

The Noctuidae Catocalinae from New Caledonia and the New Hebrides (Lepidoptera)

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THE LEPIDOPTEROUS FAUNA of New Caledonia and the New Hebrides has not been studied extensively. I have dealt elsewhere with the whole of the Rhopalocera (Viette, in press) and have prepared a catalogue of the known Heterocera from these regions (Viette, 1949).

In this paper are presented means of determining the known species of Noctuidae Catocalinae and descriptions of male and female genitalia which complete the original descriptions of these species. Material in the Department of Entomology of the National Museum of Paris has made this work possible.

The subfamily Catocalinae is well represented in New Caledonia and the New Hebrides as it is in all warm regions but, as an effect of the relative poorness of the fauna of these regions, there are not very many species. Most of these species are known from southern Asia and the other Pacific archipelagoes.

This subfamily is distinguished by having M_2 well developed in the posterior wings (Noctuidae Quadrifidae), M_1 and M_2 more or less convergent toward their base, the middle tibiae with little spines, and the male retinaculum not having the shape of a small tongue. The venation is the same for the whole subfamily, for which reason it is described here: R_1 is free; an areola is present; R_2 arises from the apex of the areola as do R_5 and the common stalk to R_3 and R_4 ; M_1 arises from the superior angle of the medial cell or a little below; M_3 and Cu_{1a} are separated from the inferior angle. In the pos-

terior wings, the medial cell extends through a third or a half of the wing; R and M_1 arise from the same point, the superior angle of the medial cell; M_2 , M_3 , and Cu_{1a} are plainly separated from the inferior angle.

Key to the Genera

1. Metathoracic tibiae without spines **Parallelia**
Metathoracic tibiae with spines 2
2. Prothoracic tibiae without spines 3
Prothoracic tibiae with spines 8
3. Metathoracic tibiae with spines only between the medial and the terminal spurs **Lagoptera**
Metathoracic tibiae with spines only above the medial spurs 4
4. Abdomen with hairs dorsally 5
Abdomen with scales dorsally 6
5. Frons with a tuft of hairs dorsally . . . **Anua**
Frons without a tuft of hairs dorsally **Achaea**
6. Posterior wings with a normal medial cell, extending to about the middle of the wing **Mocis**
Posterior wings with a small medial cell, not extending one-third of the length of the wing 7
7. Antennae reaching the third quarter of the costa **Chalciope**
Antennae reaching the middle of the costa **Grammodes**
8. Labial palpi with the second joint widened, spatulate **Phyllodes**
Labial palpi with the second joint normally formed **Cocytodes**

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Genus *COCYTODES* Guénéé

Cocytodes Guénéé, 1852, Spec. Gén. Lépid., Noct. 3: 41; Hampson, 1894, Fauna Brit. India, Moths 2: 485; 1913, Cat. Lepid. Phal. B.M. 12: 258; Gaede, 1938, in Seitz 11: 457 (type *coerulea* Gn.).

The proboscis is fully developed; the labial palpi are upturned, the second joint reaching the middle of the frons. The frons is smooth, clothed with flattened hairs and scales. The male antennae are simple. The thorax is clothed with hairs, without a crest. The tibiae are fringed with long hairs and have spines. The medial cell of the posterior wings extends about one-third of the wing.

One species only is known from these regions.

Cocytodes coerulea Guénéé

Fig. 1a-c

Cocytodes coerulea Guénéé, Spec. Gén. Lépid., Noct. 3: 41, pl. 13, fig. 10, 1852.

Arcte caerulea Guénéé; Hampson, Fauna Brit. India, Moths 2: 486, fig. 272, 1894.

Cocytodes caerulea Guénéé; Hampson, Cat. Lepid. Phal. B. M. 12: 259, fig. 33, 1913.

Cocytodes coerulea Guénéé; Tams, Ins. of Samoa, Lepid. 4: 214, 1935.

Cocytodes caerulea Guénéé; Gaede, in Seitz 11: 457, 1938.

Cocytodes caerulea Guénéé; Viette, Pacific Science 3(4): 330, 1949.

Wingspread 86-88 mm.; length of the anterior wings 37-38 mm.

The head and the thorax are reddish brown, the abdomen is gray. In the male, there is a strongly sclerotized subrectangular plate in the middle of the tergite of the sixth abdominal segment which is transversely striped with black (Fig. 1b).

The anterior wings and thorax are reddish brown irrorated with bluish white scales, especially in the proximal part of the wing; the subbasal line is black, slightly oblique and sinuous; the orbicular spot is black and small;

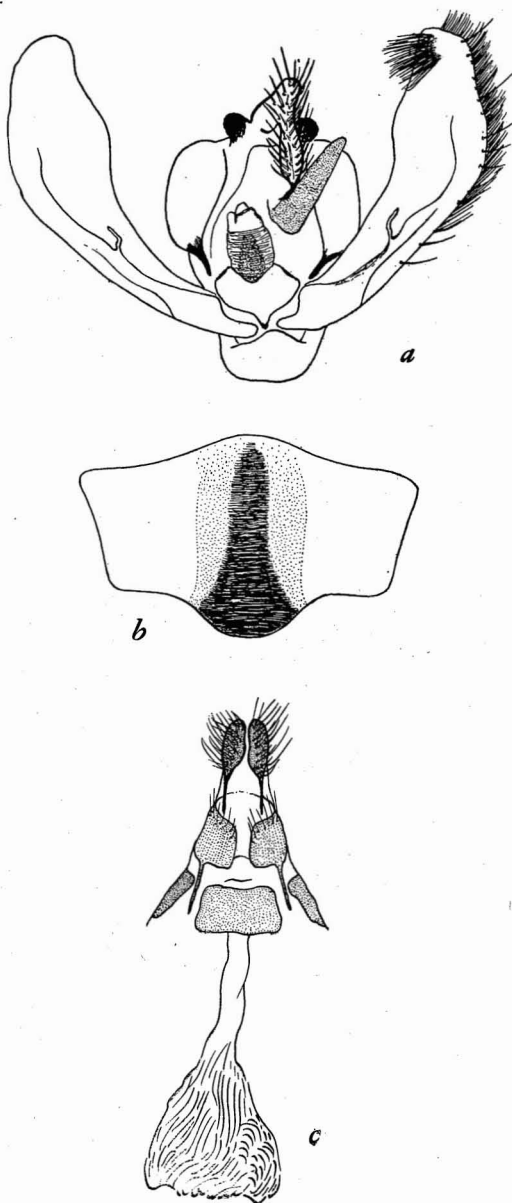


FIG. 1. *Cocytodes coerulea* Guénéé: a, male genitalia; b, tergite of the eighth abdominal segment; c, female genitalia.

the reniform spot is well marked; the post-medial line is at first oblique with regard to the costa, then, on a level with M_3 , becomes almost parallel to the latter, and finally reaches almost perpendicularly the inferior edge of the wing at its distal third; a large

part of the wing is dark, only the apex and the costal area are really reddish brown.

The posterior wings are blackish brown with purple tracings, which include a medial spot, a spot in the middle of the abdominal edge, a submarginal band, and a very narrow marginal band between Cu_{1b} and A_2 .

The underside is lighter than the upper side. The anterior wings have an indication of a dark, transverse band edged with gray. The posterior wings have the tracings of the upperside well marked. The underside of the body is a dirty white.

Genitalia ♂: (Fig. 1a). The tergite of the sixth urite has a middle plate which is striped transversely (Fig. 1b). The tegumen is not much developed dorsally but carries laterally large processes which are suddenly thinned at their apex and end in a well-sclerotized and strongly colored point; the uncus is directed downward, it is hairy and sharp at its extremity; a scaphium is present; the vinculum is not much developed; the valvae are long, widened at the end; a small angular process is present about the middle of the dorsal edge of the sacculus; the juxta has almost the shape of a V; the penis is asymmetrical without cornuti.

Genitalia ♀: (Fig. 1c). Simple, the lobes of the oviporus are normal, with posterior apophyses; the eighth urite is unsclerotized in the medioventral area; the anterior apophyses are present; the ostium bursae is membranous as is the bursa copulatrix and the ductus bursae; the bursa copulatrix is ornamented with unsclerotized folds.

New Caledonia (Layard): Puerihouen (Quod), Canala (Delacour), Baraoua (Catala).

Loyalty Islands: Lifu (Whitmei).

New Hebrides (Mathew).

The species extends from India to Fiji and Samoa.

Genus *PHYLLODES* Boisduval

Phyllodes Boisduval, 1832, in Dumont d'

Urville, Voyage de l'Astrolabe, Lepid. 1: 246; Hampson, 1913, Cat. Lepid. Phal. B.M. 12: 389; Gaede, 1938, in Seitz 11: 470 (type *conspicillator* Cr.).

The proboscis is fully developed; the labial palpi are upturned; the second joint strongly widened, spatulate; the third joint small, normal, and dilated at its apex; the frons is smooth with a thick tuft of hairs; the antennae are filiform, reaching the middle of the costa. The thorax is clothed with hairs, without crest; the anterior wings have a strongly arched costa and the apex is slightly projected; in the posterior wings the medial cell does not extend as much as one third of the wing.

Only one species is of interest here.

Phyllodes imperialis Druce

Fig. 2a, b

Phyllodes imperialis Druce, Ann. and Mag. Nat. Hist. VI, 2: 241, 1888.

Phyllodes imperialis Druce; Hampson, Cat. Lepid. Phal. B.M. 12: 392, pl. CCXI, fig. 5, 1913.

Phyllodes meyricki imperialis Druce; Gaede, in Seitz 11: 470, pl. 48 b, 1938.

Phyllodes imperialis Druce; Viette, Pacific Science 3(4): 330, 1949.

Wingspread 159–175 mm.; length of the anterior wings 78–80 mm.

This is one of the most beautiful and largest of the moths from New Caledonia and the New Hebrides. The head, the thorax, and the abdomen are abundantly clothed with reddish gray hairs, with a light purple tint on the head, the patagiae, the inferior edge of the tegulae, and the abdomen.

The anterior wings are very wide, with the external margin and the inferior edge describing an arc of a circle; the costa is strongly arched in its apical part and the apex is slightly projected. The background color is rusty brown, more or less dark according to the specimens, with the variable tracings

more or less marked; the most variable tracing is the spot, without a distinct margin, which is found at the apex of the cell and the color of which varies from greenish white to a lighter shade of the background color. When they are well marked three transverse basal bands which are a little darker than the background color can be distinguished. There are also a slightly arched line which passes through the middle of the spot, and a line that starts at the apex runs almost parallel to the costa as far as Cu_{1b} and is there directed toward the inferior edge of the wing.

The space outside this line is lighter in color.

The posterior wings are black with a gray base. A lengthened spot, more or less bright pink, and a marginal band of white spots, typically triangular extend from the anal angle to the middle of the wing; each spot is found between veins.

The underside of the anterior wings is grayish, and the medial space is black with three whitish spots; the posterior wings are gray; the abdominal space is black with the pink spot; the body and the legs are gray.

Genitalia ♂: The tegumen is not strongly developed and has a narrow and thin uncus, first turned upward, then downward; the apex is sharp, the dorsal part of the uncus is clothed with bristles; the vinculum is rather broad, lengthened toward the frons but does not form a real saccus; the anal tube has a well-developed scaphium; the valvae (Fig. 2a) are subrectangular with a short expansion in the area of the external ventral angle; in the middle of the internal surface is a narrow process; the juxta is well developed and the penis is short, in part membranous in its apical region.

Genitalia ♀: The lobes of the oviporus are almost square; the posterior apophyses are normal; the eighth urite is entirely sclerotized, showing a differentiated plate in the middle ventral area above the ostium bursae; this, although not specialized, is clearly in-

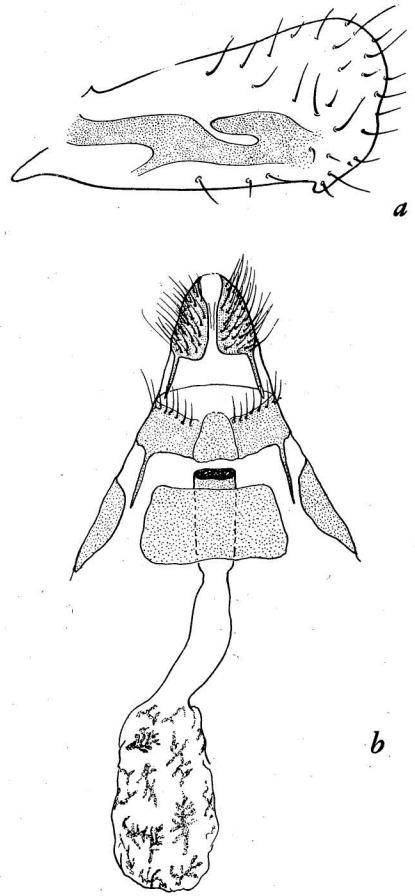


FIG. 2. *Phyllodes imperialis* Druce: a, right valva of male; b, genitalia of female.

dicated; the ductus bursae is highly sclerotized in the part connected with the ostium bursae; the bursa copulatrix is large, with small sclerotized marks (Fig. 2b).

New Caledonia (Millot).

Loyalty Islands (coll. de Joannis).

New Hebrides (Hampson l.c., Mrs. Pruvot, coll. de Joannis).

Genus LAGOPTERA Guénéé

Lagoptera Guénéé, 1852, Spec. Gén. Lépid., Noct. 3: 223; Hampson, 1913, Cat. Lepid. Phal. B.M. 12: 413; Gaede, 1938, in Seitz 11: 471 (type *honestata* Hb.).

The proboscis is fully developed; the labial

palpi are upturned, with the second joint lengthened to reach the vertex of the head; the third joint is short; the frons is smooth; the male antennae are ciliated. The thorax is clothed with hairs, without crest; the pro- and metathoracic tibiae of the males are fringed with long hairs; the prothoracic tibiae have no spines and the metathoracic tibiae have spines only between the medial and apical spurs. In the male, the underside of the posterior wings is entirely clothed with specialized scales (the androconiae of Hampson, 1913). The first segments of the abdomen carry tufts of hairs dorsally.

Only one species is known from this area.

Lagoptera miniacea Felder

Fig. 3a-c

Lagoptera miniacea Felder, Reise Novara, Lepid., pl. 116, fig. 8, 1874.

Lagoptera miniacea Felder; Hampson, Cat. Lepid. Phal. B.M. 12: 416, 1913.

Lagoptera miniacea Felder; Tams, Ins. of Samoa, Lepid. 4: 214, 1935.

Lagoptera miniacea Felder; Gaede, in Seitz 11: 471, pl. 49 b, 1938.

Lagoptera miniacea Felder; Viette, Pacific Science 3(4): 330, 1949.

Wingspread 88–92 mm.; length of the anterior wings 43–45 mm.

The head and the thorax are reddish brown, more or less dark, the vertex with a little white line; the abdomen is light reddish brown anteriorly, the rest is pale red.

The background color of the anterior wings is that of the thorax irrorated with black and bluish white scales. At the extremity of the medial cell is found a black spot (the reniform spot), which is usually rather large, but which can become greenish white, or can be reduced to a little black point, or can even be absent; a basal dark line, lightly waved, exteriorly bent, is seen; the post-medial line is straight, dark; an indication of

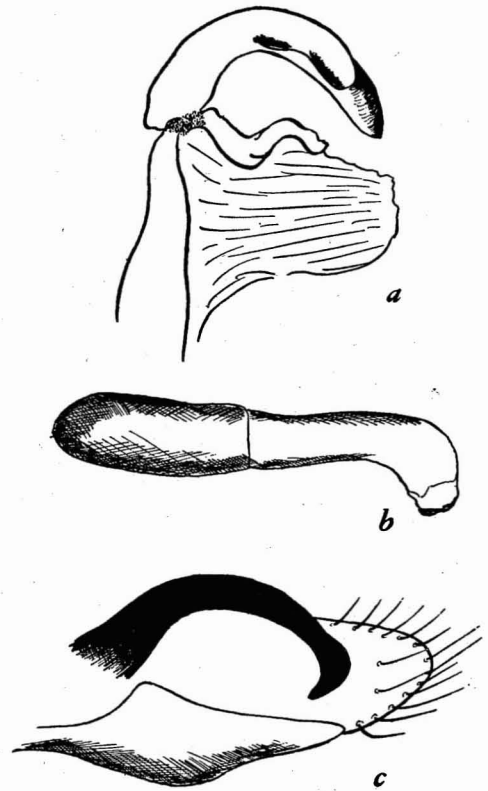


FIG. 3. *Lagoptera miniacea* Felder: a, tegumen, uncus, and anal tube; b, penis; c, right valva.

some black spots between M_1 and M_2 is sometimes seen in the marginal area.

The posterior wings are pale red with an indication of a black spot at the apex of the medial cell and a marginal black band with pale red on the external margin.

The underside of the wings is pale red; the legs are of this color with the underside black, irrorated with bluish white scales.

Genitalia ♂: The tegumen is not much developed, being almost indistinct; the uncus is strongly developed (Fig. 3a), bifid and asymmetrical, the right part being longer than the left part, these two parts rounded at their apex; the scaphium is very characteristic, highly sclerotized, carrying at its apex two lateral humps preceded by two dimples; the lateral dorsal parts of the ninth urite are narrow and long; the valvae (Fig. 3c) have

the costa well developed as a long and strong arm, upturned, widened at its apex, strongly sclerotized, and well colored; the valvula and the sacculus are recognizable but the sacculus is not distinct; the juxta is simple, in the shape of a lengthened plate; the penis (Fig. 3*b*) is long, with the rostral extremity widened and neatly indicated, with the distal apex upturned almost at 90 degrees and inclined toward the left side.

Genitalia ♀: The lobes of the oviporus and the eighth urite are rather long but narrow as compared with the great development of the seventh urite. The lobes of the oviporus, as well as of the eighth urite, are abundantly clothed with bristles. The tergite of the seventh segment is strongly developed and covers the whole genitalia. The sternite of the same segment is modified; beneath the ostium bursae are found two triangular plates with their tops turned caudad: these plates lie on each side of the middle line; the ductus bursae is completely sclerotized and strongly colored; the ostium bursae is clearly marked and well visible; the bursa copulatrix is membranous and abundantly ornamented with unsclerotized folds.

New Hebrides: Mallicolo (Risbec), Tanna (Mrs. Pruvot).

Also from Solomon Islands, Fiji, and Samoa.

Genus ANUA Walker

Anua Walker, 1858, List Spec. Lepid. Ins. B.M. 15: 1788; Hampson, 1913, Cat. Lepid. Phal. B.M. 12: 425; Gaede, 1938, in Seitz 11: 472 (type *fnifascia* Wlk.).

The proboscis is fully developed; the labial palpi are upturned, the second joint reaching the vertex of the head, the third joint being long and directed obliquely; the frons is smooth with a tuft of hairs; the male antennae are ciliated. The thorax has no crest. The venation is as described for the subfamily.

Anua coronata Fabricius

Fig. 4*a-c*

Noctua coronata Fabricius, Syst. Entom.: 596, 1775.

Ophiusa coronata Fabricius; Hampson, Fauna Brit. India, Moths 2: 502, 1894.

Anua coronata Fabricius; Hampson, Cat. Lepid. Phal. B. M. 12: 427, fig. 101, 1913.

Anua coronata Fabricius; Collenette, Roy. Entom. Soc. London, Trans. 76: 476, 1928.

Anua coronata Fabricius; Tams, Ins. of Samoa, Lepid. 4: 214, 1935.

Anua coronata Fabricius; Gaede, in Seitz 11: 473, pl. 49 d, 1938.

Anua coronata Fabricius; Swezey, Bernice P. Bishop Mus. Bul. 189: 171, 1946.

Anua coronata Fabricius; Viette, Pacific Science 3(4): 330, 1949.

Wingspread 72–96 mm.; length of the anterior wings 37–42 mm.

The head and the thorax are reddish brown tinted with gray; the abdomen is yellow with the anterior edge of the segments black.

The anterior wings are reddish brown irrorated with gray and black; the antemedial line is brown and is obliquely curved in the middle of the cell; the orbicular spot is small and greenish gray; at the apex of the cell the reniform spot is typically greenish gray with some small black spots; a brownish shadow is found beneath the costa; the postmedial line is brown, oblique; the submarginal line is whitish; the spaces between the ante- and postmedial lines and the subterminal line and the external margin are of a lighter shade of the background color.

The posterior wings are yellow with a middle band and a submarginal black band from the costa to the anal fold.

The underside of the wings is yellow; in the anterior wings, in the area of the inferior angle, there is an indefinite black spot; the legs are yellow with the tarsi gray.

Genitalia ♂: The dorsal part is characterized by its asymmetry (Fig. 4*a*); the tegu-

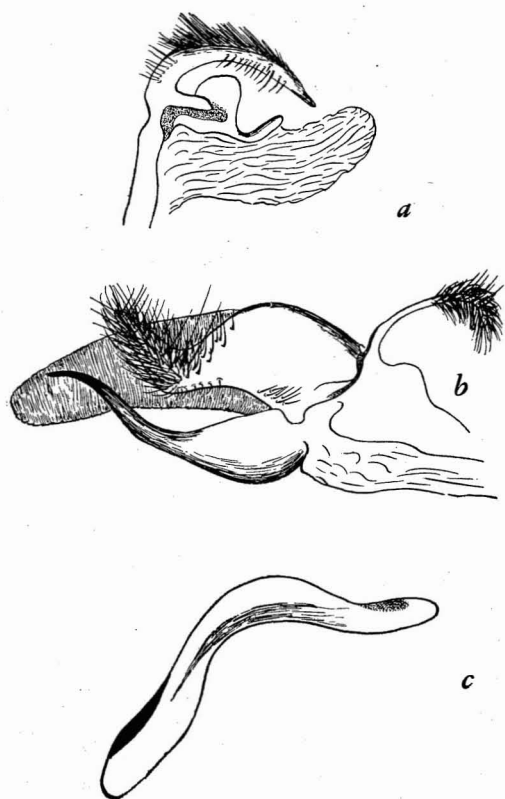


FIG. 4. *Anua coronata* Fabricius: a, tegumen, uncus, and anal tube; b, left valva; c, penis.

men is very narrow and the uncus is curved and clothed dorsally with bristles; on the right side, between the uncus and the anal tube, and arising from the latter, there is a vertically raised plate that is undoubtedly an excrescence of the scaphium; at the base of the uncus, toward the left, there is a kind of process directed backwards; moreover, as in most of the species still to be discussed, the valvae (Fig. 4b) carry, at their origin, a kind of long and narrow membranous bag abundantly clothed with bristles; there is a long costal arm, the sacculus is well developed and ends as a long, well-sclerotized and colored spur; the penis is at a right angle, speckled dorsally toward its apex (Fig. 4c).

Genitalia ♀: Resemble the genitalia of *Lagoptera miniacea* Feld., showing a large seventh segment and two lateral, triangular

plates at the middle line beneath the ostium bursae; however, it is distinguished from *L. miniacea* by a larger development of the eighth urite and by the ductus bursae which has first a sclerotized part, then a separate less sclerotized area, and finally an area in which there are some sclerotized longitudinal lines; the bursa copulatrix is membranous.

Hampson (1913) cites the following aberrations described as species by the old authors, because of the coloration of the reniform spot:

magica Hübner, Zutr. Exot. Schmett. 3: 32, figs. 535 and 536, 1827. The reniform spot is entirely black.

leonina Fabricius, Syst. Entom.: 596, 1775. The reniform spot is entirely green-gray.

ancilla Fabricius, Entom. Syst. 3(2): 17, 1794. The reniform spot is absent.

New Caledonia: Nouméa (coll. Fleutiaux).

New Hebrides: Pentecôte Island (Mrs. Pruvot).

This species has a geographical distribution that extends from India to the Society Islands.

Genus ACHAEA Hübner

Achaea Hübner, 1827, Verz. bekannt. Schmett., p. 269; Hampson, 1913, Cat. Lepid. Phal. B. M. 12: 496; Gaede, 1938, in Seitz 11: 479 (type *janata* L.).

The proboscis is fully developed; the labial palpi are upturned, the second joint reaching almost to the vertex, the third joint being short or moderately long; in the species described here, the antennae are filiform. The thorax has no crest; the prothoracic tibiae do not possess any spines, but the meso- and metathoracic tibiae do have them. The first segments of the abdomen bear tufts of hairs dorsally.

The genus contains numerous species occurring chiefly in the Ethiopian area, southern and southeastern Asia, and as far east as the

Marquesas archipelago. Two species are of interest here.

Key to the species

1. The third joint of the labial palpi is almost as long as the second joint; the posterior wings have two medial white spots *serva*
The third joint of the labial palpi is very short; the posterior wings present a medial white band *janata*

Achaea serva Fabricius

Fig. 5a-d

Noctua serva Fabricius, Syst. Entom., p. 593, 1775.

Ophiusa serva Fabricius; Hampson, Fauna Brit. India, Moths 2: 495, 1894.

Achaea serva Fabricius; Hampson, Cat. Lepid. Phal. B.M. 12: 521, fig. 123, 1913.

Achaea serva Fabricius; Tams, Ins. of Samoa, Lepid. 4: 216, 1935.

Achaea serva Fabricius; Gaede, in Seitz 11: 480, pl. 52 d, 1938.

Achaea serva Fabricius; Swezey, Bernice P. Bishop Mus., Bul. 186: 172, 1946.

Achaea serva Fabricius; Viette, Pacific Science 3(4): 330, 1949.

Wingspread 62-80 mm.; length of the anterior wings 34-41 mm.

The head and the thorax are reddish brown and the abdomen brown-gray.

The anterior wings are red-brown, more or less dark; the antemedial line is dark, oblique, wavy; a black spot is in the middle of the medial cell; the reniform spot is small, occasionally even indistinct, and sometimes only a blackish shadow can be seen in its place; the medial line is slightly sinuous, curved exteriorly on a level with the medial cell; the postmedial line is dark and sinuous; the marginal area is of the background color, but darker, with an indication of a subterminal line; sometimes there is a series of black spots along the external margin.

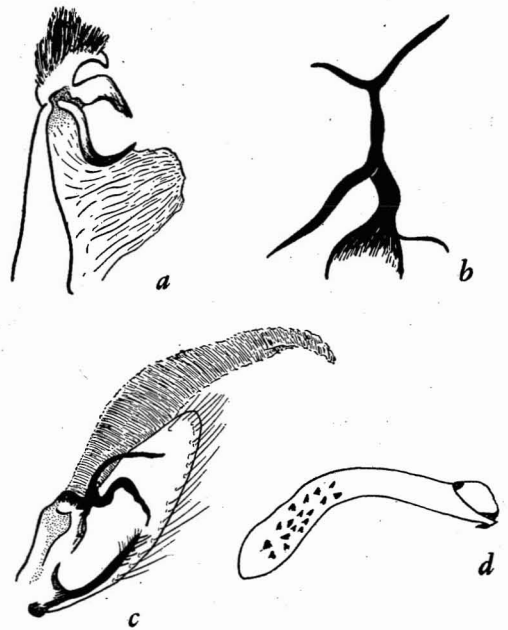


FIG. 5. *Achaea serva* Fabricius: *a*, tegumen, *b*, asymmetrical formation of the costal part of the left valva; *c*, right valva; *d*, penis.

The posterior wings are black with a purplish blue reflection and on each wing there are five white spots, two in the middle, and three near the margin, at the extremity of costa, of M_2 , and between Cu_{11b} and $A 1$.

The underside of the four wings is grayish white, irrorated with black scales; in the anterior wings, there are a white spot on the discocellular veins and a large black spot in the area of the inferior angle of the wing; in the posterior wings there is a brown submarginal band which becomes black toward the anal angle.

Genitalia δ : The tegumen is very narrow and carries an important excrescence raised vertically, curved at its end, and clothed dorsally with strong bristles (Fig. 5a); the lateral parts of the ninth urite are progressively narrowed dorsally; the uncus is curved ventrally at its apex; the anal tube carries a very well-developed scaphium; at their base the valvae (Fig. 5c) have a long bag abundantly clothed with bristles, and they are

simple, oval, with a distinct sacculus; in the proximal part of the dorsal area they have an asymmetrical formation that arises from the costa (Fig. 5*b* and *c*); between this part and the sacculus is the valvula; the penis is curved, with a great many cornuti and a point at its apex on the ventral side (Fig. 5*d*).

Genitalia ♀: The lobes of the oviporus are small, lengthened, and clothed with bristles, as is the eighth urite which is well developed; the anterior and posterior apophyses are present; the tergite of the seventh segment is very well developed; the ostium bursae is in the middle of a sclerotized area which extends caudad in the shape of a band that joins the eighth segment; beneath the ostium bursae is a plate that works like a clapper and is homologous with the two fused triangular plates described in the two previous species; this plate has a medial notch in the shape of a V on its caudal edge; the first part of the ductus bursae is sclerotized, becoming less heavily sclerotized; the bursa copulatrix is, in part, also lightly sclerotized.

New Caledonia (Marie, Quod): Mont Mou (Quod), Western Coast (Risbec).

Loyalty Islands: Lifu (Marshall).

New Hebrides: Vaté (Turner).

Also in Samoa.

Achaea janata Linné

Fig. 6*a-c*

Geometra janata Linné, Syst. Natur., ed. 10, p. 527, 1758.

Achaea janata Linné; Rebel, Hamb. Wiss. Anstalt, Jahrb., 2 Beiheft, 32: 128 and 149, 1915.

Achaea janata Linné; Collenette, Roy. Entom. Soc. London, Trans. 76: 477, 1928.

Achaea janata Linné; Tams, Ins. of Samoa, Lepid. 4: 216, 1935.

Achaea janata Linné; Swezey, Bernice P. Bishop Mus. Bul. 186: 171, 1946.

Achaea janata Linné; Viette, Pacific Science 3(4): 331, 1949.

Noctua melicerta Drury, Ill. Exot. Ins. 1: 42, pl. 23, fig. 1, 1770.

Ophiusa melicerta Drury; Hampson, Fauna Brit. India, Moths 2: 494, 1894.

Achaea melicerta Drury; Hampson, Cat. Lepid. Phal. B.M. 12: 536, fig. 124, 1913.

Achaea melicerta Drury; Gaede, in Seitz 11: 480, pl. 52 f, 1938.

Achaea pentasema Prout; Ann. and Mag. Nat. Hist. IX, 3: 181, 1919.

Achaea pentasema Prout; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 52–60 mm.; length of the anterior wings 27–32 mm.

The head and the thorax are gray, occasionally mixed with reddish brown; the abdomen is gray.

The anterior wings typically have a grayish brown background color with a basal black streak well indicated only in the costal half, and an antemedial black line, wavy, oblique; two black spots are on a level with the discocellular veins; then comes a blackish brown space, between the postmedial and submarginal lines; from the costa a dark line extends toward the apex; along the external margin there is a series of black spots. This typical coloration is very variable; the background color can be darker, with the brownish black tracings sometimes being less evident, sometimes lacking completely.

The posterior wings are blackish brown with a purplish blue reflection; the base of the wings is lighter; a medial white band and three marginal spots are placed at the apex of the costa, on a level with M_2 and at the anal angle.

Genitalia ♂: As in *A. serva* the tegumen has a dorsal excrescence which is densely clothed with bristles (Fig. 6*a*) and becomes rostral distad of the excrescence; at the apex a sclerotized blade emerges from the bristles; the uncus has a normal shape terminating in a point; there is a well-developed scaphium covered at the extremity with fine hooks; the

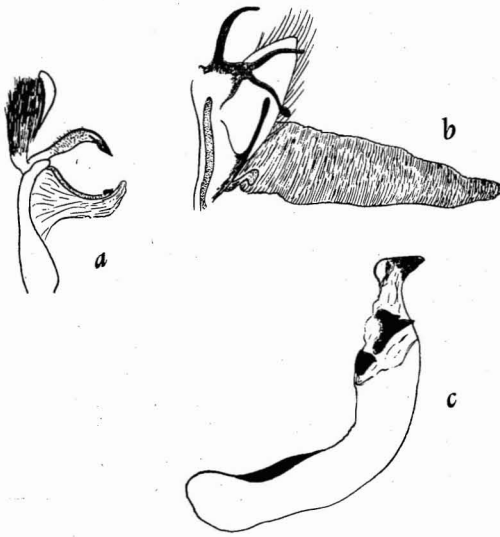


FIG. 6. *Achaea janata* Linné: *a*, tegumen, uncus, and anal tube; *b*, right valva; *c*, penis.

lateral parts of the ninth segment are narrow; the valvae (Fig. 6*b*) have a spur-shaped well-defined sacculus; the superior or costal part of the valvae is reduced here to an area carrying three long, strongly sclerotized, well-colored processes; between them can be seen a simple valvula; at the base of the valvae there is a long, membranous bag, covered with many bristles as there is in *A. serva*; the penis (Fig. 6*c*) is dorsally curved, asymmetrical, pointed, and well colored at its apex, and has a vesica with many thick cornuti.

Genitalia ♀: Similar to *A. serva* but distinguished by the shape of the sclerotized area above the ostium bursae, which is here fully developed, extends full width to the eighth urite and is inflected on the edges, forming a sort of pocket at the depth of which the ostium bursae opens; the clapper, placed underneath the copulatory opening, is almost square, with the medial notch of the caudal edge rounder; the bursa copulatrix is less sclerotized.

New Caledonia (Marie): Nouméa (Quod, Risbec, Catala).

New Hebrides: Vaté, Port Vila (Kowalsky).

This species extends from the Persian Gulf to the Marquesas Islands.

Genus PARALLELIA Hübner

Parallelia Hübner, 1827, Verz. bekannt. Schmett., p. 269; Hampson, 1913, Cat. Lepid. Phal. B.M. 12: 551; Gaede, 1938, in Seitz 11: 481 (type, *bistriaris* Hb.).

The proboscis is fully developed; the labial palpi are upturned; the second joint is on a level with the vertex and lightly scaled; the frons is smooth with a tuft of hairs above; the male antennae are ciliated; the pro- and metathoracic tibiae are generally without spines.

Key to the species

1. Anterior wings with the costa showing a light lobe before its middle . **redunca**
Anterior wings with the costa not showing a similar lobe 2
2. Anterior wings with the postmedial line toothed beneath M_1 **prisca**
Anterior wings with the postmedial line not toothed beneath M_1 **joviana**

Parallelia redunca Swinhoe

Fig. 7*a-d*

Ophiusa redunca Swinhoe, Cat. Lepid. Heter. Mus. Oxon. 2: 141, 1900.

Parallelia redunca Swinhoe; Hampson, Cat. Lepid. Phal. B.M. 12: 553, fig. 131, 1913.

Parallelia redunca Swinhoe; Gaede, in Seitz 11: 481, pl. 53 a, 1938.

Parallelia redunca Swinhoe; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 61–64, mm.; length of the anterior wings 28–29 mm.

The head and thorax are reddish brown, the tegulae have a whitish apex; the legs are clothed with gray hairs which are yellow at their origin.

The anterior wings have a background

color of reddish brown, more or less tinged with purplish gray, chiefly in the costal half. There are three transverse lines; the antemedial is the most distinct, and is dark, edged laterally by lighter color; there is an indication of a dark medial line; the postmedial line is formed, as is the antemedial, but at first it is perpendicular to the costa, then is deeply curved inward; the costal part, which is

darker in color, does not pass this line; the space exterior to the postmedial line is lighter in color, with, in the male, a black spot on a level with M_1 ; there is also a marginal series of little black points; the cilia are dark.

The posterior wings are blackish gray with an indication of gray bands, in the middle and at the anal angle, both perpendicular to the abdominal edge.

The underside is gray-white with the postmedial line only slightly indicated.

Genitalia ♂: It is narrow and high; the lateral parts of the ninth urite are narrow dorsally; the uncus (Fig. 7a) is strongly modified, consisting of plates raised vertically, abundantly clothed with bristles on the rostral side and carrying a strong dorsal tooth on the caudal side; the scaphium is well constituted; the vinculum is reduced; the valvae (Fig. 7b) are rather complex, having a well-defined sacculus; there is a simple valvula, which is slightly pointed and turned at its apex; the costal part is strongly denticulated with a sharp, sclerotized and well-colored apex; laterally, at the basis of the valvae, is a membranous bag clothed with bristles; the penis (Fig. 7c) is strongly curved dorsally in its rostral part, its caudal part is very much sclerotized; there are no cornuti.

Genitalia ♀: The lobes of the oviporus are but slightly developed as are the posterior apophyses, which are hardly sclerotized; the eighth urite shows short and clearly visible anterior apophyses, but the development of the seventh tergite is characteristic; its edges, on the ventral side, are folded, thus delimiting a kind of chamber closed by a clapper that has the shape of a lengthened trapezoid and whose caudal edge is slightly curved in the middle; the ostium bursae opens at the end of a well-colored and highly sclerotized conduit (Fig. 7d); the ductus bursae and the bursa copulatrix are membranous.

New Hebrides (coll. de Joannis).

Hampson (1913) cites this species from Dutch New Guinea and Queensland.

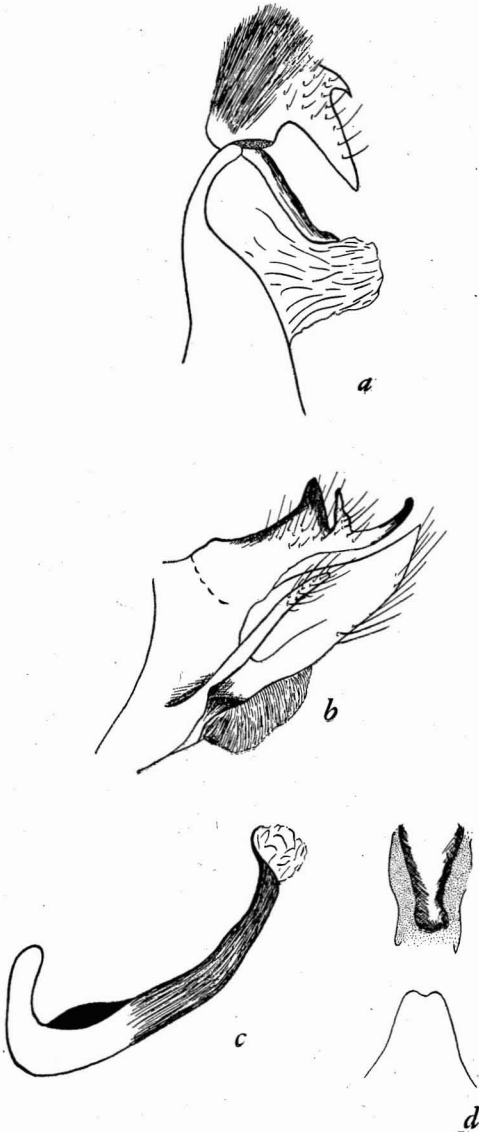


FIG. 7. *Parallelia redunca* Swinhoe: a, tegumen, uncus, and anal tube; b, right valva; c, penis; d, clapper and ostium bursae.

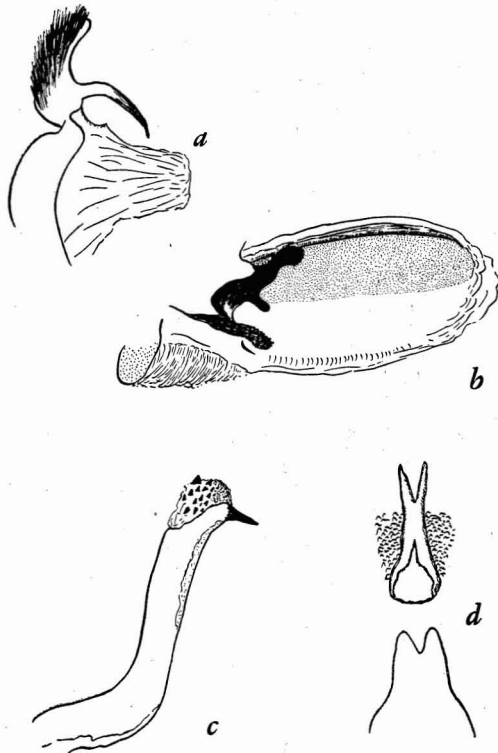


FIG. 8. *Parallelia prisca* Walker: a, tegumen, uncus, and anal tube; b, right valva; c, penis; d, clapper and ostium bursae.

Parallelia prisca Walker

Fig. 8a-d

Ophisma prisca Walker, List Lepid. Ins. B.M. 14: 1385, 1858.

Parallelia prisca Walker; Hampson, Cat. Lepid. Phal. B.M. 12: 558, pl. CCXIX, fig. 10, 1913.

Parallelia prisca Walker; Tams, Ins. of Samoa, Lepid. 4: 217, 1935.

Parallelia prisca Walker; Gaede, in Seitz 11: 482, pl. 53 b, 1938.

Parallelia prisca Walker; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 60-65 mm.; length of the anterior wings 28-30 mm.

The head and thorax are reddish brown, the legs are gray with the tarsi yellowish gray; the abdomen is grayish brown.

The anterior wings have a dark reddish brown background color; the subbasal line, which is clearly indicated in the costal half, is red-brown, defined on each side by reddish ochre; the oblique and sinuous antemedial line is red-brown defined on each side by reddish ochre; there is a white spot, more or less marked, in the middle of the medial cell; the reniform spot is small, defined by a dark edging; there is a series of dark red-brown lines curved outwardly but becoming perpendicular at the inferior edge of the wing; these lines grow dimmer and dimmer in the marginal area till they are almost unicolorous dark reddish brown; the external margin of the wing is a purplish pale gray; in the apical area there is an oblique white streak partly edging a chocolate brown apical spot.

The posterior wings are dark gray with purplish white-gray medial and marginal bands; none of these bands reaches the costa.

The underside of the wings is more or less dark gray with slightly purplish reflections at the basis of the posterior wings and is irrorated with black scales.

Genitalia ♂: The dorsal parts of the ninth urite are slightly incurved; between the much reduced tegumen and the typical uncus is a strong plate (Fig. 8a) vertically raised and abundantly clothed with bristles in its rostral part; the valvae (Fig. 8b) are oval, and differ from those of the other two species in having a kind of clavus toward the base and, in the costal half, a sclerotized modified formation; the penis (Fig. 8c) is highly upturned, with a strong point at its apex, and shows many cornuti.

Genitalia ♀: Similar to the female genitalia of *P. redunca* but can be distinguished easily by the shape of the process on the conduit which is contiguous with the ostium bursae, and by the shape of the clapper whose caudal edge is deeply notched in its middle (Fig. 8d).

New Hebrides (coll. de Joannis).

Loyalty Islands (coll. Mus. Hist. Nat. Paris).

Also from Samoa, Tonga, and Fiji.

Parallelia joviana Stoll

Fig. 9a-d

Noctua joviana Stoll, Pap. Exot. 4: 237, pl. 399, fig. B, 1782.

Ophiusa joviana Stoll; Hampson, Fauna Brit. India, Moths 2: 499, 1894.

Parallelia joviana Stoll; Hampson, Cat. Lepid. Phal. B.M. 12: 571, fig. 132, 1913.

Parallelia joviana Stoll; Gaede, in Seitz 11: 485, pl. 53 f, 1938.

Parallelia joviana Stoll; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 43-46 mm.; length of the anterior wings 20-22 mm.

The head and thorax are purple-gray, more or less dark, while the abdomen is gray; the labial palpi and the underside of the body and the legs are fawn-gray.

The anterior wings have a brownish gray background color; in the proximal third of the wing can be seen the red-brown sub-basal line, laterally edged by ochre-brown; this subbasal line does not extend beyond the costal half of the wing and there is an ante-medial line, formed in the same manner, slightly curved toward the inside; the post-medial line is whitish gray, at first almost perpendicular to the costa, then becoming undulate. Inward of this postmedial line is a large dark brown area, bordered by a semi-circular line, edged with a whitish gray space; the space between the postmedial line and the external margin is grayish brown with a dark brown spot at the apex, preceded, near the costa, by purplish gray. There is a marginal series of black dots.

The posterior wings are blackish gray, lighter basally and with the margin purplish gray in the abdomen angle area.

The underside is ochre-brown irrorated with darker spots.

Genitalia ♂: The tegumen is very narrow and almost indistinct, with a long, strongly downcurved, and well-developed saccus (Fig. 9a); the uncus has a lateral tuft of bristles at its base; there is a well-developed scaphium; the vinculum is reduced; the valvae (Fig. 9b) are modified; the costal part of the valva is changed into a long widened arm indented at its apex; the sacculus is long, filiform, bristled at its apex; the valvula is fully developed, clothed with bristles on its edges; lateral to the valva can be seen a long membranous bag, abundantly clothed with

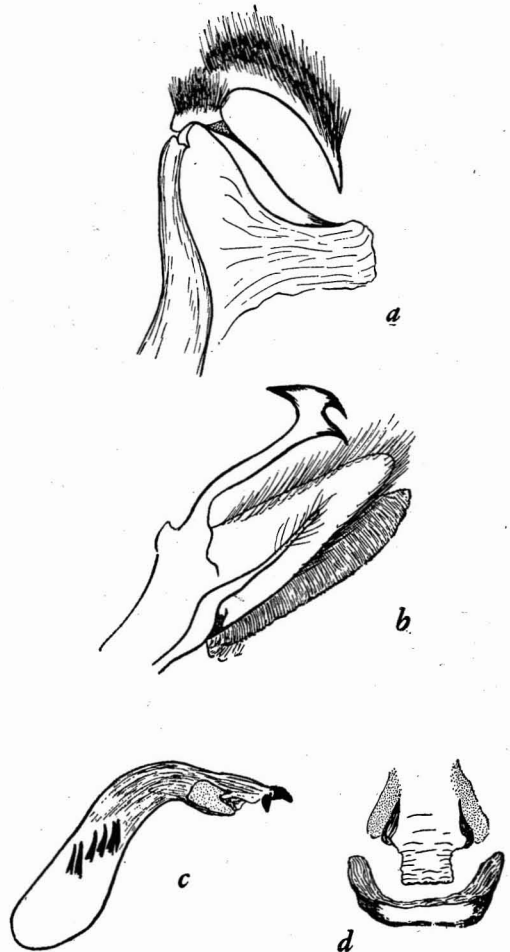


FIG. 9. *Parallelia joviana* Stoll: a, tegumen, uncus, and anal tube; b, right valva; c, penis; d, clapper and ostium bursae.

bristles; the penis is curved at a right angle, is asymmetrical, and has cornuti (Fig. 9c).

Genitalia ♀: The female genitalia are distinguished from those of the other species by the shape of the ostium bursae and of the clapper; the clapper is thick, showing folds of stronger sclerotization, and is semicircular (Fig. 9d).

Loyalty Islands: Lifu (Hampson, 1913).

New Hebrides (Paris Museum, coll. de Joannis).

The species extends from India to the New Hebrides.

Genus GRAMMODES Guénée

Grammodes Guénée, 1852, Spec. Gén. Lépid., Noct. 3: 275; Hampson, 1913, Cat. Lepid. Phal. B.M. 13: 13; Gaede, 1938, in Seitz 11: 489 (type *geometrica* F.).

The proboscis is fully developed, the labial palpi are upturned; the second joint reaches the vertex of the head and is slightly scaly; the third joint is small and oblique; the frons is smooth with tufts of hairs above; the male antennae are ciliated. The thorax has no crest, the prothoracic tibiae are not spined, but the metathoracic tibiae have spines at their base. The abdomen is clothed with scales, and is without a crest. The anterior wings have a rounded apex and the medial cell of the posterior wings reaches a third of the length of the wings.

Only one species is known from this area.

Grammodes oculicola Walker

Fig. 10a-d

Grammodes oculicola Walker, List Spec. Lepid. Ins. B.M. 14: 1446, 1858.

Grammodes oculicola Walker; Hampson, Cat. Lepid. Phal. B.M. 13: 15, 1913.

Grammodes oculicola Walker; Collenette, Roy. Entom. Soc. London, Trans. 76: 477, 1928.

Grammodes oculicola Walker; Gaede, in Seitz 11: 489, pl. 54 e, 1938.

Grammodes oculicola Walker; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 34-42 mm.; length of the anterior wings 16-19 mm.

The head, labial palpi, thorax, and abdomen are gray, the labial palpi and the abdomen being lighter in color.

The anterior wings have a brown background color with two rather wide creamy-white oblique bands; the more basal band starts from the basal third of the costa and reaches the middle of the inferior edge of the wing; the second band starts from the distal third of the costa; it is parallel to the first band till Cu_{1a} is reached, then it is suddenly narrowed, changes direction and reaches the inferior margin of the wing at a point where it almost touches the first band; in the inferior angle there is a black spot margined anteriorly and posteriorly by a fine bluish white streak; along the external margin there is a more or less well-defined ochre-brown band; the cilia are gray in the proximal half and white in the distal half.

The posterior wings are blackish gray with a rather wide medial white band perpendicular to the costa, that is turned at its apex and does not reach the anal angle; the cilia are white except on a level with the costa and M_3 , where they are black; they become gray in the area of the anal angle.

The underside of the wings is blackish gray, white basally, and with well-marked white tracings.

Genitalia ♂: The tegumen is indistinct, dorsally there is an uncus (Fig. 10a) which has a tuft of long, vertically raised bristles laterally, and a similar tuft dorsally and ventrally; the scaphium is well distinguished and sclerotized; a little above the articulation of the valvae, from the dorsal part of the ninth urite, two lateral extensions arise; the valvae (Fig. 10b), although distinct, are simple; the costa and the sacculus are well developed, and have the shape of long, highly sclero-

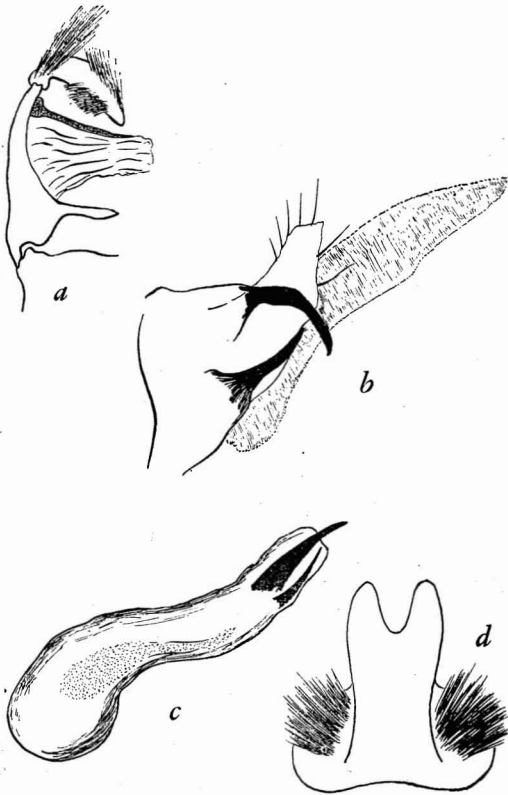


FIG. 10. *Grammodes oculicola* Walker: *a*, tegumen, uncus, and anal tube (v—valva); *b*, right valva; *c*, penis; *d*, clapper.

tized, well-colored processes pointed at their apex; the valvula has its edges notched and is clothed with bristles; laterally there is a long, membranous bag abundantly clothed with scales; the penis is rather large (Fig. 10*c*), is globular at one end, and has two long cornuti.

Genitalia ♀: The lobes of the oviporus are small with rather long posterior apophyses; the eighth segment is reduced; the tergite of the seventh segment is always fully developed; the characteristic piece, the clapper, which closes the chamber where the ostium bursae opens, is formed by a long medial piece which is deeply notched at its apex and flanked at its base by two lateral parts having tufts of bristles (Fig. 10*d*).

New Caledonia: Nouméa (Paris Museum, coll. Fleutiaux).

Loyalty Islands: Lifu (coll. Paris Museum).

Genus *CHALCIOPE* Hübner

Chalciope Hübner, 1827, Verz. bekannt. Schmett., p. 268; Hampson, 1913, Cat. Lepid. Phal. B.M. 13: 26; Gaede, 1938, in Seitz 11: 490 (type *cephise* Cr.).

The proboscis is fully developed; the labial palpi are upturned; the second joint, which reaches the vertex of the head, is lightly scaled; the third joint is short, and is clothed with raised scales beneath; the frons is smooth with tufts of hairs above; the male antennae are ciliated. The thorax is without crest, the meso- and metathoracic tibiae have long hairs on their inner side and are spined, the prothoracic tibiae are not spined. The abdomen is smooth without crest. The anterior wings have a slightly projected apex. In the males the basal area of the underside of the wings is clothed with specialized hairs.

Chalciope cephise Cramer

Fig. 11*a-c*

Noctua cephise Cramer, Pap. Exot. 3: 59, pl. 227, fig. C, 1779.

Trigonodes cephise Cramer; Hampson, Fauna Brit. India, Moths 2: 528, 1894.

Chalciope cephise Cramer; Hampson, Cat. Lepid. Phal. B.M. 13: 30, fig. 6, 1913.

Chalciope cephise Cramer; Tams, Ins. of Samoa, Lepid. 4: 217, 1935.

Chalciope cephise Cramer; Gaede, in Seitz 11: 490, pl. 54 f, 1938.

Chalciope cephise Cramer; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 53–61 mm.; length of the anterior wings 26–29 mm.

The head, the thorax, and the abdomen are more or less light ochre-gray; the labial palpi and the frons are darker; the legs are ochre.

The anterior wings are dark brown with a wide costal, marginal band and, at the inferior edge, are cream-white irrorated with

black scales; the dark brown space thus defined is divided by a wide, oblique band extending from the middle of the costa to the external inferior angle; there is a submarginal line of black spots in the light marginal space.

The posterior wings are blackish gray with a yellowish white basal spot and a medial space both poorly defined; the area of the anal angle is also yellowish white but somewhat grayer.

The underside of the wings is ochre irrorated with black scales. In the anterior wings there is a black spot in the distal half of the wing preceded by a yellowish white one.

Genitalia ♂: The tegumen is indistinct,

but there is a well-developed uncus (Fig. 11*a*) which is acute apically and bears a long tuft of bristles both dorsally and ventrally; the scaphium is present but is almost perpendicular to the uncus; the anal tube is short and rather low with regard to the uncus; the valvae (Fig. 11*b*) show little development of the costal part and sacculus; the apex is rounded, clothed with long, strong bristles; the internal side of the valva has a long, narrow process, well sclerotized and colored at its end. (Should it be considered as a harpe?) The juxta is highly developed and, laterally to the penis, shows two triangular parts clothed with small prickers; the penis is curved at its apex and is speckled (Fig. 11*c*).

New Hebrides: Mallicolo (Risbec).

The species is also found in Samoa.

Genus MOCIS Hübner

Mocis Hübner, 1827, Verz. bekannt. Schmett., p. 267; Hampson, 1913, Cat. Lepid. Phal. B.M. 13: 76; Gaede, 1938, in Seitz 11: 493 (type *undata* F.).

The proboscis is fully developed; the labial palpi are upturned; the second joint reaches the vertex of the head and is slightly scaly; the third joint is short, oblique; the frons is smooth; the male antennae are ciliated. The thorax, without crest, is clothed with scales; the prothoracic tibiae are not spined; the metathoracic tibiae are spined. The abdomen is clothed with scales, without crest. In the anterior wings, the apex is slightly projected; the venation is similar to that of the species last described.

Key to the species

1. Anterior wings with two parallel, rather wide, transverse bands *trifasciata*
Anterior wings with an oblique transverse band, narrower, starting from the apex *frugalis*

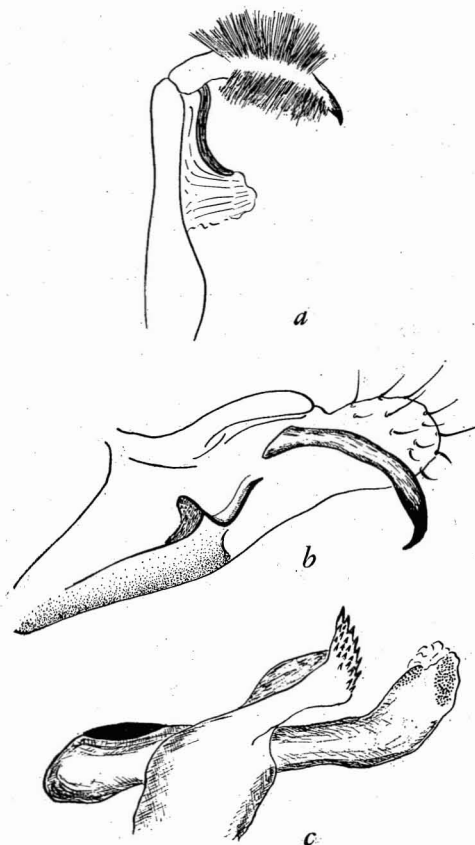


FIG. 11. *Chalciopse cephise* Cramer: *a*, tegumen, uncus, and anal tube; *b*, right valva; *c*, penis and juxta.

Mocis frugalis Fabricius

Fig. 12a-c

Noctua frugalis Fabricius, Syst. Entom., p. 601, 1775.

Remigia frugalis Fabricius; Hampson, Fauna Brit. India, Moths 2: 527, 1894.

Mocis frugalis Fabricius; Hampson, Cat. Lepid. Phal. B. M. 13: 87, fig. 23, 1913.

Mocis frugalis Fabricius; Collenette, Roy. Entom. Soc. London, Trans. 76: 478, 1928.

Mocis frugalis Fabricius; Tams, Ins. of Samoa, Lepid. 4: 218, 1935.

Mocis frugalis Fabricius; Gaede, in Seitz 11: 493, 1938.

Mocis frugalis Fabricius; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 33-36 mm.; length of the anterior wings 18-19 mm.

The head, thorax, and abdomen are gray, the head and thorax being darker than the abdomen; the legs are gray mixed with ochre.

The anterior wings have a background color of dark gray mixed with black scales; the costa and the apex are a darker, blackish gray. The coloration of the species is rather variable; typically there is: a reniform spot slightly marked on the discocellular veins; a variable, elongate, medial, ochre-brown spot above the anal vein; a transverse, oblique, ochre-brown band starting from the apex and reaching the distal third of the inferior margin; within this band is a fine black line edged with cream-white; there is a submarginal series of black spots, each spot being on a vein, and these spots are bounded by a fine ochre-brown line; the external margin is ornamented with a fine black line, and a black spot is found at the proximal third of the inferior edge.

The posterior wings are blackish gray, with the base and a slightly medial band lighter in color.

The underside is blackish gray, with the marginal parts darker in color.

Genitalia ♂: The tegumen is very small, almost indistinct; the uncus (Fig. 12a) is typical; there is a scaphium; the lateral parts of the ninth urite are narrow; the valvae (Fig. 12b) are complicated, showing a strong process dorsally, a series of teeth ventrally, and a kind of long, colored, and strongly sclerotized spur medially; the penis is curved; the juxta is laterally lengthened (Fig. 12c) by two formations that meet dorsad of the penis; the part thus formed is very sharp and bears a number of sclerotized teeth.

Genitalia ♀: The lobes of the oviporus and the parts of the eighth segment are normal with anterior and posterior apophyses; the tergite of the seventh segment is always well developed, but here the lateral edges of the ventral side fuse with the part called the clapper in the preceding species, and thus only the apex remains free; hence the ostium bursae opens at the bottom of a completely enclosed chamber; the ductus bursae is first sclerotized, then membranous, then sclero-

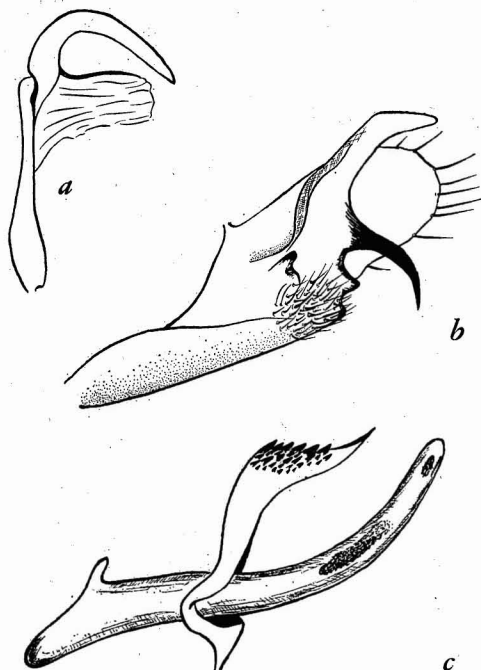


FIG. 12. *Mocis frugalis* Fabricius: a, tegumen, uncus, and anal tube; b, right valva; c, penis and juxta.

tized again; the bursa copulatrix has a slightly sclerotized part and a membranous part.

New Caledonia (Marie): Canala (Delacour), Nouméa, Voh (Catala).

This species has a wide geographical range extending over the Ethiopian region, the Indo-Australian area, and the Pacific islands (Carolines, Marshall, Gilbert, Ellice, Fiji, Samoa) to the Marquesas Islands and the Tuamotu Archipelago.

The specimens from New Hebrides and the Loyalty Islands, indicated in my Catalogue (1949), actually belong to the next species.

Mocis trifasciata Stephens

Fig. 13a-c

Catephia trifasciata Stephens, Ill. Brit. Entom. Haust. 3: 128, 1829.

Mocis trifasciata Stephens; Hampson, Cat. Lepid. Phal. B.M. 13: 93, pl. CCXXIII, fig. 23, 1913.

Mocis trifasciata Stephens; Collenette, Roy. Entom. Soc. London, Trans. 76: 478, 1928.

Mocis trifasciata Stephens; Tams, Ins. of Samoa, Lepid. 4: 218, 1935.

Mocis trifasciata Stephens; Gaede, in Seitz 11: 493, pl. 55 c, 1938.

Mocis trifasciata Stephens; Viette, Pacific Science 3(4): 331, 1949.

Wingspread 45-48 mm.; length of the anterior wings 21-23 mm.

The head and thorax are brownish gray, the abdomen is gray; the legs are gray mixed with ochre-brown.

The anterior wings are gray irrorated with black scales and have a slight bluish reflection. Typically, a rather wide transverse band can be seen, which is ochre-brown at the basal third of the wing; interiorly it has a cream line; toward the exterior it is poorly defined and mixes with the background color; another ochre-brown transverse band is at the distal third of the wing; this band is wider

at the costa than at the inferior edge, and it too is very badly defined, having lighter and darker parts; exterior to it is a line of black spots; the marginal band is a little darker than the background color; the margin is a thin black line.

The posterior wings are ochre-brown-gray, with the abdominal margin, a medial band, and some parts along the external margin creamy white.

The underside is ochre with darker distal parts.

Genitalia ♂: The lateral dorsal parts of the ninth urite are narrow; the tegumen is indistinct and the uncus is typical with a small beak at the apex (Fig. 13a); the scaphium is present; the valvae (Fig. 13b) are subrectangular with a small lengthening at the dorsal apex; neither the costa nor the sacculus is well defined; a short process starts from the internal surface and widens

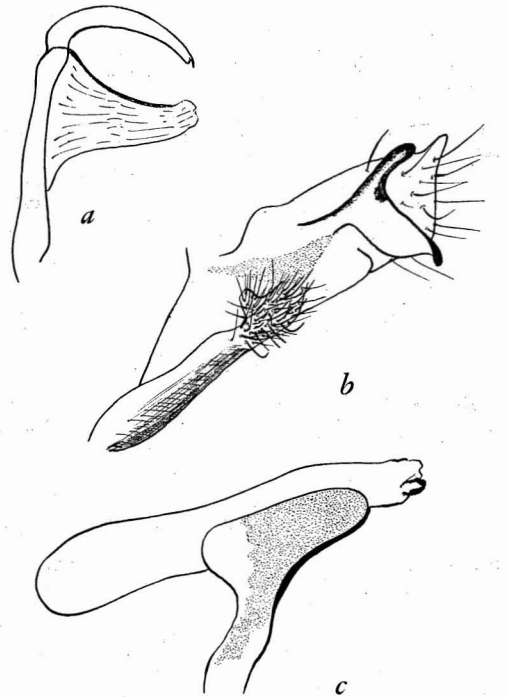


FIG. 13. *Mocis trifasciata* Stephens: a, tegumen, uncus, and anal tube; b, right valva; c, penis and juxta.

apically into a wide plate which carries raised extensions both dorsally and ventrally, the ventral being upturned; the penis is straight, and is carried by a juxta lengthened by two long plates, lateral to the penis (Fig. 13c).

Genitalia ♀: These have the same form as those of *Mocis frugalis* F., but can be distinguished by their larger anterior and posterior apophyses, and particularly by a greater specialization of the chamber where the ostium bursae opens; the lateral ventral edges of the seventh tergite come to a level with the ductus bursae upon which, beneath, is fused a lengthened part, which is curved at its caudal edge and is homologous to the part called the clapper in the other species but which here does not have the same function. Thus the ostium bursae is pushed backwards; the ductus bursae is longer, sclerotized; the bursa copulatrix is membranous.

New Caledonia: Canala (Delacour), Nouméa (Catala).

Loyalty Islands (coll. Donckier, Paris Museum).

New Hebrides: Mallicolo (Risbec); Tanna (Aubert de la Rüe); Vaté, Port Vila (Risbec).

The species extends from Ceram, New Guinea, and the Solomons to the Marquesas and the Austral Islands, including Tonga, Fiji, and Samoa.

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