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DISTRIBUTION OF CHRYSOMELID PESTS ASSOCIATED WITH CERTAIN AGRICULTURAL PLANTS IN PAPUA NEW GUINEA (COLEOPTERA)*

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Abstract

Various cash and subsistence crops were sampled for chrysomelid beetles in five provinces of Papua New Guinea during July-August 1982. Principal plants sampled included cardamom and wild gingers, legumes, aibika, maize and sugar cane, pumpkin, and sweet potato (*Ipomoea*). Wild *Ipomoea* was also sampled. Twenty-five species of Chrysomelidae are identified from these collections; each species is diagnosed or keyed and is listed under its respective host, with further information given on its occurrence and altitudinal range in New Guinea and its overall distribution. Keys are provided for the appropriate species of Hispidinae and Cassidinae.

This report is a result of our field survey on the ecological and geographical distribution of chrysomelid pests associated with certain agricultural plants in Papua New Guinea conducted during the period from July 12 to August 28, 1982. The survey was carried out from nearly sealevel to 2750 m altitudes at different areas, but particularly in the Highlands. The following abbreviations are used : C. P. – Central Province ; E. H. P. – Eastern Highlands Province ; M.P.- Morobe Province; S.P.- Simbu Province; and W.H.P.- Western Highlands Province.

Cardamom and Wild Gingers

1. *Lema connectens* Baly

Head, thorax, basal 2/5 of elytron, and legs except apical half of metafemur orange-testaceous ; apical 3/5 of elytron blackish blue ; abdomen and apical half or more of metafemur black; antenna pale or dark; length 5.4-7.1 mm.

This species ranges from about sealevel to 2000 m altitude and is known

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to occur only in New Guinea and the Aru Islands. This species was found on cardamom (*Elettaria cardamomum*) at Kuk, and on wild gingers elsewhere.

Localities observed: Baiyer River Sanctuary, 1200 m, W. H. P. 6. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 13. viii.

2. **Lema monicorum** Gressitt

Head, antenna, most or all of prothorax, apical 2/5 of elytron, ventral surfaces, and metaleg black ; basal 3/5 of elytron orange-testaceous; vertex, base of pronotum, pro- and mesolegs often stained with orange ; length 5.5-6.5 mm.

This species has been collected from 750 m to 1600 m altitude over the eastern part of New Guinea, and is associated with gingers (Zingiberaceae), including at least one record from cardamom [Baiyer River, 1220 m, i. 1971 by T. L. Fenner].

Locality observed : Baiyer River Sanctuary, 1200 m, W. H. P., 6. viii.

3. **Rhyparidella arachi** (Gressitt)

Body surfaces and legs black; elytron smooth, shining ; pronotum smooth to subgranulate, barely duller than elytron ; occiput granulate, dull; antenna with basal segments yellow-testaceous, apical segments fulvous ; length 2.9-3.85 mm.

This species ranges from sealevel to 2400 m altitude and is known to occur only in New Guinea. Our specimens were collected from cardamom, a new host record. Previous records (Gressitt, 1963) show that this species may damage peanuts (*Arachis hypogaea*) and kapok (*Ceiba pentandra*).

Locality observed : Baiyer River Sanctuary, 1200 m, W. H. P., 5. viii.

Legumes

Cassena intermedia (Jacoby) (= *Solenia papuana* Jacoby)

Elytron, metathorax and abdomen blackish blue; head, pro- and mesothorax, and legs yellowish brown, antenna pitchy black with basal segments brownish ; length 3.3-4.7 mm.

This species is widely distributed from 1100 m to 1700 m altitude and is commonly found on mung bean (*Phaseolus aureus*), lima bean (*Phaseolus lunatus*), and so on. This species is known to occur only in New Guinea.

Localities observed : Wau, 1100-1300 m, M. P., 14-26. vii. and 16-20. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Kundiawa, 1500 m, S. P., 3. viii. ; Sepik-Wahgi Divide, 1700 m, N of Baiyer River, W. H. P., 7. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

2. **Monolepta bifasciata** (Hornstedt)

Yellowish brown, elytron with basal and postmedian markings blackish; first segment of posterior tarsus nearly 1 3/4 times as long as following three segments combined ; length 4.7-5.0 mm.

This species is widely distributed in SE Asia and is known as a pest of

maize, cassava, and so on. Although we collected this species from several localities, we did not observe it on any agricultural plants. This species occurs from about sealevel to 1600m altitude in Papua New Guinea.

Localities observed: Laloki, 20 m, 18 km, NE of Port Moresby, C. P., 13. vii. ; Wau, 1100-1300 m, M. P., 14-26. vii. and 16-20. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Gent River, 700 m, Jimi Valley, W. H. P., 7. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

Aibika (*Abelmoschus manihot*)

1. *Nisotra obliterata* Jacoby

This species somewhat resembles *Cassena intermedia* (Jacoby), a pest of legumes, in having the similar body shape and coloration, but clearly separable from it in having the posterior femur more strongly widened, and pronotum with a pair of short longitudinal sulci at anterior margin, in addition to basal ones. This species is known to occur in New Guinea only, and is widely distributed from about sealevel to 1600 m altitude. In several gardens, heavy infestations on leaves were observed.

Localities observed: Laloki, 20 m, 18 km NE of Port Moresby, C. P., 13. vii. and 25-26. viii. ; Bulolo, 700 m, M. P., 18. viii. ; Wau, 1100-1300 m, M. P., 16-20. viii. ; Kundiawa, 1500 m, S. P., 3. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

Maize and Sugar Cane

1. *Dicladispa fabricii* (Guérin-Méneville)

This species is known to occur in NW and NE New Guinea, New Britain and Bougainville.

Locality observed : Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. vii, many specimens on maize and sugar cane.

2. *Dicladispa linnei* (Weise)

This species has been recorded from NE and SE New Guinea.

Localities observed : Wau, 1100-1300 m, M. P., 14-26. vii and 16-20. viii. ; many specimens on maize; Kundiawa, 1500 m, S. P., 3. viii.

3. *Hispellinus albertisii* (Gestro)

This species has been recorded from NW, NE and SE New Guinea.

Localities observed : Boda, 500 m, 6 km SE of Sogeri, C. P., 24. viii.; Rulolo, 700 m, 18. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.; on maize. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

KEY TO HISPID SPECIES INFESTING MAIZE IN PAPUA NEW GUINEA

1. Antenna without any dorsal spine; claws double, as usual2
- First antennal segment with distinct dorsal spine; claws single; spines on dorsal surfaces shorter, entirely black ; length 4.0-5.1 mm **Hispellinus albertisii**
2. Entirely black; pronotum with median groove less distinct; length 5.0-5.5 mm **Dicladispa linnei**
- Partly black: pronotum and most of femora dark reddish brown; pronotum with median groove more distinct; length 5.0-6.2 mm **Dicladispa fabricii**

Pumpkin

1. Aulacophora similis (Olivier)

Yellowish brown ; ventral surfaces of meso- and metathorax, abdomen and most of antenna and legs blackish; in male fifth abdominal segment trilobed and its median lobe deeply sulcate at middle, first antennal segment widened, and elytron with lateral portion of humerus covered by fine hairs; length 6.7-7.3 mm.

This species is widely distributed in SE Asia and Oceania, and occurs from about sealevel to 1300 m altitude in Papua New Guinea.

Localities observed : Laloki, 20 m, 18 km NE of Port Moresby, C. P., 13. vii. and 25-26. viii. ; Wau, 1100-1300 m, M. P., 14-26. vii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.

2. Aulacophora albofasciata Baly

Reddish brown ; labrum, ventral surface of mesothorax and antenna mostly black; legs black with most of anterior leg and femur of middle leg brownish; elytron black with a yellowish brown transverse band at middle, or entirely black in darkest specimens, or yellowish brown with basal 1/3 black in palest specimens; in male fifth abdominal segment trilobed and its median lobe deeply excavated at middle ; length 6.2-7.8 mm.

This species is most commonly found in gardens from about sealevel to 1700m altitude, and is known to occur only in New Guinea.

Another New Guinean species, *Aulacophora pallidifasciata* Jacoby is characteristic in having the head entirely black, and the interantennal space narrower, being nearly as wide as the diameter of a single eye.

Localities observed : Laloki, 20 m, 18 km NE of Port Moresby, C. P., 13. vii. ; Boda, 500 m, SE of Sogeri, C. P., 24. viii. ; Bulolo, 700 m, M. P., 18. viii. ; Wau, 1100-1300 m, 14-26. vii. and 16-20. viii.; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Sepik-Waghi Divide, 1700 m, N of Baiyer River, W. H. P., 7. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

3. Aulacophora robusta Duvivier

Reddish brown ; ventral surfaces of metathorax and abdomen black;

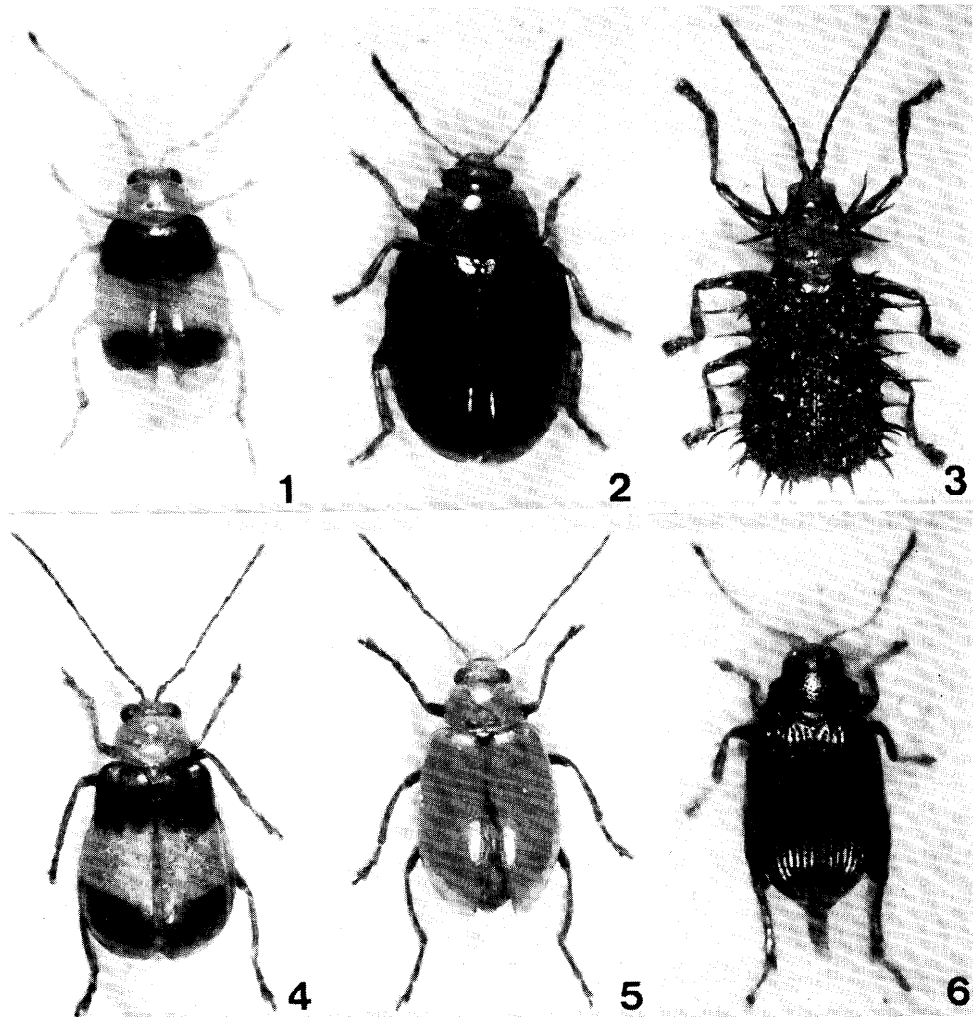
antenna and legs mostly brownish, in part dark; punctures of elytron stronger; elytron reddish brown, or sometimes pitchy black with marginal area brownish; in male head with a pair of distinct tubercles and fifth abdominal segment trilobed with its median lobe deeply excavated at middle; length 7.0-7.8 mm.

This species is known to occur only in New Guinea.

Locality observed : Gent River, 700 m, Jimi Valley, W. H. P., 7. viii.

4. *Aulacophora rigoensis* Jacoby

Yellowish brown; head with a pair of black markings behind eyes ;



Figs. 1-6. Dorsal view. 1: *Monolepta bifasciata*. 2: *Nisotra obliterata*. 3: *Dicladispa fabricii*. 4: *Aulacophora albofasciata*. 5: *Monolepta semiviolacea*. 6: *Arsipoda tenimberensis*.

elytron with large basal and apical markings black; ventral surfaces with middle of second to fourth abdominal segments black; in male fifth abdominal segment trilobed and median lobe with a deep longitudinal sulcus; length 5.3-5.5 mm.

Gressitt (1953) reported this species as a pest of eggplant (*Solanum melongena*) and pumpkin (*Cucurbita pepo*) from SE New Guinea. This species is known to occur only in New Guinea.

Locality observed: Laloki, 20 m, NW of Port Moresby, C. P., 13. vii.

Sweet Potato

1. *Colasposoma regulare* Jacoby

Golden green, with apical margin of each abdominal segment brownish; antenna and legs bluish; body strongly convex, dorsal surfaces closely and distinctly punctate; length 6.1-8.9 mm.

This species is known to occur only in New Guinea.

Locality observed: Boda, 500 m, 6 km SE of Sogeri, C. P., 24. viii.

2. *Monolepta semiviolacea* Fauvel

Ochraceous; scutellum, ventral surfaces of meso- and metathorax, abdomen, and legs entirely black; antenna black with basal segments brownish; first segment of posterior tarsus long; length 5.0 mm.

This species is known to occur in New Caledonia, Vanuatu [New Hebrides], and Papua New Guinea. According to Brun and Chazeau (1980), this species is a pest of *Ipomoea batatas* in New Caledonia.

Locality observed: Kundiawa, 1500 m, S. P., 3. viii.

3. *Arsipoda tenimberensis* (Jacoby)

Suboval; cupreous black; elytron with strong longitudinal rows of punctures; pronotum covered by strong punctures and with subbasal transverse furrow delimited by a short longitudinal furrow each side; length 1.9-2.3 mm.

We observed large numbers of this species in various localities from about sealevel to 1600 m altitude in Papua New Guinea. This species is known to occur in Indonesia and New Guinea.

Localities observed: Laloki, 20 m, 18 km NE of Port Moresby, C. P., 13. vii.; Boda, 500 m, SE of Sogeri, C. P., 24. viii.; Bulolo, 700 m, M. P., 18. viii.; Wau, 1100-1300 m, M. P. 14-26. vii. and 16-20. viii.; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.; Gent River, 700 m, Jimi Valley, W. H. P., 7. viii.; Kundiawa, 1500 m, S. P., 3. viii.; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

4. *Cassida strigula* Montrouzier

This species is known to occur in New Guinea and N Australia.

Localities observed: Laloki, 20 m, 18 km NE of Port Moresby, C. P., 25-26. viii.; Boda, 500 m, 6 km SE of Sogeri, C. P., 24. viii.

5. *Cassida diomma* Boisduval

This species is known to occur only in New Guinea.

Localities observed : Bulolo, 700 m, M. P., 18. viii. ; Wau, 1100-1300 m, M. P., 14-26. vii. and 16-20. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Kundiawa, 1500 m, S. P., 3. viii.; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

6. *Aspidomorpha punctum* (Fabricius)

This species is known to occur in New Guinea and N Australia

Localities observed: Laloki, 20 m, 18 km NE of Port Moresby, C. P., 13. vii. and 25-26. viii. ; Kundiawa, 1500 m, S. P., 3. viii. ; Kuk, 1600 m, near Mount Hagen, W. H. P., 12-13. viii.

Wild species of *Ipomoea*

The following six species were observed on wild species of *Ipomoea*, and all potentially infest sweet potato.

1. *Aspidomorpha adhaerens* (Weber)

According to Simon Thomas (1954), this species is able to complete its entire life cycle on *Ipomoea batatas*. Simon Thomas also noted that the distribution of this species extends from the Celebes to the Solomon Islands, and occurs in New Guinea along the N coast up to 1000 m altitude. In this survey, we observed it on wild *Ipomoea* at altitudes of up to 1200 m.

Localities observed: Bulolo, 700 m, M. P., 18. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.

2. *Aspidomorpha punctum* (Fabricius)

This species is also treated above, as it was collected from sweet potato, as well as from wild *Ipomoea*.

Localities observed : Boda, 200 m, 6 km SE of Sogeri, C. P., 24. viii. ; Bulolo, 700 m, M. P., 18. viii.; Wau, 1100-1300 m, M. P., 14. vii. and 16--20. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii. ; Gent River, 700 m, Jimi Valley, W. H. P., 7. viii.

3. *Aspidomorpha socia* Boheman

This species is known to occur only in New Guinea.

Localities observed: Boda, 500 m, 6 km SE of Sogeri, C. P., 24. viii. ; Bulolo, 700 m, M. P., 18. viii. ; Wau, 1100-1300 m, M. P., 16-20. viii. ; Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.; Gent River, 700 m, Jimi Valley, W. H. P., 7. viii.

4. *Cassida personata* Spaeth

This species is known to occur only in New Guinea.

Locality observed : Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.

5. *Cassida sexguttata* Boisduval

This species known to occur only in New Guinea.

Localities observed : Port Moresby, C. P., 12. vii. ; Bulolo. 700 m, M. P., 18. viii.

6. *Laccoptera impressa* Blanchard

This species is known to occur in New Guinea and N Australia.

Locality observed: Baiyer River Sanctuary, 1200 m, W. H. P., 4-8. viii.

KEY TO CASSID SPECIES IN PAPUA NEW GUINEA POTENTIALLY INFESTING SWEET POTATO

1. Claws without comb-like structure at base; ventral surfaces and legs entirely brownish 2
- Claws with comb-like structure at base 6
2. Disc of elytron black with markings brownish 3
- Disc of elytron entirely black; length 5.8-6.0 mm *Cassida diomma*
3. Pronotum brownish with basal part blackish 4
- Pronotum entirely brownish ; length 5.0-5.8 mm *Cassida strigula*
4. Disc of elytron black with many small markings brownish 5
- Disc of elytron black with a large subbasal marking brownish ; length 5.5-5.8 mm *Cassida personata*
5. Disc of elytron with X-shaped marking behind scutellum and a round subapical marking brownish ; length 5.1-5.8 mm *Cassida sexguttata*
- Disc of elytron brownish with sutural marking and common U-shaped marking on outer portion of disc black; length 5.5 mm (Spaeth-New Guinea, Solomon Is.) *Cassida papuana*
6. Body round in outline, depressed; elytral surface fairly smooth, with broad subhorizontal lateral expansion ; ventral surfaces and legs yellowish brown 7
- Body somewhat pentagonal; elytral surface rugose and deeply punctate, with moderately broad, declivitous lateral expansion ; ventral surfaces largely black ; legs blackish and partly brownish; dorsal surfaces black with anterior half of pronotum and middle of explanate margin of elytron brownish ; length 8.6 mm *Laccoptera impressa*
7. Postscutellar elevation of elytron rather strong, with its summit sharply pointed 8
- Postscutellar elevation of elytron rather weak, with its summit rounded 9
8. Dorsal surfaces yellowish brown, but elytron with anterior and posterior bands of explanate margin and most parts of disc reddish brown; length 7.2-10 mm *Aspidomorpha socia*
- Dorsal surfaces yellowish brown, elytron with anterior and posterior bands of explanate margin and most parts of disc, except postscutellar area, blackish ; length 10 mm (Boisduval-New Guinea) *Aspidomorpha novaeguineensis*
9. Body length longer, than 10 mm 10
- Body length shorter than 9 mm; elytron usually with anterior and posterior bands on explanate margin black and somewhat irregular marking on disc black ; markings variable, reduced or enlarged ; length 7.8-8.6 mm *Aspidomorpha punctum*
10. Body generally round in outline, apex of elytron round; elytron usually yellowish brown with anterior and posterior bands on explanate margin and small markings on disc black; markings variable, reduced or enlarged ; length 10-12 mm (Fabricius-SE Asia) *Aspidomorpha miliaris*

- Body generally oval in outline, apex of elytron slightly angulate; elytron usually yellowish brown with anterior and posterior bands on explanate margin and U-shaped marking on disc black, markings variable, reduced or enlarged; length 10-12 mm **Aspidomorpha adhaerens**

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