

DESCRIPTION OF *NEOBRACHIELLA* SP.  
(COPEPODA, SIPHONOSTOMATOIDA, LERNAEOPODIDAE)  
PARASITIC IN THE BUCCAL CAVITY OF CALIFORNIA HALIBUT  
(*PARALICHTHYS CALIFORNICUS*)

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OPIS MORFOLOGICZNY *NEOBRACHIELLA* SP.  
(COPEPODA, SIPHONOSTOMATOIDA, LERNAEOPODIDAE)  
PASOŻYTUJĄCEJ W JAMIE GĘBOWEJ HALIBUTA KALIFORNIJSKIEGO  
(*PARALICHTHYS CALIFORNICUS*)

California halibut, *Paralichthys californicus* (AYRES, 1859) from off Southern California coast has been already surveyed for its crustacean parasites (WILSON 1921, 1935, CAUSEY 1960, Ho 1972). No representative of the genus *Neobrachchiella* has been found however. My recent findings (PIASECKI 1991) constitute the first record of *Neobrachchiella* on *P. californicus* and the present paper is the first description of the parasite found.

Another representative of the same host genus: *Paralichthys adspersus* (STEINDACHNER, 1867) from the south Pacific is known to harbour *Neobrachchiella paralichthyos* CASTRO et BAEZA, 1986.

The genus *Neobrachchiella* was established in 1979 by KABATA and it includes species being placed previously in the genus *Brachchiella*. Differences are based on the details, so many of the copepods must be re-examined to recognize their true taxonomic position. The most recent account was published by CASTRO and BAEZA (1987). They discussed broadly all the species known to be *Neobrachchiella* representatives. In the key provided in their paper, the females of the genus are divided into three groups, by the number of posterior processes they possess. Group I has two pairs, group II has one pair, and group III has more than two pairs of the processes. Since the appearance of the above mentioned article, some more redescrptions and descriptions of the new species of the genus have been published (RUBEC 1988, CASTRO and BAEZA 1989, KABATA 1990, LUQUE and FARFAN 1991, KABATA 1992).

Materials and methods

A single, non-ovigerous female was recovered from the mouth cavity of the California halibut, *P. californicus*. The single host fish was collected

on 12 September, 1989 in the entry canal to the Long Beach yacht port, by r/v Yellowfin, using an otter trawl. The fish measured 53.8 cm (total length).

The copepod was prepared for examination in Ocean Studies Institute at California State University, Long Beach, using the standard EM methods involving fixation in glutaraldehyde and postfixation in osmium tetroxide (T. DOUGLASS personal communication). Further preparations, like critical point drying and coating (carbon and gold palladium), were done in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. All possible details were observed using Hitachi 570 SEM, and documented on the micrographs. Some of the micrographs served as a source for line drawings.

Terminology used follows that proposed by KABATA (1979).

### Description

*Neobrachiella* sp. (Figs 1-10).

**Host:** *Paralichthys californicus* (AYRES, 1859).

**Locality:** Canal between Long Beach, CA and Seal Beach, CA, USA; 33°45'N; 118°07'W.

**Voucher specimen:** (USNM 257129), dehydrated non-ovigerous female deposited in National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA.

#### Description of the female:

Body compact (somewhat contracted in specimen examined). Total length, including posterior processes: 2.88 mm. Short massive, slightly compressed dorsoventrally cephalothorax, inclined at right angle towards ventral side (Fig. 1). Dorsal shield well developed (Fig. 2). Border between cephalothorax and genital trunk marked by constriction well pronounced on dorsal side, posterior to bases of second maxillae. Trunk oval, moderately elongated, bent dorsal (post-mortem feature of studied specimen), ending in two pairs of sub-conical, slightly inflated posterior processes (Figs 5, 6), with small genital process between them (Fig. 5). Ventral pair larger, with acuminate tips, dorsal pair with similar but much smaller tips (Fig. 6).

**First antenna** (Figs 3, 7) — indistinctly four-segmented, with well developed apical armature. Whip and solus not observed. Tip of the appendage occupied by five setae and three tubercles: flagelliform seta 6 with tubercle 3 at its base, digitiform seta 4 with tubercle 1 at its base. Complex 5 of three setae. Tubercle 2 present (not shown on Fig. 7).

**Second antenna** (Figs 8-10) — its sympod, prominent, heavily sclerotized, unsegmented, very broad at base, tapering gradually towards small rami (Fig. 2). Latter equall in length and apparently fused. Exopod aligned with long axis of sympod; endopod slightly deflected from it. Exopod one segmented,

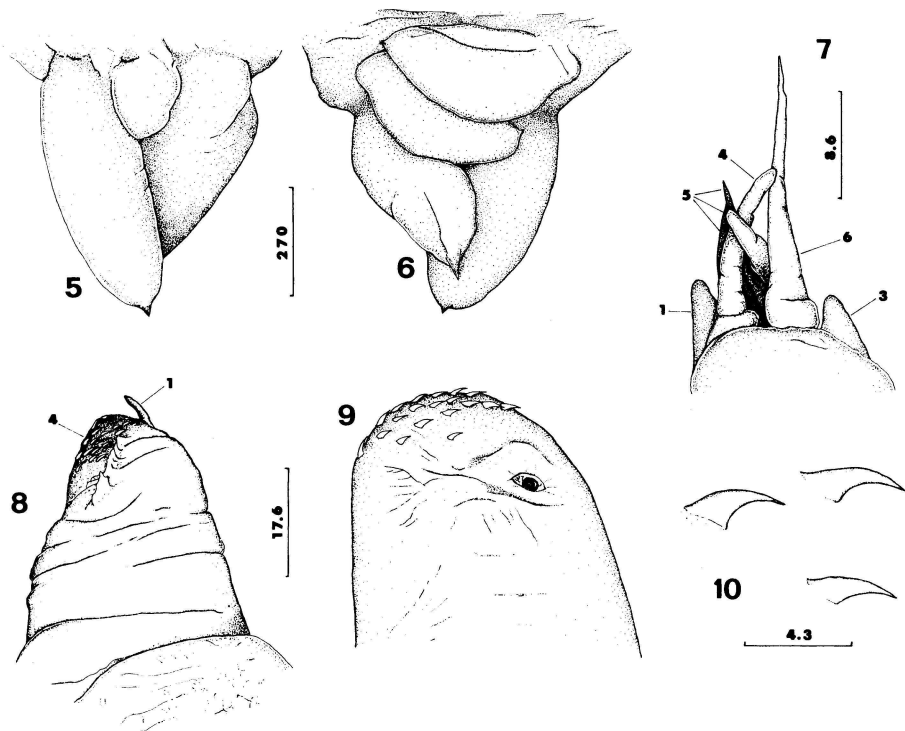


Figs 1-2. *Neobrachiella* sp., female. 1 — Entire, lateral; 2 — Cephalothorax, anterior



Figs 3-4. *Neobrachiella* sp., female. 3 — First antenna, ventral; 4 — Second maxilla, ventral





Figs 5-10. *Neobrachiella* sp., female.

- 5 — Ventral pair of posterior processes, and genital process, ventral;  
 6 — Both pairs of posterior processes, dorsal; 7 — Tip of first antenna, ventral;  
 8 — Endopod of second antenna, ventral; 9 — Exopod of second antenna, ventral;  
 10 — Falciform hooks (denticles) of exopod of second antenna. Scale bars in  $\mu\text{m}$

broad, bulbous, with distal part covered with at least twenty widely spaced, falciform, elongated, very sharp, outwards pointing denticles (Figs 9, 10). In central part of exopod's distal half, prominent, blunt denticle, only slightly protruding from cuticle (Fig. 9). Endopod indistinctly two-segmented, with only slightly curved, almost straight, small hook 1, and swelling 4 covered with densely packed falciform hooks (?) directed towards exopod (Fig. 8). Next to swelling, irregular cuticular ridge. Other possible apical elements not observed.

**Mandible, first maxilla** — not examined.

**Second maxilla** (Figs 1, 4) — short and thick, totally fused with opposite member. Tip expanded to form round marginal collar surrounding base of bulla. Latter broad, plano-convex with short manubrium, hidden totally in terminal concavity of second maxillae.

**Maxillipeds** anterior to second maxillae. Subchela with spiniform seta on lateral wall of basal part; other details not observed.

Male: Unknown.

### Discussion

No representative of the genus *Neobrachiella* has been hitherto described from California halibut. Among all the species known to possess two pairs of posterior processes, only two: *N. gracilis* (WILSON, 1908) and *N. hostilis* (HELLER, 1865), have the ventral pair longer than the dorsal pair. Both these copepods have been collected from fishes very distant phylogenetically from the present host. Some morphological differences also distinguish these two species from that described above. *N. gracilis* is more slender, with strongly elongated second maxillae and cephalothorax (YAMAGUTI 1963). *N. hostilis*, according to its most recent redescription (BEN HASSINE and RAIBAUT 1978) has the bases of its posterior processes distinctly apart, and exopod of its second antenna is armed with fewer and bigger spines of different shape.

The present description is based on SEM observations only and the drawings are based on SEM micrographs, which makes it exceptional among other contemporary descriptions of parasitic copepods. It resulted, however, from the fact that the specimen had been postfixed in osmium tetroxide before the present author realized it is worth special attention. The postfixation made it inaccessible for the light microscopy. Some details are insufficiently determined, and some further studies based on subsequent findings are required. Some morphological features of the copepod described in the present paper suggest that the parasite found on *Paralichthys californicus* has not been previously recorded and described from any other hosts. On the other hand it can not be declared a new species because the only specimen is not mature enough to have fully developed posterior processes, which constitute an important taxonomic feature of the genus.

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