Pacific Science (1977), vol. 31, no. 3

A New Species of *Peroderma* Heller (Caligoida: Lernaeoceridae), Parasitic on the Fish *Bregmaceros japonicus* Tanaka[1]

KUNIHIKO IZAWA[2]

ABSTRACT: Two female specimens of parasitic copepods found on the fish *Bregmaceros japonicus* Tanaka, taken on the Pacific coast of Japan, represent a new species, which is described under the name of *Peroderma pacifica* n. sp.

THE AUTHOR HAD THE OPPORTUNITY to study two female specimens of lernaeocerid copepods, each parasitic on an individual of the fish *Bregmaceros japonicus* Tanaka. The host fishes were collected on the Pacific coast of Japan by Dr. M. Okiyama in October 1968 and sent to Dr. S. M. Shiino for identification. The parasites were almost completely buried in the flesh of the hosts, only their posterior ends and egg sacs exposed to the exterior. This condition reminded the author of the situation in the monotypic genus *Peroderma* Heller 1865. Indeed, there were many characters in common with the type of this genus, *P. cylindricum* Heller, despite differences in general configuration of body and structure of appendages. It seemed that the parasites might be recognized as a new species of *Peroderma*.

Peroderma cylindricum Heller has been recorded (Brian 1912, Candeias 1952, Capart 1953, Nunes-Ruivo 1954) from various hosts and localities, such as *Sardina pilchardus* (Walb.) and *Englaulis encrasicholus* (L.) in the Mediterranean, *Sardinella eba* Cuv. et Val. in the Atlantic, and *Coilia dussumieri* Cuv. et Val. in Bombay. The hosts are all representatives of the Clupeidae and Englaulidae. This note represents the first record of the genus *Peroderma* from the Pacific, and the host is new to the genus.

The parasite was dissected from one of the two alcoholic host specimens and examined by immersing it in lactic acid.

Peroderma pacifica n. sp.

Material and Host

Two females with egg sacs parasitic on two individuals of *Bregmaceros japonicus* Tanaka (69 mm and 64 mm long) were found among the drift fishes on the beach at Orito, Simizu, Japan, by Dr. M. Okiyama on 28 October 1968. The specimen buried in the right side of a host (69 mm long) was selected as holotype and the other, from the left side of the other host (Figure 1) was designated the paratype. The type material will be deposited in the museum of the University of Mie.

Habitat

The parasite (Figure 2) buries itself almost entirely in the middle region of the host body near the base of the dorsal fin, penetrating the muscular tissue to the vertebral column. The head is closely surrounded by a cystlike host membrane and is applied at the ventral surface to the vertebrae and peritoneum. Only the posterior end and the egg sacs are exposed to the exterior.

Holotype

Female with egg sacs. Body (Figures 3, 4) elongate, plump; consisting of head and trunk as in *Peroderma cylindricum*. Length excluding egg sacs, 6.0 mm. Head, 1.5 mm long, 1.7 mm wide, 1.2 mm thick. Trunk inclusive of abdomen, 5.1 mm long on midline, 2.1 mm wide, 1.9 mm thick at the broadest portion across the anterior quarter of its length. Abdomen, 0.3 mm long, 0.7 mm wide at the base. Neck, 0.2 mm in diameter and attached to trunk about 1.3 mm behind

[1] Manuscript accepted 23 July 1976.
[2] Faculty of Fisheries, University of Mie, Tsu, Mie Prefecture, Japan.

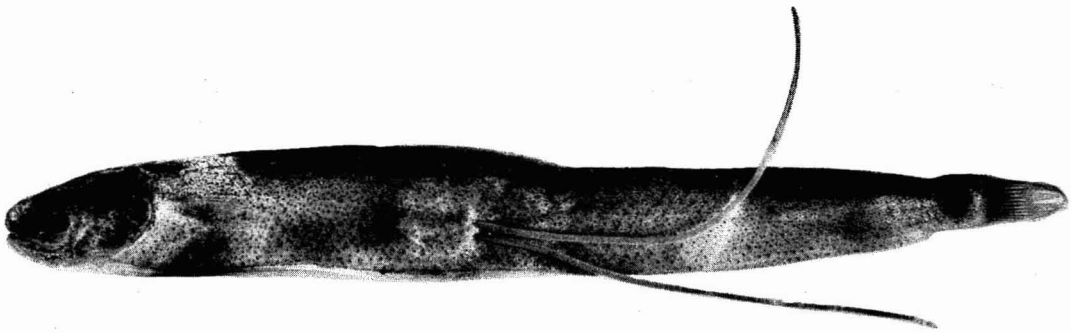


FIGURE 1. *Bregmaceros japonicus* Tanaka infected by *Peroderma pacifica* n. sp., body length 64 mm.

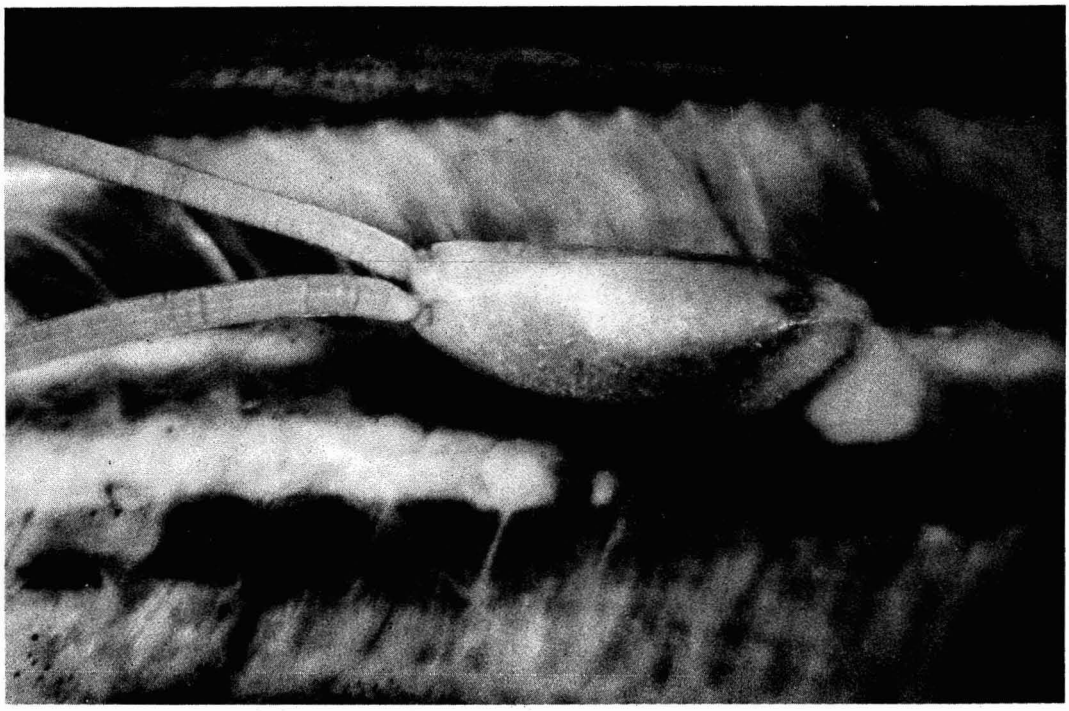
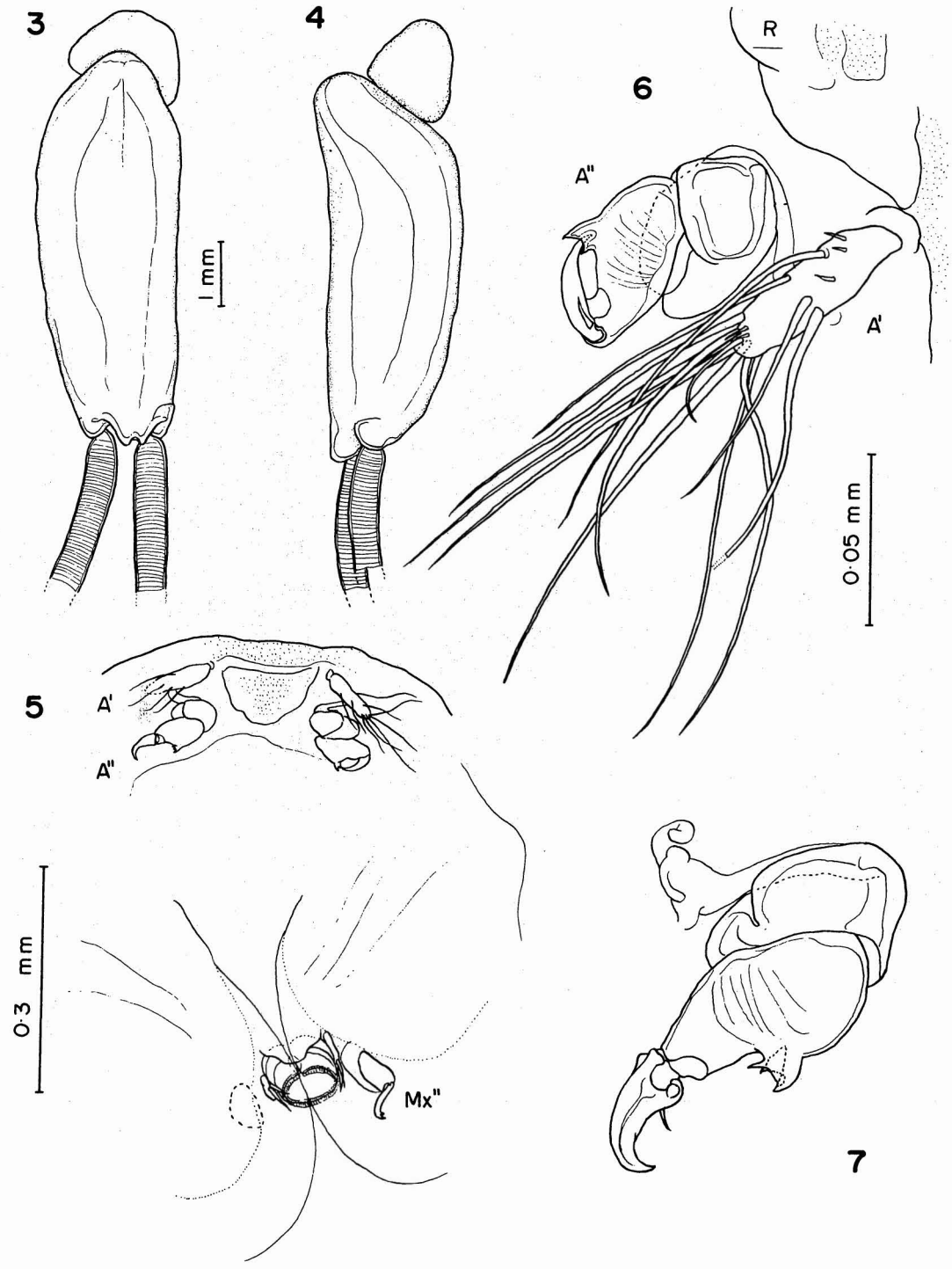


FIGURE 2. *Peroderma pacifica* n. sp. on the host with the flesh removed. Length of the parasite 6.0 mm.

the anterior end. Head and neck, whitish in alcohol; trunk, yellow-brown as a whole, but whitish at both extremities and on mid-dorsal surface; eggs, yellow. Eye discernible.

Cephalothorax globular, rounded dorsally, flattened ventrally, smooth on surface, and lacking processes. Cephalothorax with a rostrum and two pairs of antennae on the ventral face near the anterior margin. Mouth parts located about 0.5 mm behind the antennae. First two legs, 0.5 mm posterior to the month; third legs, 0.5 mm posterior to the first legs and near the postero-ventral border of cephalothorax. Sternal surface greatly swollen on either side of mouth parts forming a median groove in which the mouth parts are found (Figure 5). Neck obsolete, represented by a constriction between cephalothorax and trunk.

Trunk elongate, nearly cylindrical, more



FIGURES 3–7. *Peroderma pacifica* n. sp., female. 3. Body, dorsal view. 4. Same, lateral view. 5. Antennae and mouth parts in situ, ventral view. 6. First and second antennae in situ, ventral view. 7. Second antenna, ventral view, magnification same as in Figure 6. *A'*, first antenna; *A"*, second antenna; *Mx"*, second maxilla; *R*, rostrum.

or less flattened on dorsal side. Anterior quarter curved dorsally and tapering forward into a blunt end. Posterior gradually narrowing and terminating in a pair of ventro-lateral lobes and dorso-median abdomen. These lobes and abdomen, the only portions of the parasite exposed externally, have a thicker chitinous dermis than does the rest of body. Abdomen roughly triangular, with bilobed tip and without caudal ramus. Egg sacs attached to the depressions between abdomen and lateral lobes.

Rostrum semicircular, rounded on posterior margin. Surface of rostrum and cephalothorax finely granulated.

Two antennae just lateral to rostrum. First antenna (Figure 6) of one segment, rod-shaped, armed with about 16 long and short setae. Second antenna (Figures 6, 7) of three segments and subchelate; second segment furnished at the inner distal angle with a tricuspidate process having a central depression against which the terminal claw acts; terminal claw sickle-shaped, with a basal seta, and articulated with penultimate segment at its outer distal angle.

Mouth tube formed by lamellar labrum and cylindrical labium (Figure 8). Labrum armed with an oval distal plaque and a pair of stylets, both wrapped by labium (Figure 9). Labium fringed by a few membranous hems. Mandible unknown. First maxilla (Figure 10) biramous, situated just lateral to mouth tube; protopodite short, almost completely fused with the body wall at its broad base, and bearing a single seta; endopodite short, ending in two long, slender hairs; exopodite fusiform, somewhat longer than endopodite proper, and wrinkled on its surface. Second maxilla (Figure 11) of three segments, situated postero-laterally to mouth tube; first segment largest and broadest; second slender; third short, forked into longer inner and shorter outer claws, and carrying a striated membrane close to the bases.

First two pairs of legs (Figure 12) biramous, subequal in size and structure, and composed of protopodite of two segments and rami of two segments. Protopodite of first leg broad and provided with two plumose setae, one at outer distal angle and the other at inner distal angle. First exopodite segment armed with a tiny, outer distal spinule and an inner plumose seta; second segment fringed by five long plumose setae and two tiny outer spinules. First endopodite segment unarmed; second segment equipped with four plumose, inner setae and three, shorter, simple spines. Protopodite of second leg carrying a plumose seta only at outer distal angle; as in first leg, except that the two outer spinules of second segment are longer and stouter. Endopodite also as in first leg, the inner three setae longer and plumose.

Third leg (Figure 13) uniramous, consisting of protopodite of two segments and ramus of two segments; except for six feeble, apical spines, each segment unarmed.

Egg sac not coiled, 25 mm long, 0.5 mm wide, containing about 1400 uniseriate eggs.

Male

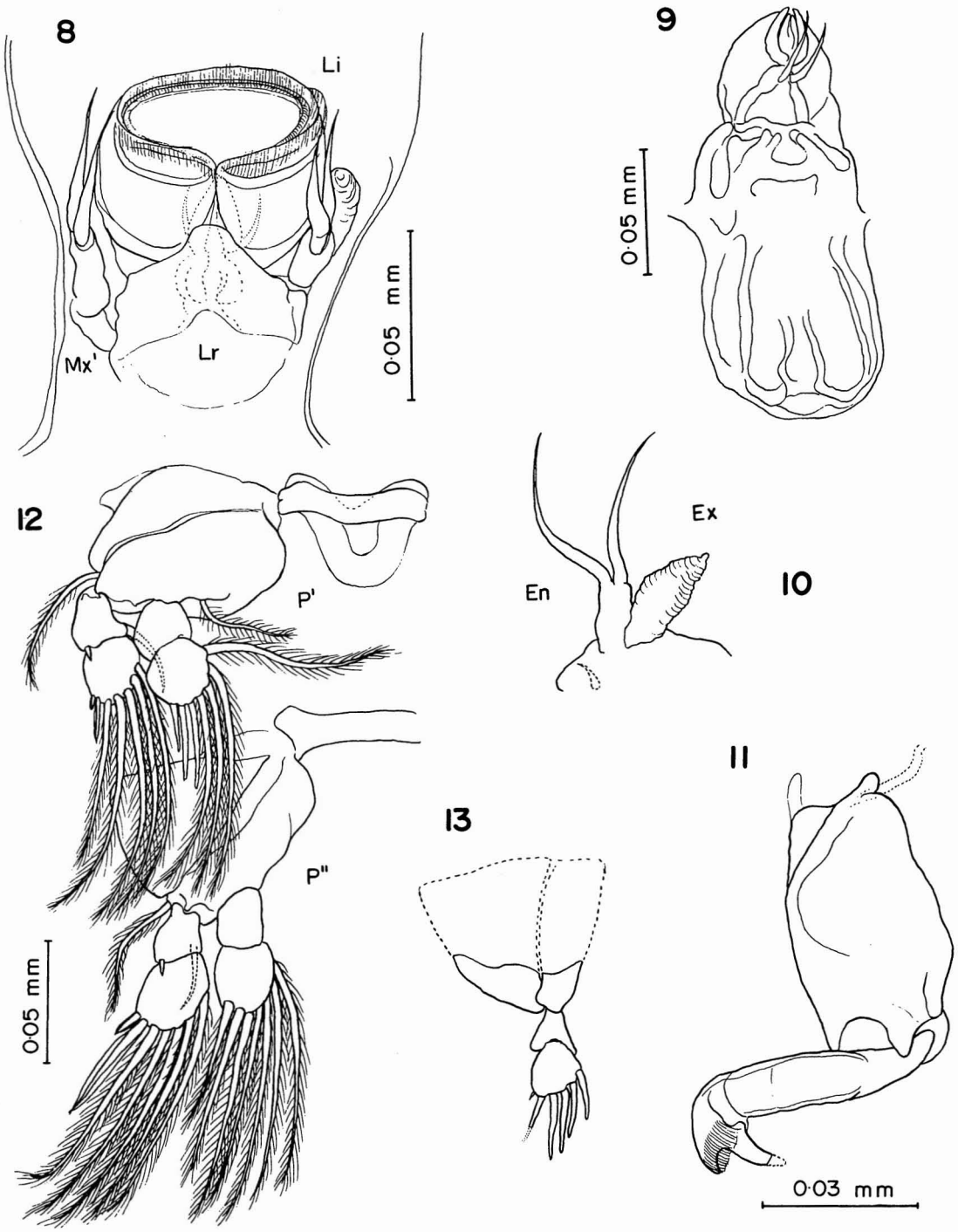
Unknown.

REMARKS

Peroderma pacifica n. sp. differs from the type *P. cylindricum*, in that the trunk is rather depressed and arched upward at its anterior quarter, the cephalothorax is attached to the trunk more anteriorly and is inclined forward instead of forming a right angle with the trunk. Also, the cephalothoracic surface is smooth, without branched tuft or warty structure seen in *P. cylindricum*.

The appendages show certain differences from those of *P. cylindricum*. The first antenna, which has three (Bassett-Smith 1899, Wilson 1917) or four segments (Nunes-Ruivo 1954) in *P. cylindricum*, has one segment in *P. pacifica* n. sp. The canine-toothlike process of the second segment of the second antenna in *P. cylindricum* is replaced by a tricuspidate process in *P. pacifica* n. sp. The terminal segment of the second maxilla is devoid of denticulations present in *P. cylindricum*. The first two pairs of legs differ slightly in setation in the two species.

The body length of *P. pacifica* n. sp. (6.0



FIGURES 8–13. *Peroderma pacifica* n. sp., female. 8. Mouth tube and first maxilla, antero-ventral view. 9. Inner surface of labrum. 10. First maxilla, lateral view, magnification same as in Figure 8. 11. Second maxilla, ventral view. 12. First and second legs in situ, ventral view. 13. Third leg, ventral view, magnification same as in Figure 12. *En*, endopodite; *Ex*, exopodite; *Li*, labium; *Lr*, labrum; *Mx'*, first maxilla; *P'*, first leg; *P"*, second leg.

mm) does not reach that of *P. cylindricum* (9.5 mm, after Bassett-Smith 1899; 12.5–13.0 mm, after Brian 1912; 15 mm, after Heller 1868).

ACKNOWLEDGMENTS

The author expresses his thanks to Dr. Muneo Okiyama of Japan-Sea Regional Fisheries Research Laboratory, for offering him the specimens of this interesting animal, and to Dr. Sueo M. Shiino of Sima Marineland, who was kind enough to look over this manuscript.

LITERATURE CITED

BASSETT-SMITH, P. W. 1899. A systematic description of parasitic Copepoda found on fishes, with an enumeration of known species. Proc. Zool. Soc. London 11:438–507.

BRIAN, A. 1912. Copépodes parasites des poissons et des échinides. Résult. Camp. Sci. Monaco, 38:1–58.

CANDEIAS, A. 1952. On *Peroderma cylindricum* (Heller) parasite of *Sardina pilchardus* (Walb.) from the Atlantic. Notas e Estudos Ins. Biol. Mar. Lisboa, 1:1–10.

CAPART, A. 1953. Quelques copépodes parasites de poissons marins de la région de Daker. Bull. Inst. Franç. Afr. Noire, 15(2): 647–671.

HELLER, C. 1868. Reise der Österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, Zoologische Theil, II, Pt. 3, Crustaceen, 280 pp. Wien.

NUNES-RUIVO, L. 1954. Copépods parasites de poissons. Vie et Milieu, Suppl. 3:115–138.

WILSON, C. B. 1917. North American parasitic copepods belonging to the Lernaeidae with a revision of the entire family. Proc. U.S. Nat. Mus. 53(2194):1–150.