ON TREBIUS LONGICAUDATUS SHIINO (COPEPODA : CALIGOIDA) FOUND ON THE FETUS OF SQUATINA NEBULOSA REGAN

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Citation

Issue Date
1963-12-31

URL
http://hdl.handle.net/2433/175334

Type
Departmental Bulletin Paper

Textversion
publisher
ON TREBIUS LONGICAUDATUS SHIINO (COPEPODA: CALIGOIDA) FOUND ON THE FETUS OF SQUATINA NEBULOSA REGAN)

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With 2 Text-figures

Trebius longicaudatus Shiino is a caligid copepod parasitic on Squatina nebulosa Regan. Among the members of the genus Trebius this species, which was originally found in the buccal cavity or on the body surface of host, is characterized above all by the possession of much elongate abdomen which is nearly twice as long as the carapace, occupying less than half the length of the entire body.

The year before last, Dr. T. Tokioka of Seto Marine Biological Laboratory presented me with a number of specimens found by Dr. E. Harada on the body of the fetuses of the same host species caught off Shirahama. They were remarkable not only for their unusual location on the host body but also for an extraordinary elongation of their abdomen which reaches several times the length of the rest of body. In spite of these, a thorough investigation on their morphology demonstrated that they belong to the known species same as that found on the exterior of the host. I feel, therefore, the necessity of giving a short account as regards the proportions of the body regions and some minor points that escaped my notice when I gave the definition of the species.

Before going farther, I wish to express my obligation to Dr. T. Tokioka who kindly presented the material to me.

Trebius longicaudatus Shiino
(Figs. 1 and 2)


Occurrence: 11 females; 9 of them carrying egg strings. On the body sur-

1) Contributions from the Seto Marine Biological Laboratory, No. .

face of the fetuses of *Squatina nebulosa* Regan caught off Shirahama, Wakayama Prefecture, by Mr. Inagaki and Dr. Harada, May 4, 1961.

**Female**: Body white in alcohol, without pigment spots; egg strings yellowish. Carapace more or less convex above, genital segment somewhat swollen dorsi-ventrally; abdomen cylindrical, extraordinarily elongate and with one or two constrictions, though segmental boundaries hardly discernible.

![Image of Trebius longicaudatus Shiino, female, parasitic on the fetus of Squatina nebulosa Regan. ×4.7](image-url)
Except for an unusual prolongation of the abdomen, the constitution of the
rest of body and the detail in the structure of appendages are in strict accord
with those of the holotype. Measurements of the body regions taken from 9
females with perfect abdomen are listed in the table inserted here. They are
represented by 12.5 times the real length unless otherwise indicated.

<table>
<thead>
<tr>
<th>Carapace plus 4th segment</th>
<th>Genital segment</th>
<th>Length of abdomen</th>
<th>Total length</th>
<th>Real body length</th>
<th>Length of egg tube</th>
<th>Real length of egg tube</th>
<th>Length of abdomen plus 4th segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>44×38</td>
<td>46×31</td>
<td>277</td>
<td>366</td>
<td>29.4 mm</td>
<td>71</td>
<td>5.7 mm</td>
<td>6.3</td>
</tr>
<tr>
<td>46×31</td>
<td>35×21</td>
<td>161</td>
<td>242</td>
<td>19.4 mm</td>
<td>0</td>
<td>0</td>
<td>3.5</td>
</tr>
<tr>
<td>46×36</td>
<td>48×31</td>
<td>298</td>
<td>362</td>
<td>29.0 mm</td>
<td>184</td>
<td>14.8 mm</td>
<td>5.8</td>
</tr>
<tr>
<td>46×37</td>
<td>43×29</td>
<td>271</td>
<td>360</td>
<td>28.8 mm</td>
<td>73</td>
<td>5.8 mm</td>
<td>5.9</td>
</tr>
<tr>
<td>47×34</td>
<td>50×33</td>
<td>323</td>
<td>420</td>
<td>33.6 mm</td>
<td>215</td>
<td>17.2 mm</td>
<td>6.9</td>
</tr>
<tr>
<td>47×38</td>
<td>32×20</td>
<td>97</td>
<td>176</td>
<td>14.1 mm</td>
<td>0</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td>47×39</td>
<td>50×35</td>
<td>363</td>
<td>460</td>
<td>36.8 mm</td>
<td>130</td>
<td>10.4 mm</td>
<td>7.7</td>
</tr>
<tr>
<td>48×39</td>
<td>50×33</td>
<td>334</td>
<td>432</td>
<td>34.6 mm</td>
<td>194</td>
<td>15.3 mm</td>
<td>7.0</td>
</tr>
<tr>
<td>50×36</td>
<td>55×36</td>
<td>425</td>
<td>530</td>
<td>42.5 mm</td>
<td>201</td>
<td>16.8 mm</td>
<td>8.5</td>
</tr>
</tbody>
</table>

In the holotype the ratio between the length of the abdomen and that of
the carapace plus the fourth segment attains merely to 1.26. In the longest
female of the present lot of specimens the abdomen reaches 8.5 times the rest
of body and even in the shortest one it exceeds twice. It is of uniform width
throughout its entire length and has one or two slight constrictions, which
scarcely show any segmental border on the surface. Owing to the preservation
in a narrow vial, the abdomen is folded once or twice, leaving faint transverse
furrows behind, which are liable to be mistaken for the true lines of articulation.
The genital segment has three papillae on the caudal margin on each side of
the base of abdomen. The internal papilla which is triangularly pointed lies
just above the attachment of egg string and the others are located a little more
laterally and ventrally and invisible from above.

The distal segment of the first antenna is not biarticulated. The second
maxilla has the inner accessory branch much more reduced than in the holotype.
The sternal furca possesses the branches somewhat more divergent. The outer
spines on the exopodite joints of the second leg are associated at their bases
each with a more or less broad membraneous lamina with parallel striation on
the surface. Two short outer spines on the third joint of the same exopodite
are doubly fringed by fine hairs. The second exopodite joint of the succeeding
leg is hairy on the inner margin instead of having two rows of cirri. Distal
two joints of the exopodite of the same leg have a narrow pectinated rim on the
outer margin. The corresponding joints of the exopodite in the fourth leg are
also furnished with an outer pectinate rim. In other points as in the holotype.
Remarks: The species is known only from the female. A plausible explanation for an excessive prolongation of the abdomen may be sought in the respiratory adaptation of the copepods living in such an unusual environment as the interior of the host cloaca. Since anal respiration is known occasionally to be the case with the Order Copepoda, it is presumed that those internal parasites may be able to get access to fresh respiratory water by extruding the tip of long abdomen at times from the host anus.

LITERATURE


Fig. 2. Trebius longicaudatus SHINO, female, parasitic on the fetus of Squatina nebulosa REGAN. A, dorsal view; B, first antenna; C, second maxilla; D, sternal furca; E, outer margin of exopodite of second leg; F, third leg; G, caudo-lateral angle of genital segment, ventral view; H, caudal end of abdomen. A, H ×12, B, C, F ×82, D, E ×170, G ×42.