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ON THE LARVAE OF LAGRIIDAE OCCURRING IN JAPAN¹⁾

(COLEOPTERA : CUCUJOIDEA)

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The family Lagriidae is a rather large group of the Cucujoidea, comprising more than 1000 species in the world. So far as I am aware, 18 species of this family have been known to occur in Japan, and yet any larvae of these species have not been mentioned in detail. In this paper are given descriptions of the larvae of four species occurring in Japan.

Before going further, I wish to express my sincere thanks to Prof. C. Watanabe, Prof. H. Sawada, Prof. K. Sasamoto, Prof. T. Nakane, Dr. K. Kurosa, Dr. M. Miyatake, Mr. A. Haga and Mr. K. Mizusawa, for their kind help in various ways.

Family **Lagriidae**

The larvae of this family are characterized by the following features:—

Body markedly pigmented dorsally, with different kinds of setae. Head-capsule, mouth-parts and antennae furnished with numerous setae; median and frontal sutures visible; antennae 2 or 3-jointed, the 2nd joint apparently elongated and club-shaped towards apex and the 3rd exceedingly small; clypeus and labrum clearly delimited from frons; epipharynx exhibits 4 or 5 paired marginal setae, anterior and posterior sensillae, and microtrichia; mandibles asymmetrical, with a well-developed grinding structure; maxillary palpi 3-jointed; malar areas of maxillae without uncus; maxillary articulating areas not bilobed; labial palpi 2-jointed; ligula present; prementum, mentum, submentum and gula delimited by sutures, but submentum and gula tending to be confluent; hypopharyngeal sclerome thickly sclerotized. Thoracic and abdominal segments rather densely distributed with numerous setae; tergites with a fine ridged line on each cephalic margin (except pronotum). Legs bearing a number of setae (except tarsunguli). Spiracles annular or elliptical.

Arthromacra viridissima Lewis, 1895

Mature larva: Body subcylindrical, parallel-sided and umber-brown; dorsal and ventral surfaces bearing a few long setae; cerci robust, sharply pointed caudodorsally.

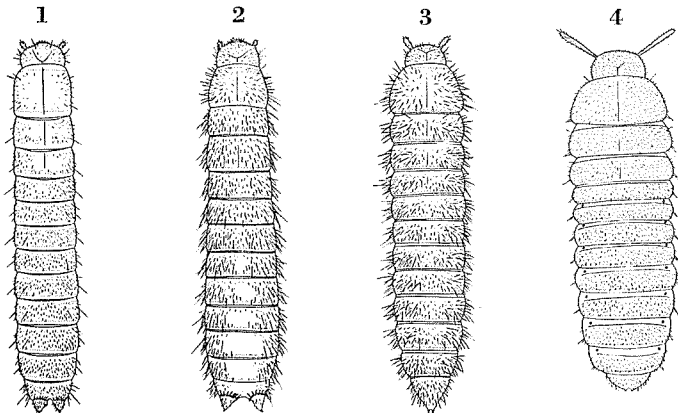
Head-capsule (Figs. 5, 6) about 1.2 mm. in length and about 1.6 mm. in breadth, hardly parallel-sided; anterior portion colorless; median suture almost 1/3 length of head-capsule; ocelli (Fig. 11) with about 5 pigmented spots on each side, which are closely connected each

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other. Antennae (Fig. 15) not separated from mouth-frame, and inserted to its lateral region, with 2 joints, the 2nd 1.5 times as long as 1st. Labrum (Fig. 17) nearly 1.5 times as wide as long, the anterior margin without emargination. Epipharynx (Fig. 20) with 2 conspicuous unisetiferous sensillae (Fig. 20, us) on anterior region; median region enclosed by microtrichia. Mandibles (Figs. 24, 25) tridentate apically, with dorsal and ventral cutting edges strongly retracted; left mandible armed with an additional tooth and a well-developed grinding projection (Fig. 25, gp): grinding surface of right mandible 3-carinate. Maxillae (Fig. 33) with malar area nearly parallel-sided basally; relative lengths of palpus: I: II: III = 6: 8: 5. Labium (Fig. 36) with 1st joint of palpus a little longer than 2nd; ligula moderately projecting. Hypopharyngeal sclerome (Fig. 36, hs) clearly asymmetrical, subpentagonal.

Prothorax more or less parallel-sided on basal half, and a little wider than long. Legs (Fig. 40) not elongated, subequal in length; coxal cavitas approaching each other; tibiae about 2.2 times as long as wide; tarsunguli entirely curved inwards. Abdominal sternites



Figs. 1-4: Mature larvae (dorsal view). 1: *Arthromacra viridissima*. 2: *Nemostria rufobrunnea*. 3: *Lagria nigricollis*. 4: *Lyprops sinensis*.

each with a finely ridged cephalic margin. Ninth abdominal segment (Figs. 45, 46) possesses numerous short and stiff setae; cerci suffused with reticulations, pubescence and a longitudinal basal band, and with tip-ends straight.

Body-length about 13 mm.

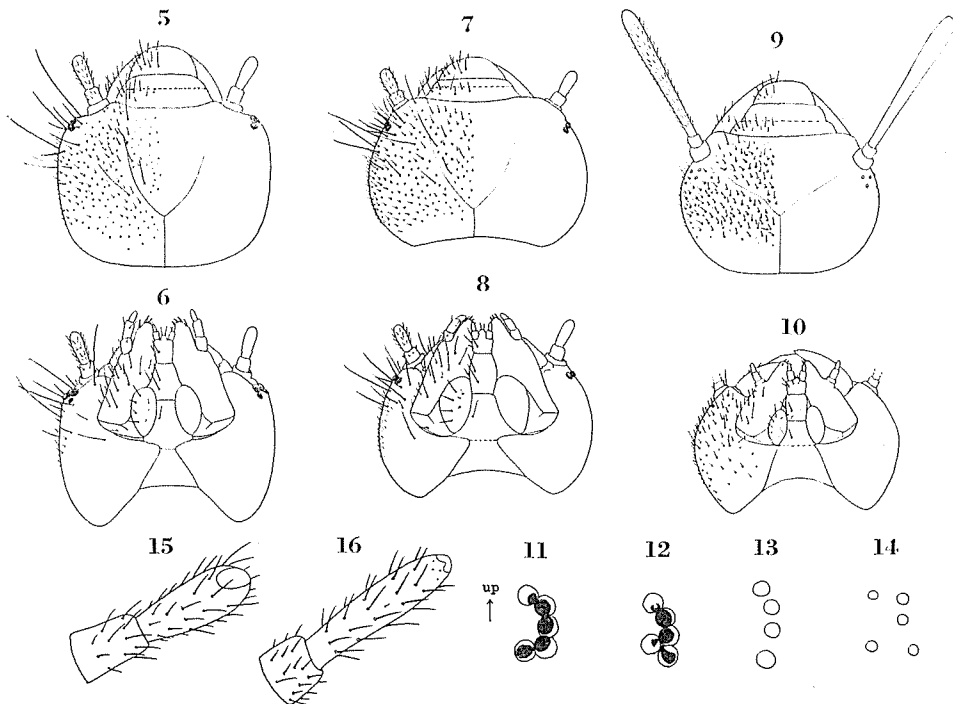
Described from 3 larvae, of which 2 were found within a rotten wood at Daibosatsutoge, Yamanashi-ken, on May 21, 1961 by N. Hayashi, and the other within a decayed tree at Kirizumi, Gumma-ken, on May 27, 1962 by N. Hayashi.

Nemostria rufobrunnea (Marseul, 1876)

Mature larva: Body subcylindrical, slightly enlarged posteriorly and umber-brown; surrounding skin having many long setae; cerci strongly pointed caudodorsally.

Head-capsule (Figs. 7, 8) about 1.2 mm. in length and about 1.8 mm. in breadth, roundly sided; median suture a little shorter than 1/4 length of head-capsule; ocelli (Fig. 12) with about 5 connected spots on each side. Antennae contiguous laterad of mouth-frame, and

2-jointed, the 2nd joint being 1.5 times as long as 1st. Labrum slightly wider than 1.5 times as wide as long, the anterior margin being straight. Epipharynx (Fig. 21) bears 2 conspicuous unisetiferous sensillae; microtrichia densely distributed in a circle. Mandibles (Figs. 26, 27) tridentate apically, with dorsal and ventral cutting edges strongly incurved; left mandible armed with a dull additional tooth and with a strikingly pointed grinding projection. Maxillae with basal sides of malar area parallel; relative lengths of joints of palpus: 5:9:5. Labium with 1st and 2nd joints of palpus subequal in length; ligula moderately elevated. Hypopharyngeal sclerome asymmetrical and subpentagonal.



Figs. 5-10: Heads. 5: *Arthromacra viridissima* (dorsal view). 6: ditto (ventral view). 7: *Nemostria rufobrunnea* (dorsal view). 8: ditto (ventral view). 9: *Lyprops sinensis* (dorsal view). 10: ditto (ventral view).

Figs. 11-14: Right ocelli (up: upper surface). 11: *Arthromacra viridissima*. 12: *Nemostria rufobrunnea*. 13: *Lagria nigricollis*. 14: *Lyprops sinensis*.

Figs. 15, 16: Antennae. 15: *Arthromacra viridissima*. 16: *Lagria nigricollis*.

Prothorax slightly widened backwards and a little wider than long. Legs (Fig. 41) subequal in length; coxal cavitas being well contiguous; tibiae about 2.2 times as long as wide; trochanters and femora possessing a number of exceedingly long setae on ventral surface; tarsunguli weakly incurved. Abdominal sternites each with a finely ridged anterior margin. Ninth abdominal segment (Fig. 47) sparsely scattered with minute setae on dorsal surface; cerci with a longitudinal basal band which is extremely strong and multidenticulated, and with tip-ends which are strongly curved dorsolaterally and separated each other.

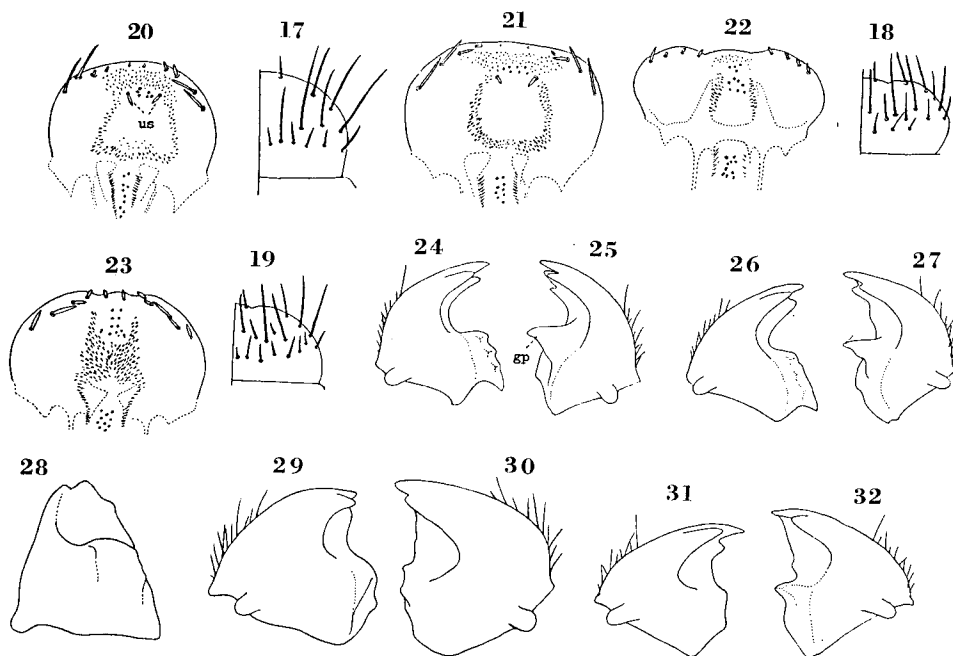
Body-length about 13 mm.

Described from one larva within a rotten wood at Saeki, Ôita-ken, on June 2, 1954 by K. Kurosa.

Lagria nigricollis Hope, 1842

Mature larva: Body fusiform, rather closely scattered with long setae and umber-brown to black dorsally; 9th abdominal segment conical, terminating in 2 very small spine-like cerci.

Head-capsule about 1.0 mm. in length and about 1.5 mm. in breadth, swollen laterally;



Figs. 17-19: Labra (right half). 17: *Arthromacra viridissima*. 18: *Lagria nigricollis*. 19: *Lyprops sinensis*.

Figs. 20-23: Epipharynxes. 20: *Arthromacra viridissima* (us: unisetiferous sensillae). 21: *Nemostria rufobrunnea*. 22: *Lagria nigricollis*. 23: *Lyprops sinensis*.

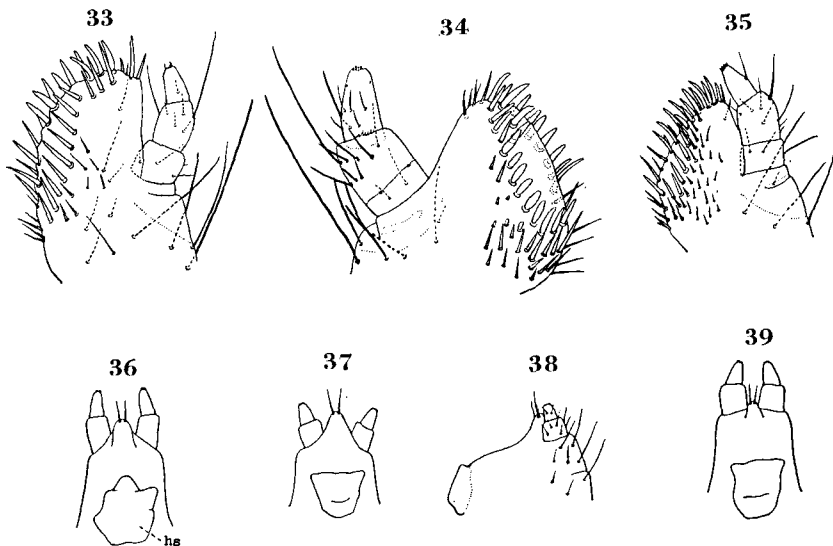
Figs. 24-32: Mandibles (ventral aspects except fig. 28). 24, 25: *Arthromacra viridissima* (gp: grinding projection). 26, 27: *Nemostria rufobrunnea*. 28-30: *Lagria nigricollis* (28: inner aspect). 31, 32: *Lyprops sinensis*.

ocelli (Fig. 13) with 4 well-separated spots on either side, of which ventral one being largest. Antennae (Fig. 16) dorsolaterad of mouth-frame, and nearly $2/3$ length of head-capsule, with 2 joints, the 2nd joint almost 3.5 times as long as 1st. Labrum (Fig. 18) nearly 2.5 times as wide as long, the anterior margin weakly biemarginate. Epipharynx (Fig. 22) with microtrichia parallel; anterior sensillae longitudinally scattered. Mandibles (Figs. 28-30) apparently thickened basally; dorsal and ventral subapical teeth divided from apical tooth by a small incision respectively, but dorsal subapical tooth of left mandible indistinct. Maxillae (Fig. 34) with malar area distinctly dilated posteriorly; relative lengths of joints of

palpus : I : II : III = 3 : 6 : 10. Labium (Figs. 37, 38) with basal and apical joints of palpus subequal in length, ligula extending beyond level of apex of basal joint; buccal surface (hypopharynx) strongly thickened proximally in lateral view. Hypopharyngeal sclerome with antero-lateral angles developed laterally.

Prothorax moderately widened backwards, about 1.5 times as wide as long. Legs (Fig. 42) slender, elongate, and gradually increasing in length towards posterior pair; coxal cavities separated each other, and distance between them increasing posteriorly; tibiae almost 3.7 times as long as wide. Ninth abdominal segment (Fig. 48) with lateral sides almost straightly convergent to apex, the cerci conjoined proximally.

Body-length about 11 mm.



Figs. 33-35: Maxillae (buccal aspects). 33: *Arthromacra viridissima*. 34: *Lagria nigricollis*. 35: *Lyprops sinensis*.

Figs. 36-39: Labia (buccal aspects except fig. 38). 36: *Arthromacra viridissima* (hs: hypopharyngeal sclerome). 37, 38: *Lagria nigricollis* (38: lateral aspect). 39: *Lyprops sinensis*.

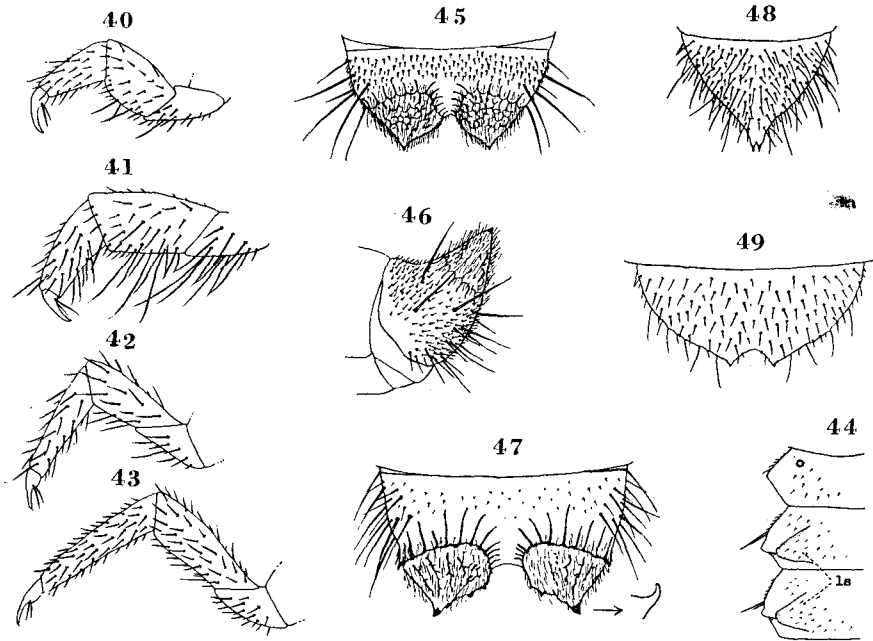
Described from one larva taken under a moist fallen tree at Daibosatsu-toge, Yamana-shi-ken, on May 21, 1961 by K. Mizusawa.

Lyprops sinensis Marseul, 1876

Mature larvae: Body onisciform, markedly depressed; dorsal surface entirely without long setae and ocher-brown except yellowish lateral sides; 9th abdominal segment semi-circular, the hind margin with a triangular incision.

Head-capsule (Figs. 9, 10) about 1.3 mm. in length and about 1.7 mm. in breadth, roundly sided and obviously granulated above; median and frontal sutures deeply striated, the former about 3/7 length of head-capsule; ocelli (Fig. 14) with 5 well-separated spots on each side. Antennae inserted some distance from mouth-frame and dorsolaterad of head-

capsule, with 2 joints, the 2nd 15 to 17 times as long as 1st and also hardly longer than head-capsule. Labrum (Fig. 19) nearly twice as wide as long, the anterior margin scarcely biemarginate. Epipharynx (Fig. 23) with anterior sensillae rather longitudinally scattered, and with a cluster of microtrichia behind the anterior sensillae. Mandibles (Figs. 31, 32) triangular in outline; right mandible tridentate apically, while the left bidentate, furnished with a small blunt tooth near grinding projection. Maxillae (Fig. 35) with malar area amplicated basally; relative lengths of joints of palpus : I : II : III = 8 : 14 : 11. Labium (Fig. 39) with bases of palpi contiguous, the basal joint being scarcely longer than the apical;



Figs. 40-43: Mesothoracic legs. 40: *Arthromacra viridissima*. 41: *Nemostria rufobrunnea*. 42: *Lagria nigricollis*. 43: *Lyprops sinensis*.

Fig. 44: Ventrolateral region of 1st to 3rd abdominal segments of *Lyprops sinensis* (ls: lateral swellings).

Figs. 45-49: 9th abdominal segments (dorsal aspects except fig. 46). 45, 46: *Arthromacra viridissima* (46: lateral aspect). 47: *Nemostria rufobrunnea*. 48: *Lagria nigricollis*. 49: *Lyprops sinensis*.

ligula very small. Hypopharyngeal sclerome, the antero-lateral angles pointed outwards.

Prothorax widened posteriorly, about twice as wide as long. Legs (Fig. 43) elongate, slender, gradually increasing in length towards posterior pair; distance between hind coxal cavitas being widest; tibiae about 4.5 times as long as wide. Abdominal segments (except caudal segments) each nearly 5 times as wide as long; 2nd and 3rd segments (Fig. 44) having a pair of lateral swellings (Fig. 44, ls) on ventral surface; spiracles of 1st segment ventro-lateral, and those of 2nd to 8th dorsolateral. Ninth abdominal segment (Fig. 49) flattened, about 2.5 times as wide as long, the posterior margin slightly pointed backwards at sides

of median incision.

Body-length about 11 mm.

Described from 3 larvae collected on dead bush-woods at Setagaya, Tokyo, on June 8, 1951 by A. Haga.

The larvae described in this paper may be distinguished by the following key:—

Key to the larvae of Japanese species

- 1 Body subcylindrical; ocelli closely connected each other; antennae laterad of mouth-frame; legs not elongate, nearly equal in length. 2
- Body fusiform or onisciform; ocelli well-separated each other; antennae dorsolaterad of mouth-frame; legs distinctly elongated, gradually increasing in length towards posterior pair. 3
- 2 Body subparallel-sided; head-capsule not swollen laterally; tip-ends of cerci straight.
. *Arthromacra viridissima* Lewis
- Body slightly enlarged posteriorly; head-capsule roundly swollen laterally; tip-ends of cerci recurved outwards, well-separated each other. *Nemostria rufobrunnea* (Marseul)
- 3 Body fusiform, with long setae on dorsum; ocelli with 4 spots on each side; antennae shorter than head-capsule. *Lagria nigricollis* Hope
- Body onisciform, without long setae on dorsum; ocelli with 5 spots on each side; antennae longer than head-capsule. *Lyprops sinensis* Marseul

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Corrections

In the author's preceding paper, "On the larvae of three species of Cephaloidea, Melandryidae and Pyrochroidae occurring in Japan (Coleoptera: Cucujoidea)", Ins. Mats. 26: 108-114, 1963, are found the following errors.

Page 108, line 15 from top, for "specis" read "species."

Page 112, line 12 from top, for "with a paired projections" read "with paired projections."
(N. HAYASHI)