount cell. Arrow shows a tooth on the margin of membrane connecting ribs of spine scale and double arrows show a spine scale with three membranes. Holotype. 2. Scales. Arrow shows a minute spike on the rim of the lacuna. Figs. 3. *Spiniferomonas nichollsi* sp. nov., whole mount cell. Arrow shows the rectangular plate. Holotype. Scale bar = 1 μ m.

Spiniferomonas nichollsii sp. nov.

Cellulae sphaeroides, 5–6 μm diametro, squamis et spinis tectae. Squamae elliptis, 1.0–1.5 \times 0.7–1.0 μm , uno lacuna elliptica. Squamae spina, 2.9–4.0 μm longae, e spiculo carinato quod flacans foras in 2/5 parte terminale dimidiata ad formantas tres apices et e discis basalibus planis vel leviter cavatis, 0.6–0.7 μm diametro, compositae. Apex longissimus lingui formi et truncato, e membrana lata lateralis et membrana rectangulata ad centrum, 0.3–0.4 μm alta, constructo. Cystae ignotae. Holotypus: Fig. 3.

Lecta ab H. Ito in stagno Doro-ike in monte Rokko, Praef. Hyogo, Japonia (June 24, 1977).

Cells spherical, 5–6 μm in diameter, covered with plate scales and spine scales (Fig. 3). Plate scales elliptical with a centrally located single elliptical lacuna, 1.0–1.5 \times 0.7–1.0 μm . Spine scales, 2.9–4.0 μm long, consisting of a keeled shaft that flares outward in the distal 2/5 to form three apices and a plane or saucer-shaped basal disc (0.6–0.7 μm in diameter). The middle apex much longer than the two other apices, truncated tongue-form, with broad membrane at both sides and a rectangular plate at central portion (Fig. 3). The rectangular plate has one or two hollows on the upper margin. Cysts not found.

The fixed water sample that contains holotype specimen (No. 770624D) is deposited in the herbarium of Water Quality Laboratory, Kobe City Waterworks Bureau.

The epithet is given in honor of Kenneth H. Nicholls.

The number of spine scales and plate scales per cell varies from 13 to 15 and from 50 to 70 respectively. No variations in the shape of plate and spine scales have been observed.

In Doro-ike Pond, *S. nichollsii* was found on June 24 and July 8 in 1977.

Fourteen species of *Spiniferomonas* have been classified into seven morphological groups

(Group A–D, F–H) (Siver 1988, Kristiansen and Tong 1989, Nicholls 1989). Both *S. hamata* and *S. nichollsii* are assigned to the group C, together with *S. takahashii* and *S. alata*. The group C is characterized by one type of plate scale with a single lacuna and triangular spine scales with flared distal portion. *S. hamata* differs from *S. takahashii* and *S. alata* in having plate scales with one spike and spine scales with a hooked apex, and *S. nichollsii* differs from these two species in having spine scales with one rectangular plate.

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伊藤裕之*・高橋永治**：兵庫県南部産黄金藻（Ⅳ）2新種 *Spiniferomonas hamata* と
S. nichollsii（黄金藻綱，パラピソモナス科）

兵庫県南部にある泥池と安場池から見出された2新種 *Spiniferomonas hamata* と *S. nichollsii* を記載した。両種は1つのくぼみのある板鱗片と外側に張り出した翼をもつ三角形の刺鱗片をもつ群に含まれる。（*652 神戸市兵庫区楠谷町37-1 神戸市水道局水質試験所，**990 山形市小白川町1-4-12 山形大学理学部生物学科）