

The genus *Teleopsis* Rondani (Diptera, Diopsidae): discussion of its taxonomic position and revision of the species occurring in the Philippines

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Generic issues around *Teleopsis* are discussed: it is proposed to maintain the genera *Teleopsis* Rondani, 1875 s.s., *Megalabops* Frey, 1928 and *Cyrtodiopsis* Frey, 1928 s.s. Four *Teleopsis* Rondani species are described from the Philippines: *T. cobiae* spec. nov., *T. freyi* spec. nov., *T. nitidifacies* spec. nov. and *T. nitidiscutum* spec. nov. Five *Teleopsis* species from the Philippines are redescrbed: *T. boettcheri* Frey, 1928, *T. motatrix* Osten Sacken, 1882, *T. pharao* Frey, 1928, *T. selecta* Osten Sacken, 1882, and *T. shillitoi* Tenorio, 1969. For *T. boettcheri* and *T. motatrix* lectotypes are designated and for *T. pharao* a neotype. Four other *Teleopsis* were, based on misidentifications, previously recorded for the Philippines: *T. belzebuth* (Bigot, 1874), *T. discrepans* (Walker, 1857b), *T. rubicunda* van der Wulp, 1897 and *T. sykesii* (Westwood, 1837). All nine Philippine *Teleopsis* are endemic. Four subgroups are recognised within the Philippine *Teleopsis*. For each of the nine *Teleopsis*, data on sexual dimorphism, as related to eye span, are presented. Besides the nine *Teleopsis* species, two *Eurydiopsis* Frey, 1928 and one *Sphyracephala* Say, 1828 occur in the Philippines. A key to these twelve diopsid species is included.

Introduction

In a first contribution towards a revision of the genus *Teleopsis* Rondani, 1875 (Diptera: Diopsidae), Feijen (1998) gave a generic review and treated the *ferruginea* group from Sri Lanka. This second contribution discusses the taxonomic position of the genus *Teleopsis* and deals with the *Teleopsis* from the Philippines. Since the first contribution towards a *Teleopsis* revision, a major development was the partial revision of the Diopsidae at generic level by Baker et al. (2001). This revision, based on molecular data, led to the inclusion of genus *Cyrtodiopsis* Frey, 1928, within *Teleopsis* Rondani, 1875. This conclusion is now evaluated within the taxonomical and historical context. The *Teleopsis* species described after 1998 will be briefly reviewed.

Five *Teleopsis* species have so far been described from the Philippines: *T. boettcheri* Frey, 1928, *T. motatrix* Osten Sacken, 1882, *T. pharao* Frey, 1928, *T. selecta* Osten Sacken, 1882 and *T. shillitoi* Tenorio, 1969. Some confusion surrounded *Teleopsis* species occurring in the Philippines. Several other *Teleopsis* species previously reported from the Philippines will now be indicated as misidentifications. Likewise, several of the five *Teleopsis* described from the Philippines were erroneously reported from other countries. In this paper four new *Teleopsis* species are described from the Philippines. In addition to this, a preliminary analysis will be presented on subdivisions within the *Teleopsis* of the Philippines based on various morphological characters including eye stalk dimorphism.

Most Philippine *Teleopsis* show sexual dimorphism with regard to their eye span. Detailed biometric data are presented for the nine species concerned. Biometric data, especially also allometric slope (least-squares regression slope of eye span versus body length) and rate of dimorphism appear important taxonomic tools at specific, subgeneric and generic level. For *Teleopsis* this aspect will be reviewed at the end of this series of its revision.

Besides the nine *Teleopsis* species now recognised for the Philippines, three more Diopsidae are known to occur on these islands. Feijen (1999) dealt with two *Eurydiopsis* Frey, 1928 species: *E. glabrostylus* Feijen, 1999 and *E. subnotata* (Westwood, 1848). Furthermore, at least one representative of *Sphyracephala* Say, 1828 occurs in the Philippines. These are also included in this paper for the convenience of those who study Philippine diopsids.

Material and methods

Abbreviations used

BMNH	The Natural History Museum (formerly British Museum (Natural History)), London, UK
BPBM	Bernice P. Bishop Museum, Hawaii, USA
DEIC	Deutsche Entomologische Institut im ZALF, Müncheberg (formerly Deutsches Entomologisches Institut, Eberswalde), Germany
MLUH	Wissenschaftsbereich Zoologie, Sektion Biowissenschaften, Martin-Luther-Universität, Halle, Germany
MZLU	Zoological Museum, Lund University, Lund, Sweden
RMNH	NCB Naturalis (formerly Nationaal Natuurhistorisch Museum and Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands
USNM	United States National Museum of Natural History, Washington, USA
UZMH	Zoological Museum, University of Helsinki, Finland
D	Rate of dimorphism
IVB	Inner Vertical Bristle
OVB	Outer Vertical Bristle
SE	Standard Error

The taxonomic position of *Teleopsis*

Baker et al. (2001) generated a phylogenetic hypothesis of relationships among 33 species of stalk-eyed flies based on a molecular data set comprising three mitochondrial and three nuclear gene regions. Their combined analysis of all data equally weighted produced a single most-parsimonious cladogram with relatively strong support at the majority of nodes. Their results showed *Teleopsis* to be paraphyletic and imbedded within *Cyrtodiopsis*. A monophyletic *Teleopsis* required an additional seven steps on the tree, and a monophyletic *Cyrtodiopsis* requires an additional 12 steps. For both of these genera to be monophyletic, 21 extra steps are required. The work of Baker et al. was further elaborated upon by Meier & Baker (2002), in which study the molecular data set was combined with the morphological data set of Meier & Hilger (2000). They

The second group is based on *Teleopsis quadriguttata* (Walker, 1857a). With this species as the type, Frey (1928) erected the genus *Megalabops*. Contemporaneously, Brunetti (1928a) placed the same species in *Teleopsis*. Shillito (1971a) doubted whether *Teleopsis* and *Megalabops* were separable. Steyskal (1972) placed *Megalabops* in synonymy with *Teleopsis*, stating that the former only differed from the latter 'in degree of development of same characters.' Feijen (1989) followed Steyskal's view, stressing that for an eventual later division of *Teleopsis* other differential characters will have to be used. Feijen (1998) added that *T. sykesii*, the type-species of *Teleopsis*, would also fall under *Megalabops* using Frey's criteria. This confusion was caused by *T. sykesii* sensu Frey not being conspecific with *T. sykesii*. Feijen (1998) considered this the definitive end of *Megalabops* as a separate genus. However, during the present revision it became clear that this view had to be reconsidered. For both morphological and biometric reasons, the representatives of the *T. quadriguttata* group have to be considered as a group distinct from *Teleopsis* s.s. As *Teleopsis quadriguttata* remains the type of the genus *Megalabops*, this would indicate a resurrection of a *Megalabops* based on characters very different of those used by Frey. This view will be worked out later. This revised version of *Megalabops* contains also considerably more species than the original *T. quadriguttata*. Besides *T. bigotii* Hendel, 1914, *T. cheni* Yang & Chen, 1999, and *T. yunnanensis* Yang & Chen, 1999, I know of about ten undescribed species belonging to this genus. The geographic distribution is to the north of that of *Teleopsis* s.s. and overlaps only marginally with this genus. As such, a revised *Megalabops* occurs in Nepal, Northern India, Myanmar, West Malaysia, Thailand, Cambodia, Vietnam and China (mainland and Taiwan).

The third group is based on *Cyrtodiopsis* Frey, 1928 with as type *Cyrtodiopsis dalmanni* (Wiedemann, 1830). This monotypical genus was revised and extended by Shillito (1940), who characterised *Cyrtodiopsis* with: a coating of comparatively coarse hairs, no supra-alar spines, strongly curved scutellar spines with a very weak bristle, and strong OVB. He added *Diopsis quinqueguttata* Walker, 1857a and *Diopsis whitei* Curran, 1936 to the genus. Five species were placed in synonymy with *C. dalmanni* (partly based on Osten Sacken, 1881 and Wulp, 1897), but Feijen (1981) indicated that these synonymies have to be reviewed as *C. dalmanni* forms part of a complex of closely related species. Examination of the wing patterns of various *C. dalmanni*'s in Shillito's plate already made this clear, but it was confirmed by study of the genitalia. Shillito also described two new species: *C. africana* Shillito, 1940 and *C. currani* Shillito, 1940. The former species extended the genus to Africa. Shillito indicated the close resemblance to *Diopsina ferruginea* Curran, 1928, but considered it generically distinct. However, Feijen (1978, 1984) placed *C. africana* in *Diopsina* Curran, 1928. In fact, Shillito (in litt., 1974) wanted to erect a new genus for *C. africana* but was prevented from doing so. This explains the cryptic remark in Shillito (1940) 'in Uganda, a new species has been found which must be attributed to this (i.e. *Cyrtodiopsis*) genus.' The generic position of *Cyrtodiopsis* was further complicated by Steyskal (1972) who added four Madagascan and two Chinese diopsids to the genus. Feijen (1989) indicated the need to erect a new genus for the Madagascan species, while for the Chinese species *Eosiopsis* Feijen, 2008 (replacement name for *Sinodiopsis* Feijen, 1989) was created.

The fourth group is formed by *Diopsis quinqueguttata* Walker, placed in *Cyrtodiopsis* by Shillito (1940). The reasoning for placing *D. quinqueguttata* in *Cyrtodiopsis* was not strong. Shillito remarked that the description of *D. quinqueguttata* by Walker (1857a) is

'characteristically inadequate, but the type is in good condition ... and shows the covering of hairs that is characteristic of this genus.' Hairy species occur also in other genera (*Sphyracephala*, *Diasemopsis* Rondani, 1875, *Teleopsis* and *Diopsina*), so hairiness should not have been used as the major argument to place a diopsid in a certain genus. Shillito did remark that 'This species is readily distinguished from others in the genus by its black appearance — in which it bears a superficial resemblance to *D. subnotata* Westwood, which is found in the same region but which is generically distinct.' Shillito continued with 'The type of *quinqueguttata* is in fair condition, but it has been thought advisable to give the following re-description from fresh material ... (from) Sarawak.' Walker described *D. quinqueguttata* from Mount Ophir in West Malaysia, so it is somewhat unusual to redescribe it based on material from Sarawak, especially when the type is still available. Both the description and illustration of the wing do not show the five wing spots that gave the species its name. Shillito probably mistook the hyaline apex as the fifth 'spot' and clearly described the middle third of the wing as 'not quite so dark with a light spot at the foot of the discal cell and a similar spot on the anterior margin opposite.' However, Walker (1857a) adequately described the wing as 'with two interrupted nearly limpid bands, the first of two dots, the second of three dots.' This leads to the conclusion that Shillito redescribed *C. quinqueguttata* based on a different species. An extra argument is found in Burkhardt & Motte (1996) who listed for Brunei a large *Cyrtodiopsis* spec. nov. 'close to *C. quinqueguttata* (Walker).' Burkhardt & Motte knew the real *C. quinqueguttata* well from their work in West Malaysia. The same authors (Burkhardt & Motte 1985) also expressed their reservations on the generic placement of *C. quinqueguttata*, which 'according to its morphological characters, habitus and behaviour, seems to be related to *Eurydiopsis subnotata* rather than to any of the *Cyrtodiopsis* species.' Feijen (1989) agreed that *C. quinqueguttata* is an aberrant species, but doubted that it is more related to *Eurydiopsis* than to the other *Cyrtodiopsis*. This latter view seems to be confirmed by the analysis of Baker et al. (2001).

This review of the taxonomic developments in the four groups distinguished in the *Teleopsis* clade, leads to the following comments on the conclusions of Baker et al. (2001) and Meier & Baker (2002) that *Teleopsis* is paraphyletic and imbedded within *Cyrtodiopsis*.

1. The conclusion that *Teleopsis* is imbedded in *Cyrtodiopsis* is based on assuming that *Diopsis quinqueguttata* was correctly placed within *Cyrtodiopsis*. However, the reasons for placing it in *Cyrtodiopsis* were weak from the start, while later authors doubted its correct placing. As such, an alternative conclusion could be that *quinqueguttata* was not correctly placed in *Cyrtodiopsis*.
2. *Cyrtodiopsis* is a weakly defined genus, which led to inclusion of various other, non-related groups. It might be better to redefine *Cyrtodiopsis* s.s. in the sense of the *dalmanni* species group cf. Földvári et al. (2007)
3. The conclusion that *Teleopsis* is paraphyletic depends on the placement of the *T. quadriguttata* group. A clear alternative is formed by rejecting the earlier synonymy of *Teleopsis* and *Megalabops*. A crucial element of the analysis by Baker et al. is the placing of 'quadriguttata' and the *dalmanni* group as sister groups. Resurrecting the genus *Megalabops* appears an elegant way to accommodate this new position of 'quadriguttata.' Its separation from *Teleopsis* s.s. is supported by additional morphological and biometrical reasons.

4. Based on the analysis of Baker et al., the genera *Teleopsis* s.s., *Megalabops* and *Cyrtodiopsis* s.s., can be accommodated within a single clade. The three genera will have estimated sizes of around 50, 15 and 10 species, respectively.
5. The position of the *T. quinqueguttata* group within the same clade needs to be verified. One option is to erect a new genus for this group. However, before such a step is taken, it appears better to await additional molecular data sets for several aberrant groups within *Teleopsis* s.s. like *T. sykesii*, the *T. ferruginea* group, *T. selecta* and especially the *T. sexguttata* group. One of the interesting conclusions in Baker et al. is, that supra-alar spines developed convergently in the genera *Teleopsis* s.s. and *Megalabops*. As such, the possibility exists that that also happened in other groups now included in *Teleopsis* s.s.
6. At the generic level also the position of *Eosiopsis* needs to be considered. There is a possibility that after molecular analysis this small genus will also find a place within the *Teleopsis* s.l. clade. If so, it might come closest to the *T. quinqueguttata* group.
7. While the synonymies of *Teleopsis* s.s., *Cyrtodiopsis* and *Megalabops* will now be rejected, the alternative proposals for the status of the four groups in the *Teleopsis* s.l. clade are not in conflict with Meier & Baker's (2002) opinion that if their synonymies are accepted all diopsid genera in the analysis become monophyletic.

For the time being, I propose to maintain *Teleopsis* s.s. and *Cyrtodiopsis* s.s. as separate genera and to reinstate a revised genus *Megalabops*, as sister group of *Cyrtodiopsis*, which is supported by the findings of Baker et al. (2001). In addition, *T. quinqueguttata* is included into *Teleopsis* awaiting a forthcoming revision.

***Teleopsis* species described since 1998**

After the *Teleopsis* catalogue in Feijen (1998), three papers described new species of *Teleopsis*. Yang & Chen (1999, for publication year see Griffiths, 2000) described *Teleopsis cheni* and *T. yunnana* from China. These species fall in the *T. quadriguttata* group, so a placement within *Megalabops* will later be proposed.

Földvári et al. (2007) described *Teleopsis thaii* from Thailand as a species belonging to the *T. dalmanni* group. This new species would have fallen within *Cyrtodiopsis* before the generic revision by Baker et al. (2001). Földvári et al. compared *T. thaii* with *C. dalmanni* from West Malaysia, while among the synonyms of this species given by Shillito (1940) figures *Cyrtodiopsis truncata* (Brunetti, 1928b) from Thailand. The relation between *T. thaii* and *C. truncata* requires further investigation. It also remains to be confirmed whether *C. dalmanni* really occurs in West Malaysia, as it was described from Java (see also Feijen, 1981).

Liu et al. (2009) described (in Chinese) *T. hainanensis* and *T. pseudotruncata* from Hainan, China. These two new species are still difficult to place. In the text, the presence of three pairs of thoracic spines is clearly indicated, which in combination with the illustrations of the wing pattern indicates that these flies belong to *Teleopsis* s.s. This forms a distinct range extension of *Teleopsis* s.s. So far only *Diopsis chinica* Yang & Chen, 1999, a *Sphyracephala* species and a species of the *quadriguttata* group were known from Hainan (Yang & Chen, 2002). Liu et al. considered *T. hainanensis* as 'somewhat similar

to *T. shillitoi*.' However, from the figures it is clear that it is not related to that species. The new species *T. pseudotruncata* was compared to *T. truncata* Brunetti, apparently still in its old placement in *Teleopsis* s.s., not considering that Shillito (1940) placed it in synonymy with *Cyrtodiopsis dalmanni*. *T. pseudotruncata* is anyway neither related to *C. dalmanni* nor to *C. truncata*

***Teleopsis* Rondani, 1875**

Teleopsis Rondani, 1875: 442. Type species *Diopsis sykesii* Westwood by original designation. Ref.: Wulp, 1896, Brunetti, 1907, Frey, 1928, Shillito, 1940, Shillito, 1971a, Steyskal, 1972, Feijen, 1989, Feijen, 1998, Baker et al., 2001, Meier & Baker, 2002.

Catalogues of *Teleopsis* were given by Wulp (1896, Oriental), Brunetti (1907, Oriental), Brunetti (1928a), Descamps (1957, Afrotropical), Steyskal (1972), Steyskal (1975, Oriental), Cogan and Shillito (1980, Afrotropical), Evenhuis (1989, Australasian) and Feijen (1998). Shillito (1971a) showed that, except for the one Madagascan species, *Teleopsis* does not occur in Africa and that various African diopsids were erroneously referred to it. Feijen (1998) stated that true *Teleopsis* species are so far only recorded from the Oriental Region, while one species is known from Madagascar. In Feijen & Feijen (2011), it is shown that records of *Teleopsis* for Madagascar and the Australasian region (Iran Jaya and even North Australia (Queensland)) are due to mislabelling. After Feijen & Feijen (2011), *Teleopsis* s.s. then reverts to being a purely Oriental genus with species occurring in India, ?Myanmar, Sri Lanka, Indonesia (Sumatra, Java, Bali, Borneo), Malaysia, Brunei, Thailand, China (Hainan) and the Philippines.

Catalogue of *Teleopsis* from the Philippines

Teleopsis boettcheri Frey, 1928: 75. Type-series from Samar, Panaon and North Mindanao. Lectotype from Mindanao now designated. Lectotype and most paralectotypes in UZMH, 1 paralectotype in MZLU).

Teleopsis cobiae spec. nov. Holotype from Siargao (UZMH), paratypes from Negros, Leyte and Mindanao (UZMH and BPBM).

Teleopsis freyi spec. nov. Holotype from Palawan (UZMH), paratypes from Palawan and Culion (UZMH and BPBM).

Teleopsis motatrix Osten Sacken, 1882: 236. Type-series (four out of five fragments) from the Philippines (DEIC). Lectotype now designated, while two surviving fragments became paralectotypes.

Teleopsis nitidifacies spec. nov. Holotype from Samar (UZMH), paratypes from Samar, Mindaro, Siargao, Mindanao and Palawan (UZMH, DEIC, BPBM, RMNH).

Teleopsis nitidiscutum spec. nov. Holotype from Luzon (UZMH), paratypes from Luzon, Mindaro, Polilo, Mindanao and Palawan (UZMH, RMNH, MLUH and BPBM).

Teleopsis pharao Frey, 1928: 74. The type-series from Luzon has been lost. A neotype from Luzon has now been designated (UZMH).

Teleopsis selecta Osten Sacken, 1882: 236. Holotype from the Philippines (DEIC).

Teleopsis shillitoi Tenorio, 1969: 483. Holotype from Jolo, Sulu Archipelago (BPBM), paratypes from Jolo (BPBM, USNM, BMNH).

The following *Teleopsis* species have also been recorded for the Philippines, but these are considered misidentifications:

Teleopsis belzebuth (Bigot, 1874) by Osten Sacken (1882) and Frey (1928), now referred to as *T. nitidifacies* spec. nov., *T. nitidiscutum* spec. nov. and *T. pharao*.

Teleopsis discrepans (Walker, 1857b) by Tenorio (1969), now referred to as *T. nitidifacies* spec. nov.

Teleopsis rubicunda van der Wulp, 1897 by Frey (1928), now referred to as *T. freyi* spec. nov.

Teleopsis sykesii (Westwood, 1837) by Frey (1928) and Tenorio (1969), now referred to as *T. cobiae* spec. nov.

As no *Cyrtodiopsis* and *Megalabops* are known to occur in the Philippines, this paper only deals with species of *Teleopsis* s.s.



Figs 2-5. Photographs of life Philippine diopsids by Dr Steve Marshall. 2, *Sphyracephala* nr *detrahens*, Los Banos, 15.iii.2010; 3, *Eurydiopsis subnotata* (Westwood, 1848), Pakil, Laguna, 24.iii.2010; 4, *Teleopsis pharao* Frey, 1928, Pakil, Laguna, 2.iv.2010; 5, *Teleopsis nitidiscutum* spec. nov. Los Banos 15.iii.2010. Note that the lateral thoracic spines in the *Eurydiopsis* are metapleural spines while those in the *Teleopsis* are supra-alar spines. This can be considered a case of convergent evolution.

Other Diopsidae in the Philippines

Three Diopsidae species belonging to other genera are known to occur in the Philippines. Feijen (1999) dealt with *Eurydiopsis glabrostylus* Feijen, 1999 and *Eurydiopsis subnotata* (Westwood, 1848) (fig. 3). Furthermore, one representative of *Sphyracephala* is known to occur in the Philippines. The correct identification of this latter species (fig. 2) poses a problem. From the Oriental region three *Sphyracephala* species are so far recognised (Feijen, 1989): *S. hearseiana* (Westwood, 1845), *S. detrahens* (Walker, 1860) (= *S. cothurnata* Bigot, 1874) and *S. bipunctipennis* (Senior-White, 1922). *S. hearseiana* has as type-locality India and also occurs in Bangladesh, while *S. bipunctipennis* is only known from Sri Lanka. *S. detrahens* has as type-locality Sulawesi, Indonesia. However, *S. detrahens* has been variously recorded for Hainan (Chen, 1949, Yang & Chen, 2002), Taiwan (Hendel, 1914), Japan (Ôhara, 1993), Philippines (Frey, 1928), Papua New Guinea (Malloch, 1938), Irian Jaya (Evenhuis, 1989), Laos (Evenhuis, 1989), Malaysia (Tan, 1965) and Thailand (Evenhuis, 1989). However, it is highly unlikely that *S. detrahens* has such a wide distribution. For instance, the specimens from Japan, so well illustrated by Ôhara (1993), show a wing pattern very different from *S. detrahens* from Sulawesi. Just as well, the specimens from the Philippines are, on first sight, quite similar to those of Sulawesi. Study of the genitalia is required to confirm the identity of the Philippines specimens. For the time being, they are referred to as *Sphyracephala* nr *detrahens*.

Key to the Diopsidae of the Philippines

- 1 Arista tripartite; eye stalk broad (~ 0.5 times the widest sagittal eye diameter), alula present; sixth vein extending beyond cell cup; syntergum only including terga 1+2, apical bristle more than twice as long as the scutellar spine (fig. 2) *Sphyracephala* nr. *detrahens*
- Arista bipartite; eye stalk slender (< ~0.3 times the eye diameter), alula absent; sixth vein not extending beyond cell cup; syntergum including terga 1+2+3, apical bristle less than half the length of the scutellar spine or absent (figs 3-5) 2
- 2 Large (mean body length ≥10 mm), no supra-alar spine, syntergum with distinct seam between terga 2 and 3, scutellar spines somewhat curved, apical bristle absent, sexual homomorphism for eye span (fig. 3); *Eurydiopsis* 3
- Medium-sized (mean body length ≤7 mm), supra-alar spine present, seam between terga 2 and 3 usually indistinct, scutellar spines strongly curved, apical bristle present, weak to strong sexual dimorphism for eye span (except one homomorphic species) (figs 4-5); *Teleopsis* 4
- 3 Facial teeth absent, frons with elevation in front of ocellar tubercle, infuscation at wing tip, large distal anterior hyaline spot extending into cell r4+5, scutellar spines medium-sized (19-20% of body length), oblong surstyli slightly constricted in the middle and with a ratio l/w of 2.7, surstyli glabrous with only apically a few microtrichia, ♀ tergum 8 two sclerites *Eurydiopsis glabrostylus*
- Small but distinct facial teeth, depression in front of ocellar tubercle, almost hyaline wing apex, very small distal anterior hyaline spot in cells r1 and r2+3, long scutellar spines (25% of body length), rectangular surstyli with ratio l/w of 2.3, distal third of outer side of surstyli covered with microtrichia, ♀ tergum 8 a single sclerite (fig. 3) *Eurydiopsis subnotata*

- 4 Cone of IVB 4.5-5.0 times diameter of stalk, OVB 3.5 times diameter of stalk, (probably) sexual homomorphic with regard to eye span, 6 (3 pairs) of hyaline wing spots, tergum 3 with pollinose basal band, Luzon (fig. 101) *Teleopsis selecta*
- Cone of IVB 0.5-3.5 times diameter of stalk, OVB 0.5-2.0 times diameter of stalk, sexually dimorphic for eye span, 0-5 hyaline wing spots, tergum 3 with 1-2 pairs of pollinose spots 5
- 5 Small species (mean body length 4.6-5.4 mm), weak sexual dimorphism for eye span (mean ratio span/body length in ♂♂ 1.0-1.1, rate of dimorphism D = 1.0-1.1), IVB + cone 6.5-8.0 times diameter of stalk, 3 complete wing bands, 5 hyaline wing spots, tergum 3 with 2 pairs of pollinose spots; *Teleopsis boettcheri* group 6
- Medium to large species (mean body length 5.6-7.0 mm), moderate to strong sexual dimorphism for eye span (mean ratio span/body length in ♂♂ 1.3-1.6, rate of dimorphism 2.1-3.9), IVB + cone 2.5-5.0 times diameter of stalk, 1- 2 complete wing bands, 0-4 hyaline wing spots, tergum 3 with 1 pair of pollinose spots 7
- 6 Head, thorax and abdomen with regular pattern of hairs, no spots on tergum 4, ♀ cerci elongate (ratio l/w 4.2), spermathecae round with 7-8 small protuberances, surstylus straight with subbasal indentation, no microtrichia on surstylus, Mindanao-Samar (fig. 19) *Teleopsis boettcheri*
- Head, thorax and abdomen with only some weak hairs, one pair of small pollinose spots on tergum 4, ♀ cerci rather broad (ratio l/w 2.1), spermathecae elongate with 5-6 long protuberances, surstylus straight and slender, microtrichia on surstylus, Palawan-Culion (fig. 21) *Teleopsis freyi* spec. nov
- 7 Large species (mean body length 6.8-7.0 mm), small IVB 0.5-0.8 times diameter of stalk, cone of IVB 2-2.5 times diameter stalk, sclerites of ♀ sternum 8 triangular, ♂ sternum 5 a single sclerite, surstylus fused to epandrium; *Teleopsis pharao* group 8
- Medium-sized species (mean body length 5.6-6.6 mm), larger IVB 2-4 times diameter of stalk, cone of IVB about equal in length to diameter of stalk, sclerites of ♀ sternum 8 rounded to elongate, ♂ sternum 5 two sclerites, surstylus articulate; *Teleopsis motatrix* group 9
- 8 4 hyaline wing spots, wing apex with only edges infuscated, central and preapical wing bands broadly linked, 1 pair of pollinose spots on tergum 4, spermathecae with 24-30 protuberances, ♂ spiracle 7 in sternum 7+8, small hairs on surstylus, Luzon (figs 4 & 25) *Teleopsis pharao*
- No hyaline wing spots, wing apex strongly infuscated, central and preapical wing bands not linked, no spots on tergum 4, spermathecae with ~14 protuberances, ♂ spiracle 7 well in membrane, no hairs on surstylus, Mindanao-Leyte (fig. 20) *Teleopsis cobiae* spec. nov.
- 9 IVB 2-3 times diameter of stalk, collar with at least anterior edge glossy, scutum mostly glossy, ♀ sternum 6 two sclerites or almost divided into two, spermathecae with 9-16 protuberances, ♂ spiracle 7 in sternum 7+8, apical hairs on surstyli 1/3 or less the length of surstyli, widely distributed in the Philippines 10
- IVB 4 times diameter of stalk, collar pollinose, scutum pollinose, ♀ sternum 6 a single sclerite, spermathecae with 6-8 protuberances, ♂ spiracle 7 just in membrane, apical hairs on surstyli more than half the length of surstyli, Sulu archipelago only (fig. 26) *Teleopsis shillitoi*

- 10 Rate of sexual dimorphism for eye span ~2.4-2.5, two complete wing bands, ♀ sternum 5 a single sclerite, ♀ spiracle 7 in tergum, spermathecae with 9-11 protuberances, ♂ sternum 4 a single sclerite, surstylus ~0.17-0.19 mm long (> 0.5 height of epandrium) 11
- Rate of sexual dimorphism for eye span ~3.9, one complete wing band, ♀ sternum 5 two sclerites, ♀ spiracle 7 in membrane, spermathecae with 14-16 protuberances, ♂ sternum 4 two sclerites, surstylus ~0.13 mm long (~1/3 the height of epandrium) (fig. 22) *Teleopsis motatrix*
- 11 Face glossy, no hyaline wing spots, ♀ sternum 6 two sclerites, surstylus in posterior view slender (ratio l/w ~3), surstylus basally hardly constricted in posterior view (fig. 23) *Teleopsis nitidifacies* spec. nov.
- Face mainly pollinose, usually 3 hyaline wing spots (variability in connections of wing bands sometimes reducing the wing spots to 2 or 0), ♀ sternum 6 one sclerite (almost divided), surstylus in posterior view broad (ratio l/w ~2), surstylus basally strongly constricted in posterior view (figs 5 & 24) *Teleopsis nitidiscutum* spec. nov.

Subdivisions within the *Teleopsis* of the Philippines

In tables 1 & 2 the biometrical and morphological character states are summarized for the nine Philippine *Teleopsis*. Four groups can be distinguished in the nine *Teleopsis* from the Philippines:

Table 1. Mean trait size for eye span, body length, wing and scutellar spine in mm (± SE) of nine Philippine *Teleopsis* species. Allometric slope (± SE) is the least-squares regression slope of eye span on body length. The dimorphism column gives the difference between male allometry and female allometry. N refers to the number of pairs determining the allometric slope.

<i>Teleopsis</i>	Sex	N	Eye span	Body length	Wing	Scutellar spine	Allometric slope	Dimorphism
<i>boettcheri</i>	♀	15	4.2 ± 0.1	5.0 ± 0.1	3.5 ± 0.1	1.09 ± 0.03	0.95 ± 0.08	1.09
	♂	27	4.8 ± 0.2	4.6 ± 0.1	3.3 ± 0.1	0.98 ± 0.03	2.04 ± 0.13	
<i>cobiae</i> spec. nov.	♀	5	6.4 ± 0.4	7.0 ± 0.3	4.6 ± 0.3	1.30 ± 0.13	1.19 ± 0.25	2.46
	♂	7	9.7 ± 0.7	6.8 ± 0.2	4.8 ± 0.1	1.39 ± 0.06	3.65 ± 0.49	
<i>freyi</i> spec. nov.	♀	14	4.7 ± 0.1	5.4 ± 0.1	3.7 ± 0.1	1.00 ± 0.03	0.91 ± 0.09	1.01
	♂	16	5.6 ± 0.3	5.2 ± 0.2	3.5 ± 0.1	0.90 ± 0.04	1.92 ± 0.19	
<i>motatrix</i>	♀	16	5.9 ± 0.2	6.2 ± 0.1	4.3 ± 0.1	1.50 ± 0.04	1.17 ± 0.11	3.89
	♂	18	9.5 ± 0.6	6.0 ± 0.1	4.3 ± 0.1	1.40 ± 0.04	5.06 ± 0.65	
<i>nitidifacies</i> spec. nov.	♀	27	5.5 ± 0.2	5.9 ± 0.2	4.2 ± 0.1	1.32 ± 0.06	1.10 ± 0.04	2.54
	♂	57	8.9 ± 0.4	6.0 ± 0.1	4.4 ± 0.1	1.30 ± 0.03	3.64 ± 0.13	
<i>nitidiscutum</i> spec. nov.	♀	15	5.9 ± 0.2	6.3 ± 0.2	4.6 ± 0.1	1.30 ± 0.05	1.02 ± 0.12	2.37
	♂	20	9.6 ± 0.7	6.1 ± 0.2	4.5 ± 0.2	1.27 ± 0.05	3.39 ± 0.26	
<i>pharao</i>	♀	3	5.9 ± 0.3	6.9 ± 0.2	4.9 ± 0.2	1.14 ± 0.04	1.50 ± 0.09	2.14
	♂	6	9.1 ± 0.6	7.0 ± 0.2	4.9 ± 0.2	1.08 ± 0.03	3.64 ± 0.54	
<i>selecta</i>	♂	2	5.4 ± 0.2	6.4 ± 0.0	4.5 ± 0.1	1.24	-	-
<i>shillitoi</i>	♀	8	5.0 ± 0.2	5.6 ± 0.3	3.8 ± 0.1	1.20 ± 0.04	0.91 ± 0.10	2.66
	♂	5	9.8 ± 1.3	6.6 ± 0.4	4.4 ± 0.1	1.23 ± 0.05	3.57 ± 0.48	

Table 2. Character states on which the division of the nine Philippine *Teleopsis* into four groups is based (x Ø = times diameter of eye stalk).

Character	<i>T. selecta</i> group	<i>T. boettcheri</i> group		<i>T. pharao</i> group
	<i>T. selecta</i>	<i>T. boettcheri</i>	<i>T. freyi</i> spec. nov.	<i>T. cobiae</i> spec. nov.
Size	medium	small	small	large
Ratio eye span/body ♀	-	0.85	0.86	0.91
Ratio eye span/body ♂	0.84	1.04	1.07	1.42
Rate of dimorphism	-	1.09	1.01	2.46
Hairiness	+	+++	+	+
Face	pollinose	pollinose	pollinose	pollinose
FT	no	no	just protruding	small
IVB	3 × Ø	4½ × Ø	4 × Ø	¾ × Ø
Cone of IVB	4½-5 × Ø	3½ × Ø	2½ × Ø	2½ × Ø
OVB	3½ × Ø	2 × Ø	2 × Ø	½ × Ø
Scutum	pollinose	pollinose.	pollinose, in some ⅓ glossy	pollinose
Wing bands	3	3	3	2 + ½
Central spots	6	5	5	0
Apical spot/infuscation	distinct spot	slight infuscation	slight infuscation	strong infuscation
Tergum 3 pollinose spots	basal band	2 pairs	2 pair	1 pair
Tergum 4 pollinose spots	1 pair	0	1 pair (small)	0
♀ cercus ratio l/w	-	4.2	2.1	3.8
No of sclerites ♀ sternum 5	-	1	1	1
No of sclerites ♀ sternum 6	-	1	1	1
♀ spiracle 7	-	in membrane	in membrane	in membrane
Spermathecae, protuberances	-	7-8 small	5-6 long	14 tiny
Sclerites ♂ sternum 4	1	1	1	1
Sclerites ♂ sternum 5	1?	2	2	1
♂ spiracle 7	-	at tips of sternum	in tips of sternum	well in membrane
Surstylus hairs	yes	yes	yes	no
Surstylus microtrichia	yes, not basally	no	yes, not basally	yes
Articulation surstylus	yes	yes	yes	no

- *Teleopsis motatrix* group — *motatrix*, *nitidifacies* spec. nov., *nitidiscutum* spec. nov. and *shillitoi*

- *Teleopsis pharao* group — *pharao* and *cobiae* spec. nov.

- *Teleopsis boettcheri* group — *boettcheri* and *freyi* spec. nov.

- *Teleopsis selecta* group — *selecta*

The four groups can be distinguished by: body size; relative size of OVB, IVB and conical base of IVB; wing pattern; pollinosity pattern on abdomen; and structures of female and male postabdomen.

Most Philippine *Teleopsis* show sexual dimorphism with regard to their eye span. This varies from weak to strong dimorphism. The sole representative in the *T. selecta* group appears the only homomorphic species with regard to eye span (table 1), while the species of the *T. boettcheri* group show weak dimorphism (see figs 6 & 8). Dimorphism and ratio eye span/body in ♂ are highest in the *T. motatrix* group (figs 9-11 & 13)

Table 2. continued

<i>T. pharao</i> spec. nov.	<i>T. motatrix</i> group			
	<i>T. motatrix</i>	<i>T. nitidifacies</i> spec. nov	<i>T. nitidiscutum</i>	<i>T. shillitoi</i>
large	medium	medium	medium	medium
0.86	0.96	0.93	0.94	0.90
1.29	1.58	1.50	1.57	1.49
2.14	3.89	2.54	2.37	2.66
+	++	+	+	+
pollinose	pollinose	glossy	pollinose	pollinose
small	small, rounded	just protruding	just protruding	no
$\frac{1}{2} \times \emptyset$	$2 \times \emptyset$	$2^+ \times \emptyset$	$3 \times \emptyset$	$4 \times \emptyset$
$2 \times \emptyset$	$1^+ \times \emptyset$	$1^+ \times \emptyset$	$1^+ \times \emptyset$	$\frac{3}{4} \times \emptyset$
$\frac{1}{2}^+ \times \emptyset$	$1-1\frac{1}{2} \times \emptyset$	$\frac{1}{2}^+ \times \emptyset$	$\frac{1}{2}^+ \times \emptyset$	$1\frac{1}{2} \times \emptyset$
pollinose	mostly glossy	mostly glossy	mostly glossy	pollinose
$2 + \frac{1}{2}$	$1 + \frac{1}{2} + \frac{1}{2}$	$2 + \frac{1}{2}$	$2 + \frac{1}{2}$	$1 + \frac{1}{2} + \frac{1}{2}$
4	0	0	3 (2, 0)	0
edges infuscated	almost hyaline	almost hyaline	almost hyaline	almost hyaline
1 pair	1 pair	1 pair	1 pair	1 pair
1 pair	1 pair	1 pair	1 pair	1 pair
3.8	4.2	4.6	5.5	4.1
1	2	1	1	1
1	2	2	1	1
in membrane	in membrane	in tergum	in tergum	in membrane
24-30 medium	14-16 medium	9-11 medium	9-10 medium	6-8 medium
1	2	1	1	1
1	2	2	2	2
left in sternum right half out	half in/half out of sternum	in tips of sternum	in tips of sternum	just in mem- brane touching sternum
yes	yes	yes	yes	yes
yes	yes, not basally	yes, apical half	yes, not basally	yes
no	yes	yes	yes	yes

and somewhat lower in the related *T. pharao* group (figs 7 & 12). It is well established (Burkhardt & Motte, 1985, Feijen, 1989, Baker & Wilkinson, 2001, Meier & Baker, 2002) that higher rates of dimorphism in eye span developed independently within various Diopsidae genera or species groups. Extreme cases of dimorphism occur in genera as wide apart as *Diopsis* Linnaeus, 1775, *Diasemopsis* and *Teleopsis*. On the other hand, in some genera the species are quite uniform with regard to the rate of dimorphism, like the homomorphous *Diopsina* and *Eurydiopsis*. It is interesting that in the nine Philippine *Teleopsis* species, the subgroups are clearly linked to a specific rate of dimorphism.

The other characters on which the subgroups are based are given in table 2. *Teleopsis selecta* is clearly the aberrant one of the nine species. It has unusually large IVB cones and supra-alar spines, while the wing pattern is not found in any other *Teleopsis*. Furthermore the pollinosity pattern on the abdomen and the colour patterns of spines and legs set it aside, not only in the *Teleopsis* from the Philippines, but in the genus as a

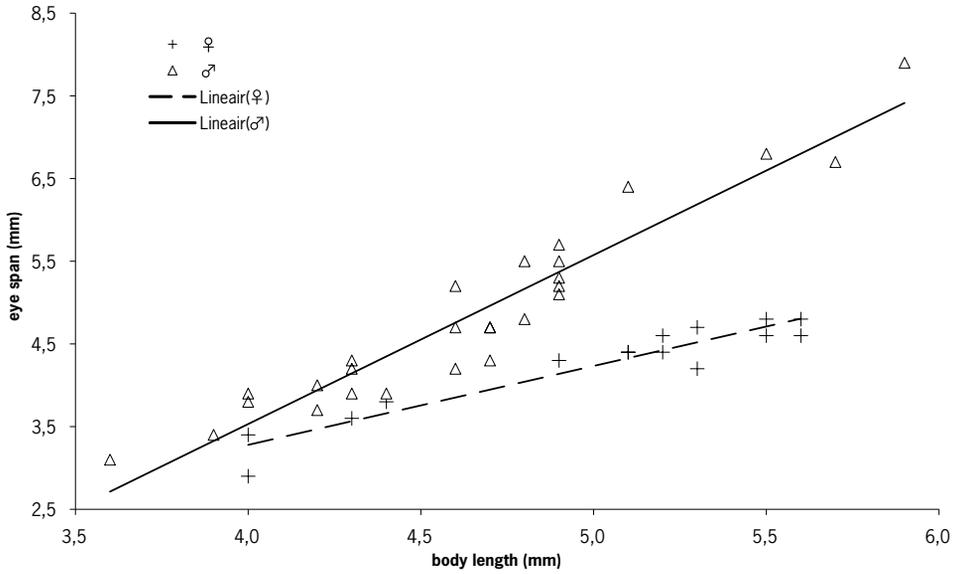


Fig. 6. *Teleopsis boettcheri* Frey, 1928: eye span plotted against body length.

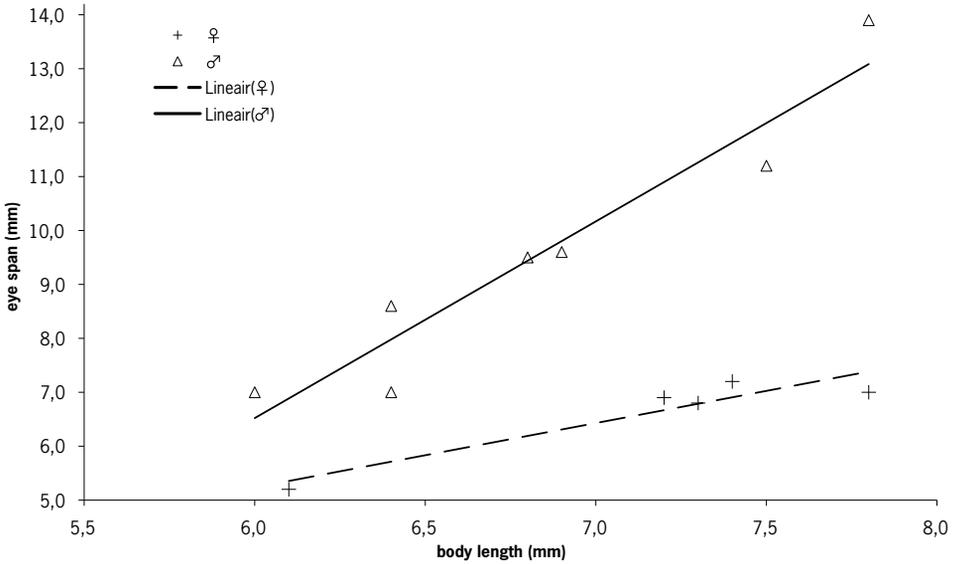


Fig. 7. *Teleopsis cobiae* spec. nov.: eye span plotted against body length.

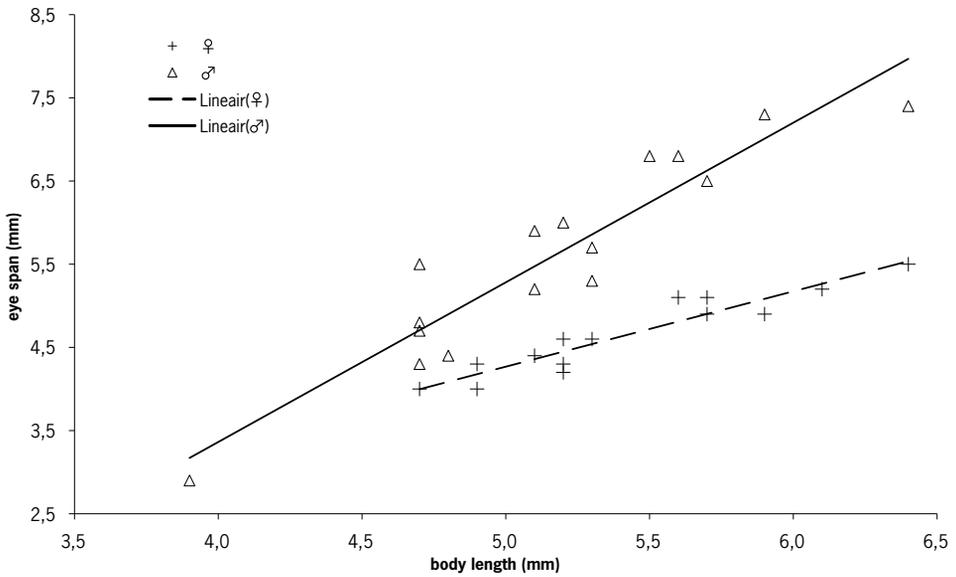


Fig. 8. *Teleopsis freyi* spec. nov.: eye span plotted against body length.

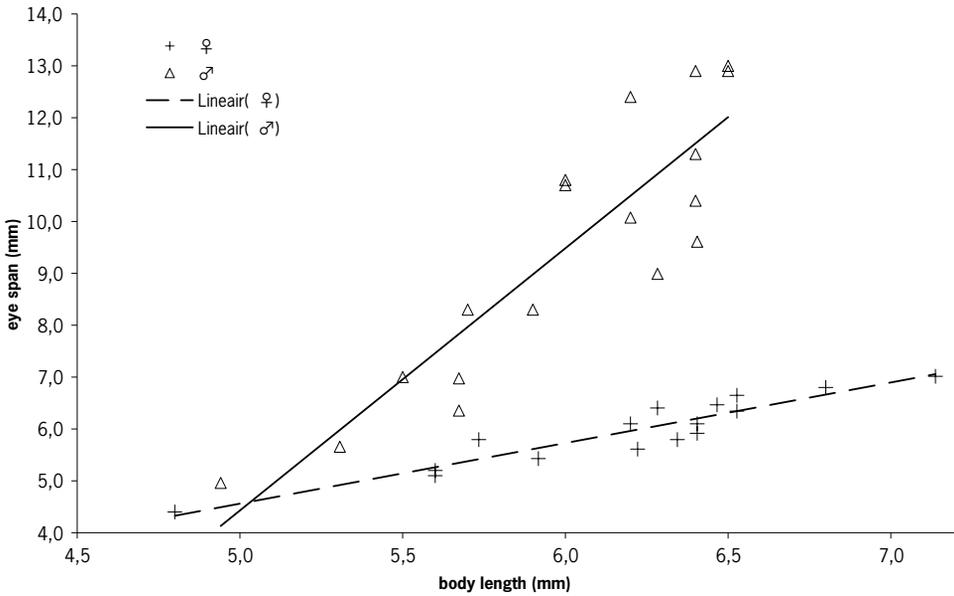


Fig. 9. *Teleopsis motatrix* Osten Sacken, 1882: eye span plotted against body length.

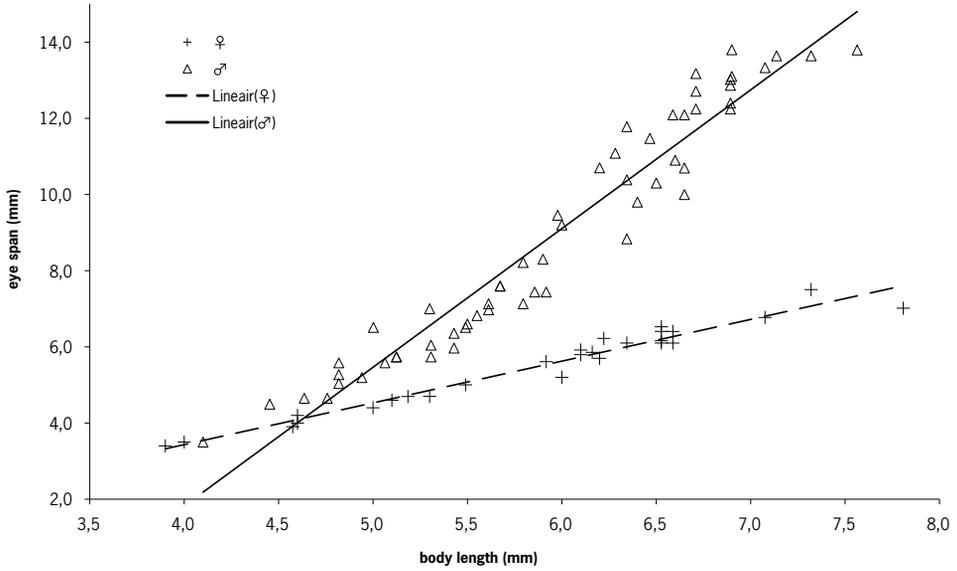


Fig. 10. *Teleopsis nitidifacies* spec. nov.: eye span plotted against body length.

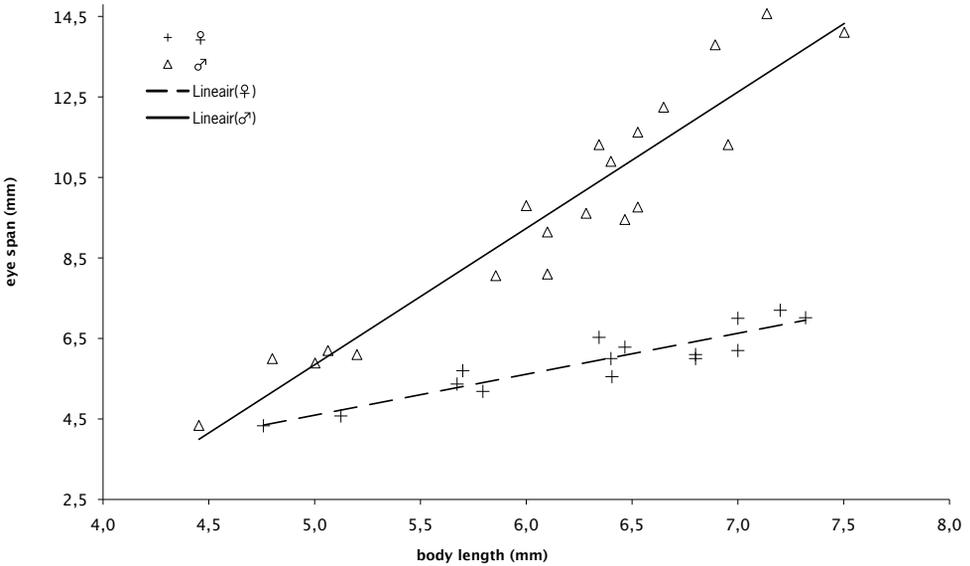


Fig. 11. *Teleopsis nitidiscutum* spec. nov.: eye span plotted against body length.

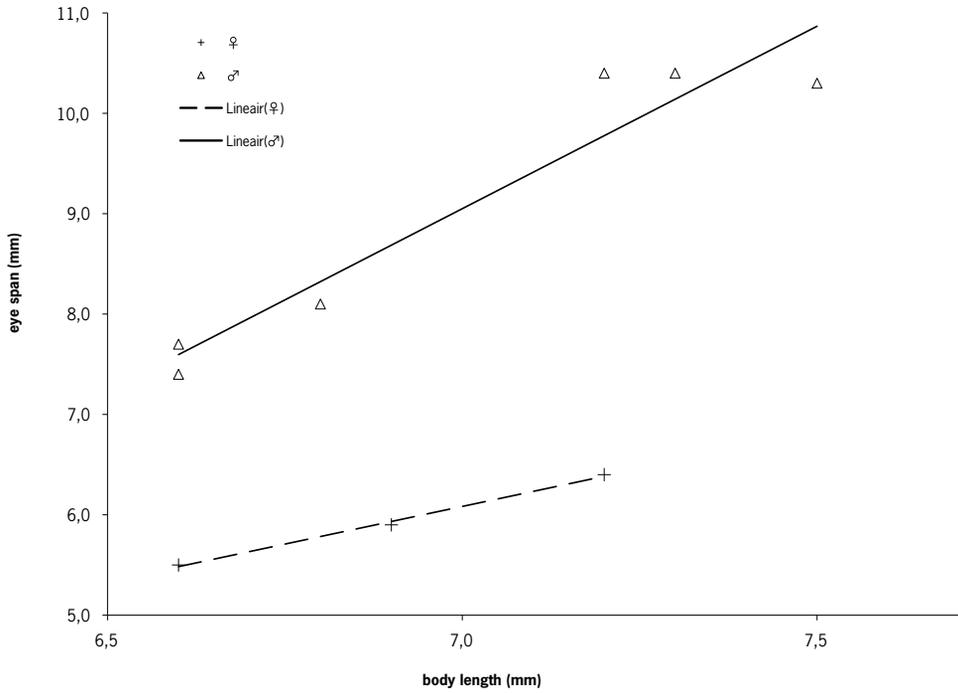


Fig. 12. *Teleopsis pharao* Frey, 1928: eye span plotted against body length.

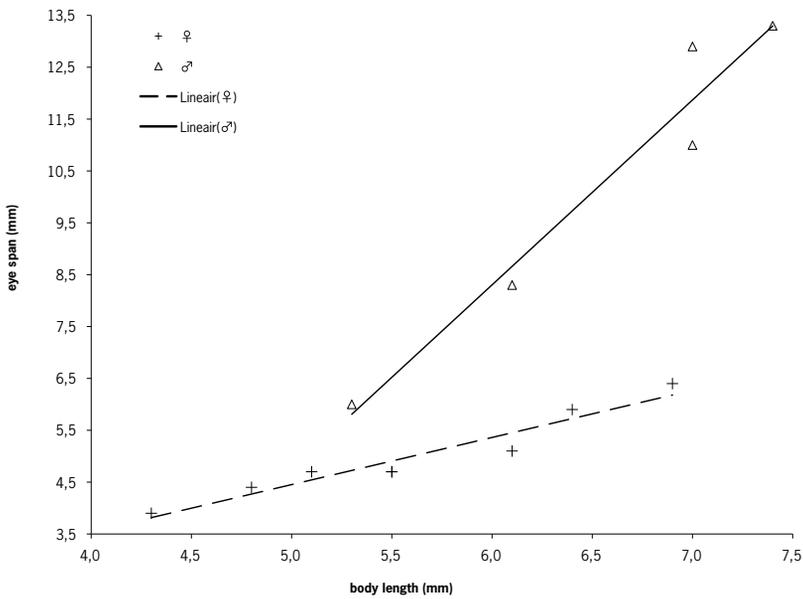


Fig. 13. *Teleopsis shillitoi* Tenorio, 1969: eye span plotted against body length.

whole. The species of the *T. boettcheri* group are distinctly small (mean body length 4.6-5.4 mm, see also table 1), have long IVB, cone of IVB and OVB, 3 complete wing bands, 5 central wing spots and a small number of protuberances on the spermathecae. In as far as the long OVB, IVB and cone of IVB, and the wing bands are concerned there is some similarity with *T. selecta*. The species of the *T. pharao* group are distinctly large (mean body length 6.8-7.0 mm), have a small IVB, medium-sized cone, a high number of protuberances on the spermathecae, a single sclerite as male sternum 5 and surstyli fused to the epandrium. The species of the *T. motatrix* group are medium-sized (mean body length 5.6-6.6 mm), have a small cone of IVB, a glossy scutum (not *T. shillitoi*) and hyaline wing apex. With the *T. pharao* group, the *T. motatrix* group shares characters like 1 pair of pollinose spots on tergum 3, reduced number of wing spots and small IVB.

Whether the Philippine *Teleopsis* form a monophyletic group remains to be seen following the study of species from other countries. A working hypothesis would be that the *T. motatrix* group and the *T. pharao* group are sistergroups. In its turn the *T. boettcheri* group might be the sistergroup of the combination of *T. motatrix* and *T. pharao* groups. The apparently rare *Teleopsis selecta* stands apart from the other Philippine *Teleopsis* and even takes up a unique position within *Teleopsis* as a whole. No clear links can at present be made between *Teleopsis* from the Philippines and from other countries. Only superficial similarities can be indicated; *T. boettcheri* is, for instance, a more hairy species like *T. trichophora* de Meijere, 1915 and an undescribed species from Borneo.

As far as geographic distribution (figs 14-18) is concerned, three species of the *T. motatrix* group (*motatrix*, *nitidifacies* and *nitidiscutum*) have a large distribution in the Philippines and are largely sympatric. *T. shillitoi*, the somewhat aberrant fourth species of the *T. motatrix* group, only occurs on the small island of Jolo in the southern Sulu archipelago. The two species of the *T. pharao* group are allopatric: *T. pharao* occurs in the north and *T. cobiae* in the south-east. The two species of the *T. boettcheri* group are also allopatric: *T. boettcheri* occurs in the south-east, while *T. freyi* is only known from the west. The rare *T. selecta* is only known from North Luzon.

All *Teleopsis* species occurring in the Philippines are likely to be endemic. Records of Philippine *Teleopsis* from other countries are considered misidentifications. This concerns *T. boettcheri* reported from Borneo by Shillito (1971b) and *T. motatrix* reported by Datta & Biswas (1985) from Sri Lanka.

Systematic part

Teleopsis boettcheri Frey, 1928 (figs 6, 14, 19, 27, 37-44)

Teleopsis boettcheri Frey, 1928: 75. Ref.— Tenorio, 1969: 483; Shillito, 1971b: 301 (only when referring to Frey's specimens); Steyskal, 1972: 11; Feijen, 1998: 52.

Not *Teleopsis boettcheri*; Shillito, 1971b: 302; Emlen & Nijhout, 2000: 676. This material most probably belonged to a very common species in Borneo, superficially similar to *T. boettcheri* (see also under Remarks below). This Borneo species is a new species of *Teleopsis* and is described in a forthcoming paper (Feijen & Feijen, 2011).

Type material.— ♂ lectotype, Philippines, Momingan (Mumungan), Mindanao, ii.1915; 3 ♀, 6 ♂ paralectotypes, Catbalogan, Samar, Philippines, iv.1915; 1 ♂ paralectotype, Mindanao, Surigao, viii.1916; 1 ♂

paralectotype, Panaon, Samar, xi.1915. All collected by Boettcher and in UZMH. Frey indicated a type series of 'ca. 25 Exx.' However, in his publication he did not designate the type, as also remarked by Steyskal (1972). Two specimens, marked 'Type' and 'Allotype' by Frey, were in 1969 sent to J. Tenorio. Both specimens were destroyed by a loosened vial in the return shipment (W. Hackman, in litt., 1989). The lectotype has now been designated. Nine more specimens in UZMH might also represent paralectotypes, but these were not examined. These must include specimens from Butuan, Mindanao. One paralectotype of *T. boettcheri* from Catbalogan, Samar, iv.1915 in MZLU. Delfinado & Hardy (1971) indicated a type series of 4 syntypes (MZH 14044-14047), but that number is not correct.

Further material examined.— 1 ♂, Philippines, Panave, 9.xii.1915 and 2 ♀, Surigao, Mindanao, v.1915 (UZMH, these three specimens were not listed by Frey); 1 ♀, Surigao, L. Mainit, Mindanao, 29.xi-1. xii.1959, L.W. Quate (BPBM); 1 ♀, Nasuli nr Malaybalay, Bukidnon, Mindanao, 22.iv.1968, D.E. Hardy (BPBM); 4 ♀, 1 ♂, Agusan, S. Francisco 10 km se, Mindanao, 12-14.xi.1959, L.W. Quate (BPBM); 1 ♂, Agusan, S. Francisco, 10 km sw, Mindanao, 12.xi.1959, C.M. Yoshimoto (BPBM); 2 ♂, Agusan, Los Arcos, Mindanao, 19-23.xi.1959, C.M. Yoshimoto (BPBM); 1 ♀, 2 ♂, Agusan, Esperanza, Baguigon, Matibog Creek, Mindanao, 300 m, 7.xi.1959, C.M. Yoshimoto (BPBM); 1 ♀, 1 ♂, Z. del Sur, 11 km nw of Milbuk, Mindanao, 390 m, 5.viii.1958, H.E. Milliron (BPBM); 2 ♂, Misamis Or, Dinakiwan Gingoog, 26 km e of Gingoog City, Mindanao, 100-300 m, 12.viii.1965, L. Torrevillas (BPBM); 1 ♀, Misamis Or., Pigtibiran, Mindanao, 600 m, 1-13.v.1961, W.M. Torreville (BPBM); 1 ♂, Balason, Misamis Or., Mindanao, 4-5. iv.1960, W. Torrevillas (BPBM); 3 ♂, Minalwang, Misamis Or., Mindanao, 1050 m, 24.iii-4.iv.1961, H. Torrevillas (BPBM); 1 ♂, Zamboanga del Norte, Manucan, 20 km s, Mindanao, 400 m, 16.x.1959, L.W. Quate (BPBM); 1 ♂, Bukignon, 15 km nw Valencia, Malignon river, Mindanao, 2300 feet, 22.iv.1968, D.E. Hardy (BPBM, identified as *Teleopsis boettcheri* by J.A. Tenorio 1969); 1 ♂, Hindangon, 20 km s Gingoog, Mindanao, 600-700 m, 20-24.iv.1960, H. Torrevillas (BPBM); 1 ♂, Atugan River, Bukidnon, Mindanao, 1800 feet, 23.iv.1968, D.E. Hardy (BPBM); 3 ♀, 2 ♂, Tigbao, Leyte, 24.viii.1957 (BPBM); 1 ♀, Balingasagao, Leyte, 50 m, 28.iv.1952, C.R. Baltazar (BPBM). In total 17 ♀, 29 ♂ and 1 ?sex were examined.

Diagnosis.— *Teleopsis boettcheri* can be recognised by its small size, hairy appearance, wing pattern (three crossbands, central band broadest, preapical band darkest, five hyaline spots, almost hyaline apex), glabrous wing base and basal anterior spot, IVB 4.5 times diameter of stalk, OVB twice the diameter of stalk, base of IVB 3.5 times stalk diameter, absence of facial teeth, pollinose scutum, two pairs of pollinose spots on tergum 3, no spots on tergum 4, female spiracle 7 in membrane, round spermathecae with 7-8 small protuberances, subbasally indented surstyli without microtrichia and with hairs, and weak sexual dimorphism in eye span ($D = 1.09$, ratio eye span/body length 0.85 in ♀ and 1.04 in ♂).

Distribution.— The islands of Samar, Panaon, Leyte and Mindanao of the Philippines (map, fig. 14).

Measurements.— Body length ♀ 5.0 mm ± SE 0.1 (range 4.0-5.6, $n = 15$), ♂ 4.6 mm ± 0.1 (range 3.6-5.9, $n = 27$); eye span ♀ 4.2 mm ± 0.1 (range 2.9-4.8, $n = 16$), ♂ 4.8 mm ± 0.2 (range 3.1-7.9, $n = 29$); wing length ♀ 3.5 mm ± 0.1 (range 2.9-4.0, $n = 14$), ♂ 3.3 mm ± 0.1 (range 2.9-3.8, $n = 20$); length of scutellar spine in ♀ 1.09 mm ± 0.03 (range 0.78-1.24, $n = 16$), ♂ 0.98 mm ± 0.03 (range 0.78-1.18, $n = 25$).

Head.— Central part pale brown to yellowish, uniformly pollinose, rather hairy; frons (fig. 37) with narrow elevation in front of ocellar tubercle, surrounded by V-shaped ridge, lateral areas rather smooth, a semi-circular groove around the frons; arcuate groove slightly darker than surrounding area; face with rather vague ridge parallel to and just below arcuate groove, upper half of face slightly protruding, facial corners rounded, slightly angular; eye span small in female (15% shorter than the length of

body) and medium-sized in male (4% longer than the length of body) - these figures are slightly modified from Feijen (1998); rate of dimorphism low, $D = 1.09$ (table 1, fig. 6); stalks glossy brown, broad apical parts blackish, pollinose; funiculus dark brown, ventral third yellowish; IVB long, 4.5 times the diameter of the eye stalk (figs 19, 37), base of IVB a long slender cone, 3.5 times the diameter of the stalk; OVB medium-sized, twice the diameter of the stalk.

Thorax.— Collar dark brown, uniformly covered with whitish pollinosity; scutum and scutellum dark brown, covered with yellowish brown pollinosity, denser pollinosity on humeral calli, anterior edge and anteromesally, covered with rows of quite long hairs; scutellar spines glossy with pollinose base, with a number of hairs on small warts; pleura brown pollinose, central ventral part glossy; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 19) very long, about 5 times as long as metapleural spines, strongly upward directed; scutellar spines long, 4 times length of scutellum, curved upward and outward, diverging under an angle of 75° ; metapleural spines short, blunt, posterolaterally directed; apical bristle short, about one-fifth the length of the scutellar spine, posteriorly directed.

Wing.— Apex somewhat infuscated with slightly darker tip, this deviates slightly from Frey's statement 'Flügel braun mit heller Flügelspitze'; three darker crossbands with five hyaline spots (figs 19, 27); preapical band (including connection with central band) much darker, apical edge of preapical band slightly concave; central band including both crossveins, broader than preapical band, with small hyaline spot in cell r4+5 touching vein M; basal band narrow, pale anteriorly; preapical band and central band broadly linked in and around cell r4+5, central band and basal band linked around vein Cu, giving four more hyaline spots, one in cell r1 and cell r2+3 (not touching vein R4+5), one basally in cell m, one in cells r1 and br (extending well into cell dm) and one centrally in cua1 (third posterior cell); slightly darker smudge below tip of cell cup (anal cell); glabrous basal areas include cell c, basal fifth of cell r1, basal two-thirds of cell br, basal three quarters of cell bm, most of cell cup except for apex, and most of anterior basal spot in cells r1 and br. The three central hyaline spots do not touch each other, contrary to what was stated by Frey '3 einander berührenden quadratischen, hellen Flecken.'

Legs.— Front leg brown, tibia slightly darker, whitish pollinosity anteriorly and basally on coxa 1 and on whole femur; mid leg and hind leg brown, apices of femora dark brown, basal and apical third of tibia dark brown; femur 1 incrassate in ♀ (ratio of length/width $4.0 \pm SE 0.0$, range 3.7-4.3, $n = 15$) and moderately incrassate in ♂ (ratio of length/width 4.2 ± 0.1 (range 3.7-5.6, $n = 27$); tubercles on distal three-quarters of femur 1, inner row in ♀ with 22.3 tubercles $\pm SE 0.5$ (range 17-29, $n = 23$) and in ♂ with 22.4 tubercles ± 0.6 (range 19-30, $n = 28$), outer row in ♀ with 16.4 tubercles ± 0.5 (range 10-23, $n = 24$) and in ♂ with 15.5 tubercles ± 0.3 (range 12-18, $n = 30$), outer row with gap.

Preabdomen.— Dorsally brown, pollinose, basal two terga with three glossy spots laterally, basal and central pair forming a glossy transverse band, tergum 3 (fig. 19) anterolaterally with large densely pollinose spots, laterally a smaller pollinose spot, terga with a number of quite long hairs; seam between terga 2 and 3 hardly visible; tergum 4 mainly glossy; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 42); intersclerite 1-2 very short, line-like; spiracle 1 in tergum.

Female postabdomen.— Deflexed, terga 6 and 7 single rectangular sclerites; tergum

8 represented by two angular sclerites (fig. 44), sclerites covered by microtrichia except for anterolateral corners; tergum 10 with one pair of hairs, cerci elongate (fig. 44), ratio of length/width 4.2, covered with microtrichia and a number of hairs; sterna 5 and 6 single rectangular sclerites (fig. 42); sternum 7 a broad, short rectangle with sharp, posteriorly directed, lateral projections; sternum 8 represented by two large, rounded sclerites (fig. 42); spiracle 7 in membrane; subanal plate rather short, triangular with rounded corners, posteriorly three pairs of long hairs and three pairs of shorter hairs; spermathecae (fig. 43) round with subapical rows of tiny protuberances (eight in the single theca and seven in each of the pair); sclerotised ring (= genital ring, ventral sclerite, see Kotrba, 1995, 2000) ellipsoid.

Male postabdomen.— Sternum 4 a single rectangular sclerite; sternum 5 (fig. 41) consisting of two rounded sclerites, narrowly joined on the meson in a V-formation, posterior halves more sclerotised; sternum 7+8 well developed, without sclerotised connection to epandrial sclerites; both spiracles 7 at the lateral tips of sternum 7+8; epandrium (fig. 38) rounded, with about 20 pairs of hairs, covered with microtrichia; surstyli articulated, rather straight, subbasally a small lateral indentation, without microtrichia and with a number of short hairs, apically some longer hairs; surstyli connected to lateral part of cerci, not interconnected; cerci somewhat pointed apically, broad, ratio of length/width 1.6, covered with microtrichia and hairs, lateral corners at greatest width glabrous; phallapodeme (fig. 39) with small dorsal hump, anterior arm curved downward anteriorly and more than 1.5 times as long as posterior arm; aedeagus with short (~30% of length of phallapodeme) genital process sticking out; fan-shaped ejaculatory apodeme (fig. 40).

Remarks.— Although Shillito (1971b) gives no reasons for identifying his Sarawak material as *T. boettcheri*, the measurements clearly indicate his specimens as belonging to a highly dimorphic species with an average eye span much larger than in the real *T. boettcheri*. In the present revision, large series of *Teleopsis* from Borneo have been studied, but no *T. boettcheri* was found. On the other hand, in Borneo a very common species occurs with a superficial resemblance (hairiness, wing pattern, paler head) to *boettcheri*. This is a new species of *Teleopsis* that will be described in a forthcoming paper (Feijen & Feijen, 2011). The cone bearing the IVB is larger in *boettcheri* (3.5 times the stalk diameter) than in the new species (1.5-2 times the stalk diameter). In the new species the apical wing infuscation is connected to the preapical crossband with a dark band, around vein R4+5. The rate of dimorphism is 2.20 in the new species versus 1.09 in *T. boettcheri*. The average eye span in males of the new species is 7.5 mm versus 4.8 mm in *T. boettcheri*.

Teleopsis boettcheri gives its name to the *T. boettcheri* group, a group which furthermore includes *T. freyi* spec. nov.

Teleopsis cobiae spec. nov.
(figs 7, 15, 20, 28, 45-52)

Teleopsis sykesii; Frey, 1928: 72; Tenorio, 1969: 483.

Type material.— Holotype, ♂ (UZMH), Philippines, Siargao, Dapa, x-xi.1916, G. Boettcher. Paratypes: 1 ♀, 2 ♂, Mindanao, Surigao, v.1915, G. Boettcher (UZMH); 1 ♂, Malignon River, 15 km nw Valencia, Bukignon, 22.iv.1968, D.E. Hardy (BPBM); 2 ♂, Minalwang, Misamis Or., Mindanao, 1050 m, 26.iii-4.

iv.1961, H. Torrevillas (BPBM); 1 ♂, Pigtibiran, Misamis Or., Mindanao, 1-13.v.1961, W.M. Torrevillas (BPBM); 1 ♀, Mt Balatukan, 15 km sw of Gingoog, Misamis Or., Mindanao, 1000-2000 m, 27-30.iv.1960, H. Torrevillas (BPBM); 1 ♀, 1 ♂, Surigao, L. Mainit, Mindanao, 23.xi-1.xii.1959, C.M. Yoshimoto (BPBM); 2 ♂, 1 ♀, Zamboanga del Norte, Masawan, trail to Mt Malindang, Mindanao, 1290 m, 5.vii.1958, 2 ex jungle clearing and 1 ex rain forest, H.E. Milliron (BPBM); 1 ♀, Lanao, 4.8 km e of Dansalan, Mindanao, 750 m, 11.vi.1958, along stream, H.E. Milliron (BPBM); 1 ♀, Bukidnon, Mt Katanglad, Mindanao, 1480 m, 27-31.x.1959, L.W. Quate (BPBM); 1 ♂, Agusan, S. Fransisco, 10 km se, Mindanao, 12.xi.1959, L.W. Quate (BPBM); 1 ♂, Tigbao, Leyte, 19.viii.1957 (BPBM); 1 ♀, Negros Or. L. Balinsasayao, 1-7.x.1959, C.M. Yoshimoto (BPBM). Four BPBM specimens carried Tenorio identification labels for *T. sykesii*. The type series counts 6 ♀, 12 ♂ and 1 ?sex.

Diagnosis.— *Teleopsis cobiae* can be recognised by its large size, wing pattern (2½ crossbands, central band broadest, preapical band darkest, no separated central hyaline spots, central and preapical wing bands not linked, strongly infuscated apex), large glabrous areas on basal wing, IVB three-quarters diameter of stalk, OVB half the diameter of stalk, base of IVB 2.5 stalk diameter, presence of small facial teeth, pollinose scutum, one pair of pollinose spots on tergum 3, no spots on tergum 4, female and male spiracle 7 in membrane, elongate spermathecae with 14 tiny protuberances, small, apically broadening surstyli with microtrichia and without hairs, surstyli fused to epanthrium, and moderate sexual dimorphism in eye span ($D = 2.46$, ratio eye span/body length 0.91 in ♀ and 1.42 in ♂).

Distribution.— The islands of Negros, Siargao, Leyte and Mindanao of the Philippines (map, fig. 15).

Measurements.— Body length ♀ 7.0 mm ± 0.3 (range 6.0-7.8, n = 6), ♂ 6.8 mm ± 0.2 (range 6.0-7.8, n = 7); eye span ♀ 6.4 mm ± 0.4 (range 5.1-7.2, n = 6), ♂ 9.7 mm ± 0.7 (range 7.0-13.9, n = 9); wing length ♀ 4.6 mm ± 0.3 (range 4.0-5.2, n = 4), ♂ 4.8 mm ± 0.1 (range 4.2-5.6, n = 9); length of scutellar spine in ♀ 1.30 mm ± 0.13 (range 1.00-1.52, n = 4), ♂ 1.39 ± 0.06 (range 1.21-1.64, n = 8).

Head.— Central part glossy brown, face thinly pollinose; frons (fig. 45) with narrow elevation in front of ocellar tubercle, surrounded by V-shaped depression, lateral areas roughened, a semi-circular groove around the frons; arcuate groove concolorous with surrounding area; face with ridge parallel to and just below arcuate groove, upper half of face somewhat protruding, a few small pale hairs, facial corners with small teeth; eye span medium-sized in female (9% shorter than the length of body) and very large in male (42% longer than the length of body); rate of dimorphism moderate, $D = 2.46$ (table 1, fig. 7); stalks brown, broad apical parts blackish, pollinose; IVB small (fig. 45), three-quarters of the diameter of the eye stalk, base of IVB a long slender cone, almost 2.5 times the diameter of the stalk; OVB very small, just over half the diameter of the stalk.

Thorax.— Collar blackish brown, wholly pollinose except for central knob; scutum and scutellum blackish brown pollinose, scutellar spines glossy brown; a few small pale hairs on thorax, scutellar spines with a small number of hairs, not on warts; pleura mostly pollinose, only ventral central part glossy; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 20) long, about 3 times as long as metapleural spines, dorsolaterally directed; scutellar spines long, 3.5 times length of scutellum, curved upward and outward, diverging under an angle of 85°; metapleural spines short, blunt, posterolaterally directed; apical bristle very small, one-ninth of spine length, posteriorly directed.

Wing.— Apex darkly infuscated, almost as dark as preapical band (figs 20, 28); 2½ crossbands; preapical band broadest, protruding in cell r4+5 towards central band, indistinct apical edge of preapical band straight; central band only including crossvein R-M, narrower in cell r2+3, interrupted in cell r1; basal band only running from vein M to posterior edge, bands not interconnected; slightly darker smudge below tip of cell cup; glabrous basal areas large, including cell c, basal three-quarters of cell r1, except for anterior margin, cell br except for apex, cell bm except for apex, most of cell cup, sub-basal section of cell dm, area below cell cup, and base of cell r2+3; the hyaline area in between the central and subapical band located in cells r1 and r2+3 is also mostly glabrous.

Legs.— Front leg brown, coxa, tibia and metatarsus darker, pollinose anteriorly and basally on coxa 1 and on inner side of femur; mid leg and hind leg brown, tibiae, apical third of femora and subbasal band on femur 3 darker; femur 1 moderately incrassate in ♀ (ratio of length/width $4.6 \pm \text{SE } 0.1$, range 4.4–4.8, $n = 5$) and slender in ♂ (ratio of length/width 5.2 ± 0.2 , range 4.5–6.3, $n = 7$); tubercles on distal three-quarters of femur 1, inner row in ♀ with $26.9 \text{ tubercles} \pm 1.1$ (range 22–32, $n = 9$) and in ♂ with $30.7 \text{ tubercles} \pm 1.3$ (range 26–38, $n = 9$), outer row in ♀ with $21.2 \text{ tubercles} \pm 0.6$ (range 19–24, $n = 9$) and in ♂ with $21.9 \text{ tubercles} \pm 0.6$ (range 20–26, $n = 9$), outer row with small gap.

Preabdomen.— Dorsally blackish brown, pollinose, basal two terga with three glossy spots laterally, the central one forming a transverse band, tergum 3 (fig. 20) anterolaterally with densely pollinose spots, tergum 4 thinly pollinose; seam between terga 2 and 3 quite distinct; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally fused to syntergum (fig. 50), spiracle 1 in tergum.

Female postabdomen.— Deflexed, terga 6 and 7 single rectangular sclerites; tergum 8 represented by two sclerites (fig. 52), sclerites covered by microtrichia except for anterior quarters; tergum 10 with one pair of hairs, cerci rather elongate (fig. 52), ratio of length/width 3.8, covered with microtrichia and a number of hairs; sterna 5 and 6 single rectangular sclerites (fig. 50); sternum 7 a single rectangular sclerite, slightly curved; sternum 8 represented by two triangular sclerites; spiracle 7 in membrane; subanal plate pentagonal, posteriorly two pairs of long hairs and two pairs of short hairs; spermathecae (fig. 51) rounded, somewhat elongate, subapically 14 small protuberances, sclerotised ring an elongate triangle with anterior corner rather acute.

Male postabdomen.— Sterna 4 and 5 single rectangular sclerites (fig. 49); sternum 7+8 with vague sclerotised connection to epandrial sclerites; both spiracles 7 well in membrane; epandrium (fig. 46) rounded, with about 25 pairs of hairs, covered with microtrichia; surstyli fused to epandrium, on outer side no seam visible, small, broadening apically, covered with microtrichia, no hairs; surstyli without sclerotised connection to lateral part of cerci, not interconnected; cerci somewhat rectangular, slightly longer medially, broad, ratio of length/width 1.6, well-sclerotised part large and triangular, covered with microtrichia and hairs; phallapodeme (fig. 47) with large, broad anterior arm curved downward anteriorly, anterior arm 1.5 times as long as posterior arm, vane long and narrow; aedeagus with short (~25% of length of phallapodeme) genital process sticking out; ejaculatory apodeme long, slender and wedge shaped (fig. 48).

Remarks.— *Teleopsis cobiae* belongs to *T. pharao* group.

Etymology.— This species is named after Cobi Feijen in recognition of her contributions to the study of Diopsidae.

Teleopsis freyi spec. nov.
(figs 8, 14, 21, 29, 53-60)

Teleopsis rubicunda; Frey, 1928: 75; Shevtsova et al. 2011: 671, fig. 5(O).

Teleopsis rubicunda; Frey (nec van der Wulp); Tenorio, 1969: 483. For this interpretation Tenorio referred to 'pers. comm. with J.F. Shillito.'

Type material.— Holotype, ♂ (UZMH), Philippines, N. Palawan, Binaluan, xi-xii.1913, G. Boettcher. Paratypes: 7 ♀, 6 ♂ (same data as holotype; this series represent the specimens identified as *rubicunda* van der Wulp by Frey, 1928); 1 ♀, N. Palawan, Bacuit, xii.1913, G. Boettcher (UZMH); 2 ♀, 6 ♂, Tarumpitao Point, Palawan, 1.i.1960, L.W. Quate (BPBM); 3 ♀, 1 ♂, Kukukan, 12 m S Tarumpitao, Palawan, 500 m, 6-10.i.1960, L.W. Quate (BPBM); 1 ♂ Ransang R., S. Tarumpitao, Palawan, 400-500 m, 11.i.1960, L.W. Quate (BPBM); 1 ♀, 1 ♂, Eran Pt, 8 km SW Tarumpitao Pt, Palawan, 31.xii.1959-4.i.1960, L.W. Quate (BPBM); 1 ♂, Mantalingajan Range, Pingisan, Palawan, 620 m, primary forest, 11.iv.1962, H. Holtman (BPBM) (identified by Tenorio as *Teleopsis rubicunda* Frey, nec van der Wulp); 1 ♀, Culion, San Pedro, Calamianes Group, near sea level, among dry leaves, in dry shaded stream bed, 29.iii.1947, H. Hoogstraal (BPBM) (identified by Tenorio as *Teleopsis rubicunda* Frey, nec van der Wulp). In total 15 ♀ and 17 ♂ were examined.

Diagnosis.— *Teleopsis freyi* can be recognised by its small size, absence of hairiness, wing pattern (three crossbands, central band broadest, five hyaline spots, almost hyaline apex), glabrous wing base and basal anterior spot, IVB 4 times diameter of stalk, OVB twice diameter of stalk, base of IVB 2.5 times stalk diameter, slightly protruding facial corners, usually mainly pollinose scutum, two pairs of pollinose spots on tergum 3, one pair of spots on tergum 4, female spiracle 7 in membrane, rather broad ♀ cerci, elongate spermathecae with 5-6 long protuberances, male spiracle 7 in sternum 7+8, straight and slender surstyli with microtrichia and hairs, and weak sexual dimorphism in eye span ($D = 1.01$, ratio eye span/body length 0.86 in ♀ and 1.07 in ♂).

Distribution.— The islands of Palawan and Culion of the Philippines (map, fig. 14).

Measurements.— Body length ♀ 5.4 mm ± SE 0.1 (range 4.7-6.4, $n = 14$), ♂ 5.2 mm ± 0.2 (range 3.9-6.4, $n = 16$); eye span in ♀ 4.7 mm ± 0.1 (range 4.0-5.5, $n = 15$), ♂ 5.6 mm ± 0.3 (range 2.9-7.4, $n = 17$); wing length ♀ 3.7 mm ± 0.1 (range 2.9-4.2, $n = 15$), ♂ 3.5 mm ± 0.1 (range 2.3-4.2, 13); length of scutellar spine in ♀ 1.00 mm ± 0.03 (range 0.87-1.18, $n = 13$), ♂ 0.90 mm ± 0.04 (range 0.56-1.15, $n = 12$).

Head.— Central part reddish brown, mainly pollinose; ventral edges and transverse band on posterior side glossy; frons (fig. 53) with shallow V-shaped depression in front of ocellar tubercle, lateral areas smooth, a semi-circular groove around the frons; arcuate groove concolorous with surrounding area; face with ridge parallel to and just below arcuate groove, upper half of face protruding, a number of pale hairs, facial corners slightly protruding; eye span small in female (14% shorter than the length of body) and medium-sized in male (7% longer than the length of body); rate of dimorphism low, $D = 1.01$ (table 1, fig. 8); stalks reddish brown, pollinose with glossy posterior side, covered with a number of pale hairs, broad apical parts blackish, pollinose; IVB long (figs 21, 53), 4 times the diameter of the eye stalk, base of IVB a slender cone, 2.5 times diameter of the stalk; OVB short, twice diameter of the stalk.

Thorax.— Collar glossy reddish brown, anterolateral edges and ventrolateral parts pollinose; scutum and scutellum reddish brown, uniformly pollinose in all specimens

from North Palawan and the Calamines, in all 17 specimens from South Palawan the posterior third of the scutum and small spots anteriorly of the intrascutal suture are glossy, scutellar spines with glossy apical halves; rows of pale hairs on thorax, scutellar spines with some hairs on warts; pleura mainly pollinose, ventral edge of mesopleuron glossy; sterna glossy reddish brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 21) long, more than 3 times as long as metapleural spines, dorsolaterally directed; scutellar spines relatively short, slightly less than 2.5 times length of scutellum, curved upward and outward, diverging under an angle of 110°; metapleural spines short, blunt, posterolaterally directed; apical bristle short, slightly more than one-quarter the length of the scutellar spine, mesally directed.

Wing.— Apex almost hyaline, tip slightly infuscated; three crossbands (figs 21, 29); preapical band narrower than central band, apical edge of preapical band straight; central band including both crossveins, centrally a hyaline spot, subbasally in cell r4+5; basal band narrow anteriorly, broadening posteriorly; preapical band and central band broadly connected in cell r4+5 till just above vein R4+5, central band and basal band broadly linked in cell bm and around vein Cu, giving four more hyaline spots, one in cells r1 and r2+3 not touching vein R4+5, one basally in cell m, one in cells r1 and br, and one centrally in cell cua1; slightly darker smudge below tip of cell cup; glabrous basal areas include cell c (except for apex), basal sixth of cell r1, (except for anterior margin), basal half of cell br, most of cell bm except for apex and posterior margin, most of cell cup and most of the basal anterior hyaline spot.

Legs.— Front leg brown, tibia dark brown, tarsus pale, pollinosity anteriorly and basally on coxa 1, inner side of femur also pollinose; mid leg and hind leg brown, tibiae darker, bases and apices of femora darker; femur 1 incrassate in ♀ (ratio of length/width $3.9 \pm SE 0.1$, range 3.6-4.4, n = 13) and moderately incrassate in ♂ (ratio of length/width 4.1 ± 0.1 , range 3.6-4.7, n = 15); tubercles on distal three-quarters, inner row in ♀ with 20.1 tubercles $\pm SE 0.4$ (range 17-23, n = 21) and in ♂ with 20.0 tubercles ± 0.5 (range 15-24, n = 22), outer row in ♀ with 15.9 tubercles ± 0.2 (range 13-18, n = 26) and in ♂ with 15.5 tubercles ± 0.5 (range 11-20, n = 23), outer row and inner row with gap, a small whitish oval spot in the gap.

Preabdomen.— Dorsally brown, pollinose, basal two terga with three glossy spots laterally, tergum 3 (fig. 21) anterolaterally with two pairs of densely pollinose spots; tergum 4 with one pair of small pollinose spots (often rubbed off), remainder of tergum almost glossy; seam between terga 2 and 3 just visible; sternum 1 dark brown, thinly pollinose; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 58); spiracle 1 in tergum.

Female postabdomen.— Strongly deflexed, terga 6 and 7 rectangular sclerites (fig. 58), tergum 6 anteromedially slightly indented; tergum 8 represented by two large sclerites (fig. 60), only posterior halves covered by microtrichia; tergum 10 with two small darkly sclerotised parts and one pair of hairs, cerci rather broad (fig. 60), ratio of length/width 2.1, covered with microtrichia and a number of hairs; sterna 5 and 6 single rectangular sclerites, sternum 6 medially constricted; sternum 7 strongly curved, medially slightly constricted, basally with narrow connections to tergum; sternum 8 represented by two sclerites (fig. 58), with central areas more sclerotised; spiracle 7 in membrane; subanal plate pentagonal, rather short, posteriorly with two pairs of long hairs and four pairs of short hairs; spermathecae (fig. 59) elongate with apically long protuberances, 6

in the single theca and 5 in each of the pair; sclerotised ring oval with lateral sections quite broad.

Male postabdomen.— Sternum 4 a single rectangular sclerite; sternum 5 represented by two square sclerites (fig. 57); place of former sternum 6 indicated by a few small hairs; sternum 7+8 with vague sclerotised connection to epandrial sclerites; both spiracles 7 in lateral tips of sternum 7+8; epandrium (fig. 54) rounded, with about 21 pairs of hairs, covered with microtrichia; surstyli articulated, straight and slender, apically somewhat pointed in posterior view (fig. 54) and more rounded in lateral view, in posterior view covered with microtrichia (except for base) and a number of hairs (apical hairs quite strong), in lateral view glabrous with posterior half pollinose except for base and apex; surstyli connected to lateral part of cerci, not interconnected; cerci broad, apical half darkly sclerotised (except for medial edge), ratio of length/width 1.3, covered with microtrichia and hairs; phallapodeme (fig. 55) with anterior arm curving downward and broadening anteriorly, anterior arm slightly longer than posterior arm; aedeagus with very long (~115% of length of phallapodeme) genital process sticking out; ejaculatory apodeme fan-shaped (fig. 56).

Remarks.— *Teleopsis freyi* spec. nov. belongs to the *T. boettcheri* group. With the *Teleopsis* outside of the Philippines, there is a superficial similarity between this new species and *Teleopsis rubicunda* van der Wulp and *Teleopsis adjacens* Brunetti, 1928. The similarity with *T. rubicunda* led to the misidentification by Frey (1928). *T. rubicunda* (from Bali, Java and Sumatra) can be distinguished from *T. freyi* by its stronger dimorphism (ratio eye span/body length 1.25 in ♂, rate of dimorphism 2.12), short base of IVB (as long as diameter of stalk), absence of FT, elongate ♀ cerci (ratio l/w 3.4), spermathecae with 4 small protuberances, single sclerite of ♂ sternum 5, and slightly curved surstyli with only subbasally a patch of microtrichia. *T. adjacens* (from Thailand, Sumatra and West Malaysia) can, for instance, be distinguished from *T. freyi* by its very long IVB (6 times diameter of stalk), short base of IVB (half the diameter of stalk), elongate ♀ cerci (ratio l/w 3.4), spermathecae with 8-11 long protuberances, single sclerite of ♂ sternum 5, and differently shaped surstyli (slightly curved, shorter, subbasally broader and without microtrichia).

Etymology.— This species is named in honour of Professor Richard Frey (1886-1965) for his outstanding contribution to the study of Philippine Diopsidae and other Diptera.

Teleopsis motatrix Osten Sacken, 1882
(figs 9, 16, 22, 30, 61-68)

Teleopsis motatrix Osten Sacken, 1882: 236. Ref.— Tenorio, 1969: 483.

not ? *Teleopsis motatrix*; van der Wulp, 1897: 193 (as possible synonym of '*sykesii*'; van der Wulp).

Teleopsis motatrix; Frey, 1928: 72 (in part, some specimens represent *Teleopsis nitidiscutum* spec. nov. and *Teleopsis nitidifacies* spec. nov.).

not *Teleopsis motatrix*; Datta & Biswas, 1985: 221. Given the superficial similarity in wing pattern, this specimen from Sri Lanka must have been a *Teleopsis ferruginea* Röder.

Type material.— Osten Sacken stated 'Five specimens, four of which fragments without abdomen; in the only specimen which has one, it is remarkably slender.' The series originated from the Philippines and was collected by Carl Semper. Three specimens of the type series could be located in the DEIC, as earlier also mentioned by Delfinado & Hardy (1971). All three carried the same handwritten Philippines

label and labels with 'Coll. Osten Sacken.' As lectotype was selected a teneral ♀; this is the specimen of which Osten Sacken described the abdomen as 'remarkably slender.' This new lectotype carried a red printed 'typus' label and a handwritten red label with the number 1972. The two paralectotypes lacked the abdomen, while one carried a handwritten label with 'type' and a red label with 1972. According to a note on a label, Tenorio compared his specimens with the type in the DEIC.

Further material examined.— 1 ♀, 9 ♂, Philippines, Momingan (Mumungan), Mindanao, ii-vii.1915; 1 ♀, Surigao, Mindanao, v.1915; 1 ♀, Dauralan (Dansalan), Mindanao, ii.1915; 1 ♂, Kalambugan (Kalambugan), Leite, i-ii.1915; 1 ♀, Kalambuuge, 19.i.1915 (all collected by Boettcher, studied by Frey 1928, UZMH); 1 ♀, 1 ♀, Momingan, ii-vii.1915, Staudinger & Bang-Haas dedit. (DEIC); 1 ♀, 1 ♂, Mindanao, Agusan, S. Francisco 10 km SE, 12.xi.1959 (DEIC, both specimens identified by Tenorio as *T. motatrix*); 1 ♂, 4.8 km e. of Dansalan, 750 m, Lanao, Mindanao, 11.vi.1958, ex jungle, along stream, H.E. Milliron; 1 ♀, Zamboanga del Sur, Lemesahan, 600 m, 7.ix.1958, in jungle, H.E. Milliron (the latter two specimens in UZMH and compared with the type by Tenorio); 4 ♀, 9 ♂, 2 ♀, Mindanao, Agusan, S. Francisco, 10 km SE, 12-18.xi.1959 (BPBM); 1 ♀, Mindanao, Lanao, Lake Lanao, Tagaya, 470-720 m., 15.vi.1958, H.E. Milliron (BPBM); 1 ♀, Mindanao, Zamboanga del Norte, Manucan, 20 km S., 400 m, 16.xi.1959 (BPBM); 1 ♀, 1 ♀, Mindanao, Zamboanga del Sur, Lemesahan, 600 m, 7-8.ix.1958, H.E. Milliron (BPBM); 1 ♀, 1 ♂, Mindanao, Zamboanga del Sur, 11 km nw of Milbuk, 390 m, 5.viii.1958, H.E. Milliron, logged area (BPBM); 1 ♀, Palawan, Eran Pt., 8 km sw Tarumpitao Pt., 31.xii.1959 - 4.1.1960, L.W. Quate, at light (BPBM). In total 16 ♀, 22 ♂ and 7 ? sex.

Diagnosis.— *Teleopsis motatrix* can be recognised by its moderate size, moderate hairiness, wing pattern (preapical crossband, incomplete central and basal bands, no separated central hyaline spots, hyaline apex), glabrous areas occupying almost half the wing, IVB twice the diameter of stalk, OVB 1-1.5 times diameter of stalk, base of IVB as long as diameter of stalk, presence of small, rounded facial teeth, glossy scutum, relatively long scutellar spines, one pair of pollinose spots on tergum 3, another pair on tergum 4, female sternum 6 with two sclerites, female spiracle 7 in membrane, elongate spermathecae with 14-16 medium-sized protuberances, male spiracle 7 half in sternum, articulated surstyli small (~0.13 mm), apically rounded and with microtrichia and some short hairs, and strong sexual dimorphism in eye span ($D = 3.89$, ratio eye span/body length 0.96 in ♀ and 1.58 in ♂).

Distribution.— The islands of Palawan, Mindanao and Leyte of the Philippines (map, fig. 16).

Measurements.— Body length ♀ 6.2 mm ± SE 0.1 (range 4.8-7.1, $n = 16$), ♂ 6.0 mm ± 0.1 (range 4.9-6.5, $n = 18$); eye span ♀ 5.9 mm ± 0.2 (range 4.4-7.0, $n = 16$), ♂ 9.5 mm ± 0.6 (range 5.0-13.0, $n = 18$); wing length ♀ 4.3 mm ± 0.1 (range 3.5-4.9, $n = 14$), ♂ 4.3 mm ± 0.1 (range 3.5-5.1, $n = 17$); length of scutellar spine ♀ 1.50 mm ± 0.04 (range 1.12-1.74, $n = 15$), ♂ 1.40 mm ± 0.04 (range 1.18-1.61, $n = 15$).

Head.— Central part yellowish brown, wholly glossy; frons (fig. 61) with shallow depression in front of ocellar tubercle, surrounded by U-shaped, fine ridge, lateral areas somewhat roughened, a ridge around the frons; arcuate groove concolorous with surrounding area; face with ridge parallel to and just below arcuate groove, upper half of face somewhat protruding (especially medially), covered with a number of long pale hairs, facial corners with small rounded teeth; eye span medium-sized in female (4% shorter than the length of body) and extremely long in male (58% longer than the length of body); rate of dimorphism high, $D = 3.89$ (table 1, fig. 9); stalks glossy brown, broad apical parts blackish, pollinose; IVB medium-sized, twice the diameter of the eye stalk

(figs 22, 61), base of IVB a pollinose strong cone, somewhat longer than the diameter of the stalk; OVB small, 1-1.5 times the diameter of the stalk.

Thorax.— Collar dark brown pollinose, central knob and anterodorsal edge glabrous, along posterior edge dorsolaterally a pair of glossy spots; scutum dark brown to black, glossy except for pollinose humeral calli, lateral and posterior edges and anterior part between the calli (some intraspecific variation in size of area), with a number of evenly distributed hairs; scutellum blackish brown pollinose, scutellar spines glossy blackish brown except for pollinose bases, with some hairs on small warts; pleura largely glossy blackish brown except for pollinose anterior and posterior areas; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 22) long, 4 times as long as metapleural spines, dorsolaterally directed; scutellar spines long, 4 times length of scutellum, compared with the other Philippine *Teleopsis* the spines are relatively longest (23% of body length in ♂ and 24% in ♀), curved upward and outward, diverging under an angle of 75°; metapleural spines short, blunt, posterolaterally directed; apical bristle short, about one-fifth the length of the scutellar spine, posteriorly directed.

Wing.— apex almost hyaline; one crossband and (usually) two incomplete bands (figs 22, 30); preapical band dark, apical edge straight, proximally somewhat protruding in cell r4+5; central band only including crossvein R-M, posteriorly broad and anteriorly narrow, often interrupted in cell r2+3; basal band only running from just anteriorly of vein M to posterior edge; bands not interconnected; slightly darker smudge below tip of cell cup; glabrous areas occupy almost half the wing area and include cell c, basal three-quarters of cell r1 (except for narrow part of central band), basal half of cell r2+3 except for (often absent) part of central band, cell br except for apex, cell bm except for apex, cell cup except for apex, area posteriorly of cell cup, spot in cell cua1 distally of cell cup, subbasal part and anterior distal corner of cell dm, subbasal part of cell r4+5 and anterior basal corner of cell m.

Legs.— Front leg brown, coxa and tibia somewhat darker, pollinosity anteriorly and basally on coxa 1, inner side of femur also pollinose; mid leg and hind leg brown, tibiae and apices of femora darker; femur 1 moderately incrassate in ♀ (ratio of length/width $4.3 \pm SE 0.1$, range 4.0-4.7, $n = 15$) and slender in ♂ (ratio of length/width 5.4 ± 0.2 , range 4.1-6.7, $n = 17$); tubercles on distal three-quarters, inner row in ♀ with 22.5 tubercles $\pm SE 0.6$ (range 18-27, $n = 21$) and in ♂ with 24.7 tubercles ± 0.6 (range 17-30, $n = 29$), outer row in ♀ with 16.9 tubercles ± 0.3 (range 14-20, $n = 21$) and in ♂ with 18.6 tubercles ± 0.5 (range 13-23, $n = 29$), outer row with small gap; legs (especially femora) hairy.

Preabdomen.— Dorsally brown; basal two terga pollinose with three glossy spots laterally, the central one forming a transverse band; tergum 3 anterolaterally (fig. 22) with densely pollinose spots, further glossy; seam between terga 2 and 3 hardly visible; tergum 4 anterolaterally with a pair of densely pollinose spots, further glossy on anterior half, posterior part (triangular) thinly pollinose, terga covered with a number of hairs; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 66); spiracle 1 in tergum; tergum 4 longer than usual; sternum 4 medially narrowly divided in both sexes (figs 65-66).

Female postabdomen.— Deflexed; terga 6 and 7 single rectangular sclerites, tergum 7 posteriorly with a small medial gap (fig. 66); tergum 8 represented by two narrowly separated sclerites (fig. 68), sclerites covered by microtrichia except for anterior third;

tergum 10 with one pair of hairs, cerci elongate (fig. 68), ratio of length/width 4.2, covered with microtrichia and a number of hairs; sterna 5 and 6 each represented by two narrowly separated sclerites (fig. 66); sternum 7 a single, slightly curved sclerite; sternum 8 represented by two long and narrow sclerites; spiracle 7 in membrane; subanal plate pentagonal with rounded corners, posteriorly two pairs of long hairs and three pairs of short hairs; spermathecae (fig. 67) rather elongate with rounded apex, apical half with rather long and narrow protuberances, 16 in the single theca and 14 each in the pair; sclerotised ring ellipsoid, acute anteriorly.

Male postabdomen.— Sternum 4 medially narrowly separated, sternum 5 represented by two well separated square sclerites, centrally more sclerotised patches (fig. 65); sternum 7+8 with sclerotised connection to epandrial sclerites; both spiracles 7 half in/half out sternum 7+8; epandrium (fig. 62) rounded, with about 14 pairs of hairs, covered with microtrichia; surstyli small (~0.13 mm) and articulated, largely free from epandrium, in posterior view (fig. 62) rounded and covered with microtrichia (a number of hairs), in lateral view (fig. 69) curved in posterior direction, apically rounded, covered with microtrichia (except basally) and a number of short hairs, in medial view (fig. 70) on apical half with microtrichia and one hair; for the differences in surstyli in the *T. motatrix* group compare figs 69-78; surstyli connected to lateral part of cerci, not interconnected; cerci apically pointed, apical two-thirds more posteriorly located than basal part, broad, ratio of length/width 1.7, covered with microtrichia and hairs; phallapodeme (fig. 63) rather narrow, anterior arm curved downward and with a small dorsal hump, anterior arm slightly shorter than posterior arm, vane basally constricted and very broad; aedeagus with long (~70% of length of phallapodeme) genital process sticking out; fan-shaped ejaculatory apodeme with small round sac (fig. 64).

Remarks.— Osten Sacken (1882) remarked on the hairiness of *T. motatrix*: 'The whole body, including the legs, is clothed with very sparse delicate hairs.' This remark apparently led Meijere (1916) in the description of his hairy *T. trichophora* to the statement 'Eine solche Behaarung scheint unter den aus dem Gebiete verzeichneten *Teleopsis*-Arten nur bei *T. motatrix* Ost. Sack. von den Philippinen vorhanden zu sein.' Although *T. motatrix* is certainly one of the more hairy *Teleopsis*, it is distinctly less hairy than *trichophora*, a species in which the hairs are also longer. *T. motatrix* is also slightly less hairy than *T. boettcheri*. *Teleopsis motatrix* gives its name to the *T. motatrix* group to which three more Philippine *Teleopsis* belong.

Teleopsis nitidifacies spec. nov.
(figs 10, 17, 23, 31, 71-72, 79-85)

Teleopsis belzebuth; Osten Sacken, 1882: 235. (in part, 4 specimens; Osten Sacken stated 'I refer, with a doubt, to this description a species which seems to be common in the Philippines, as it is represented by a dozen specimens'.)

Teleopsis belzebuth; Frey, 1928: 72 (in part, 14 specimens).

Teleopsis motatrix; Frey, 1928: 72 (in part, 6 specimens)

Teleopsis discrepans; Tenorio, 1969: 483 (in part, 2 specimens)

Type material.— Holotype ♂ (UZMH), Philippines, Catbalogan, Samar, iv.1915. Paratypes: 2 ♀, same data as holotype; 2 ♀, Los Banos, Luzon, ii.1914; 2 ♀, Dape, Siargao, ii.1916 and x-xi.1916; 2 ♀, 1 ♂, 1 ♀, Dansalan (Dauralan), Mindanao ii-vi.1915; 1 ♀, 4 ♂, Surigao, Mindanao, i.1915 (♀). v.1915 (2 ♂),

viii.1914 (♂), viii.1916 (♂); 1 ♂, Luzon, Montalban, iii.1914; 1 ♂, Butuan, Mindanao, vi.1915; 2 ♂, Panavon (= Panaon), ii.1915 and 9.xii.1915 (all previous specimens collected by G. Boettcher, studied by Frey and in UZMH); 2 ♂, Malignon river, 2300 feet, 15 km NW Valencia, Bukignon, 22.iv.1968, D.E. Hardy (1 with label *Teleopsis discrepans* Det. 1969 J.A. Tenorio, UZMH); 1 ♀, 2 ♂, 1 ? (DEIC, all 4 identified by Osten Sacken as *T. telzebuth*); 1 ♂, Subaan, i.1916, Staudinger & Bang-Haas dedit. (DEIC); 1 ♂, Dauralan, ii-iv.1915 (DEIC); 1 ♂, Luzon, Los Banos, ii-iii.1914 (DEIC); 1 ♀, Dapa, Siargao, Staudinger & Bang-Haas dedit. (DEIC); 4 ♀, 8 ♂, Mindanao, Agusan, 10 km se S. Francisco, 12-18.xi.1959, C.M. Yoshimoto & L.W. Quate (BPBM); 1 ♀, 3 ♂, Mindanao, Lanao, Butig Mts, 24 km ne of Butig, 1080 m, 21.vi.1958, rainforest or along stream, H.E. Milliron (BPBM, 1 ♂ with identification label *Teleopsis discrepans*, J.A. Tenorio, 1968); 1 ♂, Mindanao, Lanao, 4.8 km e of Dansalan, 750 m, 11.vi.1958, along stream, H.E. Milliron (BPBM); 2 ♀, 5 ♂, 1 ? , Misamis Or, Mt. Kibungol, 20 km se of Gingoog, 700-800 m, 9-18.iv.1960, H. Torre Villas; 1 ♀, 1 ♂, 2 ? , Misamis Or., Balason, 4-8.iv.1960, W. or H. Torre Villas; 1 ♀, 1 ♂, Mindanao, Misamis or, Mt. Pomalihi, 21 km. West Gingoog City, 800-1000 m, 30.iv.1965, H.M. Torre Villas; 1 ♂, Misamis or, Minubanan, 1050-1200 m, 5-9.iv.1961, H. Torre Villas; 2 ♀, 5 ♂, Mindanao, Bukidnon, 1250 m, Mt. Katanglad, 26.x.1959, L.W. Quate (BPBM, 1 ♂ with identification label *Teleopsis discrepans*, J.A. Tenorio, 1968) (BPBM); 1 ♀, 1 ♂, Mindanao, Bukidnon, 1250 m, Mt. Katanglad, 4-9.xii.1959, L.W. Quate (BPBM); 5 ♂, 1 ? , Mindanao, Bukidnon, 1480 m, Mt. Katanglad, 27-31.x.1959, L.W. Quate (BPBM); 5 ♀, 4 ♂, Mt. Montalban, Rizal, Wa-wa Dam, 150-200 m, 9-17.iii.1965, H.M. Torre Villas (BPBM); 2 ♂, Misamis Or., Pigtibiran, 600 m, 1-13.v.1969, H. Torre Villas (BPBM); 3 ♂, Palawan, Eran Pt., 8 km SW Tarumpitao Pt., 31.xii.1959 - 4.i.1960, at light, L.W. Quate (BPBM); 1 ♀, 3 ♂, Mindanao, Surigao, L. Mainit, 23.xi-1.xii.1959, C.M. Yoshimoto, L.W. Quate (BPBM); 1 ♂, Mindanao, Davao, Genitalan, 8 km NW of Mt. Apo, 690 m, 17.viii.1958, in jungle, H.E. Milliron (BPBM); 1 ♂, Mindanao, Davao Province, E. Slope Mt. McKinley, 3300 feet, 2.x.1946, open forest, H. Hoogstra (BPBM); 1 ♂, Mindanao, Cotabato Prov., Polo, nr base of Matutum, 600 m, 15.vii.1958, H.E. Milliron (BPBM); 1 ♀, 1 ♂, Mindanao, Agusan Esperanza Prov. Bayugan, Matibog Creek, 300 m, 7-8.xi.1959, C.M. Yoshimoto (BPBM); 1 ♂, Mindanao, Agusan Esperanza, 4-11.xi.1959, C.M. Yoshimoto (BPBM); 2 ♀, Mindanao Id, Davao Oriental, Boston, Mt Agtuaganon, Camp 55, 29.v-7.vi.1996, 1020 m, Müller/ Buenale, Gorost. Leg. Coll. R.A. Müller, light trap (RMNH). In total 32 ♀, 65 ♂ and 6 ? sex.

Diagnosis.— *Teleopsis nitidifacies* can be recognised by its moderate size, glossy face, wing pattern (2½ crossbands, no separated central hyaline spots, hyaline apex), glabrous areas include large basal section and anterior section between central and preapical band, IVB twice the diameter of stalk, OVB half the diameter of stalk, base of IVB as long as diameter of stalk, presence of small facial teeth, glossy scutum, one pair of pollinose spots on tergum 3 and another pair on tergum 4, female sternum 6 with two sclerites, female spiracle 7 in tergum, elongate spermathecae with 9-11 medium-sized protuberances, male spiracle 7 in sternum, articulated surstyli small (~0.17 mm), rather straight, broadest in the middle and with microtrichia and hairs, and strong sexual dimorphism in eye span (D = 2.54, ratio eye span/body length 0.93 in ♀ and 1.50 in ♂).

Distribution.— The islands of Luzon, Mindaro, Samar, Panaon, Siargao, Mindanao and Palawan of the Philippines (map, fig. 17).

Measurements.— Body length ♀ 5.9 mm ± SE 0.2 (range 3.9-7.8, n = 27), ♂ 6.0 mm ± 0.2 (range 3.9-6.9, n = 57), eye span in ♀ 5.5 mm ± 0.2 (range 3.4-7.5, n = 27), ♂ 8.9 mm ± 0.4 (range 3.5-13.8, n = 57), wing length ♀ 4.2 mm ± 0.1 (range 2.9-5.6, n = 26), ♂ 4.4 mm ± 0.1 (range 2.5-5.4, n = 47), length of scutellar spine in ♀ 1.32 mm ± 0.06 (range 0.78-1.88, n = 23), ♂ 1.30 mm ± 0.03 (range 0.74-1.74, n = 51).

Head.— Central part glossy brown, no pollinosity; frons (fig. 79) with smooth U-shaped depression in front of ocellar tubercle, a fine semi-circular groove around the frons; arcuate groove slightly darker; face with ridge parallel to and just below arcuate groove, upper half of face protruding, especially medially, very few hairs, facial teeth

just protruding, rounded; eye span medium-sized in female (7% shorter than the length of body) and extremely long in male (50% longer than the length of body); rate of dimorphism high, $D = 2.54$ (table 1, fig. 10); stalks brown, broad apical parts blackish, pollinose; IVB medium-sized, slightly more than twice the diameter of the eye stalk (fig. 79); base of IVB a slender cone, just longer than the diameter of the stalk; OVB short, slightly longer than half the diameter of the stalk; funiculus brown with black spot.

Thorax.— Collar glossy dark brown, laterally and posteriorly pollinose, laterally a posterior pair of glossy spots (often connected to glossy anterior edge); scutum glossy blackish brown (fig. 23), humeral calli and a varying area in between the calli pollinose, posterior edge pollinose, some hairs on scutum; scutellum blackish brown pollinose, scutellar spines glossy with pollinose base, with a number of hairs on small warts; pleura largely glossy blackish brown, only posteriorly and anteriorly pollinose; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 23) straight, almost 3 times as long as metapleural spines, dorsolaterally directed; scutellar spines long, 3 times length of scutellum, curved upward and outward, diverging under an angle of 85° ; metapleural spines short, blunt, posterolaterally directed; apical bristle short, about one-quarter the length of the scutellar spine, posteriorly directed.

Wing.— Apex almost hyaline; $2\frac{1}{2}$ crossbands (figs 23, 31); preapical band rather narrow, in cell r4+5 extending towards central band and almost reaching level of crossvein M-Cu, apical edge of preapical band straight; central band broadest, including both crossveins, part in cell r1 much narrower; basal band reaching from halfway cell br to posterior margin; crossbands not connected; slightly darker smudge below tip of cell cup; glabrous basal areas include cell c, more than half of cell r1, most of cell br, except for apex and tip of basal band, most of cell bm except for apex, cell cup, basal part of cell dm and the areas in cells r1 and r2+3 forming part of the hyaline band between the subapical and central bands.

Legs.— Front leg brown, tibia dark brown, apical four tarsomeres slightly paler, pollinose anteriorly and basally on coxa 1 and on inner side of femur; mid leg and hind leg brown, tibiae and apical halves of femora dark brown; femur 1 moderately in-crassate in ♀ (ratio of length/width $4.4 \pm \text{SE } 0.1$, range 3.9-5.1, $n = 19$) and slender in ♂ (ratio of length/width 5.2 ± 0.1 , range 4.4-6.5, $n = 21$); tubercles on distal three-quarters, inner row in ♀ with 22.1 tubercles $\pm \text{SE } 0.7$ (range 16-27, $n = 24$) and in ♂ with 23.8 tubercles ± 0.6 (range 15-29, $n = 36$), outer row in ♀ with 17.2 tubercles ± 0.5 (range 13-21, $n = 24$) and in ♂ with 18.2 tubercles ± 0.5 (range 13-25, $n = 38$), outer row with small gap.

Preabdomen.— Dorsally dark brown, basal two terga pollinose with three glossy spots laterally, the central one forming a transverse band; tergum 3 (fig. 23) anterolaterally with a pair of densely pollinose spots, remainder of tergum glossy; tergum 4 with an anterolateral pair of densely pollinose spots, posteriorly a triangular thinly pollinose spot, remainder of tergum glossy; seam between terga 2 and 3 indistinct; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 83), spiracle 1 in tergum.

Female postabdomen.— Deflexed, terga 6 and 7 single rectangular sclerites; tergum 8 represented by two round sclerites (fig. 85), sclerites only on posterior halves covered by microtrichia; tergum 10 with one pair of hairs, cerci elongate (fig. 85), ratio of length/width 4.6, covered with microtrichia and a number of hairs; sternum 5 a

single rectangular sclerite; sternum 6 represented by two rectangular sclerites; sternum 7 curved and medially constricted (fig. 83); sternum 8 represented by two rounded sclerites; spiracle 7 in tergum; subanal plate somewhat pentagonal but rather rounded, posteriorly two pairs of long hairs and three pairs of short hairs; spermathecae (fig. 84) somewhat elongate with apically medium-sized protuberances (11 in the single theca and 9 in each of the pair); sclerotised ring strongly pointed anteriorly.

Male postabdomen.—Sternum 4 a single rectangular sclerite; sternum 5 represented by two square sclerites; sternum 7+8 with vague sclerotised connection to epandrial sclerites; both spiracles 7 in tip of sternum 7+8; epandrium (fig. 80) rounded, with about 14 pairs of hairs, covered with microtrichia; surstyli small (~0.17 mm) and articulated, in posterior view (fig. 80) rather straight and covered with microtrichia and a number of hairs (except basally), in lateral view (fig. 71) width gradually increasing till halfway the tip and then decreasing again, basal two-fifths glabrous, remainder pollinose and along apical edge a number of hairs, on inner side (fig. 72) glabrous except for tiny spot of pollinosity at apex and some hairs near apical edge; for the differences in surstyli in the *T. motatrix* group compare figs 69-78; surstyli connected to lateral part of cerci, not interconnected; cerci widest in the middle, apically pointed on medial side, rather broad, ratio of length/width 2.1, covered with microtrichia and hairs; phallopodeme (fig. 81) slender, anterior arm slightly curved down anteriorly, anterior arm just more than half the length of the posterior arm; aedeagus with long (~70% of length of phallopodeme) genital process sticking out; ejaculatory apodeme somewhat fan-shaped (fig. 82) with anterior edge bulging outward.

Remarks.—*Teleopsis nitidifacies* spec. nov. belongs to the *T. motatrix* group. Within this group it is most closely related to *T. nitidiscutum* spec. nov.

Etymology.—The name refers to the glossy face.

Teleopsis nitidiscutum spec. nov.
(figs 5, 11, 18, 24, 32-33, 73-76, 86-92)

Teleopsis belzebuth; Frey, 1928: 72 (in part, six specimens)

Teleopsis motatrix; Frey, 1928: 72 (in part, two specimens)

Type material.—Holotype, ♂, Philippines, Los Banos, Luzon, ii-iii.1914 (UZMH). Paratypes: 1 ♀, 1 ♂ Los Banos, Luzon, ii.1914 (UZMH); 1 ♂, Calogula, 8.ii.1916 (UZMH); 1 ♂, Calopan, Mindoro, i-ii.1916 (UZMH); 1 ♂, Polillo, viii.1915 (UZMH); 1 ♀, S. Theodoro, Mindoro, i.1916 (UZMH); 1 ♀, Dauralan, ii-iv.1915 (UZMH, all UZMH specimens collected by Boettcher and studied by Frey); 2 ♀, Malignon river, 2300', 15 km NW Valencia, Bukignon, 22.iv.1968, D.E. Hardy, identified as *Teleopsis discrepans* by Tenorio (UZMH); 2 ♀, (Röder collection, MLUH, identification label '*Teleopsis belzebuth* Bigot?'); 1 ♀, Mindanao, Lanao, Butig Mts, 24 km ne of Butig, 1080 m, 21.iv.1958, along stream, H.E. Milliron (BPBM); 1 ♀, 3 ♂, Mindanao, Zamboanga del Norte, Masawan, Gundawan, 1260-1350 m, 3.vii.1958, ex rainforest, H.E. Milliron (BPBM); 7 ♂, Mindanao, Zamboanga del Norte, Masawan, trail to Mt. Malindang, 1290 m, 5. vii.1958, 5x ex jungle clearing, 2x ex rainforest, H.E. Milliron (BPBM); 1 ♀, Mindanao, Budkidnon, 1420 m, Mt. Katanglad, 31.x.1959, C.M. Yoshimoto (BPBM); 1 ♀, Luzon, Mt. Makiling, 400 m, 16.v.1959, secondary forest, C.T. Maa (BPBM); 1 ♀, Luzon, Laguna, Mt. Makiling, 250 m, 23.xi.1953, J.L. Gressitt (BPBM); 1 ♀, Mindanao, Zamboanga del Norte, Salvacion, 389 m, 6.vii.1958, 6 a.m. clustering on roof eaves, H.E. Milliron (BPBM); 1 ♀, Luzon, Camarines, Sur Prov. Mt. Iriga, 500-600 m, 9.iv.1962, light trap, L.M. Torrevillas (BPBM); 1 ♀, Misamis Or., Minalwang, 1050 m, 24.iii.-4.iv.1961, H. Torrevillas (BPBM); 1 ♂, Palawan, 11-13 km se of Tarumpitao Pt., 150 m, 19.v.1958, light trap in rainforest, H.E. Milliron

(BPBM); 1 ♂, Luzon, 2 km w of Santa Fe, Nueva Vizcaya, 11.iv.1968, D.E. Hardy (BPBM); 1 ♂, Camarines sur, Mt. Isarog, 20 km e of Naga, 500-600 m, 6.iv.1963, light trap, H.M. Torre Villas (BPBM); 1 ♂, Camarines sur, Mt. Isarog, 500 m, 5.iv.1963, H.M. Torre Villas (BPBM); 1 ♂, Mindanao, Zamboanga del Sur, Lemesahan, 600 m, 8.ix.1958, in jungle, H.E. Milliron (BPBM); 1 ♂, Los Banos, P.I. Baker (BPBM); 1 ♂, Camarines sur, Mt. Iriga, 26.iv.1962, H.M. Torre Villas (BPBM); 1 ♀, Mindanao Id, South Cotabato Prov., Parker Mts, Lake Maugham 6-7.iv.1985, 1000 m, Roland A. Müller Leg. (RMNH). In total 15 ♀, 22 ♂ and 1 ? sex. The life photograph (fig. 5) by Dr Steve Marshall was taken in Los Banos 14°9'51.54"N 121°14'15.76"E on 15.iii.2010.

Diagnosis.— *Teleopsis nitidiscutum* can be recognised by its moderate size, pollinose face, wing pattern (2½ crossbands, usually 3 separated central hyaline spots, hyaline apex), glabrous areas include large basal section and anterior spot in cells r1 and r2+3, IVB 3 times diameter of stalk, OVB half the diameter of stalk, base of IVB as long as diameter of stalk, presence of small and rounded facial teeth, glossy scutum, one pair of pollinose spots on tergum 3 and also on tergum 4, female sternum 6 a single, almost divided, sclerite, female spiracle 7 in tergum, elongate spermathecae with 9-10 medium-sized protuberances, very elongate female cerci, male spiracle 7 in sternum, articulated surstyli small (0.19 mm) and articulated, basally constricted and with microtrichia and hairs, and strong sexual dimorphism in eye span ($D = 2.37$, ratio eye span/body length 0.94 in ♀ and 1.57 in ♂).

Distribution.— The islands of Luzon, Mindaro, Polilo, Mindanao and Palawan of the Philippines (map, fig. 18).

Measurements.— Body length ♀ 6.3 mm ± SE 0.2 (range 4.8-7.3, n = 15), ♂ 6.1 mm ± 0.2 (range 4.5-7.5, n = 20); eye span ♀ 5.9 mm ± 0.2 (range 4.3-7.2, n = 15), ♂ 9.6 mm ± 0.7 (range 4.3-14.6, n = 20); wing length ♀ 4.6 mm ± 0.1 (range 3.7-5.3, n = 13), ♂ 4.5 mm ± 0.2 (range 3.5-5.6, n = 17); length of scutellar spine ♀ 1.30 mm ± 0.05 (range 0.99-1.55, n = 11), ♂ 1.27 mm ± 0.05 (range 0.87-1.64, n = 17).

Head.— Central part glossy brown (fig. 5), face pollinose laterally and subventrally; frons (fig. 86) with rounded depression in front of ocellar tubercle, lateral areas somewhat roughened, a semicircular groove and ridge around the frons; arcuate groove concolorous with surrounding area; face with not very distinct ridge parallel to and just below arcuate groove, upper half of face protruding, a few pale hairs, facial corners somewhat protruding, forming small rounded 'teeth'; stalks medium-sized in female (6% smaller than the length of body) and extremely long in ♂ (57% longer than length of body); rate of dimorphism high, $D = 2.37$ (table 1, fig. 11); stalks brown, broad apical parts blackish, pollinose; IVB strong, medium-sized, 3 times the diameter of the eye stalk (figs 24, 86); base of IVB a slender cone, slightly longer than the diameter of the stalk; OVB small, somewhat longer than the diameter of the stalk.

Thorax.— Collar largely glossy blackish brown, mediodorsally and ventral edge pollinose; scutum glossy blackish brown (fig. 5), anterior edge, humeral calli and posterior edge pollinose (in some specimens posteriorly somewhat extended medially), some hairs on scutum; scutellum blackish brown pollinose, scutellar spines glossy with pollinose base, with a number of hairs on small warts; pleura mainly glossy brown except for pollinose metapleuron and posterior and anterior edges; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 24) long, about 3.5 times as long as metapleural spines, upward directed; scutellar spines long, almost 3.5 times length of scutellum, curved upward and outward, diverging under an

angle of 80°; metapleural spines short, blunt, posterolaterally directed; apical bristle short, about one-sixth the length of the scutellar spine, posteriorly directed.

Wing.— Apex almost hyaline; 2½ crossbands (figs 24, 32, 33); preapical band darker, strongly protruding towards central band in cell r4+5 (in the three females from Bukignon and Dauralan, the preapical band is broader while the otherwise protruded part is encompassed – see figs 24, 33), apical edge of preapical band straight; central band including crossvein R-M and touching crossvein M-Cu, anteriorly narrow, broader and vague posteriorly; basal band running from halfway cell br to posterior edge; preapical band and central band just touching near vein M, central band and basal band touching along vein Cu, giving three hyaline spots, one in cells r1, r2+3 and r4+5, one basally in cell m and one centrally in cell cua1; slightly darker smudge below tip of cell cup; large glabrous basal area anteriorly extending till level of crossvein R-M, including cell c, more than basal half of cell r1, basal tip of cell r2+3, most of cell br except for apex and tip of basal band, most of cell bm except for apex, basal part in cell dm, most of cell cup, small part of cell cua1 below cell cup and the part of the anterior hyaline spot located in cells r1 and r2+3. Some intraspecific differences in wing pattern can be seen in figs 32-33. The variability in connections of wing bands sometimes reduces the number of wing spots from 3 to 2 or 0.

Legs.— Front leg brown, tibia dark brown, apical four tarsomeres pale, pollinose anteriorly and basally on coxa 1 and on inner side of femur; mid leg and hind leg brown with darker tibiae and apices of femora; femur 1 moderately incrassate to slender in ♀, ratio of length/width $4.6 \pm \text{SE } 0.1$ (range 4.2-5.6, n = 14) and moderately incrassate to very slender in ♂, ratio of length/width 5.7 ± 0.2 (range 4.5-7.5, n = 17); tubercles on distal three-quarters, inner row in ♀ with $25.2 \text{ tubercles} \pm \text{SE } 0.7$ (range 18-32, n = 19) and in ♂ with $24.8 \text{ tubercles} \pm 0.8$ (range 21-31, n = 16), outer row in ♀ with $18.0 \text{ tubercles} \pm 0.3$ (range 15-21, n = 19) and in ♂ with $18.8 \text{ tubercles} \pm 0.7$ (range 15-23, n = 16), outer row with small gap.

Preabdomen.— Dorsally blackish brown; terga 1 and 2 pollinose, basal two terga with three glossy spots laterally, central one forming glossy band; terga 3 and 4 mainly glossy; tergum 3 (fig. 24) anterolaterally with a pair of densely pollinose spots (continuing till posterior edge); tergum 4 anterolaterally with a pair of small, densely pollinose spots, posteriorly (especially posteromedially) thinly pollinose; tergum 5 thinly pollinose; seam between terga 2 and 3 rather indistinct; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 90); spiracle 1 in tergum.

Female postabdomen.— Deflexed; terga 6 and 7 single rectangular sclerites (fig. 90); tergum 8 represented by two rounded sclerites (fig. 92), only posterior half of sclerites covered by microtrichia; tergum 10 with one pair of hairs, cerci very elongate, ratio of length/width 5.5, apex somewhat knurled (fig. 92), covered with microtrichia and a number of hairs; sternum 4 with convex sides; sterna 5 and 6 single rectangular sclerites (fig. 90), sternum 6 vaguely divided medially; sternum 7 slightly curved, medially somewhat constricted, laterally longer, basally very vaguely linked to tergum; sternum 8 represented by two quite large sclerites, each centrally more sclerotised; spiracle 7 in tergum; subanal plate pentagonal, posteriorly two pairs of long hairs and four pairs of short hairs; spermathecae (fig. 91) somewhat elongate, small, with a subapical row of nine (sometimes 10 in the single theca) protuberances; sclerotised ring ovoid.

Male postabdomen.— Sternum 4 a single rectangular sclerite; sternum 5 represented by two rectangular sclerites with each centrally a more darkly sclerotised area; former place of sternum 6 indicated by some small hairs; sternum 7+8 with vague sclerotised connection to epandrial sclerites; both spiracles 7 in tips of sternum 7+8; epandrium (fig. 87) rounded, with about 17 pairs of hairs, covered with microtrichia; surstyli articulated, abruptly constricted basally both in posterior and lateral views (figs 73-76, 87), broadest subbasally, apically acute in posterior view (fig. 87) and rounded in lateral and medial views (figs 73-76), in posterior view covered with microtrichia (except basally) and a number of hairs; in lateral view basal third glabrous, apical two-thirds pollinose, apical edge with a number of hairs, in medial view only some pollinosity apically, for some minor variation in pollinosity of surstyli compare the two sets figs 73-74 and figs 75-76; for the differences in surstyli in the *T. motatrix* group compare figs 69-78; surstyli connected to lateral part of cerci, not interconnected; cerci triangular, broadest in the middle, apically acute, ratio of length/width 1.7, covered with microtrichia and hairs; phallapodeme (fig. 88) very slender, anterior arm curved downward, with dorsal hump, anterior arm slightly shorter than posterior arm, vane large and basally constricted; aedeagus with medium-sized (~55% of length of phallapodeme) long genital process sticking out; ejaculatory apodeme large, fan-shaped (fig. 89), ejaculatory sac relatively small.

Remarks.— *Teleopsis nitidiscutum* spec. nov. belongs to the *T. motatrix* group. Intraspecific variation in this species is somewhat higher than in other Philippine species, especially in the wing pattern. However, differences in the genitalia are minimal (compare figs 73-74 with figs 75-76).

Etymology.— The name refers to the glossy scutum.

Teleopsis pharao Frey, 1928
(figs 4, 12, 15, 25, 34, 93-99)

Teleopsis pharao Frey, 1928: 74. Ref.— Tenorio, 1969: 483.

Teleopsis belzebuth?; Osten Sacken, 1882: 236, in part (Osten Sacken referred 'with a doubt' a dozen specimens of the Philippines to this species. Five of these specimens were still present in the DEIC and represented four *nitidifacies* spec. nov. and one *T. pharao*).

Type material.— 2 ♂ syntypes, Philippines, Banahao, Luzon, iv.1914 and 2.viii.1914, Boettcher (UZMH). The two types were in 1969 sent to J. Tenorio and were destroyed in the return shipment by a loosened vial (W. Hackman, in litt. 1989). Delfinado & Hardy (1971) indicated the syntypes with the numbers MZH 14048 and 14049. Given the fact that the type series has been destroyed, a neotype has now been designated: ♀, Mt. Makiling, Luzon, 1000 ft, Laguna, 30.iv.1968, M.D. Delfinado (UZMH). This specimen was compared to the lost type series by J.A. Tenorio and identified as *Teleopsis pharao*. The location of the neotype is very close to that of the lost type series: 14°08'N 121°11'E for the neotype, versus 14°04'N 121°29'E for the type series. The neotype is in good condition, only the genitalia are removed (probably by Tenorio).

Material examined.— 1 ♀ neotype, Philippines, Mt. Makiling, Luzon, 1000 ft, Laguna, 30.iv.1968, M.D. Delfinado (UZMH); 1 ♀, 2 ♂, Dalton Pass, Nueva Vizcaya, Luzon, 9-10.iv.1968, M.D. Delfinado (1 ♀, 1 ♂ BPBM, 1 ♂ UZMH); 1 ♀, 3 ♂, Camarines Sur, Mt Isarog, 20 km e of Naga, Luzon, 1 ♂ 4.iv.1963, ♀ 6.iv.1963, 2 ♂ 8.iv.1963, H.M. Torre Villas (BPBM); 1 ♂, coll. Carl Semper (with handwritten label '*Teleopsis Belzebuth* Bigot??' of Osten Sacken, DEIC). The two UZMH specimens were compared

to the subsequently lost syntypes by J.A. Tenorio. One BPBM specimen also carried a Tenorio identification label. In total 3 ♀ and 6 ♂ were examined. The life photograph (fig. 4) by Dr Steve Marshall was taken in 'UP Landgrant,' Pakil, Laguna, 14°23'N 121°29'E on 2.iv.2010.

Diagnosis.— *Teleopsis pharao* can be recognised by its large size, wing pattern (2½ crossbands, central band broadest, preapical band darkest, central and preapical bands broadly linked in cell r4+5, 4 hyaline spots of which the large central spot within central band, infuscated edges of apex), large glabrous areas on basal wing and in anterior spot in r1 and r2+3, IVB half the diameter of stalk, OVB half the diameter of stalk, base of IVB twice the diameter of stalk, presence of small facial teeth, pollinose scutum, relatively short scutellar spines, one pair of pollinose spots on both tergum 3 and tergum 4, female spiracle 7 in membrane, rounded spermathecae with 24-30 medium-sized protuberances, male spiracle 7 just in sternum, basally somewhat constricted surstyli with microtrichia and without hairs, surstyli fused to epandrium, and moderate sexual dimorphism in eye span ($D = 2.14$, ratio eye span/body length 0.86 in ♀ and 1.29 in ♂).

Distribution.— So far only found on the island of Luzon, Philippines (map, fig. 15).

Measurements.— Body length ♀ 6.9 mm ± 0.2 (range 6.6-7.2, $n = 3$), ♂ 7.0 mm ± 0.2 (range 6.6-7.5, $n = 6$); eye span ♀ 5.9 mm ± 0.3 (range 5.5-6.4, $n = 3$), ♂ 9.1 mm ± 0.6 (range 7.4-10.4, $n = 6$); wing length ♀ 4.9 mm ± 0.2 (range 4.6-5.1, $n = 3$), ♂ 4.9 mm ± 0.2 (range 4.4-5.6, $n = 6$); length of scutellar spine ♀ 1.14 mm ± 0.04 (range 1.09-1.21, $n = 3$), ♂ 1.08 mm ± 0.03 (range 0.99-1.18, $n = 5$). Frey gave as measurements for the two ♂ syntypes 11.5 mm and 10.5 mm for the eye span and 7 mm and 7.3 mm, respectively, for the length of the body.

Head.— Central part dark brown, wholly pollinose (fig. 4); frons (fig. 93) with small elevation in front of ocellar tubercle, lateral areas with strong grooves, a strong semi-circular ridge around the frons; arcuate groove concolorous with surrounding area; face with ridge parallel to and just below arcuate groove, upper half of face protruding, a few pale hairs, facial corners with small teeth; eye span small in female (14% shorter than the length of body) and very long in male (29% longer than the length of body); rate of dimorphism moderate, $D = 2.14$ (table 1, fig. 12); stalks brown, pollinose, broad apical parts blackish; IVB small, about half the diameter of the eye stalk (fig. 93), base of IVB a slender cone, twice the diameter of the stalk; OVB small, slightly more than half the diameter of the stalk.

Thorax.— Collar brown pollinose, dorsally thinly pollinose, central knob glabrous; scutum and scutellum dark brown pollinose (fig. 4), very few and tiny hairs on thorax; scutellar spines glossy except for pollinose base, with a number of very small hairs but not on warts; pleura pollinose, except for lower anteroventral edge; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 25) long, more than 3 times as long as metapleural spines, dorsolaterally directed; scutellar spines relatively short, 3 times length of scutellum (fig. 25), compared with the other Philippine *Teleopsis* the spines are shortest (15% of body length in ♂ and 17% in ♀), curved upward and outward, diverging under an angle of 80°; metapleural spines short, blunt, posterolaterally directed; apical bristle broken off.

Wing.— Apex hyaline but infuscated along the edges; 2½ (almost 3) crossbands (figs 25, 34); preapical band darkest, apical edge of preapical band straight; central band including both crossveins, broad, anteriorly narrowing in apical direction, within the

central band a hyaline spot extending from subbasally in cell r4+5 to subapically in cell dm; basal band rather narrow, interrupted in cell r1; preapical band and central band broadly linked in cell r4+5, central band and basal band linked around vein Cu, giving three more hyaline spots, one in cells r1 and r2+3, one basally in cell m and one centrally in cell cua1, slightly darker smudge below tip of cell cup; glabrous areas include cell c, basal three-fifths of cell r1 except for anterior edge, basal half and subapical part of cell br, basal half of cell bm, most of cell cup except for apex, region below cell cup except for posterior edge, base of cell r2+3, most of anterior hyaline spot and fraction of hyaline spot in central band.

Legs.— Front leg brown, tibia and metatarsus dark brown, remainder of tarsus pale brown to whitish, pollinose anteriorly on coxa 1 and on inner side of femur; mid leg and hind leg brown, tibiae darker, femora with two slightly darker bands, one centrally and one apically; femur 1 moderately incrassate in ♀ (ratio of length/width 4.6 ± 0.1 , range 4.5-4.7, n = 3) and slender in ♂ (ratio of length/width 5.1 ± 0.1 , range 4.9-5.3, n = 6); tubercles on distal three-quarters, inner row in ♀ with 27.0 tubercles ± 0.7 (range 26-29, n = 4) and in ♂ with 29.3 tubercles ± 0.6 (range 27-32, n = 9), outer row in ♀ with 19.7 tubercles ± 0.4 (range 18-21, n = 6) and in ♂ with 20.0 tubercles ± 0.4 (range 19-22, n = 9), outer row with gap.

Preabdomen.— Dorsally dark brown, thinly pollinose; basal two terga with three glossy spots laterally, the central one forming a transverse band; tergum 3 (fig. 25) anterolaterally with densely pollinose spots; seam between terga 2 and 3 visible; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum.

Female postabdomen.— Deflexed, terga 6 and 7 single rectangular sclerites (fig. 97); tergum 8 represented by two rounded sclerites (fig. 99), sclerites covered by microtrichia except for anterior edge and anterolateral corner; tergum 10 with one pair of hairs, cerci rather elongate, ratio of length/width 3.8, covered with microtrichia and a number of hairs (fig. 99); sterna 5 and 6 single rectangular sclerites; sternum 7 rather broad, slightly curved, basally connected to tergum; sternum 8 represented by two quite large triangular sclerites; spiracle 7 in membrane; subanal plate pentagonal, posteriorly two pairs of long hairs and four pairs of short hairs; spermathecae (fig. 98) rounded with on apical half many protuberances, 30 in the single theca and 24-26 in the thecae of the pair; sclerotised ring ellipsoid, anteriorly pointed.

Male postabdomen.— Sterna 4 and 5 single, rectangular sclerites; sternum 7+8 without sclerotised connection to epandrial sclerites; left spiracle 7 in sternum 7+8, right spiracle 7 in sternum but slightly sticking out; epandrium (fig. 94) rounded, with about 41 pairs of strong hairs, covered with microtrichia; surstyli seamlessly fused to epandrium, medium-sized, basally somewhat constricted, truncated on inner side, covered with microtrichia (except for inner edge) and a number of small hairs; surstyli without sclerotised connection to lateral part of cerci, not interconnected; cerci largely well-sclerotised, sclerotised part triangular, broad, ratio of length/width 1.5, covered with microtrichia and hairs, lateral distal corner glabrous, medial distal corner with tuft of hairs; phallapodeme (fig. 95) curving downward anteriorly, anterior arm broadening anteriorly and about 1.5 times as long as posterior arm, vane long and slender; aedeagus with short (~30% of length of phallapodeme) genital process sticking out; ejaculatory apodeme long and wedge-shaped (fig. 96), ejaculatory sac small and round.

Remarks.— *Teleopsis pharao* gives its name to the *T. pharao* group.

Teleopsis selecta Osten Sacken, 1882
(figs 14, 35, 100-103)

Teleopsis selecta Osten Sacken, 1882: 236. Ref.— Frey, 1928: 69, 71 & 77.

Type material.— ♂ holotype (DEIC), Philippines, Carl Semper. The unique type with label 'Philippin, *Teleopsis selecta* O.S. type,' is in reasonable condition. Its head is glued-on, but comparison with the specimen mentioned below, ascertained that the head belongs to the body. One wing is lacking.

Further material examined.— 1 ♂ (teneral), Philippines, North Luzon, Cabugao, ii.1918, Boettcher (UZMH). The same specimen was studied by Frey (1928).

Diagnosis.— *Teleopsis selecta* is one of the easiest *Teleopsis* to recognise, although its genitalia have not yet been studied. It can be diagnosed by its hairy head with black anterior stripes on the stalks, unusual wing pattern (3 broad crossbands, 6 hyaline spots, distinct apical wing spot linked to preapical band), almost complete absence of glabrous wing areas, IVB 3 times diameter of stalk, OVB 3.5 times diameter of stalk, base of IVB almost 5 times diameter of stalk, absence of facial teeth, pollinose scutum with pattern of denser pollinosity, very long, upward directed supra-alar spines, pale rings on supra-alar spines and scutellar spines, pollinose basal band on tergum 3, 1 pair of pollinose spots and 1 pair of glossy spots on tergum 4, and short, articulated surstyli with microtrichia and hairs. It most probably shows sexual homomorphism with regards to eye span.

Distribution.— Semper collected in various Philippines islands like Luzon, Leyte, Bohol and Mindanao. However, the type locality is not given by Osten Sacken. As such, only the locality for the second specimen is known: North Luzon, Philippines (map, fig. 14).

Measurements.— Body length ♂ 6.4 mm ± SE 0.0 (range 6.4, n = 2); eye span 5.4 mm ± 0.2 (range 5.2-5.5, n = 2); wing length ♂ 4.5 mm ± 0.1 (range 4.4-4.6, n = 2); scutellar spine ♂ 1.24 mm (n = 1).

Head.— Central part pale brown, almost yellowish white, wholly whitish pollinose except for posterodorsal edge (fig. 100), frons smooth with two vague vertical lines laterally of ocellar tubercle, a ridge around the frons, beyond this ridge some fine grooves basally on the stalks; arcuate groove thin, slightly darker; face with very vague ridge parallel to arcuate groove and somewhat convex in profile, many pale hairs, facial corners smoothly rounded; eye span small in male (16% shorter than the length of body); stalks hairy, very pale brown, anteriorly a distinct blackish horizontal stripe, broad apical parts blackish pollinose; funiculus dark brown with pale ventral quarter; IVB long, more than 3 times the diameter of the stalk, base of IVB (fig. 101) a very long cone, 4.5-5 times the diameter of the stalk, pale basally, apically dark and anteriorly a black stripe, cone also hairy; OVB long, 3.5 times the diameter of the stalk.

Thorax.— Collar brown, wholly pollinose; scutum and scutellum brown pollinose with a pattern of denser pollinosity, brownish-grey spot on and below humeral calli, two brownish-grey stripes near the median, silvery spots around intrascutal suture and posteriorly of supra-alar spine, some hairs on thorax; pleura and sterna brown pollinose, mesopleuron with two silvery spots anteriorly; supra-alar spines (fig. 101) very long, 6-7 times as long as metapleural spines (Osten Sacken states 'unusually long'),

upward directed, brown pollinose with a pale ring in the middle; scutellar spines long, 4 times length of scutellum, curved upward and outward (fig. 101); metapleural spines short, somewhat pointed, posterolaterally directed; scutellar spines dark brown pollinose with subapical white band before dark tip, with a number of hairs (hairs not on warts contrary to what Frey stated in his key), apical bristle short, about one-sixth the length of the scutellar spine, posteriorly directed.

Wing.— Apex with dark apical wingspot; three broad crossbands (figs 35, 101); preapical band darkest, apical edge of preapical band with small curves; central band broadest, including both crossveins; basal band narrowing anteriorly, posteriorly broadening and occupying basal half of cell *cua*₁; apical wingspot linked to preapical band around vein *R*₄₊₅, preapical band and central band broadly linked in cell *r*₄₊₅, central band and basal band linked in cell *dm* and part of cell *cua*₁, giving six hyaline spots, one subapically in cell *r*₂₊₃, one subapically in cells *r*₄₊₅ and *m*, one in cells *r*₁ and *r*₂₊₃, one basally in cell *m*, one in cells *r*₁ and *br* and one centrally in cell *cua*₁; slightly darker smudge below tip of cell *cup*; wing without glabrous areas except tiny section basally in cell *c*. Osten Sacken described the wing as 'dark brown, hyaline at base and with three interrupted hyaline crossbands.'

Legs.— Front leg brown, coxa darker, basal two-thirds of femur dark brown and on inner and outer sides dark spots apically, tibia apically darker, coxa basally and on outer side with white pollinosity, femur completely covered with white pollinosity; mid leg and hind leg pale brown, femora darker brown at base and with brown rings centrally and on distal third, tibiae dark brown with a distinct pale central band on hind tibiae and a very vague one on mid-tibiae; femur 1 moderately incrassate in ♂ (ratio of length/width $4.3 \pm \text{SE } 0.3$, range 4.1-4.6, *n* = 2), tubercles on distal three-quarters, inner row in ♂ with $22.8 \text{ tubercles} \pm 0.3$ (range 22-23, *n* = 4), outer row in ♂ with $18.3 \text{ tubercles} \pm 1.3$ (range 16-21, *n* = 4), outer and inner row with gap, white pollinose spot in gap.

Preabdomen.— Dorsally brown, with greyish pollinosity; no glossy spots on syntergum; pattern of spots and bands with dense greyish white pollinosity (figs 102-103), broad basal band on tergum 1, vague basal band on tergum 2 (not reaching the edges), one pair of lateral spots on tergum 2 posteriorly of band, broad basal band on tergum 3, broader medially and laterally, the lateral extensions almost forming separate lateral spots; anterolateral spots on tergum 4, tergum 4 with two large square, almost glossy spots (fig. 102); tergum 5 largely densely pollinose; seam between terga 2 and 3 indistinct; sterna brown pollinose, only base of sternum 1 glossy; sternum 1 basally fused to syntergum.

Male postabdomen.— Due to the teneral state of the second specimen and the apparent rarity of the species, it was decided not to dissect the abdomen of one of the two specimens. From the outside it could be noted that the cerci are densely pollinose, long and rather elongate, while the surstyli are articulated, very short, apically rounded, basally glabrous and apically pollinose with a number of hairs. Sternum 4 is a single rectangular sclerite and sternum 5 is probably a single sclerite with a medial constriction posteriorly.

Remarks.— *Teleopsis selecta* takes up an isolated position among the Philippine *Teleopsis* and even within the genus as a whole. Although no females could be studied, the measurements of the two males make it likely that the species is homomorphous with

regard to eye span. The eye span is 16% shorter than the body length in the two males. In the males of the other eight Philippine *Teleopsis* the average eye span is 4 to 58% longer than the body in males and 4 to 15% shorter in females (table 2).

Teleopsis shillitoi Tenorio, 1969
(figs 13, 14, 26, 36, 77-78, 104-111)

Teleopsis shillitoi Tenorio, 1969: 483.

Type material.— Examined 1 ♀ paratype, Philippines, Jolo I, nr base of Mt Dahao, Sulu, Mindanao, 150 m, 2.ix.1958, wood, H.E. Milliron (BPBM); 1 ♀ paratype, Talipao, Jolo I., Sulu, Mindanao, 15-30 m, 31.viii.1958, grass foothills & jungle clearing, H.E. Milliron (BPBM, this specimen is not mentioned by Tenorio, but carries a paratype label).

In addition, BPBM has ♀ holotype, 3 ♂ paratypes and 6 ♀ paratypes from the same location and date as the first paratype mentioned above. Tenorio indicated that holotype and 3 paratypes would be placed in BPBM and two paratypes each in USNM and BMNH (leaving a balance of three specimens).

Further material examined.— 3 ♂, 1?, Philippines, Jolo I, nr. base of Mt Dahao, Sulu, Mindanao, 150 m, 2.ix.1958, wood (1 ♂ and 1? in secondary growth), H.E. Milliron (BPBM, same data as type series); 8 ♀, 4 ♂, Jolo I, Sulu, Mindanao, 2.ix.1958, H.E. Milliron (BPBM); 1 ♀, Jolo, 1 mi. S. Jolo, Sulu, Mindanao, i.ix.1958, H.E. Milliron (BPBM). In total 11 ♀, 7 ♂ and 1? sex were studied. Except for one headless male from Mt Dahao, all specimens are teneral.

Diagnosis.— *Teleopsis shillitoi* can be recognised by its moderate size, pollinose face, wing pattern (1 crossband, 2 incomplete crossbands, no separated central hyaline spots, hyaline apex), glabrous areas of wing include large basal section and larger (anterior) part of area between preapical and central band, IVB 4 times diameter of stalk, OVB 1.5 times the diameter of stalk, base of IVB three-quarters of the diameter of stalk, absence of facial teeth, densely pollinose, silvery grey, scutum, one pair of pollinose spots on both tergum 3 and tergum 4, female sternum 6 a single sclerite, female spiracle 7 in membrane, elongate spermathecae with 6-8 medium-sized protuberances, male spiracle 7 just in membrane, articulated surstyli rounded, small (~0.13 mm), articulated and with microtrichia and hairs, and strong sexual dimorphism in eye span ($D = 2.66$, ratio eye span/body length 0.90 in ♀ and 1.49 in ♂).

Distribution.— The island Jolo in the Sulu archipelago, Philippines (map, fig. 14).

Measurements: Body length ♀ 5.6 mm ± SE 0.3 (range 4.3-6.9, n = 8), ♂ 6.6 mm ± 0.4 (range 5.3-7.4, n = 5); eye span ♀ 5.0 mm ± 0.2 (range 3.9-6.4, n = 10), ♂ 9.8 mm ± 1.3 (range 6.0-13.3, n = 6); wing length ♀ 3.8 mm ± 0.1 (range 3.4-4.3, n = 8), ♂ 4.4 mm ± 0.1 (range 4.2-4.6, n = 5); length of scutellar spine ♀ 1.20 mm ± 0.04 (range 1.05-1.36, n = 10), ♂ 1.23 mm ± 0.05 (range 1.02-1.36, n = 7).

Head.— Central part glossy brown, face densely pollinose; frons (fig. 104) with smooth V-shaped central area, lateral areas roughened, a semi-circular ridge around the frons; arcuate groove concolorous with surrounding area; face with ridge parallel to and just below arcuate groove, upper half of face somewhat protruding, covered with a number of hairs, facial corners rounded; eye span small in female (10% shorter than the length of body) and very long in male (49% longer than the length of body); rate of dimorphism moderate, $D = 2.66$ (table 1, fig. 13); stalks brown, broad apical parts blackish, pollinose; IVB (fig. 104) long, 4 times the diameter of the eye stalk, base of IVB a

small cone, three-quarters the diameter of the stalk; OVB medium-sized, 1.5 times the diameter of the stalk.

Thorax.— Collar brown, wholly pollinose; scutum and scutellum dark brown, covered with a very dense silvery-grey pollinosity (fig. 26), scutum with a few rows of rather long hairs; scutellar spines glossy brown with pollinose base, with some hairs on small, indistinct warts; upper half of pleura pollinose, lower half glossy brown except for pollinose posterior area; sterna glossy brown, except for pollinosity anteriorly and near bases of legs; supra-alar spines (fig. 26) long, about 3 times as long as metapleural spines, dorsolaterally directed; scutellar spines long, 3 times length of scutellum, curved upward and outward, diverging under an angle of 80°; metapleural spines short, blunt, posterolaterally directed; apical bristle short, about one-fifth the length of the scutellar spine, posteromedially directed.

Wing.— Apex slightly infuscated, almost hyaline; one crossband and two incomplete bands (figs 26, 36); preapical band darkest and broadest, slightly extending in cell r4+5 towards crossvein R-M; apical edge of preapical band almost straight; central band only including crossvein R-M, anteriorly narrow and more apically located, interrupted in cell r2+3 (Tenorio's drawing shows still a thin connection); basal band running from just above vein M till posterior edge, also a tiny patch below tip of cell c; no interconnections between the bands, except for a vague band along the posterior edge between the basal and central band; slightly darker smudge below tip of cell cup; glabrous basal areas large, including cell c, basal five-sixths of cell r1 except for patches of basal and central bands, most of cell br except for apex, small patch of basal band and patch near base of cell cup, cell bm except for apex, most of cell cup, area below cell cup except for posterior edge, basal area and anterior apical corner of cell dm, most of basal half of cell r2+3 and large subbasal part in cell r4+5.

Legs.— Front leg brown, tibia dark brown, pollinose anteriorly and basally on coxa 1 and on inner side of femur; mid leg and hind leg brown, tibiae and basal and apical parts of femora dark brown; front femora quite long; femur 1 moderately incrassate in ♀ (ratio of length/width $4.5 \pm \text{SE } 0.1$, range 4.1-4.9, $n = 6$) and slender in ♂ (ratio of length/width 5.8 ± 0.2 , range 5.1-6.3, $n = 5$); tubercles on distal three-quarters, inner row in ♀ with 21.0 tubercles $\pm \text{SE } 0.9$ (range 16-26, $n = 12$) and in ♂ with 25.9 tubercles ± 0.8 (range 23-29, $n = 9$), outer row in ♀ with 16.3 tubercles ± 0.8 (range 14-21, $n = 12$) and in ♂ with 18.3 tubercles ± 0.7 (range 15-22, $n = 9$), outer row with gap.

Preabdomen.— Dorsally brown, pollinose, basal two terga with three glossy spots laterally, tergum 3 anterolaterally with densely pollinose spots; tergum 4 with small anterolateral pollinose spots; seam between terga 2 and 3 visible; sternum 1 dark brown, glossy; other sterna brown pollinose; sternum 1 basally linked to syntergum (fig. 109), spiracle 1 in tergum.

Female postabdomen.— Deflexed, terga 6 and 7 single rectangular sclerites (fig. 109); tergum 8 represented by two rectangular sclerites (fig. 111), sclerites covered by microtrichia on posterior halves; tergum 10 with one pair of hairs, cerci (fig. 111) elongate, ratio of length/width 4.1, covered with microtrichia and a number of hairs; sterna 5 and 6 single rectangular sclerites; sternum 7 strongly constricted medially (fig. 111); sternum 8 represented by two oblong sclerites; spiracle 7 in membrane; subanal plate more onion-shaped than pentagonal, posteriorly two pairs of long hairs and three pairs of short hairs; spermathecae (fig. 110) somewhat elongate, 1.5 times as long as wide, on

apical third quite long protuberances, 8 in the single theca and 6-7 in each of the pair, Tenorio in his figure shows respectively 9 and 7-8 protuberances; sclerotised ring oblong, somewhat narrower posteriorly.

Male postabdomen.— Sternum 4 a single rectangular sclerite; sternum 5 represented by a pair of square sclerites (fig. 108), posterior parts more sclerotised, places of former sclerites 6 indicated by a few hairs (fig. 108); sternum 7+8 without sclerotised connection to epandrial sclerites; spiracle 7 just in membrane, touching sternum 7+8; epandrium (fig. 105) rounded, with about 20 pairs of hairs, covered with microtrichia; surstyli articulated, small (~0.13 mm), in posterior view (fig. 105) straight with rounded apex and covered with microtrichia and a number of hairs, in lateral view (fig. 77) rather straight with rounded apex and largely covered with microtrichia (except for basal anterior corner) and on apical half a number of hairs, on inner side (fig. 78) glabrous except for some pollinosity at apex; for the differences in surstyli in the *T. motatrix* group compare figs 69-78; surstyli connected to lateral part of cerci, not interconnected; cerci widest in the middle, convex, apically and laterally strongly sclerotised, broad, ratio length/width 2.0, covered with microtrichia and hairs; phallapodeme (fig. 106) slender, anterior arm curved downward anteriorly, and slightly shorter than posterior arm; vane broad, deeply constricted basally; aedeagus with medium-sized (~60% of length of phallapodeme) genital process sticking out; ejaculatory apodeme fan-shaped (fig. 107).

Remarks.— *Teleopsis shillittoi* belongs to the *T. motatrix* group. Liu et al. (2009) described *T. hainanensis* from Hainan, China. They considered *T. hainanensis* as 'somewhat similar to *T. shillittoi*.' However, from their figures it is clear that it is not related to this species. The wing pattern is completely different, *T. hainanensis* has no cone under the IVB and the male genitalia are different. Liu et al. distinguish *T. hainanensis* from *T. shillittoi* by the 'shining black' thorax from *T. hainanensis* and the 'dark brown and black' thorax from *T. shillittoi*. However, *T. shillittoi* has a densely pollinose, silvery grey, scutum (fig. 26).

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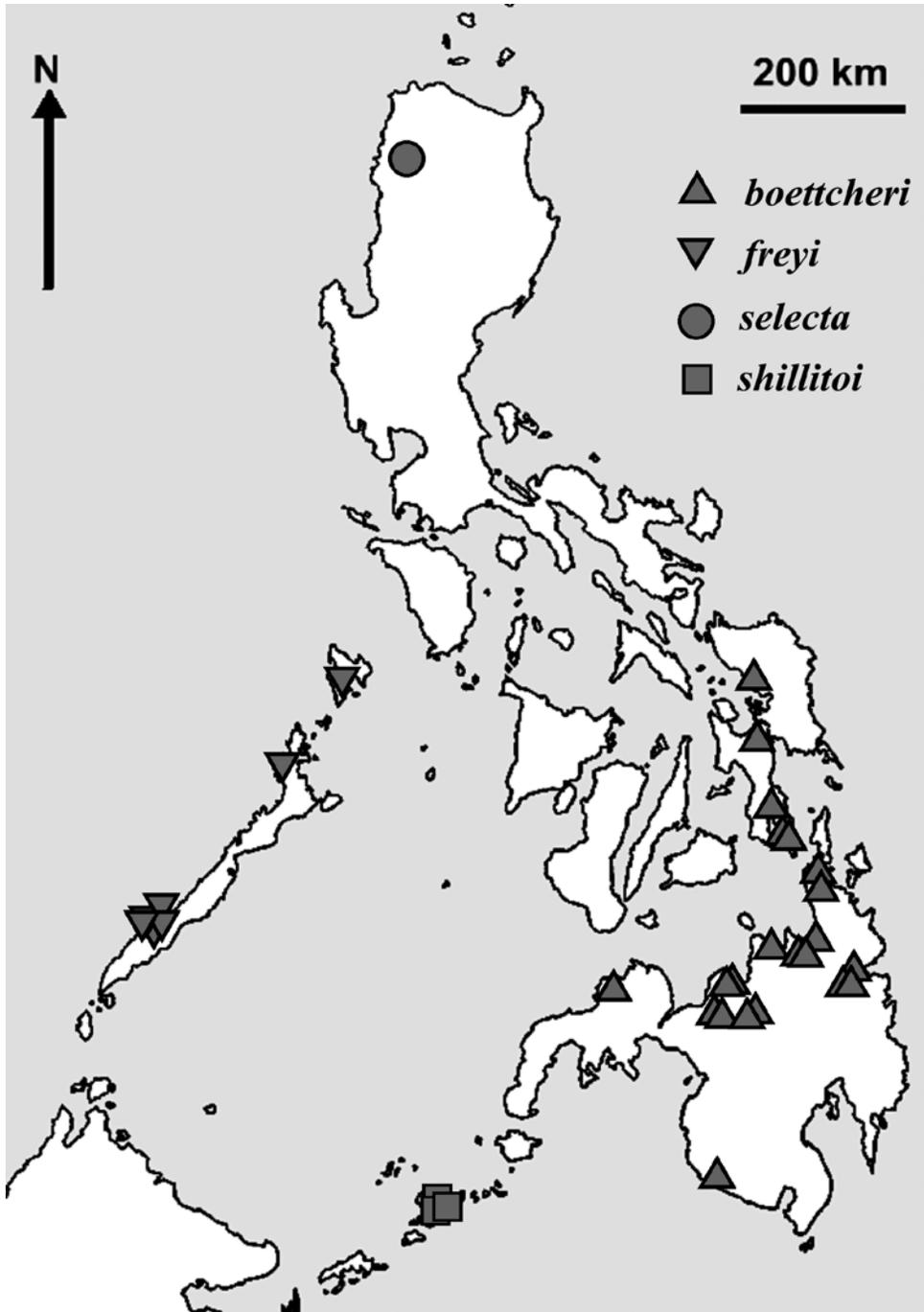
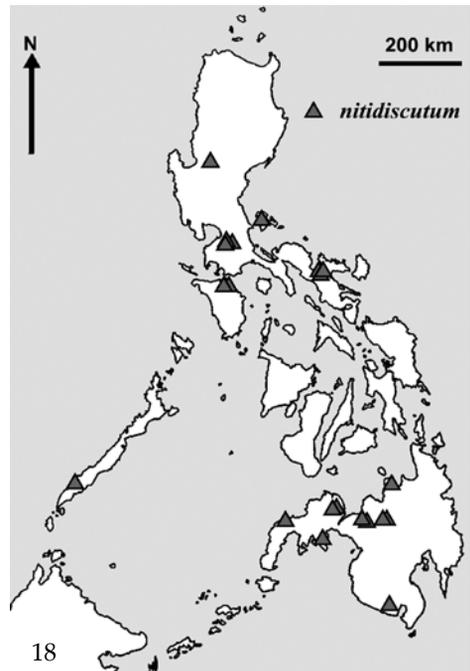
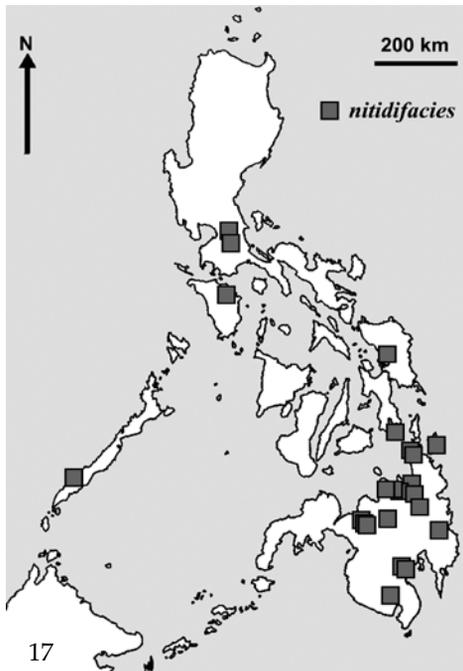
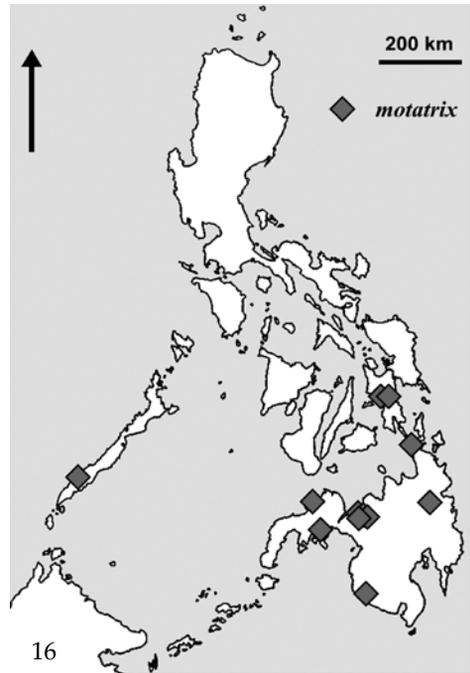
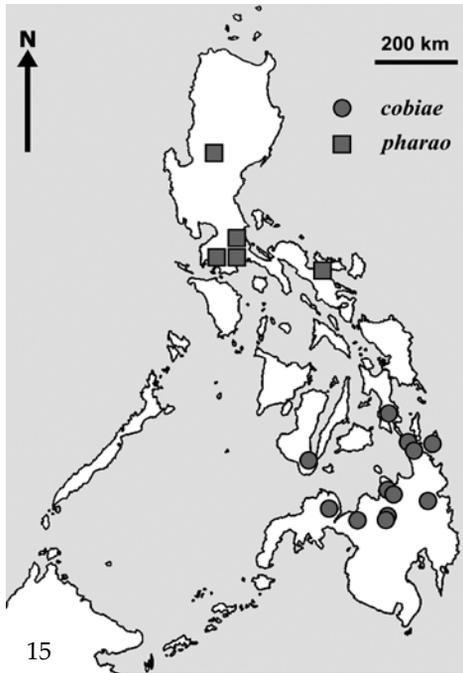


Fig. 14. Distribution map for four Philippine *Teleopsis* species: *T. boettcheri* Frey, 1928, *T. freyi* spec. nov., *T. selecta* Osten Sacken, 1882 and *T. shillitoi* Tenorio, 1969.



Figs 15-18. Distribution maps of Philippine *Teleopsis* species. 15, *T. cobiae* spec. nov. and *T. pharao* Frey, 1928; 16, *T. motatrix* Osten Sacken, 1882; 17, *T. nitidifacies* spec. nov.; 18, *T. nitidiscutum* spec. nov.



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Figs 19-22. Habitus in dorsal view. 19, *Teleopsis boettcheri* Frey, 1928, lectotype, ♂; 20, *Teleopsis cobiae* holotype, ♂; 21, *Teleopsis freyi* spec. nov. holotype, ♂; 22, *Teleopsis motatrix* Osten Sacken, 1882, Momingan, ♂. Scales 1 mm.



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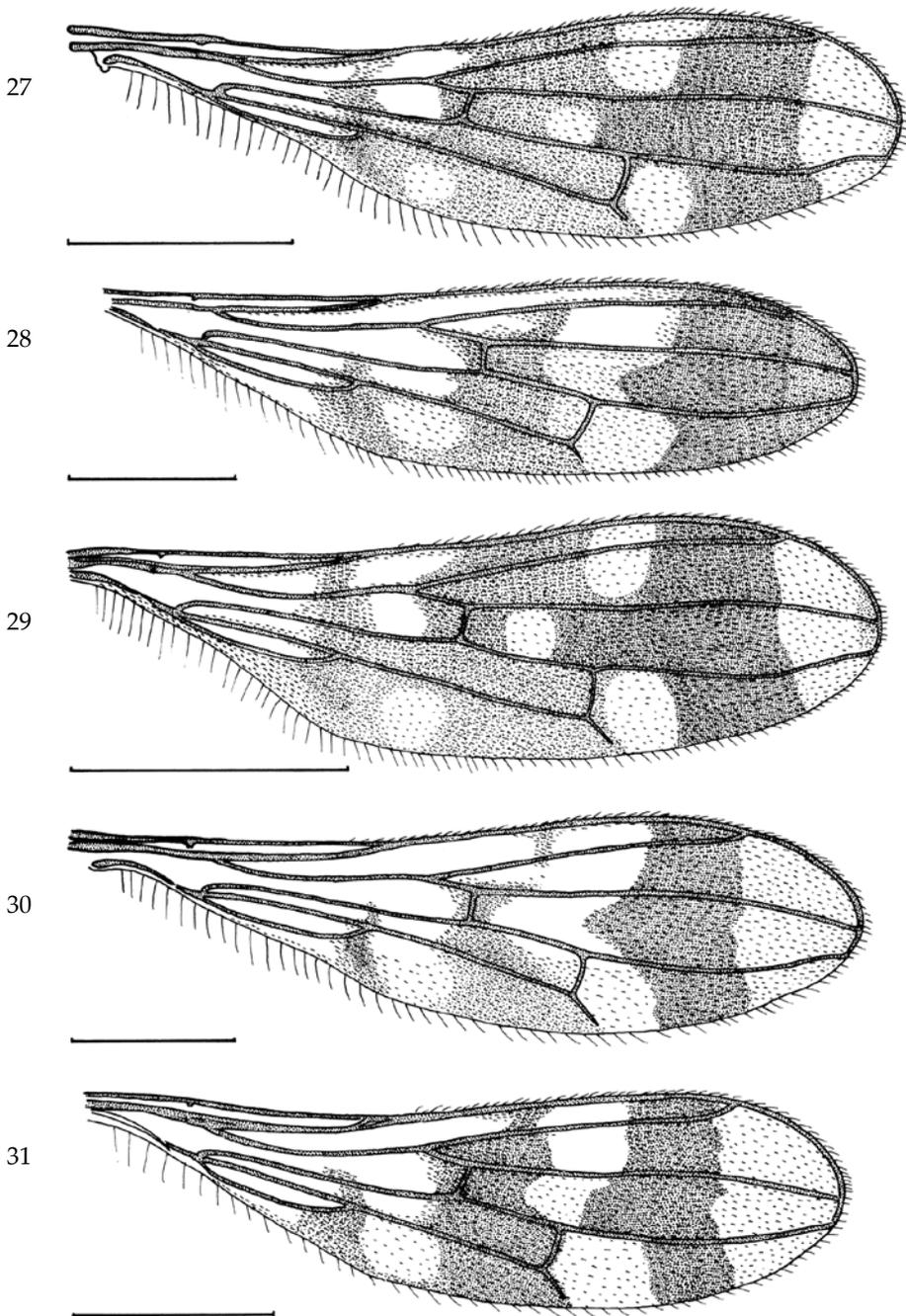


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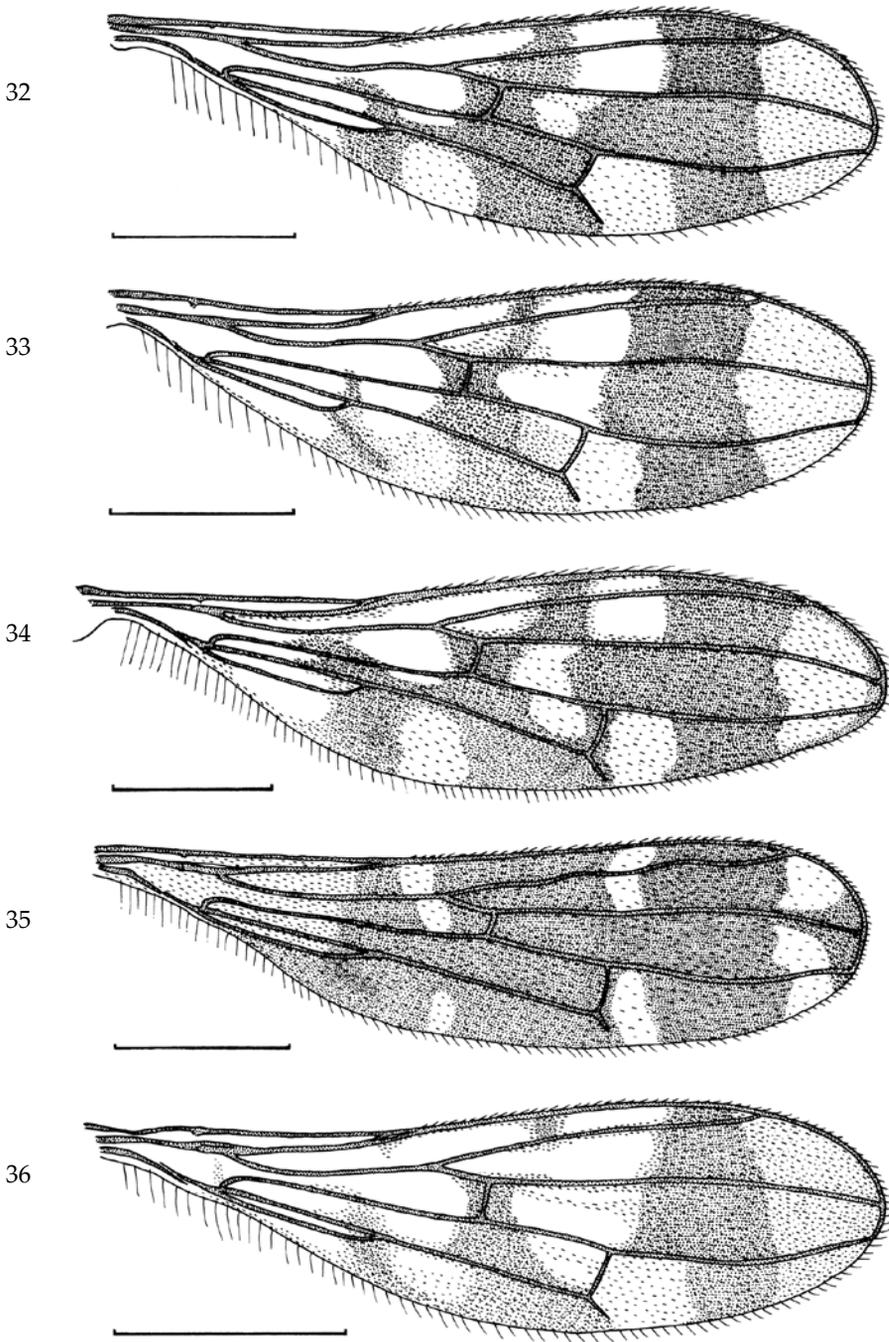


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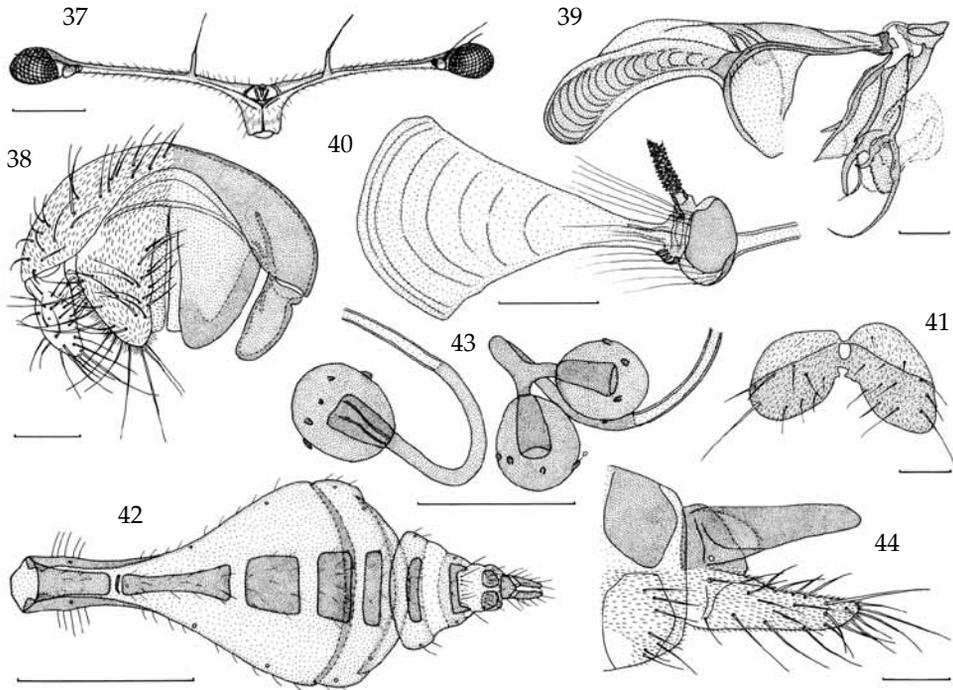
Figs 23-26 Habitus in dorsal view. 23, *Teleopsis nitidifacies* spec. nov., paratype, ♂, Malignon; 24, *Teleopsis nitidiscutum* spec. nov. paratype, ♀, Dauralan; 25, *Teleopsis pharao* Frey, 1928, ♂, coll. Carl Semper; 26, *Teleopsis shillitoi* Tenorio, 1969, ♂, Jolo. Scales 1 mm.



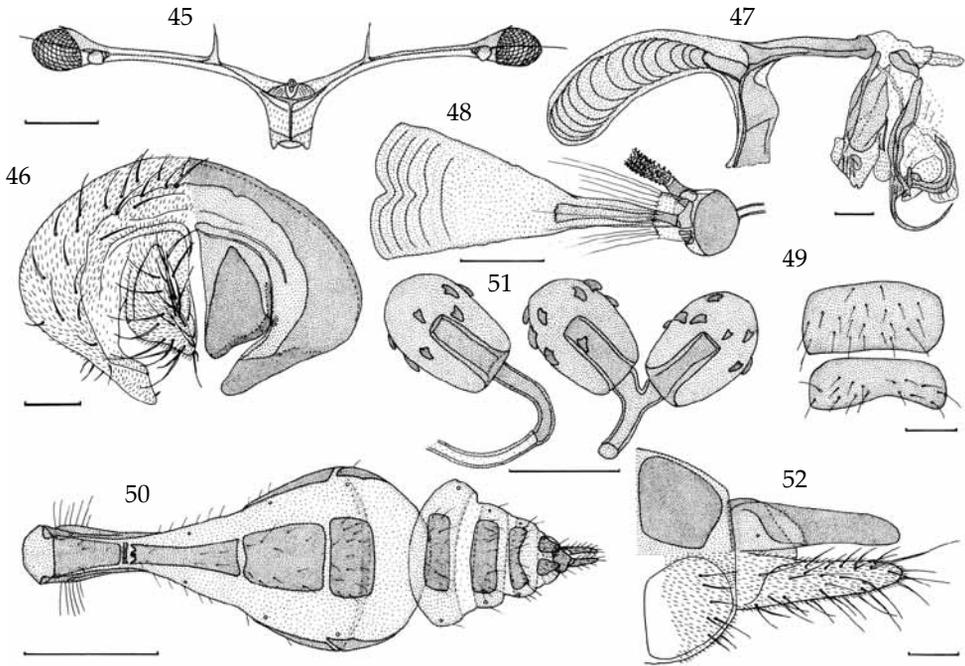
Figs 27-31. Dorsal view of wing. 27, *Teleopsis boettcheri* Frey, 1928, lectotype ♂; 28, *Teleopsis cobiae* spec. nov., holotype ♂; 29, *Teleopsis freyi* spec. nov., holotype ♂; 30, *Teleopsis motatrix* Osten Sacken, 1882, ♂, Momingan; 31, *Teleopsis nitidifacies* spec. nov., paratype, ♂, Panaon. Scales 1 mm.



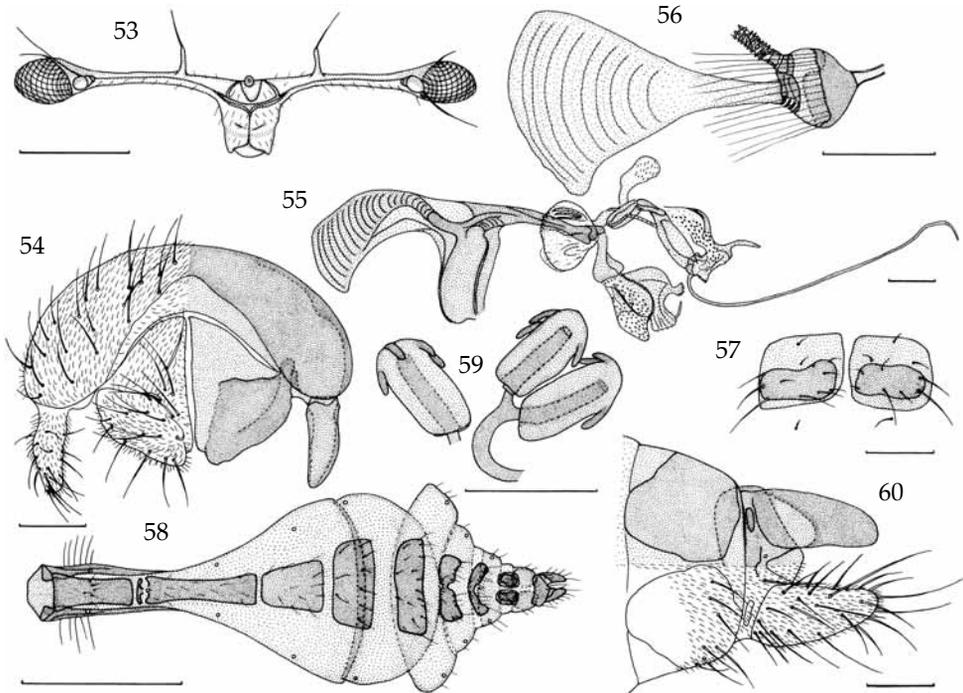
Figs 32-36. Dorsal view of wing. 32, *Teleopsis nitidiscutum* spec. nov., paratype ♂, Calopan; 33, *Teleopsis nitidiscutum* spec. nov., paratype ♀, Bukignon; 34, *Teleopsis pharao* Frey, 1928, neotype ♀; 35, *Teleopsis selecta* Osten Sacken, 1882, ♂, Cagugao; 36, *Teleopsis shillitoi* Tenorio, 1969, ♀, Jolo. Scales 1 mm.



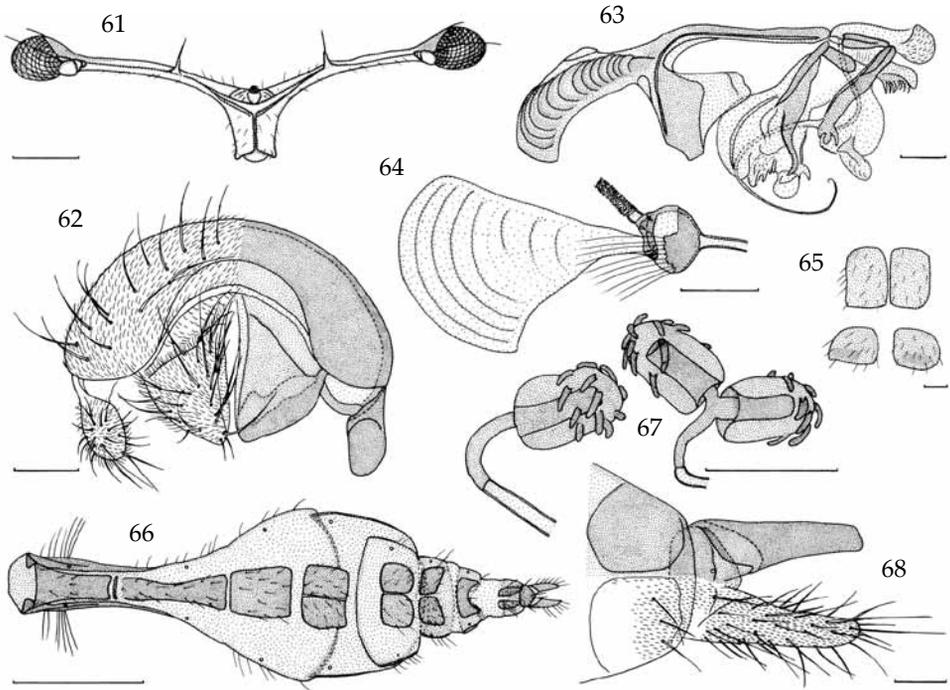
Figs 37-44. *Teleopsis boettcheri* Frey, 1928. 37, ♂ lectotype, head in anterior view; 38-41, ♂ paralectotype Mindanao; 38, posterior view of epandrium with surstyli and cerci; 39, lateral view of phallapodeme and aedeagus; 40, ejaculatory apodeme and sac; 41, ♂ sternum 5; 42-44, ♀ paralectotype, Catbalogan; 42, ventral view of abdomen; 43, spermathecae; 44, dorsal view of terga 8 & 10 and cerci; figs 37 & 42 scale 1 mm, other figs scale 0.1 mm.



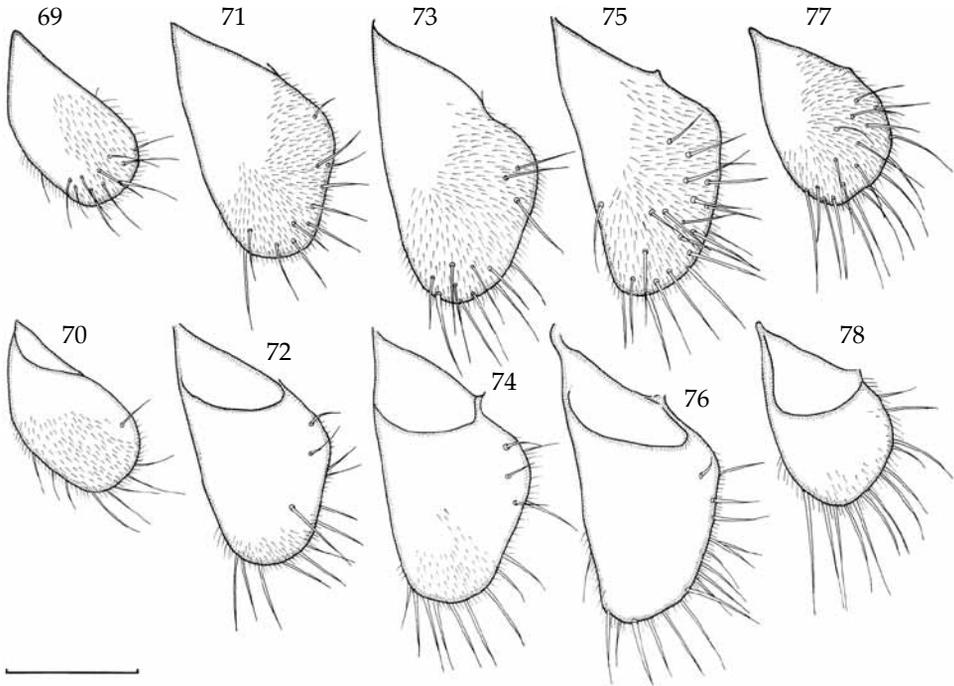
Figs 45-52. *Teleopsis cobiae* spec. nov. 45-49, ♂ paratype Surigao 1915; 45, head in anterior view; 46, posterior view of epandrium with surstyli and cerci; 47, lateral view of phallapodeme and aedeagus; 48, ejaculatory apodeme and sac; 49, ♂ sterna 4 & 5; 50-52, ♀ paratype, Mt Balatukan; 50, ventral view of abdomen; 51, spermathecae; 52, dorsal view of terga 8 & 10 and cerci; figs 45 & 50 scale 1 mm, other figs scale 0.1 mm



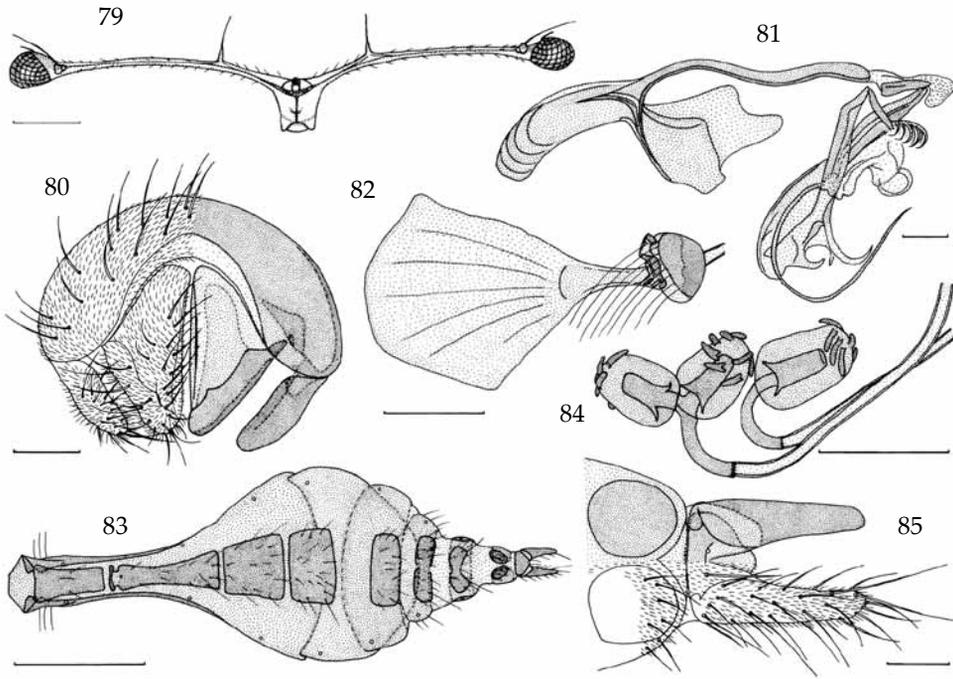
Figs 53-60. *Teleopsis freyi* spec. nov. 53, ♂ holotype, head in anterior view; 54-57, ♂ paratype, Tarumpitao Pt; 54, posterior view of epandrium with surstyli and cerci; 55, lateral view of phallapodeme and aedeagus; 56, ejaculatory apodeme and sac; 57, ♂ sternum 5; 58-60, ♀ paratype, Binaluan; 58, ventral view of abdomen; 59, spermataecae; 60, dorsal view of terga 8 & 10 and cerci; figs 53 & 58 scale 1 mm, other figs scale 0.1 mm.



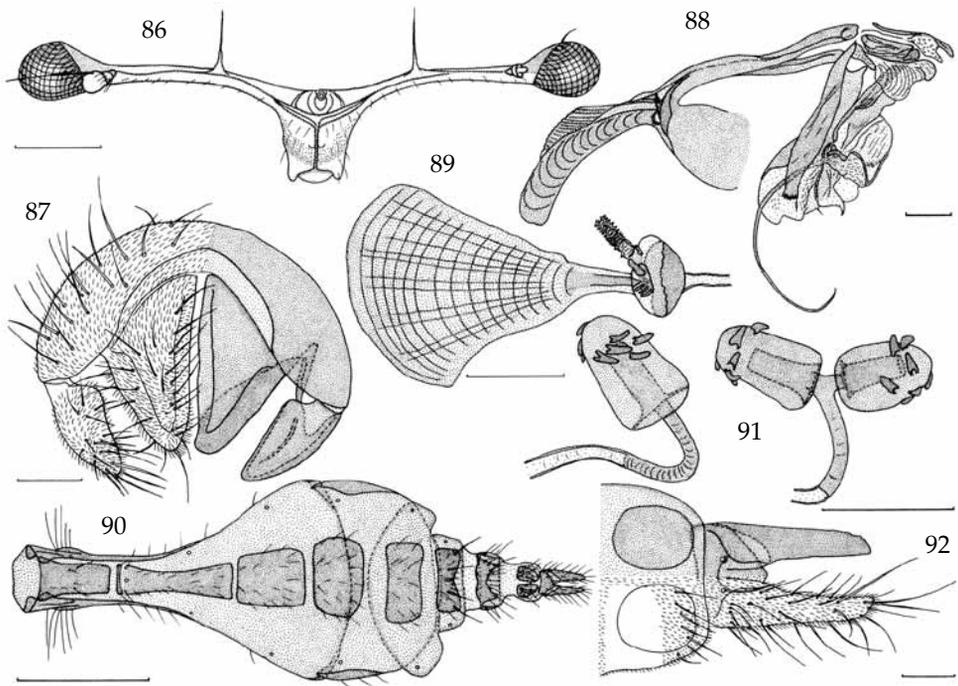
Figs 61-68. *Teleopsis motatrix* Osten Sacken, 1882. 61, ♀ Lemesahan, head in anterior view; 62-65, ♂ Momingan; 62, posterior view of epandrium with surstyli and cerci; 63, lateral view of phallapodeme and aedeagus; 64, ejaculatory apodeme and sac; 65, ♂ sterna 4 & 5; 66-68, ♀ Momingan; 66, ventral view of abdomen; 67, spermathecae; 68, dorsal view of terga 8 & 10 and cerci; figs 61 & 66 scale 1 mm, other figs scale 0.1 mm.



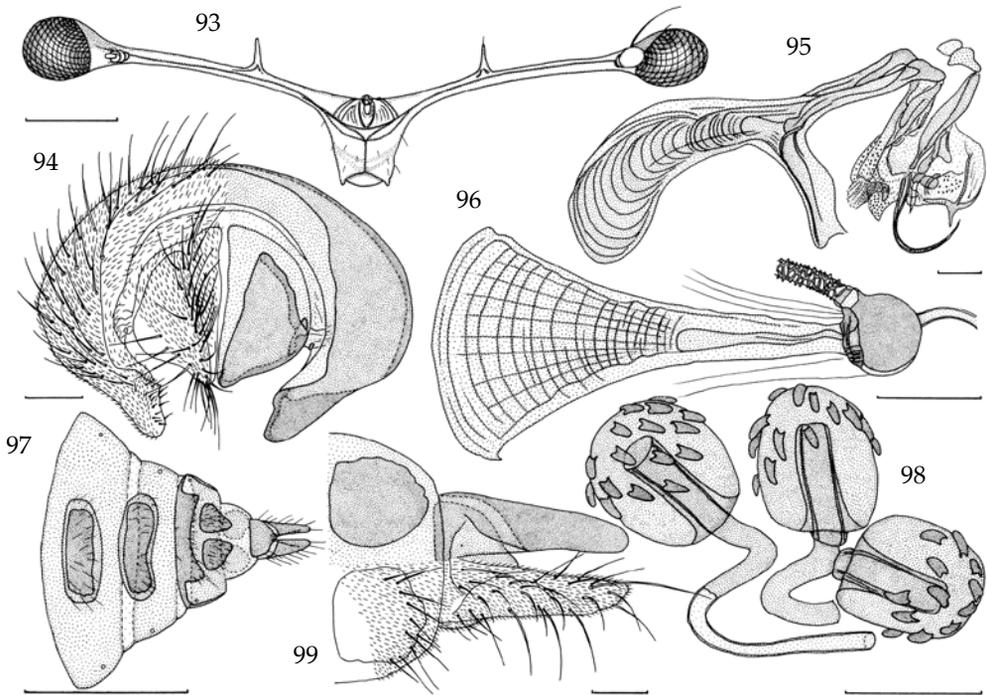
Figs 69-78. Surstyli, 69, 71, 73, 75 & 77 lateral view, 70, 72, 74, 76 & 78, medial view. 69-70, *Teleopsis motatrix* Osten Sacken, 1882, Momingan; 71-72, *Teleopsis nitidifacies* spec. nov., Panaon; 73-74, *Teleopsis nitidiscutum* spec. nov., Calopan; 75-76, *Teleopsis nitidiscutum* spec. nov., Los Banos; 77-78, *Teleopsis shillitoi* Tenorio, 1969, Mt. Dahao. Scales 0.1 mm.



Figs 79-85. *Teleopsis nitidifacies* spec. nov. 79-82, ♂ paratype Panaon; 79, head in anterior view; 80, posterior view of epandrium with surstyli and cerci; 81, lateral view of phallapodeme and aedeagus; 82, ejaculatory apodeme and sac; 83-85, ♀ paratype, Los Banos; 83, ventral view of abdomen; 84, spermathecae; 85, dorsal view of terga 8 & 10 and cerci; figs 79 & 83 scale 1 mm, other figs scale 0.1 mm.



Figs 86-92. *Teleopsis nitidiscutum* spec. nov. 86, ♀ paratype (Röder Coll.), head in anterior view; 87-89, ♂ paratype, Calopan; 87, posterior view of epandrium with surstyli and cerci; 88, lateral view of phallopodeme and aedeagus; 89, ejaculatory apodeme and sac; 90-92, ♀ paratype (Röder coll.); 90, ventral view of abdomen; 91, spermathecae; 92, dorsal view of terga 8 & 10 and cerci; figs 86 & 90 scale 1 mm, other figs scale 0.1 mm.



Figs 93-99. *Teleopsis pharao* Frey, 1928. 93, ♂, Dalton Pass, head in anterior view; 94-96, ♂, Mt. Isarog; 94, posterior view of eandrium with surstyli and cerci; 95, lateral view of phallapodeme and aedeagus; 96, ejaculatory apodeme and sac; 97-99, ♀, Dalton Pass; 97, ventral view of distal section of abdomen; 98, spermathecae; 99, dorsal view of terga 8 & 10 and cerci; figs 93 & 97 scale 1 mm, other figs scale 0.1 mm.

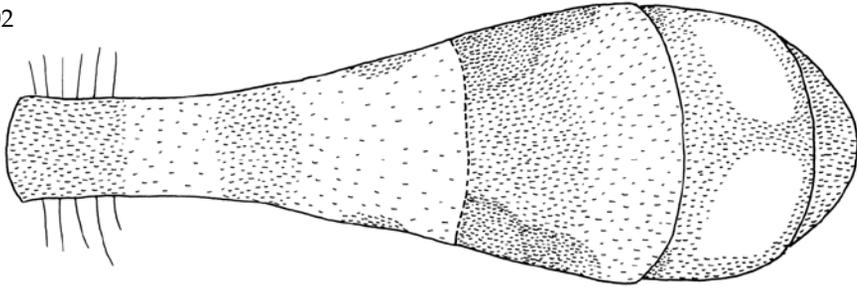


101

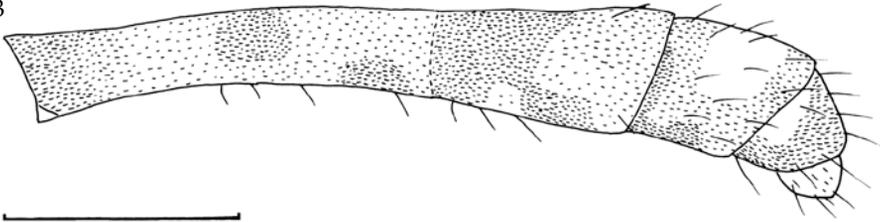
100

Teleopsis selecta
 1 mm.
 Inge van Noordwijk '09

102

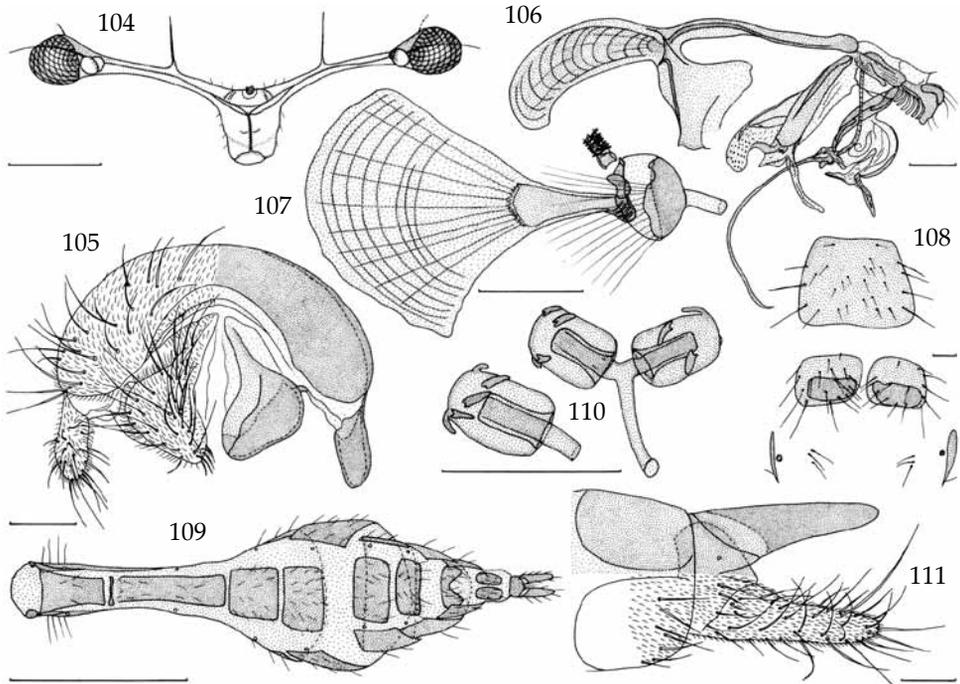


103



Figs 102-103. *Teleopsis selecta* Osten Sacken, 1882, ♂ holotype, pollinosity patterns on abdomen. 102, dorsal view; 103, lateral view; scale 1 mm.

◀ Figs 100-101. *Teleopsis selecta* Osten Sacken, 1882, after aquarelle by Inge van Noortwijk, mainly based on ♂ holotype, with some additions based on the second ♂ specimen known. 100, head in anterior view; 101, habitus.



Figs 104-111. *Teleopsis shillitoi* Tenorio, 1969. 104, ♀, Jolo, head in anterior view; 105-108, ♂ Mt Dahao; 105, posterior view of epandrium with surstyli and cerci; 106, lateral view of phallapodeme and aedeagus; 107, ejaculatory apodeme and sac; 108, ♂ sterna 4 & 5, spiracles 6 also shown; 109-111, ♀, Jolo; 109, ventral view of abdomen; 110, spermathecae; 111, ♀ paratype, Talipao, dorsal view of terga 8 & 10 and cerci; figs 104 & 109 scale 1 mm, other figs scale 0.1 mm.