

MADEIRA INSECTS : ADDITIONS TO THE LIST OF
PARASITIC HYMENOPTERA, WITH
SOME COMMENTS ON PROBLEMS OF CONSERVATION

By M. W. R. DE V. GRAHAM *

With 1 figure

ABSTRACT. The author prefaces the list of additions by an account of some collecting excursions in which he and his wife participated, followed by comments on the ecological importance of certain types of terrain in Madeira.

Records are given of species new to the Madeiran list, as follows: 17 Chalcidoidea, 5 Proctotrupoidea, 3 Braconidae. Notes are added on other rare or little-known species (7 Chalcidoidea, 1 Proctotrupoidea, 1 Ceraphronoidea) and the hitherto unknown male of *Apotetrastichus contractus* (Walker) (Chalcidoidea : Eulophidae) is described and figured. In connection with the records of certain Proctotrupoidea, a lectotype is here designated for *Teleas bassus* Walker ; and information is presented regarding rediscovered syntypes of *Teleas truncatus* Nees and *T. linnei* Nees, lectotypes being designated for both of these.

RESUMO. No presente trabalho, o autor dá uma lista de adições como resultado de colheitas efectuadas por ele e sua mulher e antecedida de comentários sobre as excursões de colheita e importância ecológica de certos tipos de terreno na Madeira.

São assinaladas novas espécies para a Madeira. 17 Chalcidoidea, 5 Proctotrupoidea, 3 Braconidae. São fornecidas notas acerca de espécies raras ou pouco conhecidas (7 Chalcidoidea, 1 Proctotrupoidea, 1 Ceraphronoidea) e o até aqui desconhecido macho de *Apotetrastichus contractus* (Walker) (Chalcidoidea : Eulophidae) é descrito e desenhado. Em conexão com os assinalamentos de certos Proctotrupoidea lectótipos são aqui designados para *Teleas bassus* Walker, *T. truncatus* Nees and *T. linnei* Nees, acrescentando informações sobre a redescoberta de sintipos destas duas últimas espécies.

INTRODUCTION

My wife and I visited Madeira once more in 1987 and spent six weeks on the island, from 15th July until 26th August, as usual with Funchal as the base for our excursions. Our trips into the open country were made

* 5, Salisbury Crescent, Oxford OX2 7TJ, U. K.

partly in a hired car driven by my wife, partly in the Landcruiser belonging to Museu Municipal, and occasionally by taxi.

The weather during our stay was unusual as the cloud cover was rather extensive, more like that of June, consequently it was very humid at lower levels especially. Above the cloud we had some extremely hot days.

On 28th July we had a strenuous though profitable expedition over Paul da Serra to Montado dos Pecegueiros and the ravine of João Delgado, led by Henrique Neves and his assistant Miguel Moreira. After exploring the higher ground between the upper end of João Delgado and Pecegueiros where some collecting was done, we moved on to Montado dos Pecegueiros. It proved difficult to locate a path through the dense cloud-zone forest because here, as elsewhere, the old paths used by the peasants have become progressively less frequented and have become overgrown. After descending a little way down the ridge, we ate our picnic lunch by a tiny pool in the forest and then returned to the Paul. We then crossed to the upper end of the lombo which lies on the western side of Ribeira de João Delgado, intending to follow any available track down the lombo towards Seixal. In the upper part a dense maquis of *Erica* and *Sarothamnus* made progress difficult; farther down, however, a narrow path appeared and I found quite good collecting in this zone down to about 1050 metres, several endemic species being taken. Some *Enytus* (Ichneumonidae) were particularly abundant; notes on these will be given elsewhere (Graham, *in press*). In the evening our party returned to the Paul da Serra. Being well above the cloud-layer all day, we enjoyed unbroken hot sunshine. One lovely sight will be long remembered: great mats of fragrant *Thymus caespitius* growing near the edges of the Paul, particularly above Pecegueiros, swarming with Clouded Yellow butterflies (*Colias crocea*) and bumble-bees, hoverflies (*Eristalis*) and occasionally, wasps of the genus *Podalonia*.

A day trip to Caramujo on 30th July, with João Silva driving us in the Landcruiser, took us from the Paul da Serra at Estanquinhos along the road past Caramujo and down into the São Vicente valley. This tortuous road (which replaces the old mountain footpath) is still in course of construction and strewn with boulders of various sizes. Below Caramujo we walked about 2 km. south-east along the Levada da Ribeira do Inferno where the rich vegetation, somewhat overgrown, provides a wonderful collecting ground. We were delighted to see so many endemic trees, shrubs and herbs all together. *Sonchus squarrosus*, *Geranium palmatum*, *Cirsium latifolium*, *Argyranthemum pinnatifidum* and *Rubus grandifolius* were amongst the species noted. My wife took a rare endemic species of Chalcidoidea here and we captured several other endemic Hymenoptera.

On another day excursion in the Landcruiser we visited Fonte da Pedra, above Achadas da Cruz in the west of the island. Here some overgrown paths leading through scrub on to the south-western slopes of Ribeira da Janela proved very interesting entomologically, several endemic

Hymenoptera being found. Later in the day we crossed the Paul to Bica da Cana and collected in the *Erica*-groves there ; these form refuges for large populations of some endemic parasitic Hymenoptera as well as other species.

We are most grateful to Manuel Biscoito for organizing a trip to the Desertas on 9th August. Leaving early in the Museum launch, with Manuel and his assistants and calling briefly at the shore of Deserta Grande, to ask for the help of Dr. Zino's dinghy, we landed on Ilheu Chão and spent about 5 hours on the summit plateau. With brilliant sunshine it was extremely hot, while for once the wind was light. Collecting was worthwhile, though only small numbers of specimens were taken, which is what one expects on these arid islands. Amongst the Hymenoptera, two interesting species of Chalcidoidea found on our previous visit in 1985 turned up again, whilst another new to the list was found. Collecting done, we waited while Manuel carried out some underwater research. Presently Dr. Zino arrived in his whaling launch and took us to the Museum boat. When Manuel had finished work he entertained us with Dr. Zino and his family to a delightful picnic on the launch. It was late when we left and as we approached Madeira and ran along its southern shore, darkness fell. It was a wonderful sight with all the lights of the island and the signals of the airport, whilst behind us the moon was rising over the Desertas.

A walk on 19th August, along the mountain path from Boca da Encumeada towards Torrinhas pass was very interesting both for collecting insects and observing plants. On the ascent over about 2 kilometres there are said to be about three thousand steps! This part was the most productive for insects, particularly the damp cliffs that border the path, where the vegetation in places consisted essentially of the *Deschampsia-argentea* association of Sjögren (1972). The upper region, towards Pico do Ferreiro and beyond, is more arid and produced few parasitic Hymenoptera, though numerous sandwasps (*Podalonia*) were active on bare sandy ground. We saw a number of Tils (*Ocotea foetens*) as well as Folhado (*Clethra arborea*) in this region, besides a number of endemic herbaceous species. I waited before we reached Pico do Jorge while my wife continued to Torrinhas pass and back, accompanied by João Silva.

On two occasions my wife and I walked along the northern coast cliff-path from Boca do Risco towards Porto da Cruz. This path is sometimes affected by landslides and in places, especially near Espigão Amarelo, is very narrow indeed (at one point only 9 inches wide, with an impressive drop of 300 metres to the ocean below!). This terrain is less frequented than many others, which would account for the presence of a quite rich insect fauna and, in places, of endemic plants. Here and there we passed small groves of *Myrica faya*, *Erica*, *Myrtus* and other shrubs, which afforded shelter to some of the insects caught. These included an endemic lacewing (Chrysopidae) and its two probable Hymenopterous parasites. Some fine bugs (Hemiptera) were taken, including *Cyphopterus retusum* (Flatidae) which appeared to be associated with a *Chenopodium* species. We

had less time to explore the forest nearer Porto da Cruz, where we noted some fine plants of *Aeonium* on the cliffs, but it would certainly repay further investigation.

We could not leave Madeira without visiting the lovely forested slopes of Fajã da Nogueira. Once again we walked, on 11th August, from the powerhouse as far as the great Til, collecting on the way and adding several species of Hymenoptera to our list. Many Madeiran Speckled Wood (*Pararge xiphia*) were seen. Amongst other parasitic Hymenoptera we found several specimens of the uncommon Chalcidoid *Platynocheilus cuprifrons* (Nees) in company with a great number of the small fly *Alophora pusilla* (Mg.) and many *Swammerdamella ? brevicornis* (Mg.) (Dipt., Scaptosidae) upon flowers of *Anthemis cotula* L.

Twice during our stay we visited Jardim da Serra, about 800 m. in the hills above Estreito de Câmara de Lobos. Here there is a Quinta, now unoccupied, built early in the 19th century by Henry Veitch, then Consul in Madeira. He used to grow tea on this estate and some magnificent eucalyptus trees of immense size exist in the grounds. There is also his mausoleum, with a memorial tablet inscribed by his widow. We did some collecting in the vicinity, obtaining interesting Hymenoptera species, amongst them *Phygadeuon posticus* (Ichneumonidae) which has not been taken since Wollaston captured it in Madeira over a century ago. After our second visit we also prospected along the rough track going north to Boca dos Namorados, which leads to very wild country on the west side of Curral das Freiras.

ACKNOWLEDGEMENTS

Again we thank our friends in Madeira who have continued to give invaluable help in various ways : Mr. G. E. Maul and Dr. Manuel Biscoito (Museu Municipal do Funchal), Mr. Henrique Costa Neves (Serviços Florestais) and Dr. F. Zino (Funchal). Mr. João Silva (Museu Municipal) gave us devoted attention when transporting us to out of the way places. Last but not least, my wife for driving us to several interesting localities, also for collecting — although not a specialist, she has developed a critical eye for uncommon species, as the records listed here will show.

We have derived great pleasure from our wanderings in Madeira and will retain vivid memories of what Camões, in a fine sonnet, called "A formosura desta fresca serra".

ECOLOGICAL IMPORTANCE OF CERTAIN TYPES OF TERRAIN IN MADEIRA

As our observations over the past few years have drawn our attention to problems of conservation in the island, some comments on this subject may be appropriate. The international Council for Bird Protection has in preparation a Datasheet for Madeira and its Island Coordinator, Dr.

T. H. Johnson, informed me that the Council in this case is also covering groups other than birds in order to address wider conservation issues. It is hoped that our comments may provide some relevant details of information.

1. São Lourenço promontory. This area has long been recognized as important in respect of its endemic mollusca and some endemic plant species. It is very different from other parts of the island. Our collecting of Hymenoptera Chalcidoidea reveals interesting features. *Ectroma dalmatinum* Hoffer, found near Caniçal, is reported otherwise only from Yugoslavia. Amongst endemic species occurring on São Lourenço but not elsewhere are *Invreia* (= *Euchalcidia*) *aeneonitens* Graham and *Elachertus tumidiscapus* Askew, the latter only in gullies running towards the southern coast, where its host plant *Juncus acutus* L. occurs. Another species, *Eriacydnus atriceps* Walker, has a precarious hold on the promontory, where I took a single female this year (1987) ; it seems to have disappeared since 1980 from its former site on Pico das Arrudas, São Martinho, owing to degradation of this site by quarrying. The Dryinid wasp *Acrodontochelys bouceki* Currado (Hym., Dryinidae) occurs just west of Caniçal. The endemic beetle *Melyrosoma abdominale* Wollaston (Col., Melyridae) appears to be restricted to the promontory and Ilhéu Chão.

2. Small groves of *Erica arborea* at high levels, notably at Achada do Teixeira, near Homem-em-pé, and Ribeira das Cales, both ca. 1450 m. There are two rather similar groves at Bica da Cana. These groves form havens, in overgrazed areas, for several parasitic Hymenoptera species and other insects, some of which are endemic ; amongst these the Braconid *Phanerotoma maculata* (Wollaston) may be noted (see Graham, 1986a). Large populations of the endemic emerald moth *Xenochlorodes nubigena* (Woll.) were also observed in these groves in 1985 and 1987 ; elsewhere only small numbers were found. The very local butterfly *Neohipparchia statilinus* (Hufn.) occurs around the *Erica*-grove at Ribeira das Cales. It is highly desirable to protect these sites, perhaps as parts of a more extensive reserve including some of the highest peaks, for example Achada do Teixeira as part of a reserve embracing Pico Ruivo, itself the site for some extremely rare plants. The groves are being affected adversely by overgrazing and to a small extent by trampling. They were surely more extensive in the 1850s when Wollaston collected there and the presence nowadays of large populations of some insect species is no doubt due to concentration in reduced areas.

3. Areas of dense cloud-zone forest such as those at Montado dos Pegueiros and some sites above Seixal are already considered to be important refuges for the pigeon *Columba trocaz* and for some endemic plants. Owing to the widespread destruction of trees of the family Lauraceae, some Coleoptera may well be confined now to the areas mentioned above.

Protection of the birds and plants would also benefit Coleoptera and other insects. These areas of dense forest have a very sparse field-layer for the most part (see Graham, 1983 : 12). Consequently insects tend to be few in numbers (Wollaston, 1856 : 50-51), particularly species feeding upon herbaceous plants.

4. By contrast with the areas just mentioned, the largest populations of some species of parasitic Hymenoptera, including endemics, are to be found in more open forest where there is a field-layer rich in herbs and grasses. No doubt this applies to other insect groups as well. Protection of some areas of this type is desirable although it may be difficult to achieve ; grasses and herbs are frequently cut for fodder and in some places goats cause considerable degradation of the sites.

Bearing in mind the (sometimes conflicting) needs of humans and the natural world, one must not expect too much from conservation projects. Nevertheless, by judicious selection of a few rather large areas rather than a number of small ones, it may be possible to afford protection to a wide spectrum of plant and animal species within their scope. We strongly support the views expressed by Sjögren (1972 : 73-75) for the protection of plant species but equally relevant to a number of insect groups and other animals.

ADDITIONS TO MADEIRAN LIST

Chalcidoidea

Eurytomidae

Systole albipennis Walker

São Martinho, Pico das Arrudas, 1 ♀, 18.vii.1987. This specimen is conspecific with a European female which I had previously compared with the holotype of *albipennis*. The species is phytophagous in the seeds of certain Umbelliferae. The only umbellifer present on Pico das Arrudas is *Foeniculum vulgare* Mill. and the above specimen may have developed on that plant. In the latest revision of European *Systole*, that of Zerova (1978) the species on *Foeniculum* is regarded as distinct from *albipennis*, under the name *foeniculi* Otten. However, according to the characters which she gives for separating the two (Zerova, 1978 : 403) the above Madeiran specimen agrees with *albipennis*. It is not clear whether *albipennis* is native to Madeira or has been introduced. The possible host-plant, *Foeniculum*, was plentiful in the Funchal valley when the island was first discovered according to Frutuoso (edition of 1979, 2 : 47) although later the area was ravaged by fire. If *albipennis* were native, one might have expected it to be more abundant, whereas only one specimen has turned up in spite of much collecting in several years in the above locality.

Encyrtidae

Anagyrus sp.

Fonte da Pedra, 1 ♂, 15.viii.1987. This is black with only the hinder part of the prepectus paler, the trochanters, knees, and bases of hind tarsi sordid whitish ; it may be a melanic form. Males of this genus are extremely difficult to identify.

Metaphycus dispar (Mercet)

Cliff path, 2 km. west of Espigão Amarelo on the way to Porto da Cruz, 1 ♀, 22.viii.1987. Probably emerged from some Coccid host on a cultivated plant.

Ixodiphagus hookeri (Howard)

Fonte da Pedra, 3 ♀ ♀, 15.viii.1987 (E. M. G.) swept from a sward of close-cropped grass where cattle had been grazing ; Bica da Cana, 1 ♀, 15.viii.1987 (M. de V. G.) also from a grassy area with cattle in the vicinity. The species is a parasite of ticks (Ixodoidea). Some of the few Madeiran tick species occur on native lizards (*Lacerta dugesii*) but it seems more likely that the *Ixodiphagus* were parasitizing the sheep-cattle tick *Ixodes ricinus* (L.) as they were found in grazing areas.

Anabrolepis zetterstedtii (Westwood)

Fajã da Nogueira, 1 ♂, 11.viii.1987, swept from herbage under the great Til (M. de V. G.).

Eupelmidae

Eusandalum inerme Ratzeburg

Ilhéu Chão (Northern Deserta), 1 ♀, 9.viii.1987, dislodged from foliage of *Jasminum odoratissimum* L. growing on the ridge in the northern part of the island (M. de V. G.). This was an unexpected find as most species of the genus are rather rare. The specimen could have emerged from a beetle host on the jasmine.

Anastatus bifasciatus (Geoffroy in Fourcroy)

Bôca do Risco, 1 ♀, 22.viii.1987 (M. de V. G.). Widely distributed in southern and central Europe ; also in western Asia. Attacks eggs of Lepidoptera or, occasionally, those of Hemiptera Pentatomoidea.

Pteromalidae**Homoporus chalcidiphagus** (Walsh & Riley)

Bôca do Risco, 1 ♀, 24.vii.1987, 1 ♀, 22.viii.1987 (M. de V. G.) ; between Bôca do Risco and Espigão Amarelo, 1 ♂, 22.viii.1987 (E. M. G.). Widely distributed in Europe and North America. It has a number of hosts, mostly Eurytomidae, on wild and cultivated grasses.

Dibrachys affinis Masi

Ilhéu Chão, 1 ♀, 9.viii.1987 (E. M. G.), 1 ♀ (M. de V. G.). Occurs in Europe and North America. Parasite of various small moths, sometimes as secondary parasite on Ichneumonid or Braconid species.

Aphelinidae**Coccophagus** sp. near **obscurus** Westwood

Bôca do Risco, 1 ♀, 22.viii.1987 (M. de V. G.). Very close to *obscurus* but with sensilla of first funicular segment more numerous, arranged in three rows ; fore coxae yellow, fore and mid femora yellow. I cannot find any species from Europe, Africa or America which seems to fit it.

Eulophidae**Neochrysocharis aratus** (Walker)

Fajã da Nogueira, 1 ♀, 11.viii.1987 (E. M. G.) ; Lamaceiros, 1 ♀, 24.viii.1987 (M. de V. G.). A widely distributed European species.

Asecodes coronis (Walker)

Fonte da Pedra, 1 ♀, 15.viii.1987 (E. M. G.). Fairly common in Europe.

Eutetrastichus diaphantus (Walker), **comb. n.**

Funchal, garden of Quinta das Cruzes, 1 ♀, 19.vii.1987 (M. de V. G.). In Europe this is a well known parasite in the galls of *Biorhiza pallida* (Oliv.) (Hym., Cynipidae). This gall-wasp does not appear to have been recorded from Madeira but it might be present on some trees of *Quercus robur*, which has been planted sporadically in various parts of the island, including gardens in Funchal.

Aprostocetus toddaliae (Risbec)

Bôca do Risco, 1 ♀, 22.viii.1987 (E. M. G.), 1 ♂, 1 ♀ (M. de V. G.) ; between Bôca do Risco and Espigão Amarelo. 1 ♀, 22.viii.1987 ; 2 km. west of Espigão Amarelo, 1 ♀, 22.viii.1987 (M. de V. G.). This species has a wide distribution in the Old World as a parasite of scale-insects but it may have spread through the cultivation of fruits (the specimens originally described came from Madagascar).

Tamarixia upis (Walker) **comb. n.**

Curral dos Romeiros, 1 ♀, 22.vii.1985 (M. de V. G.). A common species in Europe, a parasite of *Trioza urticae* L. (Hem., Psyllidae) on nettle. Possibly introduced to Madeira.

Mymaridae**Anagrus** sp. near **nigriceps** Smits van Burgst

Mountain path between Boca da Encumeada and Pico Ferreiro, 1 ♀, 19.viii.1987 (M. de V. G.).

Anaphes sp.

Bica da Cana, 1 ♂, 15.viii.1987 (M. de V. G.). Males of this genus are very difficult to identify.

Proctotrupoidea**Scelionidae****Trimorus bassus** (Walker)

Balcões de Ribeiro Frio, 1 ♀, 21.vii.1982 ; Fajã da Nogueira, 1 ♀, 25.vii.1982 (M. de V. G.). This species was described by Walker (1836 : 363, as *Teleas bassus*) from a ♀ or ♀ ♀ which he took near London. There are no specimens now in Walker's collection in BMNH but Haliday's collection (NMI, Dublin) contains two Walker ♀ ♀ under this name, which bear my serial numbers 53 and 54. No. 53 is an *Anteris*. No. 54, which agrees better with the description, is here designated LECTOTYPE of *Teleas bassus* Walker. The Madeiran specimens have been compared with the lectotype and are conspecific with it.

Gryon bolivari (Giard)

Achada do Teixeira, 1 ♀, 13.viii.1987 (E. M. G.). Known otherwise from Mediterranean Europe. Recorded hosts are *Phyllomorpha laciniata*

(Villers), *Coreus marginatus* (L.) and a species belonging either to *Rhopalus* or *Stictopleurus* (Hem., Coreidae) according to Mineo (1979 : 239). Some of these bug species occur in Madeira.

Idris (*Ceratobaeus*) sp.

Rabaçal, 1 ♂, 6.viii.1987 (M. de V. G.). The specimen is completely apterous and has mainly black antennae and legs. It seems to be near *I. (C.) pedestris* (Kieffer), the male of which is unknown (see Huggert, 1979 : 57-59, figs. 122-126).

Telenomus sp.

Bica da Cana, 2 ♀ ♀, 15.viii.1987 (E. M. G.). Appears to belong to the *crassiclava* species-group as defined by Johnson (1984 : 26), but I cannot find a name for it. The specimens have antennae like those of *aradi* Kozlov (see Kozlov & Kononova, 1983, fig. 367) and in other respects appear to be similar to *aradi* except that the marginal vein is longer (about half as long as the stigmal vein), postmarginal vein not more than twice as long as the stigmal, forewing with a weak infumate band extending from the stigma to the hind margin of the wing. A female which I took at a high altitude in the south of France may represent this species.

Telenomus near *chloropus* (Thomson)

Curral dos Romeiros, 1 ♂, 27.vii.1987 (E. M. G.) ; levada da Serra do Faial, 1 ♀, 3.viii.1987 (M. de V. G.) ; Bica da Cana, 1 ♀, 15.viii.1987 (E. M. G.).

I have also taken this species in both northern and southern Europe. It is not clear how many European species exist in the group to which it belongs, hence a discussion of background information is necessary.

The most detailed account available of *T. chloropus* (Thomson) is that of Johnson (1984 : 39-41). He regards *T. sokolovi* Mayr, 1897, *T. tischleri* Nixon, 1939 ; also the forms described by Javahery (1968) as "*truncatus* Nees" and *T. sokolovi* [sic] Mayr, as conspecific with *chloropus*.

One feature characteristic of *chloropus* (*sensu* Johnson) is the presence of postocellar furrows behind the lateral ocelli (Johnson, 1984 : 39 and Fig. 8). However, there are at least three European forms (probably distinct species) that have these furrows but differ in some other respects from one another:

1. The form described as *sokolovi* by Javahery (1968 : 434-436, Figs. 13 B-D, 14 A-F, 15 B-D) has relatively short postocellar furrows, which extended inward beyond the lateral ocelli to a length about equal to the diameter of the latter ; the eyes are thickly clothed with moderately long hairs (the foregoing features as in Johnson's Fig. 8) ; the transverse ridge

behind the eyes is relatively weak laterally and fades out in the middle of the vertex ; the vertex and inner orbits usually have some minute piliferous punctures ; the legs, excepting the coxae, are testaceous. Males have antennal segments 6 to 11 slightly longer than broad.

2. The form *tischleri* is very similar to 1 but females have infusate femora. It is probably conspecific with 1.

3. The form described erroneously as "*truncatus* Nees" by Javahery (1968 : 431 - 434, Figs. 12 A - H, 13 A, 15 A) has long postocellar furrows which extended inwards beyond the lateral ocelli for a distance much greater than the diameter of the latter ; the eyes are sparsely clothed with very short hairs ; the transverse ridge behind the eyes is strong laterally and is traceable right across the vertex ; the vertex and inner orbits lack piliferous punctures or have only a very few ; females have the femora infusate, sometimes also the tibiae. Males have antennal segments 6 to 11 not longer than broad or even very slightly transverse.

In forms 1 to 3 the mesoscutal sculpture consists of very fine engraved reticulation upon which are superimposed numerous minute warts from which hairs arise.

Form 1 agrees best with Thomson's short description of *chloropus* (1860 : 173) as he described the legs as yellow with coxae black ; it also agrees with Johnson's redescription and Fig. 8 of *chloropus* in the length of the postocellar furrows and the conspicuously hairy eyes. On the other hand it disagrees with Johnson's statement (1984 : 39) that *chloropus* has "all coxae dark brown to black ; legs otherwise yellowish-brown to brown, femora and tibia darker medially" ; but then he includes in his concept of *chloropus* form 2 and 3 which have darker legs.

Forms 1 and 3 do not appear to be local races as they can occur together in the same area. The differences noted suggest that they represent distinct species. The Madeiran specimens listed above belong to form 3 and therefore are not typical *chloropus* as illustrated by Johnson (1984, Fig. 8) ; further research is needed before a definitive name for the Madeiran form can be found.

4. This form is the true *truncatus* of Nees. In his discussion of *T. chloropus* Johnson drew attention (1984 : 40 - 41) to the nomenclatural problem posed by the name *Teleas truncatus* Nees, 1834, which was used by Mayr (1979 : 708) and Javahery (1968) for a species of *Telenomus*. Some material from Nees' collection was examined by Mayr who, however, did not see Thomson's material of *chloropus*. Szabó (1978 : 222) designated a neotype for *truncatus* as the original Nees material was supposed to have been destroyed but Johnson (1984 : 41) reported that this neotype had been destroyed. It is not generally known that a number of syntypes of Nees Chalcidoidea and Proctotrupoidea s. lat. are still extant in University Museum, Oxford, having been borrowed by Westwood in 1836 (Graham.

in press). Amongst these are two syntypes relevant to the present discussion. One is a female *Telenomus* labelled by Westwood "Teleas truncatus Es. [Esenbeck] 2. 289. E Mus. Esenb.". It is in good condition except that the clava of the left antenna is missing. As it agrees with the description, and the neotype is destroyed, I here designate this female syntype LECTOTYPE of *Teleas truncatus* Nees, 1834. This specimen shows that *truncatus* is not conspecific with *chloropus* because the lectotype has the posterior half of the mesoscutum longitudinally striate and for the same reason it is not conspecific with the Madeiran species.

The second specimen in Oxford is a female *Telenomus* labelled by Westwood "Teleas Linnaei Esenb. E Mus. Esenb.". It is in good condition, agrees with the description and is conspecific with the lectotype of *truncatus*. I here designate it LECTOTYPE of *Teleas linnei* Nees (1834 : 288). It is noteworthy that Mayr (1879 : 708) already placed *linnei* in synonymy with *truncatus* on the basis of a Nees specimen, since destroyed.

These two lectotypes have relatively long postocellar furrows as in the Madeiran form 3 above, but are immediately distinguished by the longitudinal striae on the mesoscutum.

A female of "chloropus" was recorded from Tenerife by Johnson (1984 : 40) but I have not seen this specimen and cannot say to which of the above forms it belongs.

Of the hemipterous hosts recorded for form 3 (Javahery, 1968 : 434) two are found in Madeira, viz., *Piezodorus lituratus* (F.) and *Aelia acuminata* (L.) (Hem., Pentatomidae). The former occurs on gorse (*Ulex europaeus*) and broom (*Sarothamnus scoparius*) both of which grow in the localities where the *Telenomus* under discussion was found in Madeira.

I c h n e u m o i d e a

B r a c o n i d a e

Bracon sp. near *fulvipes* Nees

Fajã da Nogueira, 2 ♂♂, 11.viii.1987 (E. M. G.). The species of this group of *Bracon* need revision and I can only attempt an approximate placing.

Chrysopthorus hungaricus (Zilahi-Kiss)

Between Bôca do Risco and Espigão Amarelo, on cliff-path leading to Porto da Cruz, 1 ♂, 24.vii.1987, 1 ♂, 22.viii.1987 ; 2 km. west of Espigão Amarelo, 1 ♀, 22.vii.1987 (M. de V. G.). These specimens were swept from foliage of *Myrica faya* Ait. growing on the seaward edge of the path. I took some specimens of a green lacewing (Chrysopidae) in the same places. Dr. P. C. Barnard (British Museum (Nat. Hist.)) kindly examined a specimen and informed me that it was *Atlantochrysa pseudoatlantica* (Tje-

der) which is apparently endemic to Madeira. *Chrysopophorus* species are known to parasitize Chrysopidae and it seems likely that *A. pseudo-atlantica* may be a host of *C. hungaricus*, or one of its hosts; in Madeira. The parasite is widely distributed in Central and southern Europe and has been reared from *Chrysopa flavifrons* Brauer, *C. ventralis* Curt. and *C. carnea* Steph.

Blacus armatulus Ruthe

Fajã da Nogueira, 1 ♀, 11.viii.1987 (M. de V. G.). A rather uncommon European species.

NOTES ON RARE OR LITTLE KNOWN SPECIES IN MADEIRA

Chalcidoidea

Pteromalidae

Makaronesa basicyanea (Walker)

Hitherto only a single ♀ was known (the holotype of *Pteromalus basicyaneus* Walker, 1872), taken in Madeira by Wollaston (see Graham, 1969 : 579 and 1975 : 52).

New record. Madeira, Queimadas, 1 ♀, 13.viii.1987 (M. de V. G.). This specimen agrees in structure with the holotype but it differs slightly in colour, the head and thorax being bronze instead of blue-green. It was swept in relict forest on the path from the Pico das Pedras road to Casa das Queimadas.

Spilomalus biquadratus (Wollaston)

New record : Desertas, Ilhéu Chão, 1 ♀, 9.viii.1987 (E. M. G.). Hitherto known only from 3 specimens, a ♀ from Montado dos Pecegueiros and a ♂ from Deserta Grande, both taken by Wollaston, also a ♀ captured near Poiso by Graham (see Gijswijt & Graham, 1986 : 126).

Eulophidae

Cirrospilus pictus atlanticus Askew

New record. Bôca do Risco, 1 ♀, 24.vii.1987 (E. M. G.). Has been taken rarely in Madeira and the Canary Islands.

C. nephelodes Graham

In 1987 specimens were found by us at Rabaçal and Caramujo. The species appears to be associated with the grass *Festuca donax* Lowe growing on steep cliffs.

Chrysocharis miranda Graham

Levada do Inferno, below Caramujo, 1 ♂, 1 ♀, 30.vii.1987 (E. M. G.). Previously this beautiful species was known only from 3 ♂♂ taken at Caldeirão Verde and 1 ♀ at Queimadas.

Aprostocetus pausiris (Walker)

Hitherto recorded from 1 ♀ taken near Poiso (Graham, 1983 : 35). New record : Ribeira das Cales, 1 ♀, 3.viii.1987 (E. M. G.). This is a very small specimen which resembles some collected in Mediterranean Europe. These isolated records suggest that the species may have been recently introduced from that area.

Apotetrastichus contractus (Walker)

Hitherto the only records were of 2 ♀♀ taken by Wollaston : one on Ilhéu Chão (Northern Deserta) and the other in Madeira (unlocalized), the latter specimen being described by Walker (1872 : 129) as a distinct species, *Tetrastichus perpusillus*. The species *contractus* has recently been transferred to a new genus *Apotetrastichus* and *perpusillus* placed in synonymy with it (Graham, 1987 : 48).

New records. Madeira : Levada da Serra do Faial, near João Frino, 2 ♀♀, 23.vii.1987 ; Levada da Serra do Faial, 3 km. south of Lamaceiros, 1 ♀, 24.viii.1987 ; Balcão de Ribeiro Frio, 1 ♂, 8.viii.1987 (M. de V. G.).

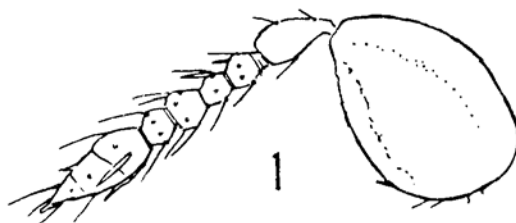


Fig. 1.— *Apotetrastichus contractus* (Walker), ♂, right antenna, internal aspect.

One ♀ is somewhat damaged. The ♂, hitherto unknown, resembles the ♀ in colour but has the antennal scape wholly yellowish. The antenna (Fig. 1) has the scape greatly swollen and hardly 1.5 times as long as

broad, with a trace of a linear sensory plaque on its front margin ; flagellum less strongly clavate than in the ♀, funicle with 4 segments which are hardly longer than broad, clava rather similar to that of ♀ ; each segment of the funicle and clava has a single sparse whorl of setae which are about as long as the segments themselves. The male antenna is remarkably dissimilar to that of ♂ *postmarginalis* (Bouček) which is considered to belong to the genus *Apotetrastichus* (see Graham, 1987, fig. 61). Comparable differences between the males of related species are known, however, in other groups, e.g., subgenus *Ootetrastichus* of the genus *Aprostocetus*. The gaster of the above male is missing but the length of the body would probably have been about 0.6 mm. originally. The female body varies in length from 0.7 to 1.0 mm. The species is thus one of the smallest Palaeartic Tetrastichinae.

The biology of only one species of *Apotetrastichus* is known : *A. postmarginalis* has been reared from immature aphids. It will be interesting if *contractus* also proves to have aphid hosts.

Proctotrupoidea

Scelionidae

Trimorus wollastonae Graham

Lombo on western side of Ribeira de João Delgado, ca. 1100 m., 2 ♀♀, 28.vii.1987 (M. de V. G.). Previously recorded only from the Fanal and Caldeirão Verde (Graham, 1984 : 89-91).

Ceraphronoidea

Ceraphronidae

Conostigmus brunneipes Dodd

Levada do Inferno, below Caramujo, 1 ♀, 30.vii.1987 (E. M. G.) ; 1 ♀ (M. de V. G.). The original material of this species was collected by Wollaston in Madeira (locality not known). Graham added (1986b : 40) records from Queimadas, Lombada das Vacas, and Ribeiro Bonito. The species is evidently associated with cloud-zone vegetation at high levels.

Chrysoidea (Bethyloidea)

Bethylidae

Bethylus latus Wollaston

I have recently found the ♂ of this species : Rabaçal, 2 ♂♂, 6.viii.1987 ; Desertas, Ilhéu Chão, 1 ♂, 9.viii.1987 (M. de V. G.). As I surmised

(1984 : 104) the ♂ has essentially the same diagnostic characters as the ♀ and would run to *latus* in my key to Madeiran species of *Bethylus* (1984 : 103). The lateral ocelli are separated from the edge of the occiput by a distance about equal to POL ; the mandibles have their outer (lower) edge evenly curved and not sinuate basally, and are testaceous in colour ; the antennae are wholly testaceous, the legs mainly so.

This is the only species of *Bethylus* I have so far found on Ilhéu Chão. Wollaston stated (1858 : 28) that he had taken *B. tenuis* 'abundantly' on this island but I can find only one specimen in his collection. It is curious that it has not turned up again.

REFERENCES

Frutuoso, G.:

1979. *Livro segundo das Saudades da Terra* [reprint of edition of 1968], xxiii + 473 pp. Ponta Delgada.

Gijswijt, M. J. & Graham, M. W. R. de V.:

1986. The genus *Spilomalus* Graham, 1956 (Hymenoptera : Chalcidoidea, Pteromalidae). *Entomologische Berichten* 46:124-127.

Graham, M. W. R. de V.:

1969. The Pteromalidae of north-western Europe (Hymenoptera : Chalcidoidea). *Bulletin of the British Museum (Natural History) Entomology, Supplement* 16:1-908.
1975. Some Chalcidoidea (Hymenoptera) from Madeira, including a new genus and two new species. *Entomologist's Gazette* 26:47-58.
1983. Madeira insects : faunal notes, additions and descriptions of new species of Chalcidoidea (Hymenoptera). *Boletim do Museu Municipal do Funchal* 35(151): 5-40.
1984. Madeira insects, mainly Hymenoptera Proctotrupoidea, Ceraphronoidea, and Bethyloidea. *Boletim do Museu Municipal do Funchal* 36(159):83-110.
- 1986a. Rediscovery of *Phanerotoma maculata* (Wollaston) (Insecta, Braconidae) in the high-altitude zone of Madeira. *Bocagiana*, No. 103:1-4.
- 1986b. Madeira insects (chiefly Hymenoptera) including additions to the list and descriptions of three new species of Chalcidoidea. *Boletim do Museu Municipal do Funchal* 38(173):28-42.
1987. A reclassification of the European Tetrastichinae (Hymenoptera : Eulophidae), with a revision of certain genera. *Bulletin of the British Museum (Natural History) Entomology Series* 55(1):1-392.

Huggert, L.:

1979. Revision of the West Palaearctic species of the genus *Idris* Förster s.l. (Hymenoptera, Proctotrupoidea : Scelionidae). *Entomologica Scandinavica*, suppl. No. 12:5-60.

Javahery, M.:

1968. The egg parasite complex of British Pentatomoidea (Hemiptera) : Taxonomy of Telenominae (Hymenoptera : Scelionidae). *Transactions of the Royal Entomological Society of London* 120(19):417-436.

Johnson, N. F.:

1984. Systematics of Nearctic *Telenomus*: classification and revisions of the *podisi* and *phymatae* species groups (Hymenoptera: Scelionidae). *Bulletin of the Ohio Biological Survey* (New Series) 6(3):i-x, 1-113.

Kozlov, M. A.:

1967. [Palaeartic species of egg parasites of the genus *Telenomus* Haliday (Hymenoptera, Scelionidae, Telenominae)]. *Entomologicheskoe Obozrenie* 46:361-378. [in Russian].

Kozlov, M. A. & Kononova, S. V.:

1983. [Telenominae of the USSR (Hymenoptera, Scelionidae, Telenominae)]. *Opredeliteli po Faune SSSR* 136:1-329. [in Russian].

Mayr, G.:

1879. Ueber die Schlupfwespengattung *Telenomus*. *Verhandlungen der zoologisch-botanischen Gesellschaft in Wien* 29:697-714.

Mineo, G.:

1979. Studies on the Scelionidae (Hym. Proctotrupeoidea) IX. Material for a revision of the genus *Gryon* Hal., with description of 4 new species (*G. australfricanum*, *G. eremiogryon*, *G. larachii*, *G. nicolai*) and notes on other Scelionids. *Bolletino del Laboratorio di Entomologia Agraria "Filippo Silvestri" di Portici* 36:234-265.

Nees von Esenbeck, C. G.:

1834. *Hymenopterorum Ichneumonibus affinium, Monographiae, genera europaea et species illustrantes* 2:pp.448. Stuttgart and Tübingen.

Nixon, G. E. J.:

1939. Parasites of hemipterous grain pests (Hymenoptera: Proctotrupeoidea) *Arbeiten über morphologische und taxonomische Entomologie* 6(2):129-136.

Sjögren, E.:

1972. Vascular plant communities of Madeira. *Boletim do Museu Municipal do Funchal* 26(114):45-125.

Szabó, J. B.:

1978. Neue und wenig bekannte *Telenomus* Haliday, 1833 Arten aus dem Karpatenbecken (Hymenoptera: Scelionidae). *Folia entomologica hungarica* (series nova) 31(2):219-236.

Thomson, C. G.:

1860. Sverges [sic] Proctotruper (Fortsättning). *Öfversigt af Kongligen Vetenskaps-Akademiens Förhandlingar* 17:169-181.

Walker, F.:

1836. On the Species of *Teleas*, &c. *Entomological Magazine* 3:341-370.

Wollaston, T. V.:

1856. *On the variation of species with special reference to the Insecta: followed by an inquiry into the nature of genera.* pp. vi, 206. London.
1858. Brief Diagnostic Characters of undescribed Madeiran Insects. *Annals and Magazine of Natural History* (3)1:18-28, 113-125.

Zerova, M. D.:

1978. [Chalcidoidea, Eurytomidae.] *Fauna Ukraini* 11, Parasitic Hymenoptera, 9th issue :
1-460 [-465], Kiev. [in Ukrainian].

Received 1.ii.1988