THE AUSTRALASIAN SPECIES OF *WINTHEMIA* ROBINEAU-DESVOIDY (DIPTERA: TACHINIDAE) WITH NOTES ON OCEANIAN AND ORIENTAL SPECIES

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Abstract

The identities of the described Australasian species of *Winthemia* are clarified by examination of original type material and 2 new species described: *W. novaguinea* and *W. queenslandica*. Notes on the type material of Oceanian and Oriental species of *Winthemia* are appended. Males of all species are keyed. *W. neowinthemioides* (Townsend) is synonymised with *W. sumatrana* (Townsend) and *W. trichopareia* (Schiner) is unlikely to be Australian.

Introduction

Winthemia Robineau-Desvoidy is a cosmopolitan genus generally regarded as taxonomically difficult. Guimarães (1972) revised the North American species but the Old World species have not been similarly treated. Females are particularly hard to identify unless associated with males and the characters used to distinguish males also need careful examination. Even the sexes may be difficult to associate because of sexual dimorphism in some of the body hairing.

This study stemmed from a request to identify parasites of fruitpiercing moths (Noctuidae) from Australia and some Pacific islands and was based on examination of the type material of Australasian and Oceanian species of *Winthemia* plus specimens assembled from museum collections. It is not a full taxonomic revision but provides a diagnosis for each described species. I have described 2 new species represented by associated specimens of both sexes: *W. novaguinea* from New Guinea and *W. queenslandica* from Queensland. It was not possible to include females in the key.

Because the distributions of some Australasian species extend into the Oriental Region, it was also necessary to examine the type material of described Oriental species of *Winthemia* listed in Crosskey (1976). As a result I have included notes on them and added these species to the key. *W. neowinthemioides* (Townsend) is synonymised with *W. sumatrana* (Townsend) as suggested by Crosskey (1976). Crosskey also suggested that *W. trichopareia* (Schiner) may be a synonym of *W. lateralis* (Macquart). However having examined the holotypes of both species and a range of reared specimens of *W. lateralis*, I doubt that this is true. In fact I doubt that *W. trichopareia* is Australian and consider that its provenance remains unknown.

The material examined in this study includes many specimens which could not be satisfactorily identified. I have attached appropriate labels to them to assist any subsequent authors who need to examine them.

Materials and methods

Male genitalia were examined after soaking in cold KOH, washing in distilled water and mounting in glycerine in cavity slides; they were then stored in glycerine in glass vials associated with the specimens. Drawings were made with the aid of a camera lucida. Measurement of body length (viewed laterally) was made from the tip of the abdomen to the antennal insertions. The ratio V:HW was calculated from the width of the vertex at the level of the posterior ocelli and the maximum head width across the eyes (excluding hairing), both viewed dorsally. Both are expressed as means with ranges given in parentheses; number of specimens measured is shown last. Terminology in diagnoses follows Crosskey (1973) and Cantrell (1984).

Abbreviations: AM, Australian Museum, Sydney; ANIC, Australian National Insect Collection, CSIRO, Canberra; BM, British Museum (Natural History), London; BPBM, Bernice P. Bishop Museum, Honolulu; CNC, Canadian National Collection, Agriculture Canada, Ottawa; DEI, Institut für Pflanzenschutzforschung (formerly Deutsches Entomologisches Institut), Eberswalde; DPI, Department of Primary Industries, Konedobu, Papua New Guinea; MNHN, Museum National d'Histoire Naturelle, Paris; MV, Museum of Victoria, Melbourne; NM, Naturhistorisches Museum, Vienna; ORSTOM, Centre O.R.S.T.O.M., Noumea; QDPI, Queensland Department of Primary Industries, Brisbane; QM, Queensland Museum, Brisbane; SAM, South Australian Museum, Adelaide; SPHTM, School of Public Health and Tropical Medicine, Sydney [collection now in ANIC]; USNM, United States National Museum, Washington; WADA, Western Australian Department of Agriculture, Perth; ZM, Zoölogisch Museum, Universiteit van Amsterdam.

Winthemia Robineau-Desvoidy

Winthemia Robineau-Desvoidy, 1830:173. Type species *Tachina variegata* Meigen, 1824, des. Robineau-Desvoidy, 1863:207.

Pseudokea Townsend, 1928:393. Type species *Pseudokea neowinthemioides* Townsend, 1928, [= *Pseudokea sumatrana* Townsend, 1927]. orig. des.

Diagnosis (based on Australasian species)

Goniine tachinids as defined by Crosskey (1973:75) having the following features in combination: *pra* large; eyes densely haired; *pf* fully haired; mesopleuron with modified (crinkled) hair surrounding mesopleural setae; barette usually fully haired; mid tibia with 1 *ad*; vibrissae inserted near level of epistomal margin; antennae largely dark; males usually with well defined hair fascicles on ventral portions of abdominal tergites 4-5 (sometimes ill defined on both or absent on T5).

Key to males of Australasian, Oceanian and Oriental species of *Winthemia* (based on type specimens)

1. Parafacials golden or bronze pollinose; large abdominal hair fascicles present 2
   Parafacials silver pollinose; hair fascicles variable or absent 3
2. Tuft of modified hair surrounding mesopleural setae pale, pleural hairs otherwise black; abdominal hair fascicles loosely defined [Taiwan] .. .. **mallochi** Baranov
   Tuft of modified hair surrounding mesopleural setae and (usually) hairs on sternopleuron pale, pleural hairs otherwise black; dense abdominal hair fascicles present [PNG, Australia].. .. **papuana** Mesnil
3. Width of parafacials subequal to that of 3rd antennal segment (Fig. 13), pale haired; tuft of modified hair surrounding mesopleural setae and most of other pleural hairs pale; mesoscutum with pale cuticle surrounding posterior pair of acrostichal setae, sometimes extending anteriorly to include second last pair [Australia] .. .. **lateralis** (Macquart)
   Width of parafacials much narrower than that of 3rd antennal segment (e.g. Fig. 15), dark haired; pleural hairs black, tuft of modified hair surrounding the mesopleural setae black or pale .. 4
4. Abdominal tergite 3 with median marginal pair of setae [Solomon Is] .. .. **sumatrana solomonica** Baranov
   Abdominal tergite 3 without median marginal pair of setae 5
5. Tuft of modified hair surrounding the mesopleural setae black 6
   Tuft pale or yellow 9
6. Abdomen with a discrete hair fascicle on tergite 4 7
   Abdomen without hair fascicles 8
7. Vertex "narrow", V:HW 0.17 (0.16-0.19); hair fascicles on tergite 4 small, discrete (Fig. 16) [Philippines, Indonesia, PNG, Australia] .. .. **sumatrana** (Townsend)
   Vertex wider, V:HW 0.26 (0.25-0.27); hair fascicles larger but less discrete [Australia].. .. .. **queenslandica** sp.n.
8. Head with *ca* 13 frontal setae descending to junction of antennal segments 2,3; parafacials densely black haired; humeral calli paler than remainder of thorax dorsally; ventral portion of tergite 5 dark [Taiwan] .. .. **diversoides** Baranov
   Head with 8-11 frontal setae and parafacials less densely haired; humeral calli dark; ventral portion of tergite 5 pale [PNG] .. .. **novaguinea** sp.n.
9. Abdomen with distinct hair fascicles on tergites 4, 5 10
   Abdomen without hair fascicles or with fascicles on tergite 4 only 12
10. Abdomen only very slightly paler laterally on tergite 3, venter dark [Indonesia] .. .. **remittens** (Walker)

Abdomen with distinct pale areas laterally on tergite 3, venter extensively pale 11

11. Abdominal venter mostly pale except for tergite 1+2 [New Caledonia] .. .. **caledoniae** Mesnil

Abdominal venter with all tergite 5, much of tergite 4 and ventral extremities of tergite 3 dark [Tonga, Fiji] .. .. **pacifica** Malloch

12. Abdomen with small discrete hair fascicles on tergite 4 (Fig. 16) [Philippines, Indonesia, PNG, Australia] .. .. **sumatrana** (Townsend)

Abdomen without hair fascicles [New Britain] .. .. **?diversoides** Baranov *sensu* Sabrosky

Australasian species

Winthemia lateralis (Macquart) (Figs 1-2, 13-14)

Eurygaster lateralis Macquart, 1843:215 (58). Holotype ♂, Australia (MNHN), examined.

Nemoraea brevisetosa Macquart, 1846:282 (154); Crosskey, 1973: 145 (synonymy). Holotype ♂, Tasmania (MNHN), examined.

Exorista lata Macquart, 1848:207(47); Crosskey, 1973: 145 (synonymy). Holotype ♂, Australia (BM), examined.

Exorista marginata Macquart, 1851:161 (188); Crosskey, 1973: 145 (synonymy). Lectotype ♂, Tasmania (MNHN), examined.

Winthemia albiceps Malloch, 1930:349; Crosskey, 1973: 145 (synonymy). Holotype ♂, Sydney, New South Wales (SPHTM).

Winthemia lateralis: Crosskey, 1973:145.

Distribution

Australia below 20°S. Non-type specimens were examined from the following localities. QUEENSLAND: Bauhinia Downs, Bundaberg, Eidsvold, Kingaroy, Beerwah, Brisbane. NEW SOUTH WALES: Glen Innes, Bourke, Armidale, Curlewis, Cobar, Wellington, Parkes, Blackheath, Jenolan, Rankin's Springs, Sydney, Murrigo, Bundanoon, Canberra [A.C.T.], Batemans Bay, Snowy River. VICTORIA: Ouyen, Springmount, Wannon, Melbourne, Frankstown. TASMANIA: Hobart. SOUTH AUSTRALIA: Poochera, Adelaide. WESTERN AUSTRALIA: Carnarvon, Hill R., Coolgardie, Perth, Pinjarra, Capel, Katanning, Busselton, Karridale.

Diagnosis

Head—Silver pollinose; *pfr* hairing dark, as are upper hairs on *pf*, but most *pf* hairing pale; lower *pf* relatively broad, at least half as wide as A.s.3 and often wider (Fig. 13); genal hairs pale except for few dark hairs posteriorly.

Thorax—Mostly dark dorsally, but scutellum, area between *dc* rows extending from scuto-scutellar suture anteriorly to near level of penultimate *post-ac* setae, lateral area above wing base and (usually) outer half of humeral callus pale. [Extent of pale areas variable, but the above case is typical.] Dark haired dorsally, pale haired on pleura, including tuft of modified hairs around mesopleural setae. Legs dark, but tibiae somewhat paler.

Abdomen—Dark, but with broad pale areas laterally on T1+2-4 and apical band of T5 pale. Median dark vitta on T1+2-4 at least as wide as distance between subapical scutellar setae and broadening posteriorly on each segment, but generally posterior half of T1+2, all of T3 and anterior half of T4 pale laterally. Ventrally pale except extreme ventral ends of tergites and sternites dark. T1+2,3 without *mmp*. Male with large loosely defined hair fascicles on T4 and smaller similar fascicles on T5 (Fig. 14). Cerci and surstyli as in Figs 1-2.

Measurements

Body length (mm): male 9.9 (7.6-12.0); female 8.6 (7.2-11.0). V:HW: male 0.22 (0.21-0.23); female 0.29 (0.28-0.30). (42 ♂♂, 40 ♀♀).

Notes

The ANIC contains several females from Queensland and New South Wales which are apparently identical to reared females of this species except that they have *mmp* on T3. Their identity is uncertain as reared females of *W. lateralis* associated with males consistently lack these setae.

This is the most widespread species of *Winthemia* in Australia, but the record of it from New Caledonia (Baranov 1934, as *W. albiceps* Malloch) is incorrect. The specimen Baranov saw is not *W. lateralis* and cannot be specifically identified. The species has a wide host range (Cantrell 1986) to which can be added *Uraba lugens* Walker (Lepidoptera: Nolidae).

Winthemia sumatrana (Townsend) (Figs 3-4, 15-16)

Pseudokea sumatrana Townsend, 1927:69. Holotype ♂, Indonesia (ZM), examined.
Pseudokea neowinthemioides Townsend, 1928:394. Holotype ♂, Philippines (USNM), examined. Syn. n.
Winthemia diversa Malloch, 1930:348; Crosskey, 1973:145 (synonymy). Holotype ♂, Killara, New South Wales (SPHTM).
Winthemia albidopilosa Mesnil, 1949:83; Crosskey, 1976:227 (synonymy). Holotype ♀, Indonesia (CNC), examined.
Winthemia sumatrana: Crosskey, 1976:227.

Distribution

Philippines, Indonesia, Papua New Guinea, coastal Queensland and New South Wales. Non-type specimens were examined from the following localities. PAPUA NEW GUINEA: Bubia via Lae, Bulolo, Wau, Port Moresby, Keria via Amazon Bay. AUSTRALIA: QUEENSLAND: Kuranda, Atherton, Ayr, Rockhampton, Westwood, Gympie, Murgon, Kingaroy, Nambour, Nanango, Bunya Mts, Brisbane, Lawes, Beenleigh, Stanthorpe. NEW SOUTH WALES: Lismore, Bay View, Narrabeen, Sydney, Stanwell Park.

Diagnosis

Head—Silver pollinose; *pfr* hairing dark; *pf* hairing dark in male, pale in female; lower *pf* relatively narrow, half as wide as A.s.3 or less (Fig. 15); genal hairs dark in male, in female anterior half pale haired, rest dark.

Thorax—Dark dorsally to base of scutellum, rest of scutellum pale; postalar calli a little paler than rest of mesoscutum in most specimens. Dark haired dorsally; pleura dark haired in male, pale haired in female (some males have the modified hairs around mesopleural setae pale). Legs dark.

Abdomen—Colour pattern similar to that of *W. lateralis*. T3 with *mmp* in female. Male with small, discrete hair fascicles on T4 only (Fig. 16). Cerci and surstyli as in Figs 3-4.

Measurements

Body length (mm); male 10.2 (7.0-11.7); female 8.4 (6.4-10.0). V:HW: male 0.17 (0.16-0.19); female 0.25 (0.25-0.27). (45 ♂♂, 38 ♀♀.)

Notes

The name *W. neowinthemioides* is well established in the literature and it is unfortunate that it must be synonymised with *W. sumatrana*. Crosskey (1976) first suggested this synonymy and having examined both holotypes, I have no doubt that it is true as they are virtually identical.

Crosskey (1976) also synonymised *W. albidopilosa* with *W. sumatrana* (as *W. neowinthemioides*). My examination of the holotype of *W. albidopilosa* showed a number of fine differences from reared Australian females of *W. sumatrana*, viz. profrons more prominent; parafrontals more densely haired; lower parafacials slightly wider; *mmp* on T1+2 more obvious; abdominal tergite 5 more sparsely haired. I think this synonymy should be maintained, but that my observations should be recorded.

Winthemia sumatrana solomonica Baranov (Figs 5-6)

Winthemia diversa solomonica Baranov, 1938:405. Holotype ♂, Solomon Is (BM), examined.

Distribution

Solomon Is (holotype only examined).

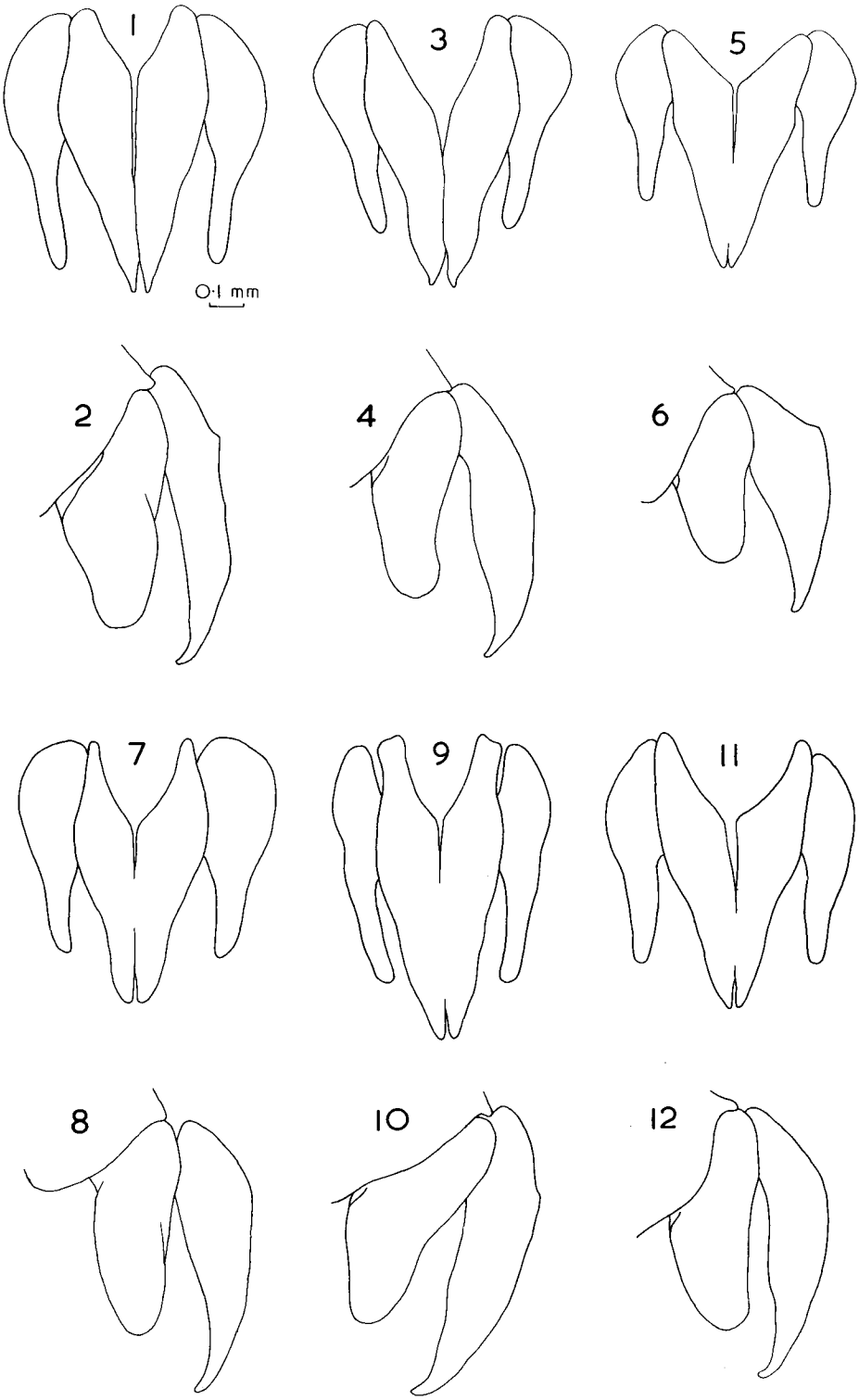
Diagnosis

Separated from *W. sumatrana s.str.* by: head with fewer *fr*; *pfr*'s and *pf*'s less densely haired; thorax with wider dark band on base of scutellum and postalar calli darker; abdomen with more extensive dark areas on intermediate tergites; T3 with *mmp*; abdomen without hair fascicles; differences in the shapes of the cerci and surstyli (Figs 5-6).

This subspecies is very similar to *W. novaguinea* in appearance, but can be distinguished by: *fr* not descending as far below profrons; more extensive dark areas on thorax and abdomen; presence of *mmp* on T3; fine differences in the shape of the cerci and surstyli.

Measurements

Body length (mm) 8.2; V:HW 0.19.



FIGS 1-12—*Winthemia* spp., cerci and surstyli (odd numbers caudal, even numbers lateral); (1-2) *W. lateralis;* (3-4) *W. sumatrana;* (5-6) *W. sumatrana solomonica;* (7-8) *W. queenslandica;* (9-10) *W. papuana;* (11-12) *W. novaguinea.* All to same scale.

Notes

The position of this taxon is problematical. Its closer resemblance to *W. novaguinea* than to *W. sumatrana s.str.* may indicate that it deserves specific status, but without additional specimens (including associated females) stability is best served by maintaining its subspecific status.

Winthemia queenslandica sp. n. (Figs 7-8)

Types—QUEENSLAND: *holotype* ♂, Finch Hatton Gorge nr Mackay, em. 17.v.1976, A. Gillison, in ANIC; *paratypes:* 3 ♂♂, 2 ♀♀, same data as holotype, in ANIC.

Diagnosis

Head—Face and *pf*'s silver pollinose, *pfr*'s bronze pollinose, postorbits bronze pollinose above, silver below, occiput silver pollinose; *pfr* hairing dark; *pf* hairing dark in male, pale in female; lower *pf* at least half as wide as A.s.3 in male, appearing relatively narrower in female; genal hairs dark in male, in female anterior half pale haired, rest dark.

Thorax—Dark dorsally to base of scutellum, rest of scutellum pale. Dark haired dorsally; pleura dark haired in male, mainly pale haired in female except mesopleural hairing dark. Legs dark.

Abdomen—Colour pattern similar to that of *W. lateralis*, but pale areas more extensive dorsally and venter completely pale. T1+2, 3 with *mmp* in female (posterior pair stronger), but these setae absent in male. Male with large loosely defined hair fascicles on T4. Cerci and surstyli as in Figs 7-8.

Measurements

Body length (mm): male 9.6 (9.2-10.8); female 8.5 (8.0-9.0). V:HW: male 0.26 (0.25-0.27); female 0.28 (0.28-0.29). (4 ♂♂, 2 ♀♀.)

Notes

The type species was reared from *Dysphania fenestrata* Swain (Lepidoptera: Geometridae).

Winthemia papuana Mesnil (Figs 9-10)

Winthemia papuana Mesnil, 1968:204. Holotype ♂, Papua New Guinea (CNC), examined.

Distribution

Papua New Guinea, Australia. Non-type specimens were examined from the following localities: PAPUA NEW GUINEA: Aiyura. AUSTRALIA: QUEENSLAND: Cairns, Crater Lakes [Coalstoun] Nat. Pk via Biggenden. NEW SOUTH WALES: Byron Bay, Sydney.

Diagnosis

Head—Male mainly golden pollinose, but lower postorbits, posterior genae and occiput silver pollinose; female mainly silver pollinose, but usually with some bronze pollinosity on *pfr*; *pfr* and *pf* hairing dark; lower *pf* relatively broad, at least half as wide as A.s.3 and often wider; genal hairs mixed pale and dark in most specimens, sometimes almost completely dark.

Thorax—Dark dorsally, but slightly paler on posterior calli and above wing bases and small pale patch between *ac* rows from about level of second *post-ac* to hind margin of scutum; scutellum pale. Dark haired dorsally; pleura mostly dark haired except pale on sternopleuron in some specimens and tuft of modified hairs around mesopleural setae usually pale (but dark in some specimens). Females more extensively pale haired on pleura. Legs dark.

Abdomen—Colour pattern similar to that of *W. lateralis*. T3 with *mmp* in female. Male with large dense hair fascicles on T4,5. Cerci and surstyli as in Figs 9-10.

Measurements

Body length (mm); male 11.3 (10.0-12.7); female 10.0 (9.0-10.4). V:HW: male 0.22 (0.21-0.22); female 0.27 (0.26-0.27). (10 ♂♂, 3 ♀♀.)

Notes

This is the first record of *W. papuana* from Australia. The Australian specimens differ from the holotype by having more extensive pale hairing on the thoracic pleura, but in other characters all agree well. However, other males from Papua New Guinea in BM also have the sternopleuron pale haired and I believe that all specimens are

conspecific. All reared specimens have been bred from *Antheraea* spp. (Lepidoptera: Saturniidae).

Winthemia novaguinea sp. n. (Figs 11-12)

Types—PAPUA NEW GUINEA: *holotype* ♂, Popondetta, 1-8.viii.1965, Dept Agric., in cacao with *Achaea janata*, in BM; *paratypes:* 10 ♂♂, 5 ♀♀, same data as holotype, in BM; 10 ♂♂, 10 ♀♀, Moale Ptn, N. Distr., Papua, ix.1965, T. V. Bourke, ex larvae *Tiracola plagiata*, in BM and DPI.

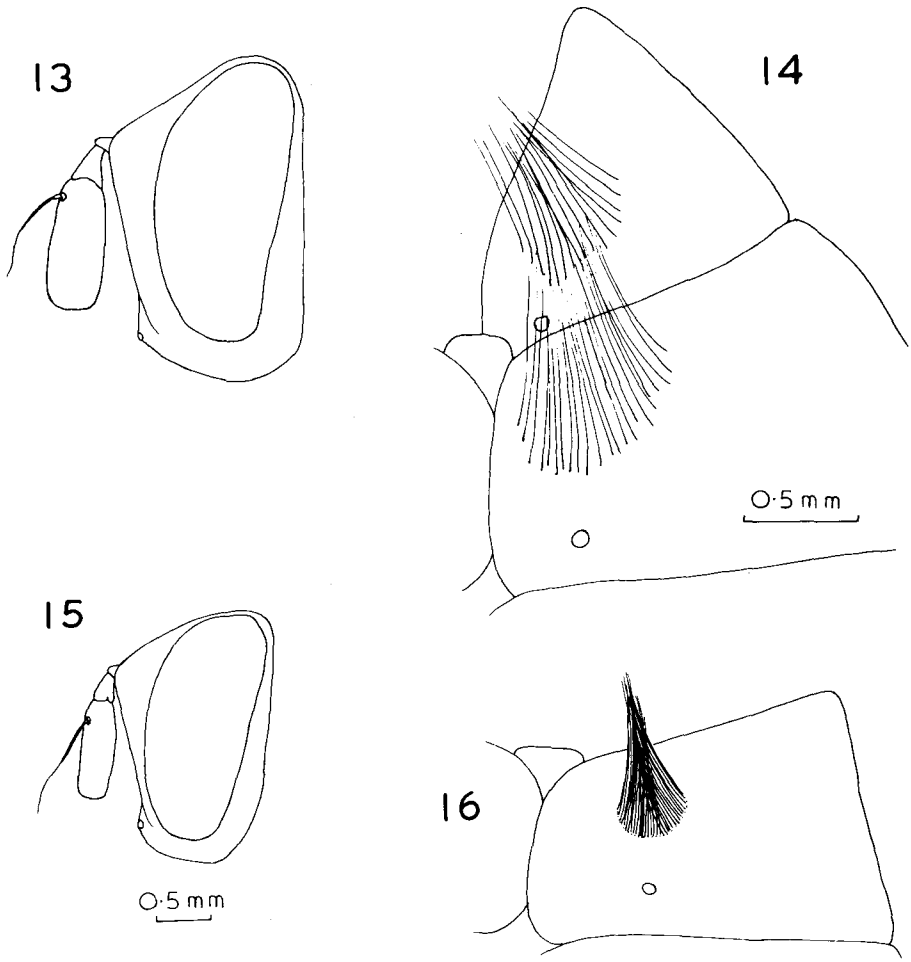
Other material examined—PAPUA NEW GUINEA: 38 ♂♂, same data as holotype, in BM; 15 ♂♂, 15 ♀♀, Moale Ptn, same data as paratypes, in BM; 40 ♂♂, 60 ♀♀, Moale Ptn, various dates, T. V. Bourke, in DPI; 10 ♂♂, 7 ♀♀, Sunshine Ptn, Morobe distr., 22.viii.1968, J. Szent-Ivany *et al.*, in BM.

Diagnosis

Very similar to *W. sumatrana* and isolated females of each species cannot be distinguished. Males may be distinguished by a broader dark basal band on the scutellum, lack of abdominal hair fascicles and fine differences in the shape of the cerci and surstyli (Figs 11-12). It is also very similar to *W. diversoides* Baranov, but can be distinguished by characters given in the key.

Measurements

Body length (mm); male 10.6 (7.9-12.1); female 9.3 (6.8-10.5). V:HW: male 0.15 (0.14-0.17); female 0.24 (0.22-0.26). (25 ♂♂, 25 ♀♀.)



FIGS **13-16**—*Winthemia* spp.: **(13-14)** *W. lateralis*: **(13)** head profile (setae omitted); **(14)** ventral view of part of T4, 5 showing hair fascicles; **(15-16)** *W. sumatrana:* **(15)** head profile (setae omitted); **(16)** ventral view of part of T4 showing hair fascicle. Figs 13, 15; 14, 16 to same scale.

Winthemia trichopareia (Schiner)

Exorista trichopareia Schiner, 1868:327. Holotype ♀, provenance unknown (NM), examined.
Winthemia trichopareia: Crosskey, 1976:227.

Measurements (of holotype)

Body length (mm) 10.52; V:HW 0.28.

Notes

The holotype is in good condition except for being a little dirty and the loss of the left fore leg and some bristles. Crosskey (1976) reported the rediscovery of this specimen and suggested that it may be a synonym of *W. lateralis*. I do not believe that this is so as the holotype shows a number of differences from reared females of *W. lateralis*, viz. humeral calli more extensively pale; pale area dorsally on scutum extending right across posterior margin and extending further anteriorly, both medially and laterally; pleura with pale ground colour on dorsal part of sternopleuron, posterodorsally on mesopleuron and much of hypopleuron and pleurotergite; presence of strong *mmp* on T3.

I have not seen any Australasian specimens which match the holotype and regard it as a *species inquirenda*. I doubt that its status will be clarified until its provenance is found and the male discovered.

Unidentified species

Many specimens examined could not be identified with certainty, particularly isolated females, e.g. the females in ANIC which resemble that of *W. lateralis*, but have *mmp* on T3. The ANIC also contains several males from north Queensland which could not be named and for which no associated females were available; they are labelled '*Winthemia* ? sp., north Queensland'. A number of males and doubtfully associated females from Western Australia in ANIC resemble *W. lateralis*, but the scutum is dark, the male fascicles are indistinct and the females have *mmp* on T3.

The BM contains a few specimens of a species which resembles *W. papuana* but has silver pollinose parafacials. I also examined a pair of voucher specimens of *W. ?diversoides sensu* Sabrosky from New Britain in the University of Hawaii collection and 2 pairs of specimens with the same data in USNM. This species was introduced into Hawaii in 1965 (but did not establish) and Hardy (1981) suggested that it might not be *W. diversoides*. Comparison of the above voucher specimens and the holotype of *W. diversoides* confirmed this. *W. ? diversoides sensu* Sabrosky has fewer *fr*, *pfr*'s and *pf*'s less densely haired, the modified hairs surrounding the mesopleural setae pale and the abdominal pale areas brighter in colour.

Oceanian species

Winthemia caledoniae Mesnil

Winthemia caledoniae Mesnil, 1968:203. Holotype ♂, New Caledonia (CNC), examined.

Distribution

New Caledonia (holotype only examined).

Diagnosis

This species is very similar to *W. pacifica* and is primarily distinguished by abdominal colouration, which is dark dorsally but broadly pale laterally on the posterior half of T1+2, all T3, the anterior half of T4 and the tip of T5; ventrally pale except most of T1+2, sternites and extreme ventral ends of other tergites. In *W. pacifica* the colouration is darker and more extensive.

Measurements

Body length 10.0 mm; V:HW 0.19.

Notes

The holotype is in good condition but is glued to a card, obscuring some ventral characters.

Winthemia pacifica Malloch

Winthemia pacifica Malloch, 1935:359. Holotype ♂, Tonga (BM), examined.

Distribution

Tonga, Fiji. Specimens were examined from the following localities. TONGA: Vavau I. (holotype), Tongatapu I. FIJI: Viti Levu.

Diagnosis

Distinguished from *W. caledoniae* by pale areas dorsally on abdomen smaller and less contrasting with dark areas; pale area at tip of T5 virtually absent, ventrally with all T5, large part of T4 and ventral ends T3 dark.

Measurements (of holotype)

Body length 10.9 mm; V:HW 0.2.

Notes

The holotype is in good condition and the genitalia are in glycerine.

Unidentified species

There are a number of specimens from both American Samoa and Western Samoa in BM, BPBM and USNM which are rather variable in appearance but which generally resemble *W. pacifica.* They can be distinguished from that species by the abdominal colouration, being darker dorsally and ventrally and by the scutellum, which is largely dark. The male fascicles are also less well defined than in *W. pacifica.* Many of these specimens were reared from either *Othreis fullonia* (Clerck) or *Spodoptera litura* (F.) (Lepidoptera: Noctuidae). I am uncertain if they belong to *W. pacifica* or whether they represent a distinct species.

Another species is represented by 2 males (host *O. fullonia*) from Vanuatu in ANIC. They can be distinguished from both *W. caledoniae* and *W. pacifica* by the dark area dorsally on the thorax extending to the basal third of the scutellum and on each side extending to the level of the subapical setae.

A single male from New Caledonia in ORSTOM differs from that of *W. caledoniae* by having wider, pale haired parafacials and hair fascicles hardly evident.

Oriental species

Winthemia diversoides Baranov

Winthemia diversoides Baranov, 1932:47. Holotype ♂, Taiwan (DEI, genitalia on slide), examined.

Distribution

Taiwan (holotype only examined)

Diagnosis

Very similar to *W. novaguinea*, but distinguished from it by characters given in the key.

Measurements

Body length 10.8mm; V:HW 0.19.

Notes

The holotype is in good condition except for splits in the sides of the abdomen. The genitalia are slide mounted but are distorted and the aedeagus is missing. Each wing has a short M1 appendix.

Winthemia javana (Bigot)

Crossotocnema javana Bigot, 1885:ccii. Holotype ♀, Indonesia (BM), examined.
Winthemia javana: Crosskey, 1976:227.

Distribution

Indonesia (holotype only examined).

Diagnosis

Head silver pollinose, width of *pf's* much narrower than that of A.s.3, pale haired. Thorax dark dorsally, including most of scutellum; modified hair surrounding mesoplural setae pale; pleura widely covered with similar but shorter modified hair, this also extending to dorsum but here interspersed with normal fine black hairing.

Measurements

Body length 8.0mm; V:HW 0.24.

Notes

The holotype is in poor condition with many setae missing on the head and abdomen and it is without legs. A coating of glue on the abdomen obscures its chaetotaxy. The extensive modified thoracic hairing has not been noted in any other species of *Winthemia.*

The ANIC holds a female from Mossman, Queensland, which is apparently identical to the holotype except that the parafrontals are bronze pollinose and there are no modified hairs on the true dorsal part of the thorax. Also in ANIC is a male from Mt Cook, Queensland, that I have tentatively associated with this female. It has similar modified hairing on the pleura but this is black.

Winthemia mallochi Baranov

Winthemia mallochi Baranov, 1932:46. Holotype ♂, Taiwan (DEI, genitalia on slide in BM), examined.

Distribution

Taiwan (holotype only examined).

Diagnosis

Head golden pollinose on *pf* and *pfr*, silver in occiput and genae; *pf* much narrower than width of A.s.3; thorax dark dorsally, dark area extending to a base of scutellum but postalar calli paler; modified hair surrounding mesopleural setae pale, but not golden or yellow; abdominal colouration typical for genus; T1+2,3 with *mmp*; large loose hair fascicles on T4,5.

This species is similar to *W. papuana*, but the latter has a more definite pale area above the wing; modified hair surrounding mesopleural setae yellow; abdominal pale areas brighter and more extensive; T1+2,3 without *mmp*; hair fascicles much denser.

Measurements

Body length 11.0mm;V:HW 0.23.

Notes

The holotype is in fair condition but is a little dirty; all frontal setae, 1 ocellar seta and 1 *iv* seta are missing and the top of the head is greased. Also, some dorsal thoracic setae are missing and the wings are tattered along the hind margins. The orientation of the genitalia on slide is good.

Winthemia remittens (Walker)

Eurygaster remittens Walker, 1859:125. Holotype ♂, Indonesia (BM), examined.

Winthemia remittens: Crosskey, 1976:227.

Distribution

Indonesia (holotype only examined).

Diagnosis

This species is distinguished from *W. caledoniae* and *W. pacifica* primarily by its darker abdominal colouration.

Measurements

Body length 10.5mm; V:HW 0.2.

Notes

The holotype is in fair condition but most of the head setae and many of the dorsal thoracic setae are missing. Both fore legs and the right mid leg are missing.

Discussion

This study confirmed that *Winthemia* is a difficult genus to treat using external morphology. The male genitalia of the species examined are exceptionally uniform and not reliably diagnostic and the problem of identifying females has already been mentioned. Perhaps the use of other techniques e.g. electrophoresis, might be more appropriate to this genus. The 2 main species in Australia, *W. lateralis* and *W. sumatrana*, are now adequately differentiated. *W. papuana* and *W. queenslandica* are added to the fauna but further specimens are needed to confirm whether *W. javana* is present in north Queensland. I hope that the limited treatment of the Oceanian and Oriental species presented here will be useful to other workers.

Acknowledgments

I thank the curators of the institutions listed for loan of specimens.

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[*Manuscript received* 11 *July* 1988.]