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Feeding Behavior of *Careproctus rastrinus* (Liparididae) in Captivity

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The feeding behavior of liparidid fishes is largely unknown with three exceptions, *Liparis inquilinus* Able (Able and Musick, 1976), *Liparis liparis* Linnaeus (Chernova, 1987), and *Careproctus reinhardti* Krøyer (Chernova, 1987). *Careproctus rastrinus* Gilbert et Burke is a demersal fish inhabiting the continental shelf and slope, and is known from waters around northern Japan and the Okhotsk Sea at depths of 100 to 582 m (Kido, 1988). In 1985, we maintained *C. rastrinus* in aquaria at Asamushi Aquarium, Aomori, Japan, throughout the year. In the following we describe the feeding behavior observed in the aquaria during April through June, with comments on the existence and use of taste organs in *C. rastrinus*.

Materials and methods

During March to April in 1985, 9 individuals of *C. rastinus* (20–30 cm in total length) were captured using shrimp traps at depths of 200 to 400 m in Funka Bay, Hokkaido and transported to Asamushi Aquarium, Aomori prefecture. In the aquarium, they were held in a large cubic tank with an acrylic glass window (2×2 m in width, 1.5 m in depth, 6,000 liters in volume), which had a half-closed recirculating and filtering system, i.e., a little seawater was continually flowing out of the tank for the purpose of maintaining good seawater quality. Water temperatures were kept at 6 to 12°C throughout the year by a cooling unit. A regime of 13 h light and 11 h dark was maintained during the observed period from April to June, with the light phase commencing at 0700 h, but the intensity of illumination and salinity were not measured. The fish were fed only during daytime, foods used being krill, *Euphausia superba*, and fillets of arabesque greenling, *Pleurogrammus azonus*. Feeding behavior was observed in daytime through the acrytic glass window (1.8×1.2 m), that allowed viewing of the entire tank, and recorded with a motor drive and manual camera. A strobe light was set for 2–3 second intervals.

Two individuals of 25 and 30 cm in total length were used for histological examination of taste organs. Histological preparations of skin and fins were stained with hematoxylin and eosin following fixation in Bouin's fluid. The number of taste buds was counted in a 5 mm^2 cross section (5×1 mm).

Results

Feeding behavior. In captivity, when off the bottom, *C. rastrinus* swam slowly, undulating the body, rowing the upper lobe of the pectoral fins and drawing the lower lobe inwards. The fish ate food when it touched around the mouth. Near the bottom, the fish usually moved with the head down (Fig. 1). When searching for food on the substrate, they spread the upper lobe of the pectoral fins and extended the lower lobe vertically toward the substrate (Fig. 1A, B). The tips of the seven or eight rays of the lower lobe touched the substrate, and the fish immediately sucked in food that was located in this manner (Fig. 1C, D).

Histology. The pectoral fin, both jaws, and parts of the head were examined histologically (Fig. 2). Taste buds were largely found in the epidermis of the tips of the rays in the lower lobe of the pectoral fins (Fig. 3A, B) and around the mouth (Fig. 3C). The taste buds were pear-shaped organs (Fig. 3D) as described by Sato (1937). They were more abundant on the lower lobe rays and the lower jaw than on the upper jaw and corner of the mouth (Fig. 2). They were not found dorsally on the head or in the pectoral fin notch (Fig. 2). On the lower pectoral fin lobe, the taste buds occurred distally on the anterior and posterior sides of each ray, but at the base they were distributed only on the anterior side.

Discussion

Able and Musick (1976) reported that *Liparis inquilinus* from the Mid-Atlantic Bight used the lower pectoral fin lobe rays to search for food, the same taste buds occurring on each ray. Chernova (1987) suggested that the same rays served as a sensory organ in *Careproctus reinhardti* from the Barents Sea. *C. rastrinus* uses the lower jaw and pectoral fin rays to feed on benthic food with the head oriented toward the bottom. This is probably the main natural feeding behavior of *C. rastrinus*.

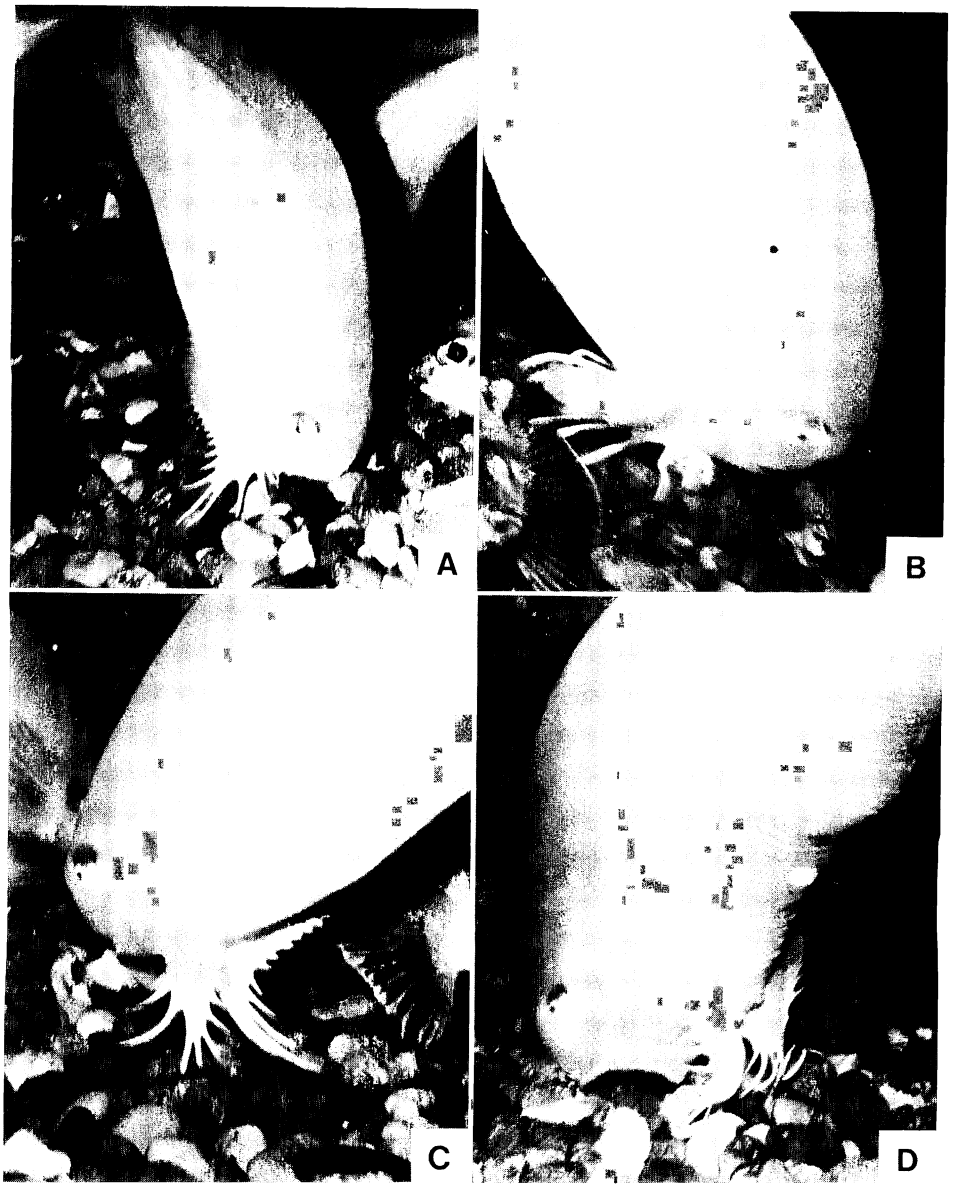

Fig. 1. Feeding behavior of *Careproctus rastrinus* in captivity. A and B: searching for food on the bottom; C: finding food by using the lower lobe of the pectoral fins; D: sucking in food.

Most liparidid fishes are demersal (Burke, 1930; Schmidt, 1950; Stein, 1978; etc.), and many deep-water liparidid fishes (e.g., species of the genera *Careproctus* and *Paraliparis*) have prolonged rays in the lower lobe of the pectoral fins. At least some of these fishes feed on benthic prey (Stein and Able, 1986). We would conclude that the feeding behavior of liparidid fishes in general might be similar to that of *C. rastrinus*.

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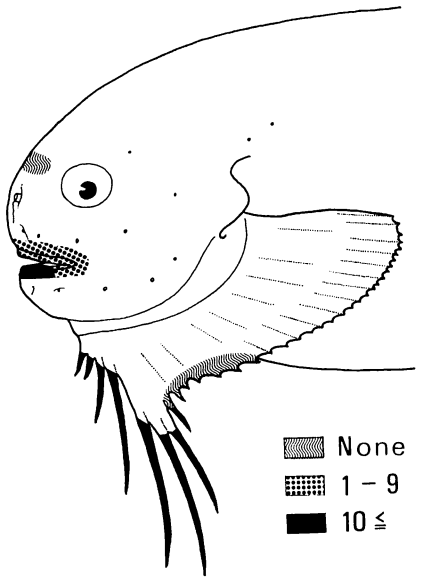

Fig. 2. The number of taste buds within 5 mm^2 (5×1 mm) cross sections of the skin and rays of *Careproctus rastrinus*.

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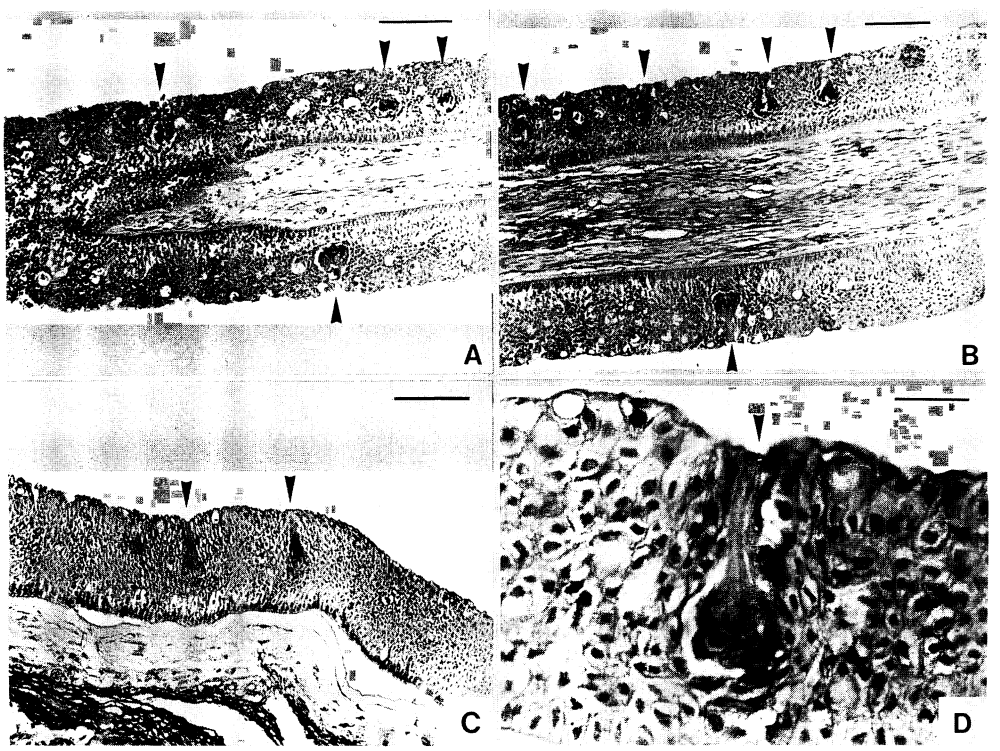

Fig. 3. Cross sections of the skin and rays of *Careproctus restrinus*. Arrows show taste buds. Scale bars indicate 100 μm (A–C) and 20 μm (D). A, tip of the longest ray in the lower lobe of the pectoral fin; B, middle portion of the same ray; C, lower lip; D, pear-shaped taste bud.

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飼育下におけるサケビクニン *Careproctus rastrinus* の摂餌行動

桜井泰憲・木戸　芳

オホーツク海および北海道から東北にかけての水深 100–400 m の陸棚上から陸棚斜面部に生息するクサウオ科のサケビクニンを，青森県営浅虫水族館の展示水槽にて長期飼育し，その摂餌行動を調べた．中層遊泳の際には，体全体を波打たせて泳ぐが，底層近くでは頭部を底に傾けた状態で遊泳する．特に，底の魚肉やオキアミなどの餌を探索する場合には，前傾姿勢に加えて胸鰭を体軸と平行に広げ，その欠刻部より前方の各鰭条は吻端近くに達し，しかも各鰭条の先端部を底に接触しながら移動する．この時，餌が鰭条に触れると，素早く吸い込むように捕食する．そこで，これらの鰭条と口部周辺の表皮の組織観察を行った結果，前方の胸鰭鰭条先端と下唇部に多数の皮膚味蕾の存在が認められ，これらが本種の餌の探索と摂餌行動に機能していることが明らかとなった．

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訂　正・Errata

魚類学雑誌39巻1号に下記の著者訂正があります．

Japanese Journal of Ichthyology, 39 (1), Sakurai and Kido: page 110, Material and methods, 5th line, Read Aomori Prefecture for Aomori prefecture; page 110, Discussion, 2nd-3rd lines, read "the rays of the lower pectoral fin lobe" for "the lower pectoral fin lobe rays."