

The species of the genus *Monosyntaxis* Swinhoe from New Guinea, with description of a new species and the transfer of another to a new genus (Lepidoptera: Arctiidae, Lithosiinae)

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Suara Serangga Papua 4 (1): 1 - 13

Abstract: The species of the genus *Monosyntaxis* Swinhoe, 1901 occurring in New Guinea are reviewed. Of the nine recognized *Monosyntaxis* species in Indo-Australia only three are known from New Guinea. One of these is a new species which is recently discovered, *Monosyntaxis bimaculata* **spec. nov.** from the Foja Mountains, and is described here. *Chrysaeglia samoana* Gaede, 1925 **syn. nov.** is synonymized with *Chrysaeglia samoensis* Rebel, 1915, which morphologically belongs to *Monosyntaxis*. *Oeonistis metallescens* Rothschild, 1912, which was previously supposed to belong to *Monosyntaxis* turned out to belong to another new genus and is transferred to *Papuasyntaxis* **gen. nov.** The adults and the genitalia of all New Guinea species are depicted.

Ikhtisar: Spesies-spesies dari genus *Monosyntaxis* Swinhoe, 1901 yang ada di New Guinea direvisi. Dari sembilan spesies *Monosyntaxis* di Indo-Australia hanya tiga diketahui dari New Guinea. Satu di antaranya baru-baru ini ditemukan, *Monosyntaxis bimaculata* **spec. nov.** dari Pegunungan Foja, dan diletakkan di sini. *Chrysaeglia samoana* Gaede, 1925 **syn. nov.** dinyatakan sinonim dengan *Chrysaeglia samoensis* Rebel, 1915, yang secara morfologis termasuk *Monosyntaxis*. *Oeonistis metallescens* Rothschild, 1912, yang sebelumnya dianggap termasuk dalam *Monosyntaxis* ternyata termasuk dalam suatu genus yang baru dan dipindahkan ke dalam *Papuasyntaxis* **gen. nov.** Gambar-gambar dari imago dan genitalia dari semua New Guinea spesies disajikan.

Keywords: *Papuasyntaxis*, *Chrysaeglia*, *Oeonistis*, gen. nov., spec. nov., Foja Mountains.

Abbreviations

- BMNH - Natural History Museum (formerly British Museum for Natural History), London, United Kingdom
KSP - Koleksi Serangga Papua (Collection of Papuan Insects), Jayapura, Indonesia
PNG - Papua New Guinea
ZMAN - Zoologisch Museum, Amsterdam, The Netherlands
ZMHB - Museum für Naturkunde der Humboldt Universität, Berlin, Germany
ZMUH - Zoologisches Institut und Museum (Universität), Hamburg, Germany

Introduction

The genus *Monosyntaxis* Swinhoe, 1901 is distributed in Sundaland, the Philippines, Sulawesi, New Guinea and Samoa, and comprises nine species, of which three are endemic to New Guinea. One of these New Guinea species was recently discovered as new to science and will be described below.

Species of the genus *Monosyntaxis* show a distinct sexual dimorphism, in the area west of New Guinea even more extreme: males are mostly black with red markings, while females are much larger and have yellow with black pattern. In New Guinea and Samoa both, males and females, of all species are silvery white or pale yellow with blackish markings, females are larger than males but less pronounced. Because of these differences between the western *Monosyntaxis* group and the eastern *Monosyntaxis* group and the absence of species in the Moluccas, Holloway (2001) assumed that the species from New Guinea and Samoa would not be related to the western group which comprises the type of the genus, *Monosyntaxis trimaculata* (Hampson, 1900). The genitalia of the New Guinea species, however, reveal that these species indeed belong to *Monosyntaxis*.

Another species which used to be assigned to this genus is *metallescens*, but a detailed study of the genitalia, external morphology and wing venation revealed that this species belongs to another genus. There is no described genus available yet where this species should be transferred to so a new genus is proposed for *metallescens*: *Papuasyntaxis* **gen. nov.**

The Samoan species *samoensis* Rebel, 1915 (holotype in ZMUH) was originally described in *Chrysaeglia* Butler, 1877 but by following authors justly treated under *Monosyntaxis*, however Holloway (2001) has doubts about its position in this genus. Rebel (1915) judged by the wing venation that this species belongs to *Chrysaeglia*, but that genus with only three recognized species and a distinctly different habitus has a distribution from the Himalaya to the Philippines and Sulawesi and it is not very likely that it does cross the Weber line to reach as far as Samoa solely. The

habitus of *samoensis* approaches that of the females of western *Monosyntaxis* species but since only few specimens are known we can only make provisional conclusions and have to wait for results of future genital studies. Gaede (1925) described a male as *Chrysaeglia samoana* (holotype in ZMHB) (fig. 8), but there is no doubt that it is conspecific with *Chrysaeglia samoensis* Rebel, 1915 which was described after a female, and therefore it is considered to be a junior synonym of *Chrysaeglia samoensis* Rebel, 1915.

Checklist of *Monosyntaxis* Swinhoe, 1901

<i>affinis</i> Rothschild, 1912	[Malayan Peninsula, Sumatra, Java]
<i>bipunctata</i> (Bethune-Baker, 1904)	[New Guinea]
<i>bimaculata</i> spec. nov.	[Papua, Indonesia]
<i>holmanhunti</i> Hampson, 1914	[Malayan Peninsula, Sumatra, Java, Bali, Borneo]
<i>montanus</i> Schulze, 1910	[Philippines (Luzon, Mindanao)]
<i>persimilis</i> Rothschild, 1912	[New Guinea]
<i>radiifera</i> Cerny, 1995	[Philippines (Mindanao)]
<i>samoensis</i> (Rebel, 1915)	[Samoa]
<i>samoana</i> (Gaede, 1925) syn. nov.	
<i>trimaculata</i> (Hampson, 1900)	[Borneo]

Description of the New Guinea species

Monosyntaxis bipunctata (Bethune-Baker, 1904)

Figs 1, 2, 5, 11-14, 27, 30

Chrysaeglia bipunctata Bethune-Baker (1904: 420); Draudt (1914: 201).
Monosyntaxis bipunctata: Rothschild (1912: 224); Strand (1922: 595); Holloway (2001: 291).

Holotype: ♂, British New Guinea [Papua New Guinea], Dinawa, viii.1902, A.E. Pratt [BMNH].

(note: In BMNH a wrong specimen, originating from Mt Kebea [PNG], is labeled with the holotype label. In his original publication Bethune-Baker (1904) designated the Dinawa specimen as type. Furthermore one specimen is present in this series from Aroa River [PNG])

Diagnosis: Male antenna serrate (pectination at one side) (fig. 5). Silvery white forewings with the inner black marking simple, like a dot or straight bar, hindwing of female pale yellow.

Other characters: Head and patagia totally orange, prothorax black, tegulae orange with large black patch at the innerside and with white hairy fringes. The orange colour may be very pale or even bleached to bone-white. Abdomen with grey hairs and in the male with a yellow tuft.

Forewing (♂ 14-17 mm, ♀ 18-20 mm) with two black markings: a vertical or somewhat oblique straight blackish blue patch almost in the middle of the wing, and a smaller black patch, which is sometimes stretched horizontally, more distal in the wing. The hindwing in the male pure white with the costa yellowish, in the female the hindwing is bone-white with extended yellow colouring in the costal and apical area.

Genitalia: Male genitalia with uncus rather small, bifid spatula shaped. Tuba analis much larger than uncus. Tegumen arched and rather narrow. Valvae narrow, cucullus straight, sacculus gradually narrowing to a club-shaped apex with small teeth at innerside, apex slightly bend upwards. Juxta simple, shield-shaped. Saccus well developed, "V"-shaped. Aedeagus short, strongly diverging from coecum to wide beaker-shaped, vesica with two large cornuti, both coarsely dentated on the upperside with few teeth. At the base of the vesica are some chitine drops with setae. Female genitalia with antrum from ventral view hidden behind the wide and large cervix bursae (at figure 27 just visible), upper half of cervix bursae more sclerotized than lower part and gradually transforming into the very short and broad ductus bursae. Ductus seminalis originating at the base of the cervix bursae. Globular bursa copulatrix of about the same size as cervix bursae. One small signum at the bottom of the bursa copulatrix, oval shaped with about twenty coarse thorns (fig. 30).

Distribution: The species is mainly distributed in the Central Mountains of New Guinea but is in the Indonesian part also found in the Foja Mountains, the Paniai area and the Arfak Mountains.

***Monosyntaxis persimilis* Rothschild, 1912**

Figs 3, 4, 6, 15-18, 28, 31

Monosyntaxis persimilis Rothschild (1912: 224); Draudt (1914: 202); Strand (1922: 596); Holloway (2001: 291).

Holotype: ♂, Centr. Dutch N. Guinea [Papua, Indonesia], Mt Goliath, 5000-7000 ft, about 139[=140] long[itude], i.1911, A.S. Meek [BMNH].

Diagnosis: Male antenna biserrate (pectination on both sides) (fig. 6). Silvery white forewings with the inner marking "V"-shaped, hindwing of female pale yellow.

Other characters: Head orange with black face, patagia orange, silvery white prothorax caudally black and with a black central spot, tegulae orange with a small black spot and white hairy fringes. Abdomen with grey hairs, in male with a yellow tuft, female abdomen yellowish grey.

Forewing (♂ 16-18 mm, ♀ 20-23 mm) silvery white with two black markings: the inner marking metallic blackish blue and strongly "V"-shaped pointing outwards, the outer marking dark brown and is a small irregular patch. Hindwing in male snow-white with the costa and apical area and fringes along the upper half of the wing suffused with orange-yellow. In the female the hindwing is pale yellow, gradually darkening apically.

Genitalia: Male genitalia with uncus spatula shaped, larger than in the former species and not bifid. Tuba analis large, but not much larger than uncus. Tegumen very broad at the top, clearly divided into two parts. Valvae broad, cucullus disc-shaped, forming almost half a circle, sacculus strongly narrowing from base to half the valva length, continued by a narrow spoon-shaped apex with a row of teeth at the outer rim, pointing inwards and increasing in size. Juxta simple, shield-shaped. Saccus well developed by broad vinculum rim. Aedeagus stretched and of moderate length, gradually broadening and with a worm-like extension ventrally. Vesica with two small cornuti, one larger dentated one and one small thorn-shaped one. At the base of the vesica are numerous chitine drops with long setae. Female genitalia with clearly defined antrum, followed by a broad straight tube which combines the sclerotized cervix bursae and the unsclerotized ductus bursae. Ductus seminalis originating at the base of the cervix bursae. The bursa copulatrix is rather small, globular and contains one small signum at the bottom. The oval shaped signum is larger than in the former species and with numerous small teeth (fig. 31).

Distribution: The species is mainly distributed in the Central Mountains of New Guinea but is in the Indonesian part also found in the Paniai area and the Wondiboy Mountains (Wandammen Peninsula).

Monosyntaxis bimaculata spec. nov.

Figs 7, 19-22

Holotype: ♂, Indonesia Papua, Kab. Sarmi, Kwerba, 2°34.5'S- 138°24.54'E, 23.xi-7.xii.2005, 1650 m, CI-RAP Mamberamo-Foya Exp., H. v. Mastrigt [ZMAN].

Paratypes (2): data as holotype 1 ♂, [ZMAN], 1 ♂ [KSP].

Diagnosis: Male antenna serrate, pectination longer than in *bipunctata*. Forewing

bone-white, not silvery white as in the other species. Dark wing markings large. Other characters: Head and patagia bone-white. Tegulae of the same colour but for the greater part covered by black except for the margins. Prothorax black, mesothorax grey-white but dorsally blackish blue with a soft metallic shimmer. Abdomen with grey-white hairs, the anal tuft pale yellow.

Forewing (17 mm) with ground colour bone-white, the rim of the costa basally blackish. Two large dark patches, the inner marking metallic blackish blue, drop-shaped and touching the dorsum; the outer marking dark brown and more or less round. Hindwing of the same colour as forewing without any pattern or fading colours. Female unknown.

Genitalia: Male genitalia with uncus bifid, heart-shaped. Tuba analis large, extending the length of the uncus. Tegumen arched and rather broad at the top, clearly divided into two parts resembling spectacles. Valvae broad, cucullus broadening in the middle, at the tip of the cucullus with a strongly sclerotized rim, sacculus narrowing to a spoon-shaped apex with small teeth at innerside of the outer rim, apex curved inwards. In figure 19 the left valva has the best position to show all features. Juxta simple, long and shield-shaped. Saccus well developed, broadly "V"-shaped by strongly defined vinculum. Aedeagus very short, coecum extremely short, strongly diverging from coecum to wide beaker-shaped with a thick worm-like extension ventrally, vesica with one large cornutum, weakly trapezium-shaped with a strong ventral thorn.

Distribution: Until now only known from the Foja Mountains in Papua, Indonesia.

Etymology: The species is named after its larger patches, rather than dots like in *M. bipunctata*.

***Papuasyntaxis* gen. nov.**

Type species: *Oeonistis metallescens* Rothschild, 1912.

Antenna in male biserrate, in female with setae. Eyes large, positioned laterally. Labial palpalae in male long and thick, in female shorter. Proboscis well developed. Forelegs without spurs, midlegs with 1 short spur and 1 long spur at the end of tibia, hindlegs with 4 spurs: 1 short and 1 longer at 1/3 at the end of tibia, 1 short and 1 longer at the end of tibia. Wing venation as in figure 32. Most striking feature is the presence of an areole in the forewing, formed by a connection between R2 and R3, which *Papuasyntaxis* shares with *Calamidia* Butler, 1877. The overall venation resembles that of *Sidyia* Walker, 1856, *Chrysaeglia* Butler, 1877 and *Monosyntaxis* Swinhoe, 1901 with which *Papuasyntaxis* is closely related to and has in common

that in the hindwing vein M4 is absent (i.e. in *Palaeosia* Hampson, 1900 it is present). The male genitalia are quite unusual compared to those of its probably related genera. Uncus thorn- or finger-shaped, like in *Calamidia* and *Palaeosia*, but the saccus is of enormous proportions and the aedeagus is long and slender, which is very unusual for Lithosiinae. Vesica with small cornuti.

The female genitalia with well defined antrum and cervix bursae, the bursa copulatrix without signum.

Etymology: The name is a combination of two characters: "Papua" of course refers to the geographical origin of the taxon and "syntaxis" refers to the relationship with *Monosyntaxis*, in which the meaning of "syntaxis" in *Papuasyntaxis* maybe even more is expressed than in *Monosyntaxis* (*syntax* = the sequence of words forming a sentence; the characteristic tuning-fork or "T"-shaped pattern in the type species symbolizes the written sentence).

***Papuasyntaxis metallescens* (Rothschild, 1912) comb. nov.**

Figs 9, 10, 23-26, 29, 32

Oeonistis metallescens Rothschild (1912: 225)

Monosyntaxis metallescens: Draudt (1914: 201); Strand (1922: 595); Holloway (2001: 291).

Lectotype: ♂ (with round red type label, herewith designated from syntypes), Centr. Dutch N. Guinea [Papua, Indonesia], Mt Goliath, 5000-7000 ft, about 139 [=140] long[itude], ii.1911, A.S. Meek [BMNH].

Paralectotype: ♀ (herewith designated from syntypes), as in lectotype [BMNH].

Diagnosis: The black tuning-fork shaped pattern on the silvery and shiny yellow forewing is unmistakable.

Other characters: Black antenna in male biserrate, in female with setae. Head and thorax golden-yellow, face of head and palpal black (underside sooty yellow), centre of thorax black. Labial palpal in male rather long and thick, 1.5 eye length, in female shorter, 1.25 eye length. Proboscis rather long, from head to halfway abdomen. Abdomen with yellow-grey hairs, tuft more yellow. Forewing (♂ 16-19 mm, ♀ 21-23 mm) with groundcolour silvery white, basal oval-shaped field pale shiny yellow. Costal rim narrowly yellow, termen yellow with black fringes. A black tuning-fork-shaped pattern runs longitudinal over the entire wing from termen to base.

Hindwing pale yellow, fading paler towards base.

Genitalia: Male genitalia with tegumen stretched and long with a finger-shaped uncus with the sharp tip bend down. Valvae with cucullus broadening and extending distally, sacculus broad at base, arched and narrowing to the middle of the valva

and continued by an extension which is depressed in the middle and curved inwards. Apex sharp. Saccus very long. Aedeagus long and slender, slightly curved, at the tip with a curved thorn. Vesica with three small cornuti, one thorn-shaped and two rectangular shaped, the rectangular ones with a tiny thorn at one side. Female genitalia with a long ribbon-shaped antrum, continued by a longitudinal slightly sclerotized cervix bursae. At the connection of antrum and cervix bursae a heavy sclerotized ribbon- and disc-shaped structure. Ductus seminalis originating at top of cervix bursae. Bursa copulatrix globular and without signum.

Distribution: Only known from Central-East Papua, Indonesia, but to be expected from at least the Central western part of Papua New Guinea too. The species prefers higher altitudes and is rather rare, though it was very abundant in Pass Valley (Jayawijaya Mountains) at 2000 meter.

Acknowledgements

I am in debt to thank the following persons and institutions to make the study of this genus possible. Mr. Willem Hogenes (ZMAN, Amsterdam), Mr. Martin Honey (BMNH, London), Dr. Wolfram Mey (ZMHB, Berlin) for their permission to study material in the mentioned collections. Dr. Jeremy D. Holloway (BMNH, London) for his advise and thoughts concerning this study. The Uyttenboogaart-Eliassen Foundation for the financial support of surveys to Papua, Indonesia and the visit of important collections. Dr. Willem N. Ellis (Amsterdam) for his help with the digital photographing of the genital slides.

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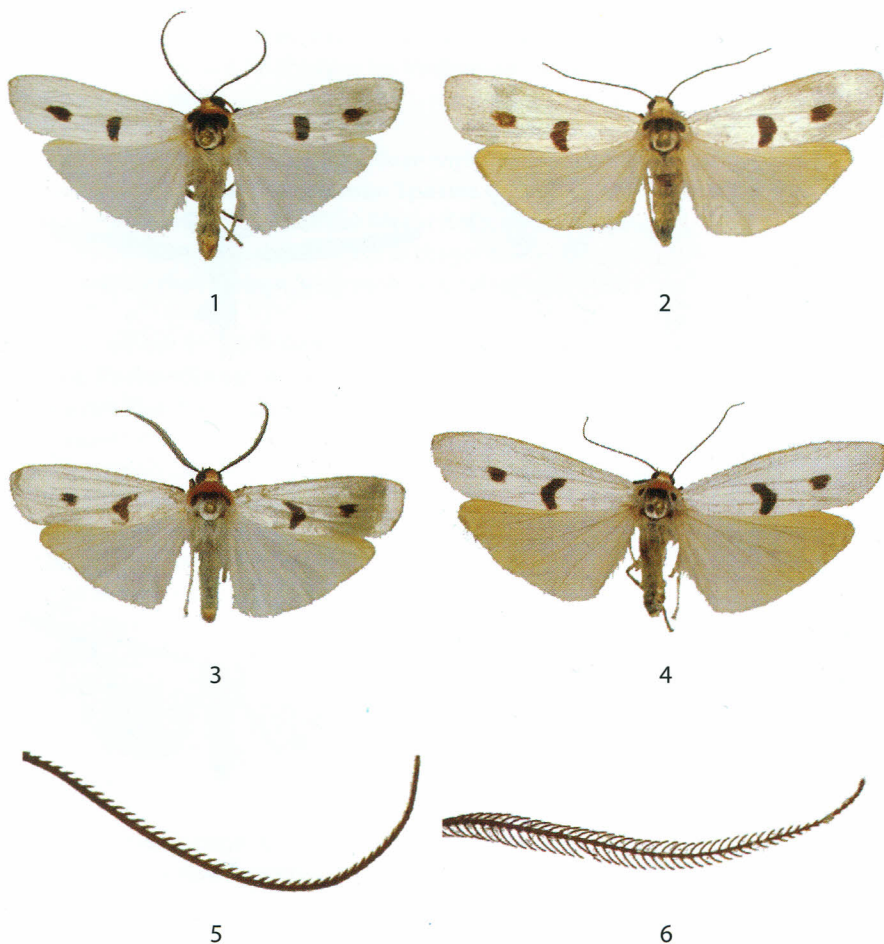


Fig. 1. *Monosyntaxis bipunctata*, male, Pass Valley, Jayawijaya Mts, Papua, Indonesia [ZMAN];

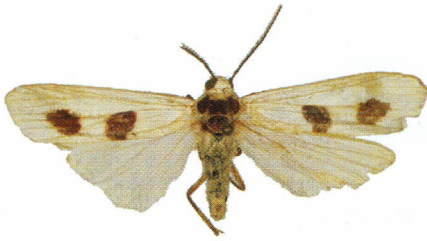
Fig. 2. *M. bipunctata*, female, Walmak, Jayawijaya Mts, Papua, Indonesia [ZMAN];

Fig. 3. *M. persimilis*, male, Wamena, Baliem Valley, Papua, Indonesia [ZMAN];

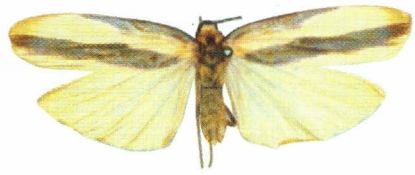
Fig. 4. *M. persimilis*, female, Pass Valley, Jayawijaya Mts, Papua, Indonesia [ZMAN];

Fig. 5. male antenna of *M. bipunctata*;

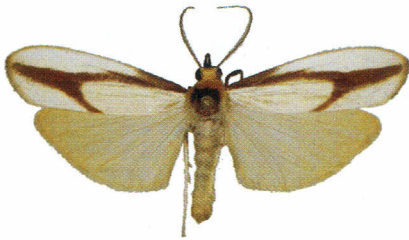
Fig. 6. male antenna of *M. persimilis*.



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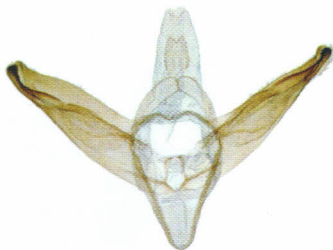
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Fig. 7. *M. bimaculata spec.nov.*, male holotype, Kwerba, Foja Mts, Papua, Indonesia [ZMAN];

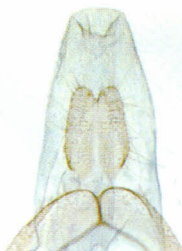
Fig. 8. *M. samoensis*, female holotype of *Chrysaeglia samoana* Gaede, Samoa [ZMHB];

Fig. 9. *Papuasyntaxis metallescens*, male, Pass Valley, Jayawijaya Mts, Papua, Indonesia [ZMAN];

Fig. 10. *P. metallescens*, female, Pass Valley, Jayawijaya Mts, Papua, Indonesia [ZMAN].



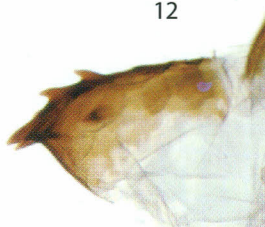
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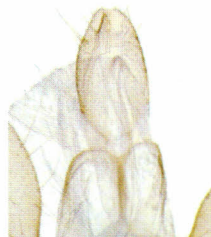
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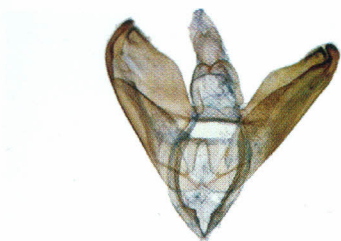
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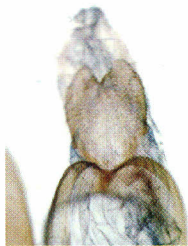
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Figs 11-14. *Monosyntaxis bipunctata*, male genitalia (prep. RV1258): 11. habitus; 12. uncus; 13. aedeagus; 14. one of the cornuti.

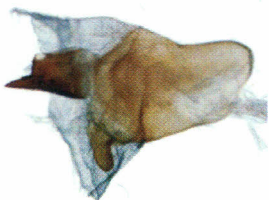
Figs 15-18. *M. persimilis*, male genitalia (prep. RV1259): 15. habitus; 16. uncus; 17. aedeagus; 18. cornuti.



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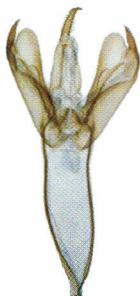
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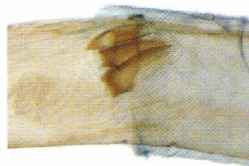
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Figs 19-22. *Monosyntaxis bimaculata*, male genitalia (prep. RV1261): 19. habitus; 20. uncus; 21. aedeagus; 22. cornutum.

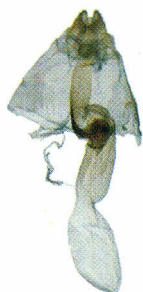
Figs 23-26. *Papuasyntaxis metallescens*, male genitalia (prep. RV1260): 23. habitus; 24. uncus; 25. aedeagus; 26. cornuti.



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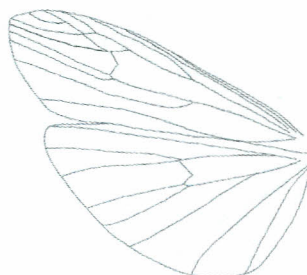
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Fig. 27. *Monosyntaxis bipunctata*, female genitalia (prep. RV1262), habitus.

Fig. 28. *M. persimilis*, female genitalia (prep. RV1263), habitus.

Fig. 29. *Papuasyntaxis metallescens*, female genitalia (prep. RV1264), habitus.

Fig. 30. *M. bipunctata*, signum.

Fig. 31. *M. persimilis*, signum.

Fig. 32. *P. metallescens*, wing venation.