

STUDIES ON THE LARVA OF *PELTAstica REITTERI*
LEWIS WITH COMMENTS ON THE CLASSIFICATION
OF DERODONTIDAE BASED ON LARVAL
CHARACTERS (Coleoptera, Derodontidae)

By Akira Fukuda

Kamikajishichô, Hachinohe, Aomori Prefecture

The Derodontidae is a very small family consisting of only four genera and about a dozen species, but the taxonomic position of this family has been much debated. That is, *Peltastica* was first referred to Trogoxetidae, *Derodontus* to Cryptophagidae, and *Laricobius* was placed in Cleridae. Modern systematists are, however, in general accord with Crowson's opinion, in placing it in the Dermestoidea together with Nothodendridae, Dermestidae and Thorictidae.

The *Derodontus* larva was first described by Böving et Craighead (1931) and placed near Rhizophagidae and Monotomidae. Since then, a detailed study of the metamorphosis of *Laricobius* was given by Franz (1958), and the larva of *Nothoderodontus* found in New Zealand was reported by Crowson (1959).

In the present study, it was attempted to describe the larva of *Peltastica reitteri* Lewis¹⁾ and to review the phylogeny of Derodontidae from the view-point of larval morphology.

Before going further, I express my sincere thanks to Prof. Dr. M. Chûjô of the Kagawa University for his constant guidance and for reading through this manuscript. Thanks are also due to Dr. R. A. Crowson of the Glasgow University and Dr. Paul J. Spangler of the U. S. National Museum for their kindness in sending material and literature.

Larva of Peltastica reitteri Lewis

Mature larva: Length, up to 5 mm. Fusiform, subcylindrical and slightly flattened on venter. Dorsal surface dark yellowish brown; cuticle of most parts dotted with numerous small granulations and bearing a few fine setae. Ventral surface and pleura creamy-white and fleshy. Head moderately depressed, slightly transverse, with sides strongly rounded, and widest behind the middle. Ocelli six on each side, four of which forming a group and placed squarely posterior to the antenna, and other two situated more dorsally. Antenna three-segmented, jointed on a distinct basal process; the first segment short, broader than long; the second segment the longest, clavate and about twice as long as the first; sensory appendix conical and half as long as the third; the third segment narrow, rather less than the first in length, bearing a minute process and a few sensory setae. Frontal sutures distinct, each reaching the antennal foramen, with a metopic suture short

¹⁾ The larva of this species was figured by me (1959), but without giving the detailed description.

and indistinct; a pair of paramedian areas along the frontal sutures glabrous and oval. Mandible symmetrical, with two apical teeth pointed and placed close together, the ventral one of which having its inner margin serrated; retinaculum sharply pointed and slightly hooked, bearing a few short fine setae; mola developed, with the inner margin crenulate and pubescent at its base; on the ventral surface, several transverse rows of granulations; the hollowed space between retinaculum and apical teeth furnished with several long and stout setae. Labrum transverse, rounded at sides, bearing eighteen inwardly-directed setae along the margin and a pair on the dorsal surface. Clypeus articulated with labrum, but fused with frons, bearing a row of six setae on the dorsal surface; epistomal suture obsolescent, only visible in transmitted light as a faint double line. Galea obtuse, bearing four long spines and one horny process along its inner margin, and rather densely fringed distally with soft, long setae; lacinia slender, with the apex deeply trilobed; cardo rather small, and clearly separated from stipes; stipes rectangular with the sides subparallel, bearing a three-segmented palpus with a distinct palpiger; articulating area a little broader than stipes, and attenuated anteriorly; epipharynx non-pubescent, with a transverse row of about fifteen extremely fine spots near the anterior margin. Labial stipes separated from mentum by a slight suture, bearing two biarticulate palpi and two short setae. Ligula transverse, with the front margin slightly produced medially, and fringed anteriorly with short setae. Submentum and gula not clearly demarcated, and the former bearing a pair of short setae near the anterior margin. Hypo-

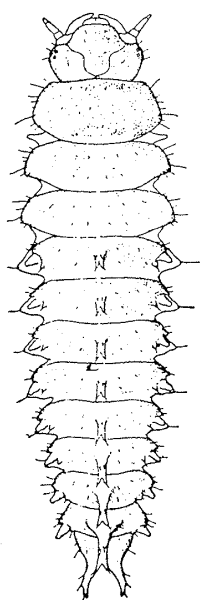


Fig. 1. Larva of *Peltastica reitteri* Lewis. Dorsal view.

pharynx with five pairs of longitudinal rows of granules; hypopharyngeal sclerome \square -shaped; lingua and superlingua rather sparsely setose, and the latter coarsely clothed with short spines. Pronotum transverse, widest behind the middle, with the sides moderately rounded and sparsely setose; front margin nearly straight, and posterior margin slightly rounded; disc with a few scattered fine setae. Meso- and metanotum similar, each with the sides slightly rounded and diverging posteriorly; hind angles rather acutely protuberant; disc with two transverse rows of fine, sparsely set setae; 1st to 8th abdominal terga each with the sides produced moderately, bearing a few short spines (each with a basal seta), hind angles each obliquely truncated by the presence of a conical process with a spiracle at its apex; each tergum with a median bifid, setose tubercle, which is gradually increasing in size posteriorly; each tubercle bearing a pair of dorsal setose papillae. Each abdominal pleuron of the first 8 segments produced into a fleshy process directed postero-laterally, carrying a long, fine, apical seta; pleuro-tergal suture somewhat obscure; sternum pale and trapezoidal, almost devoid of cuticular warts, but with a few scattered minute setae; pleuro-sternal suture distinct. The ninth abdominal segment very short, with the sides converging posteriorly, terminating in a pair of short and slightly recurved uro-

gomphi, which are feebly curved inward and each with a few setiferous tubercles. Legs of moderate length, placed somewhat wide apart; coxa stout and longer than any other segments; femur nearly cylindrical; tibiotarsus about two-thirds the length of femur; claw rather long and curved, bearing a pair of setae near the base. Spiracle annular-biforous, situated on a projecting, cone-shaped lobe, and with two chambers directed postero-dorsally; sides of chambers with numerous short teeth along the inner lateral margins.

Biology

A number of larvae are found at the sap exuding from freshly-cut stumps of *Pterocarya rhoifolia* Sieb. et Zucc. at Towada, Aomori Prefecture, Japan, during April and May. They are very sluggish in their movements and remain upon the same stump during the entire larval period, provided that sufficient food is available. Upon growing to the full under laboratory conditions, they enter the soil for pupation.

No information known is available regarding the life-history of Derodontidae, except for the account of *Laricobius erichsonii* published by Franz (1958).

Phylogenetical considerations

The *Peltastica* larva, as already stated, is most closely related to that of *Derodontus*, but may be distinguished from it by the following points:

1. Gular region not clearly demarcated.
2. Epistomal suture atrophied, existing as a faint double line.
3. Galea densely fringed with long setae apically.
4. 1st to 8th abdominal terga each with a median bifid tubercle.

The *Nothoderodontus* larva is very closely allied to that of *Derodontus* in most characters, while the larva of *Laricobius* appears to be the most highly specialized of the Derodontidae. The characters differentiating four genera are listed in Table 1.

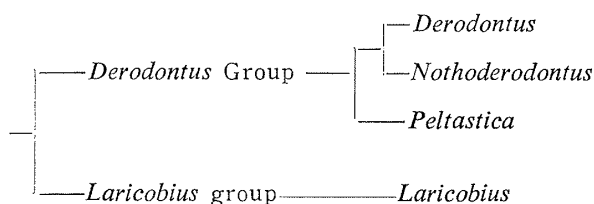


Fig. 2. Phylogeny of the Derodontidae based on larval morphology.

According to my phylogenetic conclusions, two main evolutionary lines may be recognized as shown in the above diagram. That is to say, it seems reasonable to conclude that the *Peltastica*, *Derodontus* and *Nothoderodontus* must have descended from their common ancestor, but the *Laricobius* must have separated as a specialized side branch in very early times from the ancestral Derodontid stem.

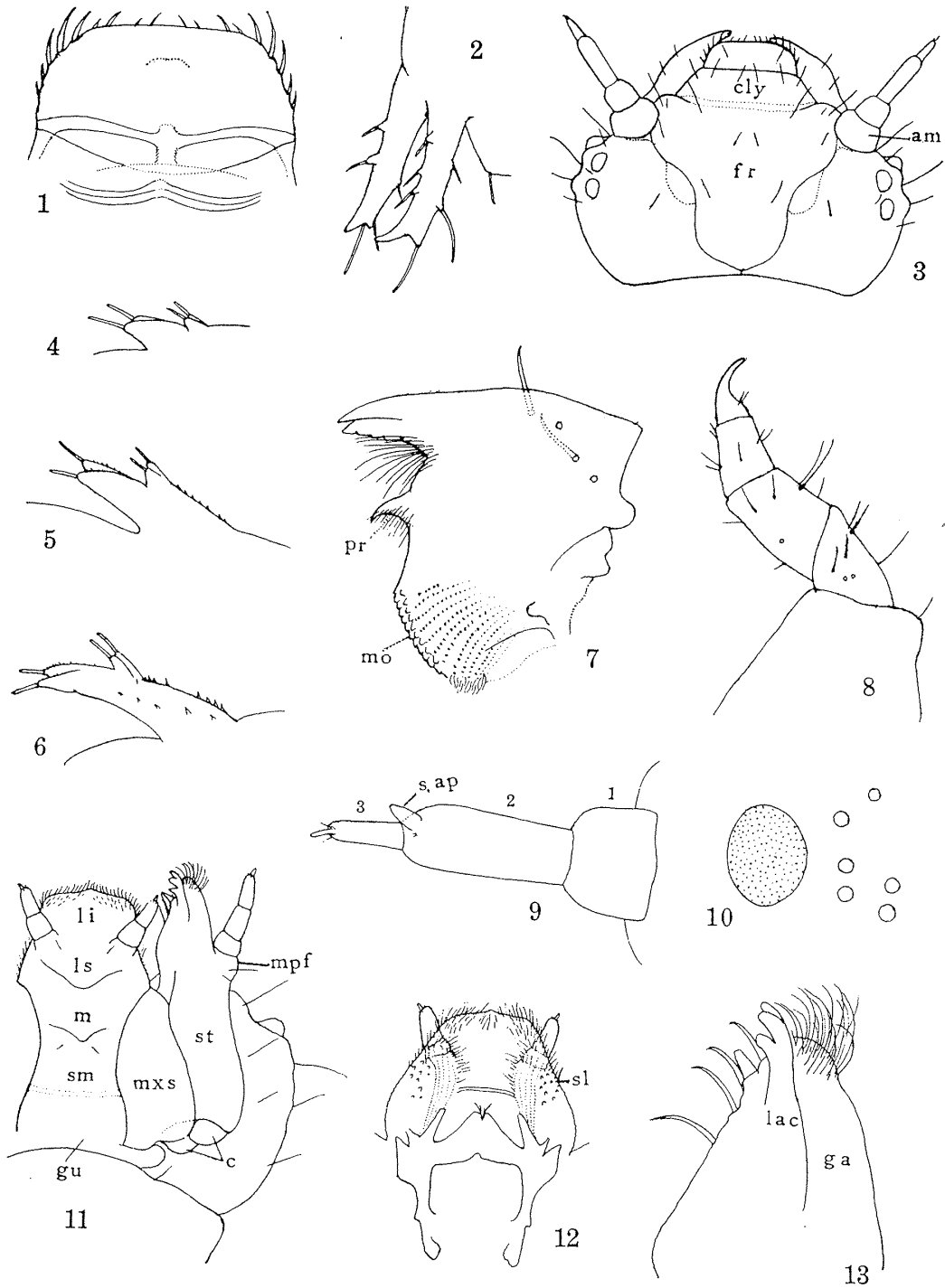
Table 1. Comparison of the larva of *Derodontidae*.

Genus	<i>Derodontus</i> *	<i>Nothoderodontus</i> †	<i>Peltastica</i>	<i>Laricobius</i> ‡
Number of ocelli	6 on each side	5 on each side	6 on each side	6 on each side
Mandible	With asperate molar part	With asperate molar part?	With asperate molar part	Without asperate molar part
Maxilla	Similar to that of <i>Peltastica</i> , but galea not fringed with long setae apically	Similar to that of <i>Derodontus</i> ?	Galea obtuse, with a few spines and densely fringed with long setae. Lacinia slender, with apex trilobed	Galea and lacinia rounded, with distal transparent margin being broad, flat and spoon-shaped
Antenna	2nd segment less than twice as long as wide	2nd segment more than twice as long as wide	2nd segment more than twice as long as wide	2nd segment less than twice as long as wide
Epistomal suture	Distinct	Distinct?	Obsolescent, visible in transmitted light as a double line	Present as a double line, visible in transmitted light
Gular region	Clearly demarcated	Similar to that of <i>Derodontus</i> ?	Not clearly demarcated	Not clearly demarcated
Urogomphi	Present	Present?	Present	Absent
Habitat	Larva was recorded from slimy fungus below bark of dying tulip tree in America	A single larva was found in a cell of the black fungal grows (known locally as "Fumagine") on a trunk of living <i>Nothophagus</i> tree in New Zealand	Larva was found at the sap exuding from a stump of <i>Pterocarya rhoifolia</i> in Japan	Larva occurs on Coniferae, as a predator of Chermesids in the Alps
Author	Böving et Craighead (1931)	Crowson (1959)	Fukuda (1959)	Franz (1958)

* Six larvae were received through Dr. Paul J. Spangler from the United States National Museum. These are labelled "*Derodontus* sp. Plummers Island, U.S.A. Mar. 20, 1914. Shannon collector".

† No material is available, but according to Crowson (1959) this larva is very similar to that of *Derodontus*, from which it may be distinguished by the characters given in the table.

‡ As no material is available, the larval characters have been extracted from the literature.



Fukuda—Larva of *Peltastica reitteri* Lewis

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Explanation of Plate 10

Larva of *Peltastica reitteri* Lewis.

1. Epipharynx. 2. Urogomphi, lateral view. 3. Head, dorsal view. (am, basal articulating membrane of antenna; cly, clypeus; fr, frons). 4. Tubercle of 1st tergite, lateral view. 5. Do. of 5th tergite. 6. Do. of 8th tergite. 7. Left mandible, ventral view. (mo, mola; pr, prostheca). 8. Mesothoracic leg. 9. Left antenna, ventral view. (1, 2, 3, segments of antenna; s. ap, sensory appendix). 10. Arrangement of ocelli. (antennal socket dotted). 11. Head, ventral view. (c, cardo; gu, gula; li, ligula; ls, labial stipes; m, mentum; mpf, maxillary palpiger; mxs, maxillary articulating area; sm, submentum; st, maxillary stipes). 12. Hypopharyngeal region. (sl, superlingua). 13. Apical part of left maxilla, ventral view. (ga, galea; lac, lacinia).

ヒメコオロギバチの狩獵に関する 2, 3 の知見

内 藤 親 彦

ヒメコオロギバチ *Motes japonicus* の prey 狩りについて 2, 3 の興味ある事実を観察し得たので次に報告する。

なおこの稿を草するに当り、親切な御教示を頂き稿の御校閲を賜った兵庫農大教授岩田久二雄先生、及び prey の同定の労を取られた大町文衛先生には心から御礼申し上げる。

筆者は今春土佐足摺に採集を試みたが、その際4月2日(足摺岬)及び4月4日(土佐清水)にタンボコオロギ *Scapsipedus parvus* Chopard 体長8~9mmの若虫を狩っている *M. japonicus* (体長10mm)を1頭ずつ捕えた。本種の prey 狩りは一般に夏に観察されており、春に見られたのは今回が初めてであり、この種のコオロギを狩ることも知られていない。観察されたのは海岸近くの平地で、4月2日は11 a.m., 4月4日は3 p.m.で、いずれも晴天であつた。*M. japonicus* は prey の上に馬乗りになつて運んでいたが、4月2日のものは不完全麻痺、4日のものは完全に麻痺されていた。又 prey はどちらも触角の先端部を切断されていた。