Second report into the *Chrysis ignita* group – a provisional approach to gain confidence in identifying the specimens

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I have now gained more experience in identifying specimens of the genus *Chrysis* with the help of grants from BWARS and BENHS in visiting further, and making loans from, museums. In addition, I have started to look at personal collections of Chrysididae, including my own collection. As such, I am now able to give the following advice for the nine names used by Morgan (1984), although I still need more experience of specimens of *C. schencki*.

1. The nine names of Morgan that will be considered are: *C. pseudobrevitarsis, C. longula, C. ruddii, C. angustula, C. ignita, C. impressa, C. schencki, C. rutiliventris* and *C. mediata*.
2. Kunz (1994) reduced these nine names of Morgan to three species: *C. pseudobrevitarsis, C. mediata* and *C. ignita*.
3. The *C. ignita* of Kunz includes Morgan's names: *angustula, impressa, schencki, rutiliventris, longula, ruddii* besides *ignita*, although *longula* and *ruddii* are recognised as varieties. I will refer to the *C. ignita* of Kunz as the *C. ignita* complex.

I have been able to find specimens of Morgan's nine names which agree with the characteristics given by Morgan. There are, however, specimens which are difficult to place with one of the names of Morgan. To overcome this problem I have developed a set of characters which will, hopefully, enable you to build up a set of "type" specimens for each name. Your set of "type" will then give you confidence to determine the more difficult specimens.

Please follow the following procedure. I will eventually prepare a set of illustrations, if the procedure is welcomed, but for this report, you will need reference to Morgan (1984).

Step 1 – Do not consider specimens taken in Scotland and Ireland. This step removes the complication in trying to identify specimens with the name *C. rutiliventris* that comes out in the earlier of the two couplets for *C. rutiliventris* in Morgan's key.

Step 2 – You need to decide that your specimens are not *C. longula* or *C. pseudobrevitarsis*. It is very possible that you will never find these species in the field and will only know them from museum collections because of their rarity. Both species seem to be relatively large, being 10mm or more in body length. Thus if you find such a large specimen you should immediately suspect one of these two species. Single diagnostic characters for these two species are:

C. pseudobrevitarsis – Spurs on the middle tibiae are of the same length.

C. longula – Punctures at the base of gastral tergum two are very large and close together. These punctures are as large as those on the mesoscutum and are so close together that the individual punctures are separated by ridges.

Step 3 – Separation of *C. ruddii*. Punctures on the second gastral tergum small (relative to those on the first gastral tergum) and of uniform size and dispersion, except at the rear margin of the tergum. This character is so distinctive that *C. ruddii* is readily recognised. The extensive copper-red colouration mentioned by Morgan may be almost as extensive on some specimens of most of the names in the *C. ignita* complex.

Step 4 – You are faced with Morgan's couplet 9 comparing the larger punctures on the anterior third of the second gastral tergum with the largest punctures on the first gastral tergum. Note Morgan's additional comments are very important.

If,

1. the basal punctures on the second gastral tergum are large (0.75-1.00 of those on the first gastral tergum),
2. extending more than one-third the length of the tergum,
3. and tergum three is bulbous go to Step 5 to separate the names*: ignita*, *impressa* and *schencki*.

If,

1. the basal punctures on the second gastral tergum are small (about 0.5 or smaller than those on the first gastral tergum),
2. or, if larger, extending less than one-third the length of the tergum,
3. and tergum three is not bulbous go to Step 7 to separate the names: *angustula*, *mediata* and *rutiliventris*.

Step 5 – First separate *C. ignita* from *C. impressa* and *C. schencki* using the following seven characters. For a "type" specimen of *C. ignita* the specimen must show all the seven characters.

1. First and second flagellar measurements as given in Morgan, i.e. first flagellar (third antennal) segment divided by the second flagellar (fourth antennal) segment.

2. Punctures sharply defined in the mid-line of gastral tergum three.
3. Gastral tergum three very bulbous, with latero-posterior margins approaching right-angles.
4. Apical rim of gastral tergum three with almost parallel sides.
5. Teeth of the apical rim of gastral three sharply produced.
6. Large punctures on gastral tergum two extend for, at least three-quarters of the length of the tergum.
7. Scapal basin with a flat bottom. Antennae must be moved forward to see this character.

In contrast, *C. impressa* and *C. schencki* show the seven characters as follows:

1. First and second flagellar measurements as given in Morgan (see above).
2. Punctures near the mid-line of gastral tergum three small or vague.
3. Gastral tergum three less bulbous than *C. ignita*, shape mid-way between a semicircular shape and the shape shown by *C. ignita*.
4. Apical rim of gastral tergum three converging posteriorly.
5. Teeth on the apical rim of gastral three bluntly produced.
6. Large punctures on gastral tergum two extend for, at most, half of the length of the tergum.
7. Scapal basin with a concave bottom. Antennae must be moved forward to see this character.

Step 6 – This step separates the very rare *C. schencki* and the very common *C. impressa*.

Females – The two characters given by Morgan relating to the shape of the hind femur and the shape of the black areas on the gastral sternum two readily separate these two names.

Males – The unusually large difference in length between flagellar segments one and two given in Morgan gives the initial clue to the recognition of this name. The mandibular characters are difficult to appreciate but the abrupt or gradual change of punctuation and the shape of the basal margin I have found the easier characters to appreciate.

Step 7 – *C. angustula* can be separated from *C. mediata* and *C. rutiliventris* by the following two characters:

1. Lateral edge of the propodeal teeth are inset from the tip of the metapleural teeth when viewed dorsally.
2. The brow-ridge shaped like a drooping moustache and the two ventrally-directed ends gradually grade into the surface of the head.

For the "type" specimen of *angustula* the following six characters must be shown.

1. Visually lateral edge of the propodeal teeth are inset from the tips of the metapleaural teeth.
2. MPL at least 0.85 times of PPW (See Morgan for meaning of MPL and PPW).
3. Brow ridge shaped like a drooping moustache and the two ventrally-directed ends gradually grading into the surface of the head.
4. Large punctures at the base of gastral tergum two distinctly smaller than those on gastral tergum one.
5. Margins of gastral tergum two not bulbous, except slightly at its extreme posterior. Margins of gastral tergum two more-or-less straight and converging anteriorly. This gastral two character can be linked to the description of this name as being "small and very slim", by which it can be recognised with the naked eye.
6. Gastral tergum three not bulbous, but semicircular in outline, or even tending to be triangular in shape.

C. rutiliventris and *C. mediata* has the propodeal teeth not inset to the metapleural teeth and the brow-ridge, although it may some times be drooping, does not gradually grade into the head but the two ventrally-directed ends are abruptly up-standing from the surface of the head.

Step 8 – To separate *rutiliventris* from *mediata* each of the "type" specimens for each name must show the following six characters.

C. rutiliventris

1. Area between the eyes rectangular.
2. Propodeal teeth distinctly projecting
3. Flagellar segments one and two black.
4. Rim of gastral tergum three narrow.
5. Punctuation just below the brow-ridge relatively fine like those ventrally and laterally situated.
6. Male genitalia with distinctive character as illustrated by Morgan. Probably the male genitalia of all the names within the *C. ignita* complex show a genitalia with this distinctive character, although further work needs to be carried out to check. Female "ovipositor" with wide segments – often it is difficult to show this character by pulling out the "ovipositor", so this character cannot be made compulsory for the "type" specimen.

C. mediata

1. Area between the eyes almost square.
2. Propodeal teeth not distinctly projecting.
3. Flagellar segments one, and some times two, metallically coloured.
4. Rim of gastral tergum three wide.
5. Punctuation just below the brow-ridge coarse, coarser than those ventrally and laterally situated.

6. Male genitalia with distinctive character as illustrated by Morgan. Female "ovipositor" with clearly elongated segments. These male and female characters determine *C. mediata* as a distinct species from *C. ignita* complex.

On the Saturday of the Annual Meeting of BWARS at Liverpool 2003 I will be available to confirm if "type" specimens have been found. I will also bring along some "type" specimens for comparison. On the Sunday I have offered a talk on how to deal with the specimens which are not "type" specimens, i.e. the difficult specimens. It is a good investment to buy and use a fluorescent lamp to view the punctures more easily and avoid surface reflection. I will bring my fluorescent lamp for demonstration.

Status and Quality Coding of aculeate Hymenoptera – Part 9: Wasps and Bees of Part 4 of the Provisional Atlas

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In this paper I will review the 51 species of wasps and bees from Part 4 of the Provisional Atlas (Edwards & Telfer, 2002). Archer (1999, 2002) defined the six statuses that are used in this paper.

Very rare species: 9 species
Chrysis fulgida, Chrysura hirsuta, Passaloecus turionum, Andrena ferox, A. gravida, A. lathyri, Lasioglossum angusticeps, Osmia parietina, Nomada errans. P. turionum was only recently added to the British list.

Rare species: 5 species.
Chrysura radians, Priocnemis coriacea, Passaloecus clypealis, P. monilicornis, Nomada ferruginata. Previously *P. clypealis* and *N. ferruginata* were provisionally given a Very rare status. From a study of their maps *C. radians* and *N. ferruginata* seem to show a loss of range.

Scarce species: 9 species.
Hedychrum niemelai, Priocnemis susterai, Diodontus insidiosus, D. tristis, Passaloecus eremita, Andrena apicata, A. nitidiuscula, Lasioglossum brevicorne, L prasinum. Previously *H. niemelai, A. nitidiuscula* and *L. brevicorne* were provisionally given a Rare status. *P. emerita* was only recently added to the British list and seems to be in the process of extending its range. From a study of its map *H. niemelai* seems to have disappeared from East Anglia.

Restricted species: 3 species.
Andrena flavipes, Lasioglossum laevigatum, Nomada fucata.

Widespread species: 13 species.
Diodontus luperus, D. minutus, Passaloecus corniger, P. gracilis, P. insignis, P. singularis, Colletes fodiens, C. similis, Andrena cineraria, A. praecox, Nomada lathburiana, Epeolus cruciger, E. variegatus.

Universal species: 4 species.
Priocnemis perturbator, P. schioedtei, Evagetes crassicornis, Colletes daviesanus.

Two species, *Hedychrum rutilans* and *Evagetes siculus* are restricted to the Channel Islands and are not included in my national status and quality coding system.

The six species (*Dolichovespula norwegica, D. sylvestris, Vespula germanica, V. vulgaris, Bombus humilis, B. subterraneus*) would still have the statuses given in Archer (1998). A comment has been made that it is probably wrong to use the same quality coding system for the social and solitary species. A nest of a social species is not really the equivalent of a nest of a solitary species since there are many more individuals associated with a nest of a social species than a nest of a solitary species. As such, compared with solitary species, the social species may be given a lower status than perhaps is appropriate. I will leave it to others to determine a new status system for the social species. When determining the national species quality or species quality score for a site I only consider the solitary species.

Archer, M.E. 1998. Status and Quality Coding of species of aculeate Hymenoptera – Part 5: The social wasps and bees. BWARS Newsletter Autumn 1998: 13-14.