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Key to the genera of Oriental cassidine beetle larvae feeding on *Ipomoea* with description of a new species of *Sindia* (Coleoptera, Chrysomelidae)

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Abstract. A key to the genera of the Oriental Aspidomorphini larvae (Chrysomelidae) feeding on plants of the genus *Ipomoea* (Convolvulaceae) is given. *Sindia schawalleri* n. sp. from the island of Leyte, Philippines, is described including larva and pupa. A key to the imagines of the genus *Sindia* is added.

Key words. Coleoptera, Chrysomelidae, *Sindia*, new species, larval morphology, Philippines.

Introduction

During a visit to the island of Leyte, Philippines, Dr. W. Schawaller (Staatliches Museum für Naturkunde Stuttgart, SMNS) and collaborators collected a copious and interesting material of chrysomelid beetles. This material, comprising over 100 species of which several are new to science, will be published elsewhere after completion of all determinations. The present paper serves to describe an abundant species of the Cassidinae taken together with larvae and pupae mainly in agrocenoses, thus obviously being a batata pest. A more detailed study of this species has revealed that it represents a new species of *Sindia*. The authorship of the new species is by the senior author, while the descriptions of larvae and pupae have been prepared by the junior author.

Taxonomy

Sindia schawalleri Medvedev n. sp.

Holotype: Philippines, Leyte, Visayas State College of Agriculture N Baybay, cultivated land, 1. III. 1991, leg. W. Schawaller, J. Trautner & K. Geigenmüller, deposited in SMNS.

Paratypes: 3 specimens in Zoologisches Forschungsinstitut und Museum Alexander Koenig (ZFMK), 4 specimens in SMNS, 2 specimens in the collection of the senior author.

Description: Body fulvous, 4 or 5 apical segments of antennae, 2 round spots on prothorax and numerous spots on elytra (fig. 1), including 3 spots on explanate margin (humeral, posterolateral and sutural) are black. Body ovate, about 1.3x longer than broad. Head impunctate, clypeus broad, transverse; frons longitudinally grooved. Antennae short, 5 apical segments thickened, segments 8—11 as long as broad, last segment slightly elongate, acuminate (fig. 2). Prothorax 1.8x broader than long, with broadly rounded sides and impunctate surface. Elytra at base slightly

broader than prothorax, with explanate margin at the broadest point about half width of disc; surface with sparse large dark punctures, arranged in more or less distinct rows, especially near suture, explanate margin with honey-comb structure. Claws with distinct comb structure on inner side and very slightly serrate on outer side (figs 3—4). Body length 7.2—7.6 mm.

Relations: The discovery of a *Sindia* species on the Philippine Islands is somewhat surprising, because the three hitherto known congeners seem to be restricted to a relatively coherent area delimited by the Himalayas, southern China, and Vietnam.

The genus is easily distinguishable by the lack of a comblike structure on the external side of the claw. The new species seems to represent an aberrant form, for its claws still retain clear traces of an external serration, thus having a somewhat intermediate position between the genera *Sindia* and *Aspidomorpha*. *Sindia schawalleri* n. sp. appears to be closely related to *Sindia sedecimmaculata* Boheman, another aberrant species (Maulik 1919). However, the new species has a general appearence very similar to *Aspidomorpha orientalis* Boheman, also known as a rather isolated species inside the genus.

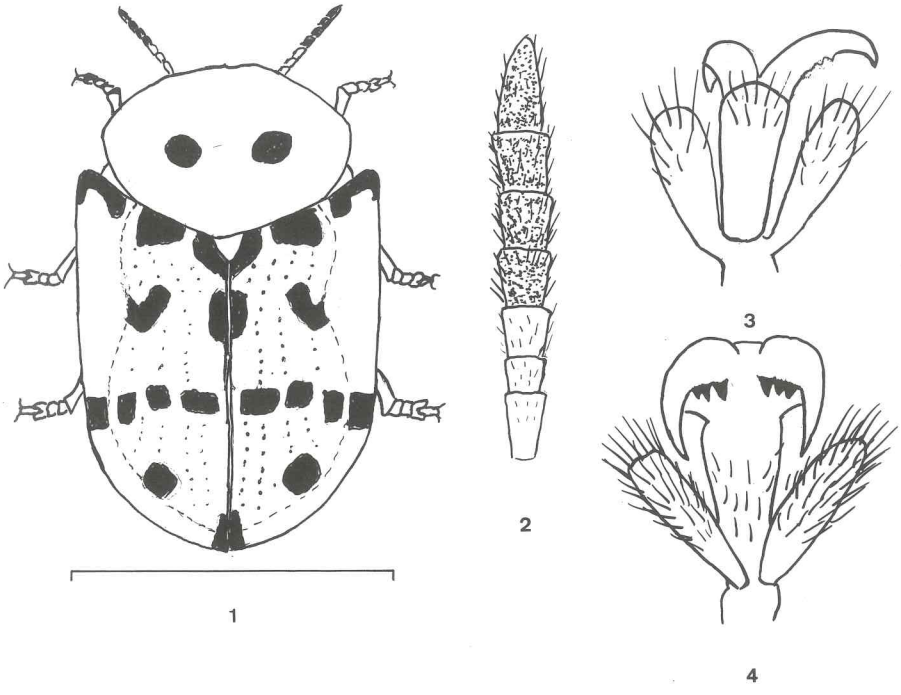
The morphology of the larva shows quite definitely that the new species cannot be included in the genus *Aspidomorpha*. *Sindia schawalleri* n. sp. is feeding on plants of the genus *Ipomoea* (Schawaller in litt. 1992) as most of the Aspidomorphini species and is probably injurious to cultivated batatas.

Key to the species of *Sindia*

1 (4) Elytron coarsely sculptured, with 2 longitudinal and numerous transverse ribs. Body oblong.
2 (3) Prothorax fulvous with 9 irregular black spots, arranged more or less in two transverse rows. Elytron fulvous with 3 spots on disc and 3 on explanate margin black, Length 11.5—14 mm. South India ..... *clathrata* Fabricius, 1798
3 (2) Upper side black with front margin of prothorax more or less fulvous. Longitudinal ribs of elytron more feeble, as in the preceding species. Length 8 mm. North India, Burma ..... *foveolata* Boheman, 1856
4 (1) Elytron smooth, without ribs. Body ovate. Prothorax fulvous with 2 black spots.
5 (6) Antennal segments 8—10 elongate. Elytra strongly and densely punctured, each with 8 round black spots, including 3 spots on explanate margin and one behind scutellum. The first spot on explanate margin placed far behind fore margin. Length 6.6—7 mm. North India, South China, Vietnam ..... *sedecimmaculata* Boheman, 1856
6 (5) Antennal segments 8—10 as long as wide. Elytra sparsely punctured. Elytra with the same pattern of black spots, but they are irregular and the first spot on the explanate margin touches fore margin. Length 7.2—7.6 mm. Philippines ..... *schawalleri* n. sp.

Larval morphology

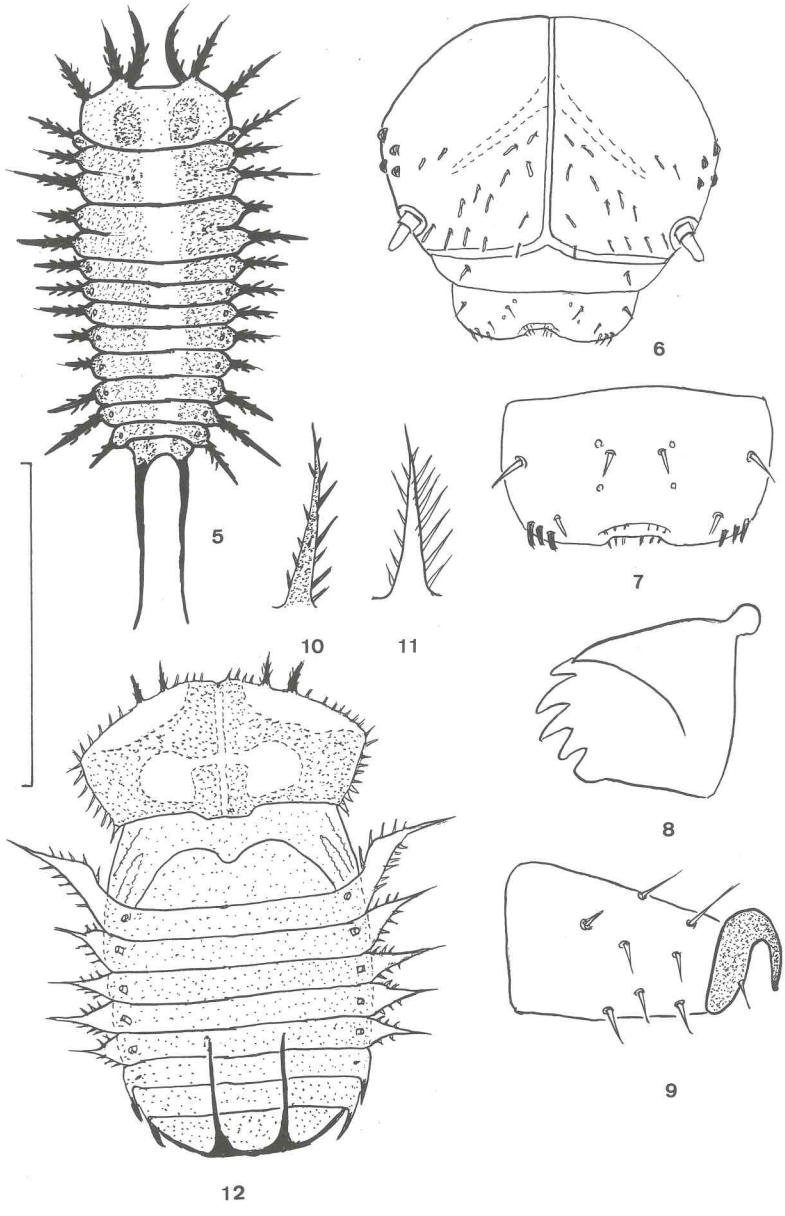
Description of last instar larva: Body ovate (fig. 5), moderately even. Head and lateral processes dark pitchy black, caudal processes dark brown, upperside with dense microsculpture on sides, with longitudinal central pale stripe, underside light with darkened apical segments. Upperside with confused rows of very short light-brown setae, surrounded by light rings. Head transversely ovate (fig. 6), epicranial suture of moderate length, frontal sutures thick, forming an acute angle, endocarina narrow. Vertex without setae, with sclerotised grains with acute apices, more or less spine-like. Frons smooth, shining, sparsely sclerotised, bearing 20—22 slightly



Figs 1—4: *Sindia schawalleri* n. sp.; 1. dorsal view; 2. apical segments of antenna; 3. claws from outer side; 4. claws from inner side. Scale for adults is 5 mm.

clavate bristles. Clypeus transverse, with a bristle on each side. Labrum (fig. 7) with very slightly arcuate fore margin and quadrangular middle excavation, having 6 short setae on its base; each side of fore margin with 3 setae; surface with 6 setae (2, 4) and 4 pores. Maxillar palpi 2-segmented, labial palpi 1-segmented. Antennae 2-segmented, with a small cone-like papilla on the apex of the second segment. Mandibles (fig. 8) broad, with 5 teeth on apex and acute inner margin. Prothorax more or less rugose, light with 2 longitudinal dark-brown spots, without setae, lateral processes conical with acute apex, secondary processes with conical, slightly serrate thecae on apex. Anterior processes with common base. Meso- and metathorax broad with transverse furrows, anterior processes shorter and narrower than posterior ones. Abdominal segments narrow, each with transverse furrow, lateral processes 1—5 shortened posteriorly, the 7th process longer than 6th and 8th process. Caudal processes not connected at base, without spinules, lateral processes with short stout spinules (fig. 10). Stigmae conical, larger on thorax. Caudal processes with exuvium and crumbly faeces structure of irregularly triangular form. Tibiotarsus short, claws with indistinct tooth (fig. 9). Length of body up to 9 mm.

Description of first instar larva: Caudal processes without secondary branching.



Figs 5—12: *Sindia schawalleri n. sp. (5*—10, 12) and *Laccoptera* (11); larva (5—10) and pupa (11—12). 5. dorsal view; 6. head; 7. labrum; 8. mandible; 9. tibiotarsus; 10, 11. lateral process of abdominal segment 1; 12. dorsal view. Scale for complete larva (5) and pupa (12) is 5 mm.

Description of pupa: Body ovate, brown with light spots (fig. 12). Prothorax with arcuate fore margin and feeble triangular protuberances near hind angles; surface shining, with sparse and small sclerotised punctures, margins with short spines and 4 processes, 2 on each side, having short spinules. First abdominal process long and curved, with 6—7 spinules on fore margin and 7—8 on hind margin. Second to 5th abdominal processes shorter, conical, with spinules. Processes of segments 6—7 spine-like, short, directed backwards. Segment 8 rounded on apex, with 2 thin and long caudal processes, lacking spinules, but usually with exuviae and faeces. There are 6 pairs of stigmata, but the last pair is reduced to an almost indistinct light spot, the first pair conical, the others tube-like. Length of body up to 8 mm.

Key for the genera of Oriental Aspidomorphini larvae

Keys for Oriental larvae of Cassidinae were proposed in the last years (Gressitt & Kimoto 1963, Zaitsev & Medvedev 1983). The genus *Sindia* is included in the key of Gressitt & Kimoto according to the description of *clathrata* Fabricius by Maulik (1948). Below we propose a key to larvae for all genera of Oriental Aspidomorphini, feeding on *Ipomoea* (*Aspidomorpha*, *Sindia*, *Laccoptera*) and on *Argyreya* (*Sindiola*).

1 (2) Caudal processes of 1st instar larvae with long secondary processes. Processes 1—2 on each side of prothorax not joined at base, bearing slender spinules. Caudal processes never twice as long as last pair of lateral processes ..... *Aspidomorpha* Hope, 1840
2 (1) Caudal processes of 1st instar larvae without secondary processes. Processes 1—2 on each side of prothorax more or less joined at base, bearing stout spinules. Caudal processes fully twice as long as last pair of lateral processes.
3 (4) Labrum with 3 marginal setae on each side (fig. 7). Microsculpture of upperside dense, dark brown. Lateral processes of body dark. Faeces structure (parasol) forming a crumbly irregular triangle, which is somewhat longer than wide ..... *Sindia* Weise, 1897
4 (3) Labrum with 5—6 marginal setae on each side. Microsculpture of upperside sparse and rather pale. Lateral processes pale, with longer spinules (fig. 11). Parasol forming a compact triangle, which is wider than long.
5 (6) Labrum with 5 pairs of marginal setae. Pusher long, cylindrical, longer than half of 8th abdominal processes ..... *Laccoptera* Boheman, 1855
6 (5) Labrum with 6 pairs of marginal setae. Pusher short, conical, shorter than half of 8th abdominal processes ..... *Sindiola* Spaeth, 1903

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Zusammenfassung

Ein Bestimmungsschlüssel für die Gattungen der orientalischen Aspidomorphini-Larven (Chrysomelidae, Coleoptera), die an Windengewächsen der Gattung *Ipomoea* fressen, wird erstellt. *Sindia schawalleri* n. sp. von der Philippinen-Insel Leyte wird nach Imago, Larve und Puppe beschrieben, und ein Bestimmungsschlüssel für die Imagines der bekannten Arten der Gattung *Sindia* Weise wird beigefügt.

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