

On the Parasitic Copepod, *Lepeophtheirus*
watanabei n. sp., found on the Fish,
Myxocephalus raninus J. & S.

(With 1 text-figure)

Sueo M. SHINO

Faculty of Fisheries, Mie Prefectural University

The new Caligid Copepod which forms the object of this short report was discovered on the body surface of the fish, *Myxocephalus raninus* J. & S. at Tosima, Hokkaido, by Dr. M. WATANABE of the Research Institute for Natural Resources in Tôkyô, and was kindly submitted me for examination. Before entering the description, I wish to express my hearty thanks for the friendliness of the named author. The species will be called *Lepeophtheirus watanabei* n. sp. after his name.*

Lepeophtheirus watanabei n. sp.

A single female. Entire length including egg tubes 5.15 mm, body excluding caudal rami 3.79 mm × 2.21 mm, egg tubes 1.72 mm long. Yellowish in alcohol, without pigment spots.

Carapace almost as long as wide, $\frac{3}{5}$ as long as body, trapezoid, being broader posteriorly than anteriorly. Frontal plates half the entire width, with a shallow median depression, forming an arc on either side of it. Lateral areas broad, with gracefully round margin, ending posteriorly in blunt lobes. Transverse dorsal groove arched forwards, dividing central region of carapace into longer cephalic and shorter thoracic areas. Eye at anterior $\frac{1}{3}$ of median length of former area. Postero-median lobe crescentic, as wide as frontal plates, and only slightly extending beyond lateral lobes. Sinuses widely open. Fourth thoracic segment $\frac{3}{10}$ as wide as carapace, $\frac{1}{4}$ as long as its own width, wedge-shaped on sides, forming an acute angle at each limb-base. Genital segment half as long as carapace, about $\frac{1}{3}$ shorter than its own width, nearly quadrangular; both anterior and posterior borders slightly inclined backwards on either side, lateral ones almost parallel with each other, and 4 corners well-round. Abdomen $\frac{1}{3}$ as long as preceding segment, a trifle shorter than wide, 2 sides some-

Received December 23, 1953

* The study was progressed by the financial aid from the Scientific Research Fund of the Department of Education.

what converging backwards, continuing to a V-shaped hind end. Border lines between each two of consecutive free segments entirely disappeared.

First antennae as usual. Apical joint of 2nd antennae strongly curved, sharp at the tip, and with 2 rather stiff spinules; posterior spine of basal joint short and of irregular shape. First maxillae composed of an ovoid base and a short, falciform apex. Second maxillae bifid, with branches subequal in size, nearly straight, and somewhat divergent. Distal joint of 1st maxillipeds much longer than the proximal, and provided, about the middle of its length, with a small, finely pectinate, triangular lobe; apical claws doubly edged with similarly pectinate, narrow rim. Second maxillipeds powerful, having palm longer than terminal joint of 1st pair. It is 3/5 as wide as long in the widest region and has strongly convex outer border, while inner border is concave, owing to the development of a large, eminent, basal projection. Terminal claw well curved, and extending beyond the middle of palm, with which it encircles a large foramen when closed, it bears a short spine at the base of unguis. Branches of sternal fork in the form of a U; each of them gradually narrower to wards blunt tip and brimmed on both outside and inside. Basal disc trapezoid, narrowing forwards, and with an oval perforation. Spines and other armatures are arranged on 4 pairs of legs as shown in the following diagram :**

Leg	Border	Sternal plate	Protopodite		Exopodite			Endopodite		
			I	II	I	II	III	I	II	III
I	outer inner		1p 1p		1rh c	3H, 1P 3P		2s		
II	outer inner	f	f, 1p 1P	f, 1s	f, 1H c, 1P, c	1H c, 1P	2H, 1Q c, 5P	c 1P	c c, 2P	c 6P
III	outer inner	f	f, 1p f, 1P		1H' 1P	c, 1h c, 1P	c, 3h c, 4P	c 1P	c c, 6P	
IV	outer inner		1p		1s, 1h	1h, 2H				

Rudiment of endopodite on 1st legs relatively long, ending in 2 hairs. Innermost plumose one of terminal spines on apical joint scarcely longer than the longest of non-plumose other 3, which are graded in length from without inwards. The latter bifid into 2 short, acuminate apices closely stuck together, except for the outermost one which ends in a simple acuminate tip. Sternum just behind 1st legs raised in a pair of round tubercles, one on each side of mid-line. Of external spines on 3rd exo-

** Abbreviations used in the table: c, row of cilia; f, membranous flange; H, longer spine; h, shorter spine; H', hook-like spine; P, longer plumose spine; p, shorter plumose spine; Q, spine ciliated on one side, with membranous rim on the other; s, solitary hair. Roman numerals indicate the numerical orders of the legs or joints and Arabian ones the number of spines and other structures present on each of them.



Lepeophtheirus watanabei n. sp., female.

A, female, dorsal view; B, 1st antenna, ventral view; C, 2nd antenna and 2 maxillae in situ; D, 1st maxilliped; E, 2nd maxilliped; F, sternal fork; G, 1st swimming leg; H, apical spines on same, further enlarged; I, 2nd leg; J, 3rd leg; K, 2 rami of same, further enlarged, posterior surface; L, 4th leg; M, postero-lateral angle of genital segment, showing 5th leg rudiment; N, caudal ramus.

A $\times 13.2$, B, F, N $\times 108$, C, D $\times 90$, E $\times 60$, G, I, J, M $\times 75$, H $\times 153$, K, L $\times 128$.

podite joint of 2nd legs, basal one exactly as those on 1st and 2nd joints, 2nd one bent inwards, with a narrow, lunular rim on outer border, and terminal one much longer, bearing an outer rim and an inner row of cilia. Membraneous flange on median sternal plate rather broad. Two rami of 3rd legs close together at each lateral angle of basal apron which bears broad flanges; exopodite 3-jointed, while endopodite 2-jointed. Fourth legs stumpy, 3-jointed; basal joint as long as distal 2 combined. Three apical spines nearly straight, doubly edged with fine pectination, leaving a short, naked, basal portion. Those successively shorter from within outwards, the outermost being no more than $1/3$ of the innermost. Spine on 2nd joint as long as the shortest of apical ones, but without pectination. Terminal joint with a short spur at inner distal angle. Genital segment bears, just beneath attaching point of each egg tube, a quadrate ventral process, which ends in 3 short plumose spines and may represent 5th leg. It is provided, further, at each outea posterior angle, with a small tubercle tipped by a single plumose spine. Caudal rami somewhat irregular in shape, with 3, plumose, terminal spines and another 3, similar, but far shorter ones which are arranged 1 at inner distal angle of the rami and 2 at outer angle; inner border of the rami ciliated. Rami of 2 sides widely apart from each other on account of intrusion of anal papillae between them. Egg tubes a little shorter than carapace and as broad as abdomen.

Type in Mie Prefectural University.

Remarks: In having nearly squarish genital segment and rather short abdomen, the present species is closely related to *L. pectoralis* (O. F. MÜLLER)¹⁻⁶). Carapace of the new species is a trifle wider than long, while longer than wide in *pectoralis*, and the genital segment is relatively smaller in the former than in the latter. The ratio between the lengths of the genital segment and of the carapace and that between the width of the former and the length of the latter are as 0.48 and 0.67 in the new species, while as 0.83 and 0.83 in *pectoralis* (calculated from the measurements taken from T. & A. SCOTT's Pl. X, fig. 3⁵). The 4th thoracic, the genital, and the abdominal segments, which are distinct in *pectoralis*, are completely fused with one another in *watanabei*. The two species are somewhat different also in the detail of the structure of the 4th legs, sternal fork, and the 2nd maxillipeds. In the constitution of the genital segment, the new species resembles, though less closely, *parvi-ventris* WILSON^{7,9}), *edwardsii* WILSON^{7,9}), *aesopus* WILSON⁸), but can be distinguished from all of them by the 4th legs benign composed of only 3 segments.

References

1. P. W. BASSETT-SMITH: J. Mar. Biol. Assoc., N. S., 4, 153—163 (1896).
2. H. J. HANSEN: Danish Ingolf-Exp., III, 7, Crustacea Copepoda II, 1—92, pls. 1—5 (1923).

3. H. MILNE-EDWARDS : Histoire naturelle des Crustacés, etc., Paris, 432—529, pls. 38—41 (1840).
4. A. SCOTT : Trans. Liverpool Biol. Soc., **15**, 188—241, pls. 1—5 (1901).
5. T. SCOTT & A. SCOTT : The British Parasitic Copepoda, 2 vols., 1—252, pls. A, B, 1—72 (1913).
6. W. THOMPSON : Ann. Mag. Nat. Hist., (1) **20**, 248 (1847).
7. C. B. WILSON : Proc. U. S. Nat. Mus., **28**, 479—672, pls. 5—29 (1905).
8. : Ceylon Pearl Oyster Fish., Suppl. Rep., **34**, 189—210, pls. 1—5 (1906).
9. : Bull. U. S. Nat. Mus., **158**, 1—635, pls. 1—41 (1932).