Host Plants and Distribution of Some Grey Weevil Species of the Tribe Celeuthetini in Netherlands New Guinea.

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(Manuscript received 4.6.1962.)

FOR a long time considerable damage has been caused to several crops in Netherlands New Guinea by different species of grey weevils of the tribe Celeuthetini. The damage caused by these species has not been previously described.

Recent identifications by the Commonwealth Institute of Entomology (London) have made it possible to carry out specific studies of the damage caused by the various species.

The following list shows the different species with their host plants and the places where they were collected.

Apirocalus cornutus Pasc.

Wedelia biflora ; Dojo (Hollandia) 19th September, 1961 ; Kota Nica, 24th December, 1961 ; Ajapo (Hollandia) 31st December, 1961. Unknown hosts : Genjem April, 1956 (coll. G. den Hoed), Ifar (Hollandia) 18th October, 1957.

Idiopsis grisea Fst.

Ipomoea sp. : Mokmer (Biak) 21st July, 17th August, 1961. *Merrenia peltata* Merr. : Sausapor (W.N.G.) 24th July, 1961.

Idiopsis perplexa Fst.

Merrenia peltata Merr. : Kota Nica 24th December, 1961. *Musa paradisiaca* L. : Kota Nica 10th October, 1960. *Wedelia biflora* : Ajapo (Hollandia) 31st December, 1961. Unknown hosts : Hollandia March 12th, 1956 (coll. G. den Hoed). Genjem April, 1956 (coll. G. den Hoed), Kepi (S.N.G.) 17th October, 1957.

Oribius immitis Pasc.

Amaranthus sp. : K. P. Landbouw (Biak) 4th January, 1957. *Brassica rugosa* Prain. : K. P. Landbouw (Biak) 28th February, 1956. *Colocasia* sp. : Fakfak 20th October, 1956 (coll. A. M. Cramer).

Oribius leucostictus Pasc.

Vigna sinensis Endl. : Saoka, near Sorong, 10th February, 1960. *Merrenia peltata* Merr. : Jangkate, near Sorong, 27th July, 1961.

Oribius* sp. aff. *immitis Pasc.

Unknown hosts : Kepi (S.N.G.) 17th October, 1957, Getenteri (S.N.G.) 11th October, 1957, Tanahmerah (S.N.G.) 7th April and 18th June, 1957, February 1958, Mandabo (S.N.G.) 9th November, 1957.

Oribius* sp. aff. *improvidus Mshl.

Acacia auriculiformis : Kota Nica 24th June, 1961. *Anona muricata* L. Kota Nica 10th May, 1956, 26th May and 16th June, 1961. *Arachis hypogaea* L.: Kota Nica 3rd November, 1961. *Asystasia intrusa* Bl.: Kota Nica 24th June, 1961. *Boehmeria nivea* Gaud. Kota Nica 12th June, 1961. *Brassica rugosa* Prain.: K. P. Landbouw (Biak) 29th February, 1961. *Calopogonium mucunoides* Desv.: Kota Nica 21st October, 1961. *Carica papaya* L.: Kota Nica 24th June, 1961. *Cassia spectabilis* : Kota Nica 24th June, 1961. *Centrosema pubescens* Benth.: Kota Nica 24th June, 1961. *Citrus* spp.: Kota Nica 26th May and 16th June, 1961. *Coffea arabica* L.: Kota Nica 7th January, 1960. *Coffea liberica* Bull., seedlings : Kota Nica 24th June, 1961, *Endospermum* sp. Kota Nica 2nd November, 1960, 6th June and 16th June, 1961. *Glycine max* Merr.: Kota Nica 30th June, 1961. *Grevillea robusta* A. Cunn.: Kota Nica 24th June, 1961. *Hevea brasiliensis* Muell. Arg.: Kota Nica 30th June, 1961. *Hibiscus rosa-sinensis* L.: Kota Nica 30th June, 1961. *Indigofera hirsuta* L.:

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Kota Nica 2nd November, 1960, 9th and 16th June, 1961. *Ipomoea batatas* Poir.: Kota Nica 26th May and 16th June, 1961. *Ixora* sp.: Kota Nica 24th June, 1961. *Mangifera indica* L.: seedlings : Kota Nica 24th June, 1961. *Merrenia peltata* Merr.: Kota Nica 16th June and 24th December, 1961. *Musa paradisiaca* L.: Kota Nica 10th October and 28th October, 1960, 26th May and 16th June, 1961. *Mussaenda frondosa* L.: Kota Nica 24th June, 1961. *Nephelium lappaceum,* seedlings : Kota Nica 24th June, 1961. *Ochroma* sp.: Sentani 22nd June, 1961. *Passiflora quadrangularis* : Kota Nica 24th June, 1961. *Passiflora foetida* L. Kota Nica 30th June, 1961. *Persea gratissima* Gaertn.: Kota Nica 26th May, 1961. *Phaseolus* spp.: Kota Nica 21st December, 1957. *Pueraria javanica* Benth.: Kota Nica 24th June, 1961. *Ricinus communis* L.: Kota Nica 30th June, 1961. *Sesbania* sp.: Kota Nica 19th February, 1958. *Solanum melongena* L.: Kota Nica 16th June, 1961. *Theobroma cacao* L.: Sewan near Sarmi, 11th March, 1958, seedlings, Kota Nica 24th June, 1961. Unknown hosts : Hollandia 12th March, 1956, Rhijnauwen near Hollandia, May 1956 (coll. G. den Hoed), 14th September, 1957, Dojo near Hollandia, August 1956 (coll. G. den Hoed), 1st November, 1956, 15th April and 12th July, 1957, Genjem April 1956 (coll. G. den Hoed), Sewan near Sarmi, 12th March, 1958, 22nd June, 1959, Jeraswir near Sarmi, 13th March, 1958, Biak, 4th January, 1957, K. P. Landbouw (Biak) 12th June, 1959.

***Oribius* sp.**

Merrenia peltata Merr.: Weroer (W.N.G.) 25th July, 1961, Sausapor (W.N.G.) 24th July, 1961, *Brassica rugosa* Prain.: K. P. Landbouw (Biak) 29th February, 1956, 4th January, 1957.

***Sphaeropterus albolineatus* Guer.**

Amaranthus sp.: K. P. Landbouw (Biak) 28th February, 1956. *Coffea canephora* Pierre et Froehner : Manokwari 13th December, 1955. *Theobroma cacao* L.: Manokwari 14th December, 1955, Wosi near Manokwari, 4th April, 1959. Unknown hosts : Fak-Fak, 23rd November, 1959.

The species *Apirocalus cornutus* Pasc. is easily recognized by the thorn-shaped protrusion on each elytron. The other species are very much alike and can only be distinguished by the structure of the male genitalia (Fig. 1).

Figure 2 shows the geographical distribution of most species throughout Netherlands New Guinea. *Apirocalus cornutus* Pasc. which was found only at Hollandia, is not included in this map. The map still shows many blank spaces

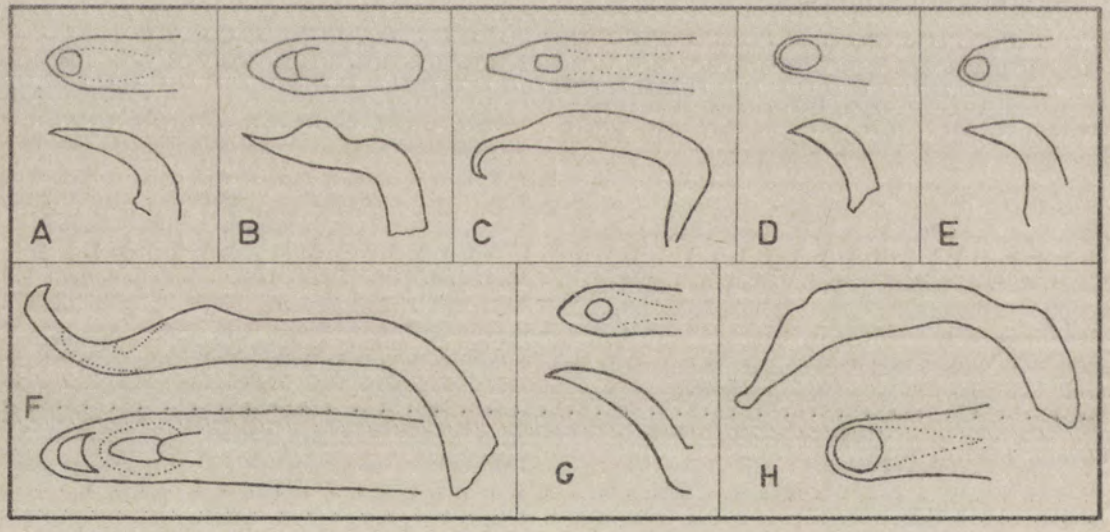

Figure 1.—Male genitalia of A. *Sphaeropterus albolineatus* Guer., B. *Idiopsis perplexa* Fst., C. *Oribius immitis* Pasc., D. *Oribius* sp., E. *Oribius leucostictus* Pasc., F. *Oribius* sp. aff. *improvidus* Mshl., G. *Idiopsis grisea* Fst., H. *Oribius* sp. aff.—*immitis* Pasc.

from which observations have not been made. There is little doubt, however, that several species also occur in these areas.

The foregoing list shows that at Kota Nica *Idiopsis perplexa* Fst. has only been found on two crops. This is in striking contrast with *Oribius* sp. aff. *improvidus* Mshl., which is a polyphagous insect. Its polyphagous nature is clearly reflected in the list of 35 host plants. Yet *Oribius* sp. aff. *improvidus* Mshl. reveals a certain preference for various parts of its host. On bananas it is mainly the young fruit (Plate I) which is attacked, and in the second instance the leaves (Fig. 3A), especially the young, rolled ones. On sour-sop only the leaves are attacked (Fig. 3B). On citrus this species shows a special preference for the leaves and secondarily for the bark of young shoots. On cacao and coffee it only attacks the young leaves of seedlings, whereas on rubber it feeds only on the young petioles, causing the leaves to fall off.

It seems that the degree of damage caused by these weevil species is dependent on the cover crop. All observations are summarized in Table I, which at the same time shows the cover crops and the degree of damage. The cover crops listed are : *Centrosema pubescens* Benth., *Calopogonium mucunoides* Desv. and *Pueraria Javanica* Benth. (indicated respectively by *Cen.*, *Cal.* and *Pu.*)

It is probable that the larvae of the weevils feed on the roots of the cover crops. Larvae of Celeuthetini weevils are recorded as boring into thick roots or attacking the epidermis of small roots. The food plants of the larvae require special study and will therefore not be discussed in this article.

To correlate the degree of damage with the kind of cover crop, the numbers of specimens of *Oribius* sp. aff. *improvidus* Mshl. and *Idopsis perplexa* Fst. (indicated on Table II by the abbreviations *O. imp.* and *I. per.*) found on banana plants were counted. The trial plot was

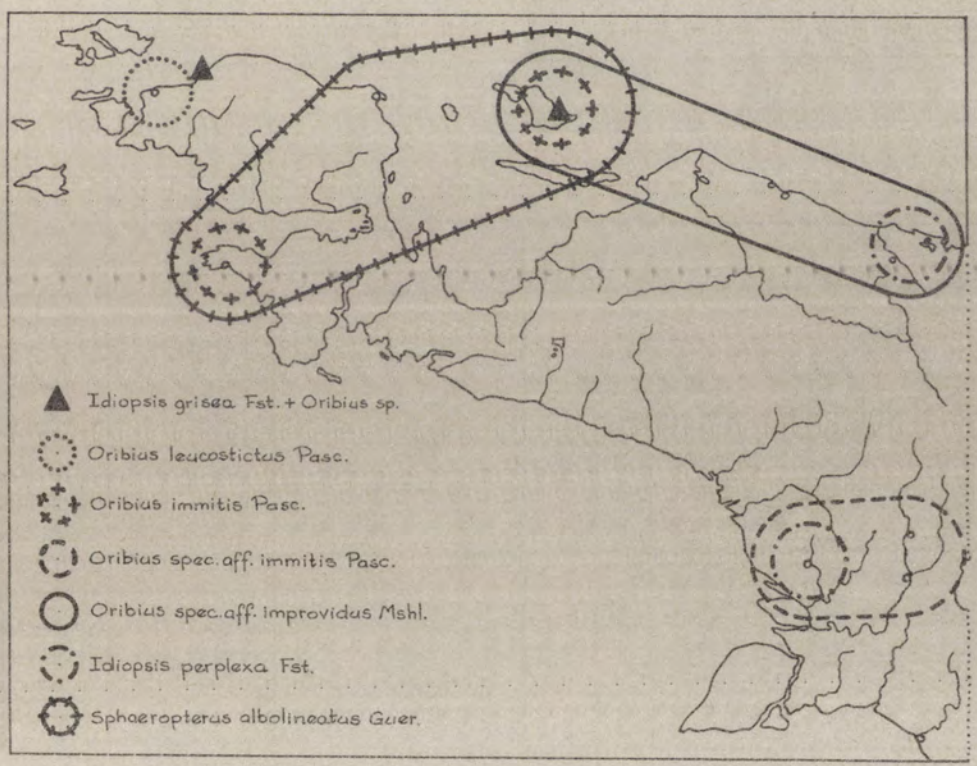

Figure 2.—Geographical distribution of some grey weevil species.

planted with *Musa paradisiaca* L. and various cover crops. The banana plants were shaken over a white sheet (this sampling method is based on the habit of these weevils to drop from the tree when disturbed and to feign death for a short period of time). In this manner the weevils can be easily caught. This method provides a fairly accurate quantitative picture.

Plate I.—Damage on banana fruit by Celeuthetini weevils.

Figure 3.—Damage by Celeuthetini weevils on (A) banana leaf and (B) sour-sop leaf.

Table II shows clearly that an undergrowth of *Calopogonium* and *Pueraria,* and to a minor degree *Centrosema,* promotes the occurrence of the two weevil species.

After removing the cover crop *Calopogonium,* it takes months for the pest to disappear completely, since it is extremely difficult in practice to remove all parts of the roots around the banana stools. Table II shows an example of this phenomenon. The first and fourth lines indicate the numbers of grey weevils per tree in Section 6D. Total weevil numbers per plant fell from (267 + 108) ÷ 5 — 75 to (56 + 34) ÷ 7 — 13 within six months following the removal of the cover crop.

The weevils are apterous and can only reach their food plants by walking. One heavily damaged clump of banana plants was found in Section 12E (Table II). Here there was no cover crop, but the infestation proved to have originated in a hedge of *Calopogonium* and *Centrosema* at a short distance from the stools The banana plants farther away in this section remained undamaged.

Table I.

Host Plant.	Cover Crop.	Degree of Damage.
Anona muricata L.	*Cen. Cal. Pu.*	Badly damaged.
....	*Cal.*	Completely stripped.
....	*Cucurbita* sp.	No damage.
Persea gratissima Gaertn.	*Cen.*	Badly damaged.
Artocarpus integra Merr.	*Cen. Cal. Pu.*	No damage.
Citrus spp.	*Cen. Cal. Pu.*	Badly damaged.
....	*Cucurbita* sp.	No damage.
....	No cover crop	No damage.
Musa paradisiaca L.	*Cen. Cal. Pu.*	Badly damaged.
....	*Cen.*	Badly damaged.
....	Grasses	No damage.
....	No cover crop	No damage.
Leucaena glauca Bth.	*Cal. Pu.*	No damage.
Theobroma cacao L.	*Cen. Cal. Pu.*	No damage.
....	Forest shade	A few weevils.
Cassia spectabilis	*Cen. Cal.*	Badly damaged.

Table II.

Date.	Section.	Cover Crop.	No. of Plants.	Nos. of O. imp.	I. per.	Particulars.
2nd November, 1960	6D	*Cen. Cal Pu.*	5	267	108	Thick layer of cover crop.
2nd November, 1960	6D	*Cen. Cal.*	5	174	0	*Cen. Cal* = 9:1
2nd November, 1960	12F	None	3	16	6	2 months ago still grown with *Cal.*
2nd June, 1961	6D	None	7	56	34	6 months ago still grown with *Cal.*
9th June, 1961	12F	Grasses	5	35	3	*Cen.* + *Cal.* along edge of plot.
9th June, 1961	12E	None	1	42	0	Near a *Cal.* plant.
2nd November, 1960	12E	None	5	3	1	None.