Descriptions of immature stages of Japanese Chrysomelinae belonging to the generic group Chrysomela (Coleoptera)

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https://doi.org/10.5109/22696

出版情報：九州大学大学院農学研究院紀要. 12 (2), pp.105-116, 1962-10. Kyushu University
バージョン：
権利関係：

Journal of the Faculty of Agriculture, Kyushu University, Vol. 12, No. 2
October 30, 1962

Descriptions of immature stages of Japanese Chrysomelinae belonging to the generic group *Chrysomela* (Coleoptera)*

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VI. Generic group *Chrysomela*

In the group, the genera *Chrysomela*, *Linaeidea*, *Plagiodera* and *Gastrolina* are included. This group is characteristic in having the following characters.

Larvae: Generally, setae sparse and rather short compared with the other generic groups. Meso- and metathorax, and first to seventh abdominal segments with nine pairs of eversible glands. The tubercles consist of (D-DL-EPa) and (EPp) type in prothorax, and (DL) type in meso- and metathorax, and abdomen. Claws not grooved at the apex. A pair of egg bursters situated on meso- and metathorax.

Pupae: Generally, sclerotization of the surface very thick and hard, and nearly glabrous. Seventh abdominal segment with a pair of lateral tuberculations, and ninth abdominal segment without any projection at the apex.

Biology: Larvae molt twice. Pupation takes place on the leaf surface.

Genus *Chrysomela* Linné, 1758

Four species of the genus have been recorded from Japan, of which two species, *C. lapponica* and *C. tremulae* I could not examine. In the fully grown larvae, *C. vigintipunctata* and *populi* are separable in having the following characters.

C. populi: 1. On sixth abdominal segment, (D) of each side united together on the longitudinal line. 2. On meso- and metathorax, (Da) distinctly larger than (Dpi). 3. On prothorax, antero-interior part of (D-DL-EPa) disappeared in the course of the larval growth.

C. vigintipunctata: 1. On sixth abdominal segment, (D) of each side not united on the longitudinal line. 2. On meso- and metathorax, (Da) and (Dpi) subequal in size. 3. On prothorax, antero-interior part of (D-DL-EPa) not so remarkably disappeared.

* Contribution Ser. 2, No. 146, Entomological Laboratory, Kyushu University. (Studies on immature stages of Japanese Chrysomelinae 3).

Chrysomela vigintipunctata (Scopoli, 1763) (Pl. 5, 1; Pl. 6, 1–4)

Last instar larvae.

Ground color pale yellow; head black; legs and tubercles blackish brown.

Generally body rather flat. Setae rather sparse and short. Granular tubercles very small and sparse. Claws grooved at the apex. Abdomen without pseudopod.

12.0×3.0 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with about eight long setae, and frons with about three long setae. Middle part of frons roundly depressed. Post-clypeus with three setae and labrum with two setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with one very large tubercle (D-DL-EPa) and a very small one (EPp). The former with about seven long and three or four very short setae, arranged on the border of the tubercle. The latter with a seta. Pleural region with an oval tubercle (P), which has a long seta. Sternal region with a tubercle (ES-SS). The tubercle with two setae, and united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles, (Da), (Dpi), (Dpe) and (DL). (Da), (Dpi) and (Dpe) suboval, and (Da) and (Dpi) subequal in size, and (Dpe) smaller than each of (Da) and (Dpi). Each of these three tubercles with one long seta and a few micro-setae. (DL) round, convex, and with two long setae and a few micro-setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two tubercles, (EPa) and (EPp). (EPa) and (EPp) oval, subequal to each other, and usually with three or four setae. On mesothorax spiracle situated on (EPa). Pleural region with an oval tubercle (P), which has a seta. Sternal region with two tubercles, (ES) and (SS). Each of (ES) and (SS) with a seta, and (ES) united with the homologous tubercle of another side on the longitudinal line. Sometimes a secondary tubercle appeared on antero-posterior part of (ES). The tubercle may be homologous to (as 1).

Abdomen: Dorsal side with two large tubercles, (D) and (DL). (D) transversely oval, and with about seven setae. (DL) round, convex, and with about two or three setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with a tubercle (EP), which has two or three setae. Pleural region with a tubercle (P), which is smaller than (EP), and has two or three setae. Sternal region with two oval tubercles. (SS-ES) oval, and with two long and one short setae. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. A secondary tubercle (as 1) appeared on antero-exterior part of (ES). The tubercle with a seta.

First instar larvae.

Head: Vertex with ten setae and frons with four setae.

Prothorax: Dorsal side with one very large tubercle (D-DL-EPa) and a very small one (EPp). The former with nine setae, only arranged on the border of the tubercle. The latter with a seta. Pleural region with a tubercle (P). The tubercle with two long setae and a few micro-setae. Sternal region with a tubercle (ES-SS), which has two setae, and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. Each of (Da), (Dpi) and (Dpe) with a seta. (Dpe) consists of an egg burster. (DL) with two setae. Epipleural region with two tubercles. On mesothorax, spiracle situated on (EPa).

Each of (EPa) and (EPp) with three setae. Pleural region with a tubercle (P), which has a seta. Sternal region with two tubercles. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS) with a seta.

Abdomen: Dorsal side with two tubercles. (D) with two long and a short setae. (DL) with a seta. Epipleural region with a tubercle (EP), which has three setae. Pleural region with a tubercle (P), which has two setae. Sternal region with two tubercles. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS-PS) with three setae, and one seta locating on (SS) very short.

Pupae.

Body elongate, pale yellow, and with many blackish brown patches which grow during the pupal period. Setae extremely short and sparse. Seventh abdominal segment with a pair of projections laterally. Apex of ninth abdominal segment without any projection.

6.5×4.0 mm.

Chrysomela populi Linné, 1758 (Pl. 5, 3; Pl. 6, 5–7)

Last instar larvae.

Ground color pale reddish yellow; tubercles blackish brown; head and legs black; claws reddish brown.

Generally body rather flat. Setae rather sparse and short. Granular tubercles very small and sparse. Claw grooved at the apex. Abdomen without pseudopod.

15.0×4.0 mm (in alcoholic specimen).

Head: Cordal suture long, and frontal suture slightly curved at the base but mostly straight. Vertex with about thirty setae, and frons with five or six setae. Middle part of frons roundly depressed. Post-clypeus with three setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa), and a small oval tubercle (EPp). The former with about fifteen long and about ten rather short setae, chiefly arranged on the border of the tubercle. The latter with about three setae. Pleural region with an oval tubercle (P), which has usually two setae. Sternal region with a tubercle (ES-SS). The tubercle with two rather long setae and a few micro-setae, and united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. (Dpi) and (Dpe) suboval, subequal in size, and usually each with one or two long and a few rather short setae. (Da) clearly larger than each of (Dpi) and (Dpe), and usually with two or three long and a few rather short setae. (DL) round, convex, and with about seven setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two oval tubercles, (EPa) and (EPp). Each of (EPa) and (EPp) usually with about six setae. On mesothorax, spiracle situated on (EPa). On metathorax, (EPp) larger than (EPa). Pleural region with a tubercle (P), which has two setae. Sternal region with two tubercles, (ES) and (SS). (ES) with two or three setae and united with the homologous tubercle of another side on the longitudinal line. (ES) small, round and usually with one long and one rather short setae. Sometimes a secondary tubercle appears on antero-posterior part of (ES). This may be homologous to (as 1).

Abdomen: Dorsal side with two large tubercles, (D) and (DL). (D) transversely

oval, and with about seven setae, of which one or two setae are long. (DL) round, convex, and with rather short three or four setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with an oval tubercle (EP), which has about six setae. Pleural region with an oval tubercle (P). The tubercles smaller than (EP) in size, and with about six setae. Sternal region with three tubercles. (SS-PS) transversely oval and with usually eight setae. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (as 1) rather small, and with a seta.

First instar larvae.

Head: Vertex with ten setae, and frons with four setae.

Prothorax: Dorsal side with one very large tubercle (D-DL-EPa) and a small one (EPp). The former with about thirteen setae. The latter with a rather long seta. Epipleural region with a tubercle (P), which has two rather long setae and a few micro-setae. Sternal region with a tubercle (ES-SS), which has two setae and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. (Da) with two setae. Each of (Dpi) and (Dpe) with a seta. (Dpe) consists of an egg burster. (DL) with four setae. Epipleural region with two tubercles, (EPa) and (EPp). Each of these tubercles with about seven or eight setae. On mesothorax, spiracle situated on (EPa). Pleural region with a tubercle (P), which has two rather long setae and a few micro-setae. Sternal region with two tubercles. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS) small and with a micro-seta.

Abdomen: Dorsal side with two tubercles. Each of (D) and (DL) with two long setae. Epipleural region with a tubercle (EP), which has about six setae, of which two setae are long. Pleural region with a tubercle (P). The tubercle with about six setae, of which one or two setae are long. Sternal region with two tubercles. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS-PS) with three setae.

Genus *Linaeidea* Motschulsky, 1860

From the Japanese fauna, one species and two subspecies have been recorded. These are *L. aenea* (L.), *L. aenea insularis* (Chûjô) and *L. aenea tsutsuii* Nakane. According to Hennig (1938), this genus is separable from the genus *Chrysomela*, in having sternal tubercles which are disappeared in the last instar larvae. This characteristic is also applicable to the Japanese species.

Linaeidea aenea (Linné, 1758) (Pl. 5, 6)

According to the description done by Lipp (1935) on European specimens, the tubercles of dorsal surface are not disappeared in the last instar larvae, but in the Japanese specimens the tubercles of dorsal surface, except glanduliferous tubercle (DL), are disappeared in the last instar larvae.

Last instar larvae.

The species is separable from *L. aenea insularis* in having the following characters in the fully grown last instar larvae.

1) On meso- and metathorax, tubercles, (Da), (Dpi), (Dpe), (EPa), (EPp) and (P), disappeared. 2) On abdomen tubercles, (D), (EP) and (P), disappeared.

First instar larvae.

Head: Vertex with about ten setae, and frons with three setae.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa) and a very small tubercle (EPp). The former with about nine rather long setae and six or seven micro-setae, arranged only on the border of the tubercle. The latter with a seta. Pleural region with a tubercle (P), which has one long seta and one micro-seta. Sternal region with a tubercle (ES-SS), which has two setae, and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. (Da) usually with four setae, and (Dpi) with two or three setae. (Dpe) with one long seta and one or two micro-setae, and consisting of an eggburgster. (DL) with about six setae, of which one or two are long. Epipleural region with two tubercles. On mesothorax spiracle situated on (EPa). (EPa) with two or three setae. (EPp) with about five setae, of which two or three are rather long. Pleural region with a tubercle (P), which has a long seta and a micro-seta. Sternal region with two tubercles, (ES) and (SS). Each of these tubercles with a seta, and (ES) usually united with the homologous tubercle of another side on the longitudinal line.

Abdomen: Dorsal side with two tubercles. (D) with three long setae and three micro-setae, and (DL) with a long seta and two micro-setae. Epipleural region with a tubercle (EP), which has one long seta and three micro-setae. Pleural region with a tubercle (P), which has one long seta and four or five micro-setae. Sternal region with three tubercles, (ES), (SS) and (PS). (PS) with two setae, and each of the other two tubercles with a seta. (ES) united with the homologous tubercle of another side on the longitudinal line.

Linaeidea aenea insularis (Chûjô, 1940) (Pl. 5, 4-5)

The species was first described by Chûjô under the name of *Chrysomela adamsi* subsp. *insularis* from Shikoku. Recently the species was treated as *Linaeidea aenea insularis* by Nakane (1957). I would like to follow Nakane's treatment. This subspecies differs from *aenea* of Japanese race in having the tubercles of dorsal surface not disappeared in the last instar larvae.

Last instar larvae.

Ground color pale yellow; head black; tubercles and tarsi blackish brown; legs yellowish brown.

Generally, body rather flat, setae rather sparse and short. Granular tubercles very small and sparse. Claws grooved at the apex. Abdomen without pseudopod.

8.0×2.5 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with about five setae, and frons with about ten setae. Middle part of frons roundly depressed. Post-clypeus with three setae. Labrum with two setae, and its anterior margin incised.

Prothorax: Dorsal side with a large tubercle (D-DL-EPa) and a small tubercle (EPp). The former with about fifteen setae, and some of them very short, and arranged only on the border of the tubercle. The latter with two setae. In the fully grown larvae, interior and exterior parts of (D-DL-EPa) and entire (EPp) disappeared. Pleural region with a tubercle (P), which has two setae. Sternal region with a tubercle (ES-SS) which has four or five setae, and is united with the homologous tubercle of another side on the longitudinal line. In the fully grown larvae, sternal tubercles disappeared.

Meso- and metathorax: Dorsal side with four tubercles. (Da) and (Dpe) suboval, and (Dpi) round. Among these three tubercles, (Da) the largest, and with about five setae. (Dpi) with three setae. (Dpe) the smallest, and with three setae, of which one is long. (DL) round, convex, and with three or four setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two tubercles, (EPa) and (EPp). (EPa) slightly larger than (EPp) and usually with five setae. Usually (EPp) with four setae. On mesothorax, spiracle located on (EPa). Pleural region with a tubercle (P), which has usually one long and two short setae. Sternal region with two tubercles, (ES) and (SS). (ES) with a long and a short setae. (ES) with two or three setae. Sometimes a secondary tubercle appears on antero-posterior part of (ES). The tubercle may be homologous to (as 1). In the fully grown larvae, tubercles of sternal region disappeared.

Abdomen: Dorsal side with two large tubercles, (D) and (DL). (D) transversely oval, and with six or seven setae. (DL) round, convex, and with a long seta and three short micro-setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with a round tubercle (EP), which has one long seta and about four micro-setae. Pleural region with an oval tubercle (P), which is smaller than (EP), and has one long seta and two micro-setae. Sternal region with four tubercles, (PS), (ES), (SS) and (as 1). (PS) transversely oval, and with two setae. (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS) and (as 1) small, and each with a seta. In the fully grown larvae, tubercles of sternal region disappeared.

Pupae.

Body pale yellow, and without blackish patch. Setae extremely short and sparse. Seventh abdominal segment with a pair of feebly raised projections laterally. Apex of ninth abdominal segment without any projection apically.

5.5×8.0 mm (in alcoholic specimen).

Genus *Plagiodera* Chevrolat, 1837

A single species of the genus has been recorded from Japan.

Plagiodera versicolora (Laichart, 1781) (Pl. 5, 7–8; Pl. 6, 8–10)

Last instar larvae.

Ground color pale yellow; head black; tubercles blackish brown; legs yellowish brown.

Generally body rather flat. Setae rather sparse and short. Granular tubercles large and rather close. Claws grooved at the apex. Abdomen without pseudopod.

5.0×2.0 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with

about ten setae, and frons with three setae. Middle part of frons roundly depressed. Post-clypeus with three setae, and labrum with two setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa) and a very small one (EPp). The former with about ten long setae and three or four rather short setae, arranged only on the border of the tubercle. The latter small, oval, and with a seta. Pleural region with a tubercle (P), which has a seta. Sternal region with a tubercle (ES-SS), which has two setae and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles (Da), (Dpi), (Dpe) and (DL). (Da), (Dpi) and (Dpe) suboval. (Da) the largest, and with a seta. (Dpe) larger than (Dpi), and with three setae. (Dpi) the smallest, and with a seta. (DL) round, convex, and with one large seta and a few micro-setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two tubercles, (EPa) and (EPp). (EPa) and (EPp) round, subequal to each other in size and each with two long and one short setae. On mesothorax, spiracle situated separately from (EPa). Pleural region with a tubercle (P), which has a seta. Sternal region with two tubercles, (ES) and (SS). (ES) with a seta. (SS) small, round and with a seta. Sometimes a secondary tubercle appeared on antero-posterior part of (ES). The tubercle may be homologous to (as 1).

Abdomen: Dorsal side with two large tubercles, (D) and (DL), and a small secondary tubercle (ad 1). (D) transversely oval and usually with three setae. Secondary tubercle (ad 1) small, round and with a seta. (DL) round, very convex, and with two or three setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with an oval tubercle (EP), which has two setae. Pleural region with an oval tubercle (P), which is smaller than (EP) and has a seta. Sternal region with two primary tubercles (ES) and (PS-SS) and a secondary tubercle (as 1). (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (PS-SS) with three setae, of which one is short. (as 1) small and with a seta.

First instar larvae.

Head: Vertex with about nine setae and frons with three setae.

Prothorax: Dorsal side with a large tubercle (D-DL-EPa) and a very small one (EPp). The former with about fifteen setae, arranged only on the border of the tubercle. The latter with a seta. Pleural region with a tubercle (P), which has a seta. Sternal region with a tubercle (ES-SS), which has two setae, and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles, (Da), (Dpi), (Dpe) and (DL). Each of (Da) and (Dpe) with a seta. (Dpe) consists of an egg burster. (Dpi) with one long seta and one micro-seta. (DL) with two long setae. Epipleural region with two tubercles, (EPa) and (EPp). (EPa) with two setae and (EPp) with three setae. Pleural region with a tubercle (P), which has a seta. Sternal region with two tubercles, (ES) and (SS), and each with a seta.

Abdomen: Dorsal side with two tubercles, (D) and (DL). (D) with two long setae and (DL) with one long seta. Epipleural region with a tubercle (EP), which has three setae. Pleural region with a tubercle (P), which has three setae. Sternal region with two tubercles, (ES) and (SS-PS). (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS-PS) with three setae, of which one locating on (SS) is very short.

Pupae.

Body rather round; pale yellow. Patches reddish brown or blackish brown. Setae extremely short and sparse. Head with a few extremely minute setae. Seventh abdominal segment with a pair of feebly raised projections laterally. Apex of ninth abdominal segment without projection.

3.5×3.0 mm.

Genus *Gastrolina* Baly, 1859

From the Japanese fauna, two species of the genus have been recorded. These two species are separable in having the following characters.

G. depressa Baly: 1. On mesothorax, (Da) clearly larger than (Dpi). 2. On metathorax, (Da) distinctly smaller than (Dpi).

G. peltoides (Gebler): 1. On mesothorax, (Da) subequal to, or slightly larger than, (Dpi). 2. On metathorax (Da) larger than (Dpi).

Gastrolina depressa Baly, 1859 (Pl. 5, 9; Pl. 6, 11)

Last instar larvae.

Ground color pale reddish yellow; head black; tubercles and legs blackish brown; claws reddish brown.

Generally body rather flat; setae rather sparse and short; granular tubercles close and large; claws grooved at the apex; abdomen without pseudopod.

9.0×2.0 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with about five setae, and frons with about fifteen setae. Middle part of frons roundly depressed. Post-clypeus with three setae, and labrum with two setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa) and a very small one (EPp). The former with about fifteen micro-setae, arranged on the border of the tubercle. The latter with a seta. Pleural region with a tubercle (P), which has a seta. Sternal region with a tubercle (ES-SS), which has two setae, and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. (Da), (Dpi) and (Dpe) oval. On mesothorax, (Da) clearly larger than (Dpi), and usually with two setae, but on metathorax, (Da) clearly smaller than (Dpi), and usually with a seta. (Dpe) subequal to, or slightly larger than (Dpi), and usually with one rather long and a few short setae. (DL) round, convex, and with rather short three or four setae, and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two tubercles, (EPa) and (EPp). On mesothorax, spiracle located on (EPa), and the tubercle usually with four setae. (EPp) with three setae. On mesothorax, (EPa) larger than (EPp), but on metathorax smaller than (EPp). Pleural region with a tubercle (P), which has a seta. Sternal region with two tubercles, (ES) and (SS). (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS) with a seta. Sometimes a secondary tubercle appeares on antero-posterior part of (ES). The tubercle may be homologous to (as 1).

Abdomen: Dorsal side with two tubercles, (D) and (DL). (D) transversely oval

and usually with three or four setae. (DL) round, convex, and with about two or three setae and an orifice of eversible gland. Epipleural region with a tubercle (EP), which is round, and has about three setae. Pleural region with an oval tubercle (P), which has two setae. Sternal region with two primary tubercles, (ES) and (SS-PS) and a secondary tubercle (as 1). (ES) with a seta, and united with the homologous tubercle of another side on the longitudinal line. (SS-PS) with four setae, and (as 1) with a seta.

Pupae.

Body elongate; pale yellow. Patches reddish brown or blackish brown. Setae extremely short and sparse. Head nearly glabrous. Seventh abdominal segment with a pair of projections laterally. Apex of ninth abdominal segment without any projection.

6.0×3.5 mm.

Gastrolina peltoides (Gebler, 1832) (Pl. 5, 10)

Last instar larvae.

Ground color pale reddish brown; head black; tubercles and legs blackish brown; claws reddish brown.

Generally body rather flat. Setae rather sparse and short. Granular tubercles large and very close. Claws grooved at the apex. Abdomen without pseudopod.

9.0×2.0 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with about fifteen setae. Frons with about five setae. Middle part of frons roundly depressed. Post-clypeus with three setae and labrum with two setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa) and a small one (EPp). The former with about eleven rather long and two or three short setae, arranged on the border of the tubercle. The latter with a seta. Pleural region with an oval tubercle (P), which has one or two setae. Sternal region with a tubercle (ES-SS), which has two setae, and is united with the homologous tubercle of another side on the longitudinal line.

Meso- and metathorax: Dorsal side with four tubercles. (Da), (Dpi) and (Dpe) oval. On mesothorax, (Da), (Dpi), and (Dpe) subequal to each other. On metathorax, (Da) the largest, and with two rather long setae, and (Dpi) subequal to (Dpe) and with a rather long seta. (Dpe) with a rather long seta and a few micro-setae. (DL) round, convex, and with three or four short setae and an orifice of eversible gland on the tip of the tubercle. Epipelural region with two tubercles, (EPa) and (EPp). (EPa) usually with four setae and (EPp) with three setae. On mesothorax spiracle located on (EPa). Pleural region with a tubercle (P), which has a seta. Sternal region with two tubercles. (ES) with a seta and united with the homologous tubercle of another side on the longitudinal line. (SS) with a seta. Sometimes a secondary tubercle appeared on antero-posterior part of (ES). The tubercle may be homologous to (as 1).

Abdomen: Dorsal side with two large tubercles, (D) and (DL). (D) transversely oval, and with two rather long and a few short setae. (DL) round, convex, and with about four rather short setae. Epipleural region with a tubercle (EP). The tubercle with about five setae. Pleural region with a tubercle (P), which has two setae. Sternal region with four tubercles. (ES) with a seta, and united with the

homologous tubercle of another side on the longitudinal line. (SS) small, and with a seta. (PS) with two long setae and a few micro-setae. (as 1) small, and with a seta.

Genus *Gastrolinoides* Chûjô & Kimoto, 1960

This is a monobasic genus and the only known species is *G. japonica* Harold, which was first described under the genus *Melasoma* and later transfered to *Gastrolina*.

Gastrolinoides japonica (Harold, 1877) (Pl. 5, 11–12; Pl. 6, 12–14)

Last instar larvae.

Ground color pale yellow; head black; tubercles blackish brown; legs yellowish brown; claws reddish brown.

Generally body rather flat, setae rather close and long. Granular tubercles very sparse and small. Claws grooved at the apex. Abdomen without pseudopod. 8.0 × 2.0 mm (in alcoholic specimen).

Head: Cordal suture long and frontal suture nearly straight. Vertex with about seventeen setae. Frons with about ten setae. Middle part of frons roundly depressed. Post-clypeus with three setae and labrum with two setae. Anterior margin of labrum incised.

Prothorax: Dorsal side with a very large tubercle (D-DL-EPa) and a very small one (EPp). The former with about eighteen setae mostly arranged on the border of the tubercle. The latter with about five setae. Pleural region with a tubercle (P), which has usually three setae. Sternal region with a tubercle (ES-SS). The tubercle with three setae, and united with the homologous tubercle of another side on the longitudinal line. In the fully grown larvae, anterior and posterior areas of (D-DL-EPa), and entire (EPa), (EPp), (P) and (ES-SS) disappeared.

Meso- and metathorax: Dorsal side with four tubercles. (Da), (Dpe) and (Dpi) elongate, and subquadrate. (Da) the largest, and with about fifteen setae. (Dpi) with about fifteen setae. (Dpe) the smallest, and with about ten setae. (DL) round, convex, and with twenty setae and an orifice of eversible gland on the tip of the tubercle. Epipleural region with two tubercles, (EPa) and (EPp). These two tubercles subequal to each other in size, and each with about fifteen setae. On mesothorax, spiracle located on (EPa). Pleural region with an oval tubercle (P), which has usually three setae. Sternal region with two tubercles. (ES) with four setae and united with the homologous tubercle of another side on the longitudinal line. (SS) with a seta. Sometimes a secondary tubercle appeared on antero-posterior part of (ES). The tubercle may be homologous to (as 1). In the fully grown larvae, tubercles of epipleural, pleural and sternal regions disappeared.

Abdomen: Dorsal side with two large tubercles, (D) and (DL). (D) nearly rectangular, almost united with the homologous tubercle of another side on the longitudinal line, and with about thirty setae. (DL) round, convex, and with about fifteen setae and an orifice of eversible gland on the tip of the tubercle. Epipelural region with a round tubercle (EP), which has about fifteen setae. Pleural region with a tubercle (P), which has about five setae. Sternal region with three tubercles. (ES) with a seta, and united with the homologous tubercle

of another side on the longitudinal line. (SS-PS) with three setae. (as 1) small, and with a seta. In the fully grown larvae, tubercles of epipleural and sternal regions disappeared.

Pupae.

Body elongate; pale reddish yellow. Setae extremely short and sparse. Seventh abdominal segment with a pair of projections laterally. Apex of ninth abdominal segment without any projection.

5.5×3.5 mm (in alcoholic specimen).

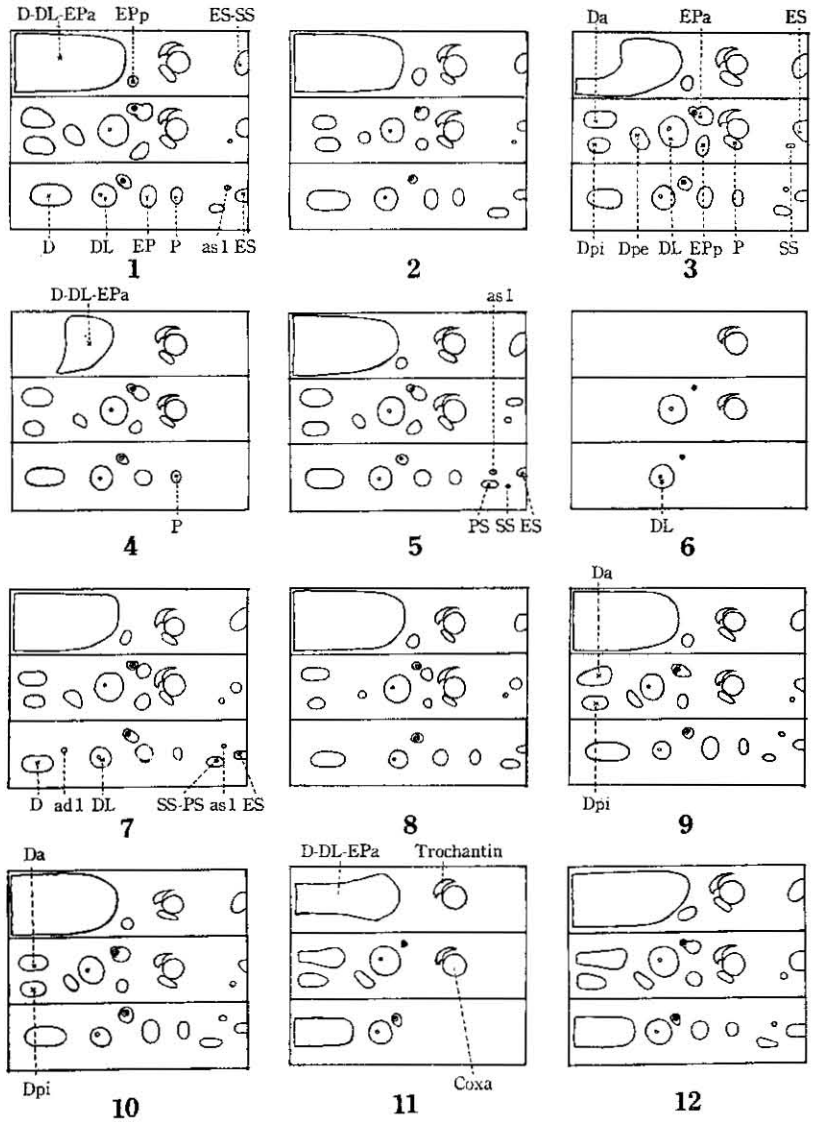
Explanation of Plates

Plate 5

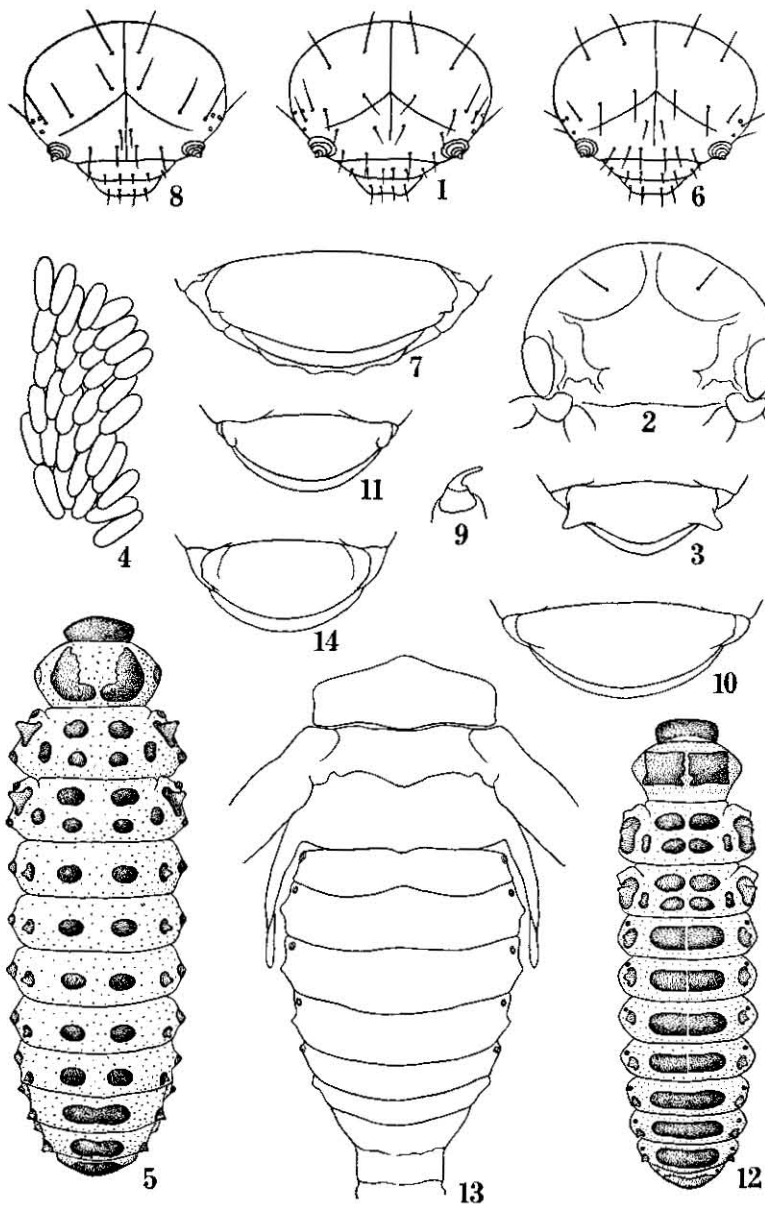
1. *Chrysomela vigintipunctata* (Scopoli). Last instar larva.
2. Ibid. First instar larva.
3. *Chrysomela populi* Linné. Last instar larva.
4. *Linaeidea aenea insularis* (Chûjô). Last instar larva.
5. Ibid. Second instar larva.
6. *Linaeidea aenea* (Linné). Last instar larva.
7. *Plagiodera versicolor* (Laichart). Last instar larva.
8. Ibid. First instar larva.
9. *Gastrolina depressa* Baly. Last instar larva.
10. *Gastrolina peltoides* (Gebler). Last instar larva.
11. *Gastrolinoides japonica* (Harold). Last instar larva.
12. Ibid. Second instar larva.

Plate 6

1. *Chrysomela vigintipunctata* (Scopoli). First instar larva: Head.
2. Ibid. Pupa: Head.
3. Ibid. Pupa: Seventh to ninth abdominal segments.
4. Ibid. Eggs.
5. *Chrysomela populi* Linné. Last instar larva: Dorsal view.
6. Ibid. First instar larva: Head.
7. Ibid. Pupa: Seventh to ninth abdominal segments.
8. *Plagiodera versicolora* (Laichart). First instar larva: Head.
9. Ibid. First instar larva: Claw.
10. Ibid. Pupa: Seventh to ninth abdominal segments.
11. *Gastrolina depressa* Baly. Pupa: Seventh to ninth abdominal segments.
12. *Gastrolinoides japonica* (Harold). Last instar larva: Dorsal view.
13. Ibid. Pupa: Dorsal view.
14. Ibid. Pupa: Seventh to ninth abdominal segments.



Immature stages of Japanese Chrysomelinae



Immature stages of Japanese Chrysomelinae