A new genus and three new species of parasitoid wasp from Papua New Guinea and redescription of Trigonophatnus Cameron (Hymenoptera, Braconidae, Rogadinae)

Donald L.J. Quicke a b, M. Alex Smith c, Cornelis van Achterberg d, Scott E. Miller e & Jan Hrcek f

a Department of Biological Sciences, Imperial College London, Silwood Park Campus, Ascot, Berkshire, SL 5 7PY, UK
b Department of Entomology, The Natural History Museum, London, SW, 7 5BD, UK
c Biodiversity Institute of Ontario, University of Guelph, Guelph, Ontario, N1G 2W1, Canada
d Department of Terrestrial Zoology, Netherlands Centre for Biodiversity Naturalis, 2300, RA, Leiden, the Netherlands
e National Museum of Natural History, Smithsonian Institution, PO Box 37012, MRC 105, Washington, DC, 20013-7012, USA
f Faculty of Science, University of South Bohemia and Biology Center, Czech Academy of Sciences, Branisovska 31, 37005, Ceske Budejovice, Czech Republic

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A new genus and three new species of parasitoid wasp from Papua New Guinea and redescription of Trigonophatnus Cameron (Hymenoptera, Braconidae, Rogadinae)

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Vojtechirogas novotnyi gen. nov. & sp. nov., V. heberti sp. nov. and V. wantok sp. nov. reared from Philiris helena (Snellen) (Lepidoptera: Lycaenidae) feeding on Macaranga spp., in northern lowland Papua New Guinea, are described and illustrated. Based on molecular data, on the modified vein 2-SC+R of the hind wing and the inclivous vein r-m of the forewing, Vojtechirogas gen. nov. appears most closely related to the monotypic genus Trigonophatnus Cameron, 1907, also from Papua New Guinea. These two genera differ from one another markedly in many characters usually considered important in Rogadinae systematics such as the presence/absence of a subbasal lobe of the claws, of the mediolongitudinal carina of the metanotum and of the basal triangular area of the second metasomal tergite. Trigonophatnus is redescribed and illustrated and is reported as a parasitoid of Hypochrysops chrysargyrus (Lepidoptera: Lycaenidae) based upon molecular analysis of host remains. Additional specimens of Vojtechirogas gen. nov. are reported but not assigned to species because of lack of molecular data in this morphologically uniform genus.

Keywords: cytochrome oxidase I; DNA barcoding; Lepidoptera; hosts; Rogadini; Lycaenidae

Introduction

The South-East Asian and Australasian members of the subfamily Rogadinae are still poorly known, and with the exception of the distinctive Spinariini (van Achterberg 2007), no group has been revised. At the generic level, identifications have been assisted by the work of Chen & He (1997) on the Chinese fauna which includes several elements that are typical of more tropical faunas. No key specific to the Australasian region has been published and very little work has been carried out on it since the early 20th century. Recently, a large herbivore and parasitoid rearing programme in Papua

*Corresponding author. Email: d.quicke@imperial.ac.uk

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New Guinea has revealed several interesting taxa as well as new host relationships (Hrcek et al. 2011). One of the reared species is large and distinctive and by reference to published descriptions and comparison with the holotype, was identified as *Trigonophatnus albobalteatus* Cameron, 1907, described from the Indonesian part of New Guinea; here we report its first host association. This species is rarely collected despite its relatively large size (6–10.5 mm) and it was previously known only from its holotype and a single, only recently recognized, specimen in the collection of the Natural History Museum in London.

In addition, a considerable number of specimens that do not belong to any previously described genus have been reared, mostly from larvae of *Philiris helena* (Lycaenidae) feeding upon various species of the tropical tree genus *Macaranga* (Euphorbiaceae). Here we describe this new genus, including three new species and illustrate and redescribe the genus *Trigonophatnus* to make available information on character systems not mentioned in its original description. Both the new genus and *Trigonophatnus* have derived hind wing venation (Figures 11, 12, 25).

Limited DNA barcode data for individuals of the new genus, and slight differences in morphology, particularly the pattern of propodeal carination, suggest that it may comprise a complex of cryptic or near cryptic species, and therefore here we are only assigning reared and barcoded specimens to the new species that we describe below.

**Terminology**

Terminology follows van Achterberg (1979, 1988). Measurements of the height and horizontal length of the eye are approximations because the very bulbous face and very large eyes make it difficult to measure consistently; in our attempts to do so, the head was orientated so that the face (defined as running from the anterior edge of the toruli to the dorsal margin of the clypeus) was horizontal or perpendicular to the measurement axis.

Base positions in the barcoding 5′ region of the mitochondrial cytochrome oxidase 1 (CO1) gene fragment are numbered according to position in the *Drosophila yakuba* sequence (Clary and Wolstenholme 1985).

Abbreviations: NHM, The Natural History Museum, London; USNM, United States National Museum, Washington, DC; RMNH, NCB Naturalis, Leiden. Many specimens listed in Appendix 1 will be returned to the PNG National Agriculture Research Institute (NARI).

**Systematics**

*Vojtechirogas* Quicke & van Achterberg gen. nov.
(Figures 1–13, 26–29)

*Type species*

*Vojtechirogas novotnyi* sp. nov. Gender masculine. Additional species: *V. heberti* sp. nov.; *V. wantok* sp. nov.
Figures 1–13. (1–12) *Vojtechirogas novotnyi* gen. nov. & sp. nov., paratype female (12 of second paratype). (13) *V. herberti* sp. nov., holotype female. (1) Wings; (2) outer hind claw; (3, 13) head, dorsal aspect; (4) mesosoma, dorsal aspect; (5) hind leg; (6) head, anterior aspect; (7) first metasomal tergite, dorsal aspect; (8) antenna; (9) habitus, lateral aspect; (10) hind tibial spurs; (11, 12) Detail of vein 1r-m and surrounding veins of hind wing. Magnification of scale line: 1.0× for 1, 5, 8, 9; 5.0× for 2; 1.5× for 3, 4, 6, 7, 10, 13; and 2.6× for 11, 12.
Diagnosis

Antenna longer than forewing. Terminal flagellomere strongly acuminate. Maxillary and labial palpi of female slender. Face wide. Occipital carina complete dorsally (but narrowly interrupted in *V. herberti* sp. nov.) and ventrally; ventrally strongly and more or less perpendicularly curved to join hypostomal carina. Tarsal claws with pointed basal lobes. Dorsal carinae of first metasomal tergite remain separated and second tergite has indistinct mediobasal area. Hind wing with vein SR tubular until beyond hamuli, very strongly curved such that at most extreme it almost reaches wing margin, where there is usually a distinct inclivous fold representing cross-vein r; vein 2-SC+R swollen; vein r-m strongly curved.

Notes

*Vojtechirogas* gen. nov. can be recognized from other genera of Rogadinae with a sclerotized and more or less curved vein SR1 of hind wing as follows:

1. Tarsal claws pectinate; marginal cell of hind wing strongly widened apically; second metasomal tergite finely sculptured; eyes and ocelli strongly enlarged; Afrotropical .......................... *Scoporogas* van Achterberg, 1991
   The biology is unknown.

   – Tarsal claws without pecten (Figures 2, 22); marginal cell of hind wing subparallel-sided apically (Figures 1, 14); second tergite coarsely sculptured, often costate (Figures 20); eyes and ocelli less developed (Figures 3, 6, 17, 21); Indo-Australian ........................................ 2

2. Head strongly protuberant in dorsal view; mediolongitudinal carina of propodeum present anteriorly; vein 2-SC+R of hind wing hardly widened; hind femur slender; pronotum coriaceous ventrally; marginal cell of hind wing near hamuli wider than apically; vein 1r-m of hind wing oblique and straight; Oriental .......................... *Rhogasella* Baker, 1917
   The biology is unknown.

   – Head hardly protuberant in dorsal view (Figures 3, 21); mediolongitudinal carina of propodeum absent anteriorly (Figures 4, 19); vein 2-SC+R of hind wing more or less widened (Figures 11, 12, 25); hind femur moderately robust (Figures 5, 18); pronotum smooth ventrally (Figures 9, 24); marginal cell of hind wing near hamuli narrower than apically (Figures 1, 14); vein 1r-m of hind wing slightly curved or vertical (Figures 11, 12, 25) .................. 3

3. Episternal scrobe long and reaching precoxal sulcus (Figure 9); tarsal claws with a large lobe (Figure 2); basal 0.1 of vein SR of hind wing sclerotized (Figure 1); basal half of vein 2-M of hind wing unsclerotized (Figure 1); vein 1r-m of hind wing slightly curved and oblique (Figures 11, 12); dorsal carinae of first metasomal tergite remain separated (Figures 7, 26–29); second metasomal tergite without a distinct triangular area mediobasally (Figure 7); Papua New Guinea .......................... *Vojtechirogas* gen. nov.
   Parasitoid mainly of *Philiris helena* (Lycaenidae) on *Macaranga* spp.
Episternal scrobe short and remaining far from precoxal sulcus (Figure 24); tarsal claws without lobe (Figure 22); basal 0.4 of vein SR of hind wing sclerotized (Figure 14); basal half of vein 2-M of hind wing sclerotized (Figure 14); vein 1r-m of hind wing straight and vertical (Figure 14); dorsal carinae of first tergite united (Figure 20); second tergite with a distinct mediobasal triangular area (Figure 20); Papua New Guinea Trigonophatnus Cameron, 1907 Parasitoid of Lycaenidae.

Key to species of the genus Vojtechirogas gen. nov.

1. Occipital carina complete mediodorsally and without mediolongitudinal depression (Figure 3); diameter of posterior ocellus of female 1.7–2.0 times POL (Figure 3); inverted V-shaped carina of propodeum wider and not connected to more or less continuous carinae running to posterior margin (Figures 14, 15, 17); smaller species, female wing length 5.0–5.3 mm; CO1 bases 1757, 1782, 1835, 1865, 1888, 1914, 2030, 2034, 2075 and 2090 A, T, G, C, A, C, T, A, T and A respectively ................................. 2

2. Propodeum with inverted U-shaped carina that curves posteriorly outwards from mid-anterior and spits to form a pair of curved, subtransverse carina (Figures 26, 27); CO1 bases 1534, 1607, 1640, 1703, 1808 and 2000 A, A, T, A, G and A respectively ................................. V. heberti sp. nov.

3. Propodeum with anteriorly wide A-shaped carina (with two cross-bars) that angles abruptly to form transverse carinae (Figures 29); CO1 bases 1534, 1607, 1640, 1703, 1808 and 2000 G, G, C, A and A respectively. V. novotnyi sp. nov.

Vojtechirogas novotnyi Quicke & van Achterberg sp. nov. (Figures 1–12, 14, 15)

Material examined


Paratype. Female, Papua New Guinea, Madang, Morox, 8 July 2005, 4° 01′ S, 144° 06′ E (USNM ENT 00643676, GenBank JF271566) (RMNH).
Figures 14–25. *Trigonophatnus albobalteatus* Cameron, holotype, female. (14) Wings; (15) hind tibial spurs; (16) occipital carina ventrally; (17) head, anterior aspect; (18) hind leg; (19) mesosoma, dorsal aspect; (20) first–third metasomal tergites, dorsal aspect; (21) head, dorsal aspect; (22) outer hind claw; (23) middle tibial spurs; (24) habitus, lateral aspect; (25) detail vein 1r-m and surrounding veins of hind wing. Magnification of scale line: 1.0× for 14, 18, 24; 5.0× for 15, 22, 23; and 2.0× for 16, 17, 19–21, 25.
Description
Length of body 5.7–7.3 mm, of forewing 5.0–5.3 mm.

Head. Terminal flagellomere strongly acuminate. Antenna with 45–47 (females) and 30–31 (males) flagellomeres; all flagellomeres longer than wide; first flagellomere 1.4 times as long as second one and about 3.5 times as long as wide. Palpi of female slender and maxillary palp 1.4 times as long as height of head. Occipital carina complete mediadorsally. Diameter of posterior ocellus of female 1.7–2.0 times POL, and OOL longer than diameter of posterior ocellus. Face rugose-punctate dorsally, but smooth medially. Clypeus largely depressed and smooth, ventrally obtuse. Hypoclypeal depression 0.5 times minimum width of face. Malar space as wide as basal width of mandible.

Mesosoma. Length of mesosoma 1.5 times its height. Antescutal depression present. Pronotum smooth but medially and anterolaterally rugose. Precoxal sulcus only medially distinctly impressed and crenulate. Mesopleuron smooth except for some fine punctures dorsally and some rugae end punctures anterodorsally. Episternal scrobe linear and reaching precoxal sulcus (Figure 9) Metapleuron smooth except for a few punctures. Notauli complete, crenulate and moderately wide. Mesoscutum sparsely setose, smooth except for some punctures. Scutellar sulcus wide and with one triangular median carina and 0–2 additional carinae. Scutellum more or less longitudinally impressed and smooth except for some punctures. Metanotum with complete mediolongitudinal carina. Propodeum without mediolongitudinal carina, reticulate medially, anterolaterally (except some punctures) and posterolaterally largely smooth; lateroposteriorly carinae protruding forming a small tubercle (Figure 9).

Forewing. $R:3-SR:SR1 = 6:22:34; 2-SR:3-SR:r-m = 14:22:11; r-m inclivous; 1-SR+M$ and $m-cu$ slightly curved; $m-cu$ rather angled with 2-CU1 (Figure 1) cu-a interstitial to distinctly postfurcal. Membrane setose except below 1A.

Hind wing. cu-a inclivous; m-cu absent; 1r-m slightly curved and reclivous; 2-M sinuate; 2-SC+R more or less widened (Figures 11, 12); $SR$ sclerotized, curved basally; marginal cell narrower near hamuli than subapically (Figure 1); $r$ narrowly developed (Figure 1) or absent (Figure 12).

Legs. Tarsal claws with large subbasal lobe. Hind femur comparatively robust (Figure 5), about four times as long as wide. Hind tibial spurs straight or slightly curved and sparsely setose, 0.2 and 0.3 times as long as hind basitarsus. Apex of hind tibia with a comb on inner side (Figure 10).

Metasoma. First tergite as long as apical width; dorsope and laterope large. Mediobasal area of second tergite minute. First to fifth tergites coarsely longitudinally costate. Sixth tergite mainly transversely striate. Second to fifth tergites with lateral crease. Second metasomal suture deep, crenulate-costate and wide. Median length of
second tergite 1.6 times third tergite. Ovipositor sheath slender and 0.05 times as long as forewing. Hypopygium enlarged and without ventral crease (Figure 9).

**Colour.** Entirely brownish yellow; basal flagellomeres apically and after 13th flagellomere entirely dark brown. Pterostigma and veins yellow, but fore wing anteriorly brown (including vein 1-R1). Wing membrane subhyaline.

**Etymology**
Named after Vojtech Novotny in recognition of his major contribution to tropical insect community ecology.

**Notes**
The holotype of *V. novotnyi* sp. nov. was cited by Hrcek et al. (2011) as “*Triraphis* sp.”

According to label data and database records, the paratype female was reared from caterpillar *Arctornis* sp. nr. *intacta* Walker, (Lymantriidae) on *Macaranga cf. brachytricha* A. Shaw. Whilst the host tree is the same species as that from which the holotype was reared, the identification of the host seems doubtful (see Discussion).

**Vojtechirogas heberti** Quicke & van Achterberg sp. nov.
(Figures 13, 16)

**Material examined**

**Diagnosis**
Morphologically extremely similar to *V. novotnyi*; differs mainly by the mediodorsally interrupted dorsal carina of the head, the presence of the shallow mediolongitudinal depression of the vertex, the slightly larger ocelli and somewhat large size.

**Description**
As *V. novotnyi* but length of forewing 5.7 mm and of body 6.6 mm. Dorsal carina of head interrupted mediodorsally and vertex with a shallow mediolongitudinal depression (Figure 13). OOL: diameter of posterior ocellus: POL = 8:3:8. Vein 1-R1 of forewing paler, similarly pigmented as vein 3-SR. Hind leg slightly wider than of *V. novotnyi*; femur, tibia and basitarsus 4.2, 7.8 and 8.2 times their width, respectively. Head paler than mesoscutum.
Etymology
Named after Paul Hebert in recognition of his major contribution to systematics through his advocacy of DNA barcoding.

Vojtechirogas wantok Quicke & van Achterberg sp. nov.
(Figure 17)

Material examined

Diagnosis
Morphologically extremely similar to V. novotnyi; differs mainly by sculpture of propodeum with a wide, A-shaped carina medioanteriorly with two strong transverse carina, and with posterior arms of “A” abruptly becoming transverse.

Description
As V. novotnyi but length of forewing 3.9 mm and of body 4.7 mm. OOL: diameter of posterior ocellus: POL = 1:1.

Etymology
“Wantok”, in the local language, means “part of my tribe”, in reference to the closely related set of species.

Re-description

Trigonophatnus Cameron, 1907
(Figures 14–25)

Type species, and only known species
Trigonophatnus albobalteatus Cameron, 1907.

Material examined
Holotype female. “[Indonesia, New Guinea], Merauke, Nieuw Guinea Expeditie 1904/5”, “Trigonophatnus albobalteatus Cam., Type, New Guinea” (RMNH).
Figures 26–29. Light micrographs showing propodeal carination of described species of *Vojtechirogas* gen. nov. (26) *V. novotnyi* sp. nov., paratype; (27) *V. heberti* sp. nov., holotype; (29) *V.? wantok* sp. nov., voucher USNM ENT 00211678; (30) *V.? novotnyi* sp. nov., voucher USNM ENT 00211679.
Additional material. One female USNM ENT 00680122, Papua New Guinea, Madang Province, Wanang, 145°10.910' E, 5°13.853' S, 28 April 2007, 100 m, reared from caterpillar collected off Fijian longan, *Pometia pinnata* (Sapindaceae) [see below] (USNM), (GenBank accession JF415905); one male, Papua New Guinea, Central Province, 20 km SE Port Moresby, 26 January 1985, J. W. Ismay (BMNH).

Diagnosis

Vein 1r-m of hind wing vertical (Figure 25); veins SR and 2-M of hind wing sclerotized basally (Figure 14); mediobasal area of second metasomal tergite large and strongly developed (Figure 20); second metasomal suture deep and wide medially (Figure 20); fourth and fifth tergites with sharp lateral margin (Figure 24); tarsal claws without lobe (Figure 22).

Description

**Head.** Face with moderately dense puncturation, without obvious transverse sculpture, slightly protruding. Segments of maxillary palp slightly swollen (females) or slender, not swollen (male). Occipital carina complete dorsally, but absent ventrally and not curved towards hypostomal carina.

**Mesosoma.** More or less smooth and shiny. Notauli deep and crenulated anteriorly. Precoxal sulcus weak. Median area of metanotum without longitudinal carina except at extreme anterior. Propodeum with V-shaped carinae medioanteriorly.

**Forewing.** Venation without conspicuous thickenings and wing membrane entirely evenly setose. Second submarginal cell moderately long, vein 3-SR nearly 2 × length of vein r-m. Vein m-cu more or less straight and making an abrupt angle with vein 2-CU1. Vein cu-a slightly postfurcal and curved.
Hind wing. Junction of veins 1-SC+R and SC+R1 (i.e. where vein 2-SC+R would be) strongly expanded. Vein r-m almost perpendicular, weakly curved. Apex of basal cell with a glabrous patch (Figure 25). Vein m-cu indicated by a small stub opposite vein r-m. Vein SR1 tubular for about basal half, weakly curved basally, and continuing to wing apex without strongly diverging from wing margin.

Legs. Claws without protruding lobes, rounded basally (Figure 22). Apex of hind tibia with a comb of setae but these rather distinct and not strongly modified. Hind tibial spurs weakly curved and setose along their whole length ventrally (Figure 15).

Metasoma. Tergite 1 rather elongate, weakly narrowed subbasally. Dorsal carinae strong and unifying to form strong mediolongitudinal carina shortly before middle of tergite (Figure 20). Dorsople deep. Tergite 2 with very large mediobasal triangular area produced to form strong complete mediolongitudinal carina; otherwise with strong longitudinal striation. Tergite 3 largely smooth. Hypopygium moderately strongly convex.

Notes
The original description by Cameron is generally accurate, and the above is provided because various additional character sets have come to light since Cameron's day, that may be useful for interpreting relationships.

*Trigonophatnus* can be recognized from all other genera of Rogadinae by the highly swollen junction of hind wing veins 2-SC+R and SC+R1. A near perpendicular hind wing vein 1r-m is also found in *Rectivena* van Achterberg, *Korupia* van Achterberg and some *Triraphis* Ruthe, but these have the claws with a large pointed or square basal lobe and have a mediolongitudinal carina on the anterior part of the propodeum.

The voucher specimen USNM ENT 680122 was cited as “Rogadinae” in Hrcek et al. (2011) and its Genbank number is JF415905.

Biology
The remnants (GenBank JF271385) of the larval host (Figure 30) of one reared wasp (USNM ENT 00680122) were identified by DNA as the butterfly *Hypochrysops chrysargyrus* Grose-Smith and Kirby (Lepidoptera: Lycaenidae). We have not successfully reared this species to adults, but Sam Legi has collected adults at Wanang, five of which we have obtained DNA barcode sequences for (GenBank accessions HQ570661, HQ570792, HQ570801, HQ570818, HQ570845). *Hypochrysops chrysargyrus* is a distinctive species in a speciose genus, placed by Sands (1986, p. 30) by itself in its own species group. The species was considered to be endemic to the main island of New Guinea (Sands 1986; Parsons 1998, p. 349), but has recently been recorded from the Torres Straits Islands, within Australian territorial boundaries (Braby 2010, p. 14). Parsons (1998, p. 349) recorded the host as *Pommetia pinnata* J.R. Forster & J.G. Forster (Sapindaceae), which is the same host as that of JF271385.
Discussion

That both *Vojtechirogas* gen. nov. and *Trigonophatnus* are parasitoids of Lycaenidae and appear to be closely related despite many morphological differences is of interest since members of many other genera of Rogadini are parasitic on Limacodidae or Zygaenidae (both Zygaenoidea) (Quicke et al. 2003; Zaldivar-Riverón et al. 2009). Although the Lycaenidae are only distantly related to the Zygaenoidea, their larvae can show considerable similarities in form, and members of the Lycaenidae, and also of the Riodinidae, have been reliably recorded hosts for *Triraphis* in the New World (Shaw 1997). Thus use of Lycaenidae as hosts, although a potential synapomorphy for *Vojtechirogas* gen. nov. and *Trigonophatnus*, appears to be homoplastic within the Rogadini.

From the four specimens of *Vojtechirogas* described above and collectively representing three new species, all but one was reared from *Philiris helena* (Snellen) (Lycaenidae) caterpillars collected from three *Macaranga* species.

Eleven additional specimens reared as part of the Madang Ecology Project have been seen (detailed in Appendix 1). Most of these were similarly reared from *P. helena* on *Macaranga*. However, one specimen (voucher USNM ENT 00211703) is recorded as having been reared from *Brethia* sp. (Choreutidae) from *Ficus pachyrhachis* K. Schum. & Laut., another specimen (voucher USNM ENT 00211675) from *Meekiaaria* sp. (Crambidae) from *Psychotria micrococca* (Laut. & Schum.) Val., and the paratype of *V. novotnyi* sp. nov. as having been reared from *Arctornis* sp. nr. *intacta* Walker (Lymantriidae) feeding on *Macaranga cf. brachytricha* A. Shaw. The last in particular seems doubtful considering the dissimilarity between the larvae of Lymantriidae and Lycaenidae. These records may reflect mistakes in rearing or databasing. On the other hand, outright rejection of such records because of prejudiced beliefs about probable host ranges which are common among parasitoid researchers could lead to false rejection of the doubtful records. A solution for such cases could be attempting to obtain a sequence of the host from the adult parasitoid using the MAPL approach (Rougerie et al. 2010). In the long term, both rearing and molecular detection (Rougerie et al. 2010; Hrcek et al. 2011; Santos et al. 2011) should be used in concert to produce reliable host–parasitoid records.

That the slight morphological differences apparent between specimens represent different species is supported by their different host tree associations and preliminary DNA barcoding evidence. The two most morphologically similar species, *V. heberti* sp. nov. and *V. wantok* sp. nov., differ from one another at six base positions in the 657 base pair read (i.e. approximately 1%). Little has been published to date on typical levels of barcoding region differences between parasitoid species, and it is likely that some groups will typically show more interspecific variation than others depending on clade ages. However, intraspecific variation is typically low (0–0.5%, see e.g. Quicke et al. 2006; Butcher et al. 2011; Veijalainen et al. 2011).

Finally, the new genus described here adds another example to the inventory of derived wing venation within the braconid wasp subfamily Rogadinae. Although all specimens available were obtained through host rearings, their almost entirely yellow coloration and large eyes and ocelli suggest that they are, in common with most other rogadines, predominantly crepuscular or nocturnal. Quicke & Shaw (2005) suggested that the vein thickenings, and curvatures and often associated areas of glabrous and thickened wing cell membrane of nocturnal rogadines might be associated with a compensatory mechanism for possibly reduced strength, though another suggestion...
is that at least in some, the wing membrane modifications could be related to sound production or reflection.

Acknowledgements

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Appendix 1. Collection and voucher details of additional specimens of *Vojtechirogas* gen. nov. from Papua New Guinea.

<table>
<thead>
<tr>
<th>USNM ENT voucher number</th>
<th>Sex</th>
<th>Province &amp; locality</th>
<th>Latitude &amp; longitude</th>
<th>Altitude (m)</th>
<th>Collection date</th>
<th>Host plant</th>
<th>Hosts or tentative hosts</th>
<th>Collection housing voucher at present</th>
</tr>
</thead>
<tbody>
<tr>
<td>00211678</td>
<td>F</td>
<td>East Sepik: Elem</td>
<td>4° 49' S 143° 55' E</td>
<td>100</td>
<td>06 June 2003</td>
<td><em>Macaranga aleuritoides</em> F. Muell.</td>
<td></td>
<td>USNM</td>
</tr>
<tr>
<td>00211679</td>
<td>F</td>
<td>East Sepik: Elem</td>
<td>4° 49' S 143° 55' E</td>
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<td>11 June 2003</td>
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