

Key to the Chrysid Wasps (Chrysididae) of the British Isles and the Channel Islands

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Introduction

Currently there are 38 species of chrysid wasps in the British fauna arranged in two subfamilies; The Cleptinae has one genus and two species and the Chrysidinae. The Chrysidinae is divided into two tribes: the Elampini with seven genera and 15 species and the Chrysidini with four genera and 21 recognised species although the number of species in *Chrysis* is unknown.

Checklist

Family Chrysididae

Subfamily Cleptinae

Cleptes Latreille, 1802

nitidulus (Fabricius, 1793)

semiauratus (Linnaeus, 1761)

pallipes Lepeletier, 1805

Subfamily Elampinae

Elampus Spinola, 1806

Notozus Förster, 1853

panzeri (Fabricius, 1804)

scutellaris (Panzer, 1798) preocc.

constrictus misident.

foveatus (Mocsáry, 1914)

Omalus Panzer, 1801

aeneus (Fabricius, 1787)

puncticollis (Mocsáry, 1887)

Philoctetes Abeille de Perrin, 1879

truncatus (Dahlbom, 1831)

Pseudomalus Ashmead, 1902

auratus (Linnaeus, 1758)

violaceus (Scopoli, 1763)

Hedychridium Abeille de Perrin, 1878

ardens (Latreille in Coquebert, 1801)

coriaceum (Dahlbom, 1854)

cupreum (Dahlbom, 1845)

integrum (Dahlbom, 1854)

roseum (Rossi, 1790)

Hedychrum Latreille, 1802

niemelai Linsenmaier, 1959
nobile misident.
nobile (Scopoli, 1763)
rutilans Dahlbom, 1854
intermedium misident.

Holopyga Dahlbom, 1845
generosa Förster, 1853
ovata Dahlbom, 1854

Subfamily Chrysidinae

Chrysis Linnaeus, 1761
angustula Schenck, 1856
brevicens Tourier, 1879
bicolor Lepeletier, 1806
corusca Valkeila, 1971
fulgida Linnaeus, 1761
gracillima Förster, 1853
ignita (Linnaeus, 1758)
illigeri (Wesmael, 1839)
chrysoprasina Hellén, 1919, preocc.
helleni Linsenmaier, 1959
succincta misident.
Impressa Schenck, 1856
longula Abeille de Perrin, 1879
mediata Linsenmaier, 1951
pseudobrevitarsis Linsenmaier, 1951
ruddii Shuckard, 1836
vanlithi Linsenmaier, 1959
schencki Linsenmaier, 1968
schenckiana Linsenmaier, 1959, preocc.
solida Haupt, 1957
terminata Dahlbom, 1854
viridula Linnaeus, 1761
ornatus Smith, 1851

Chrysura Dahlbom, 1845
hirsuta (Gerstäcker, 1869)
osmia (Thomson, 1870)
radians (Harris, 1776)
pustulosa (Abeille de Perrin, 1878)

Trichrysis Lichtenstein, 1876
cyanea (Linnaeus, 1758)

Pseudospinolia Linsenmaier, 1951

Spinolia Dahlbom, 1854
neglecta (Shuckard, 1836)

Preparation of specimens for identification

Specimens should be pinned to the left or right of the mesoscutum. The wings and legs set clear of the body so that the dorsal and ventral surfaces are visible. The antennae should be moved so that the mandibles are visible and opened. The male genitalia of *Hedychrum* species should be exposed by dissection. The genitalia are enclosed in a tube of the hidden metasomal tergites and sternites. The ovipositor tube and male genitalia of *Chrysis* species which have posterior teeth on the apical rim should be exposed by dissection.

External Morphology

Fig 1A shows a dorsal view of *Chrysis* with its body parts divided into three parts: head, middle or mesosoma and hind or metasoma. The dorsal segments of the metasoma are called tergites and the ventral segments sternites. Fig 1B shows a frontal head view particularly of the frontal carina and vague outline of the scapal basin. The antenna consists of the basal scape followed by the pedicel and flagellum consisting of flagellomeres. POD distance between posterior ocellus. OOD distance between eye and ocellus.

Distribution

British and Irish species distribution maps are available by The Bees, Wasps and Ants Recording Society (www.bwars.com).

Nomenclature changes and additions

New species: *Chrysis corusca*, *C. solida*, *C. terminata*, *Elampus foveatus*, *Hedychrum nobile*.

Chrysis vanlithi is a replacement for *C. rutiliventris*.

Chrysis leptomandibularis is not a new species.

Chrysis parietis and *C. horridula* are cryptic species near *C. ignita*.

Chrysis borealis is a cryptic species near *C. impressa*.

Fig. 1A – Dossal View of *Chrysis*

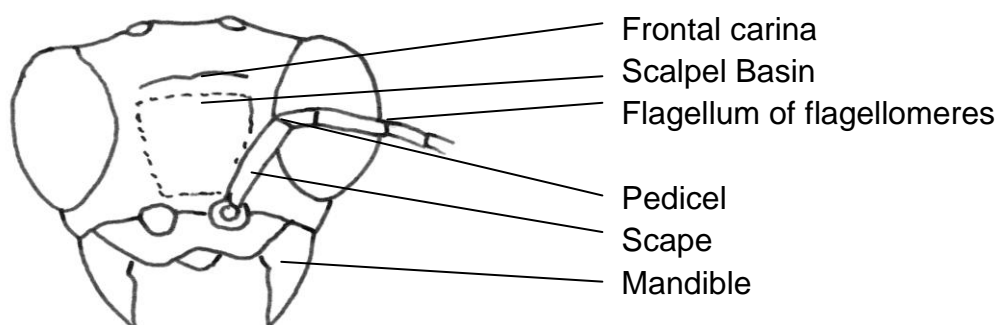
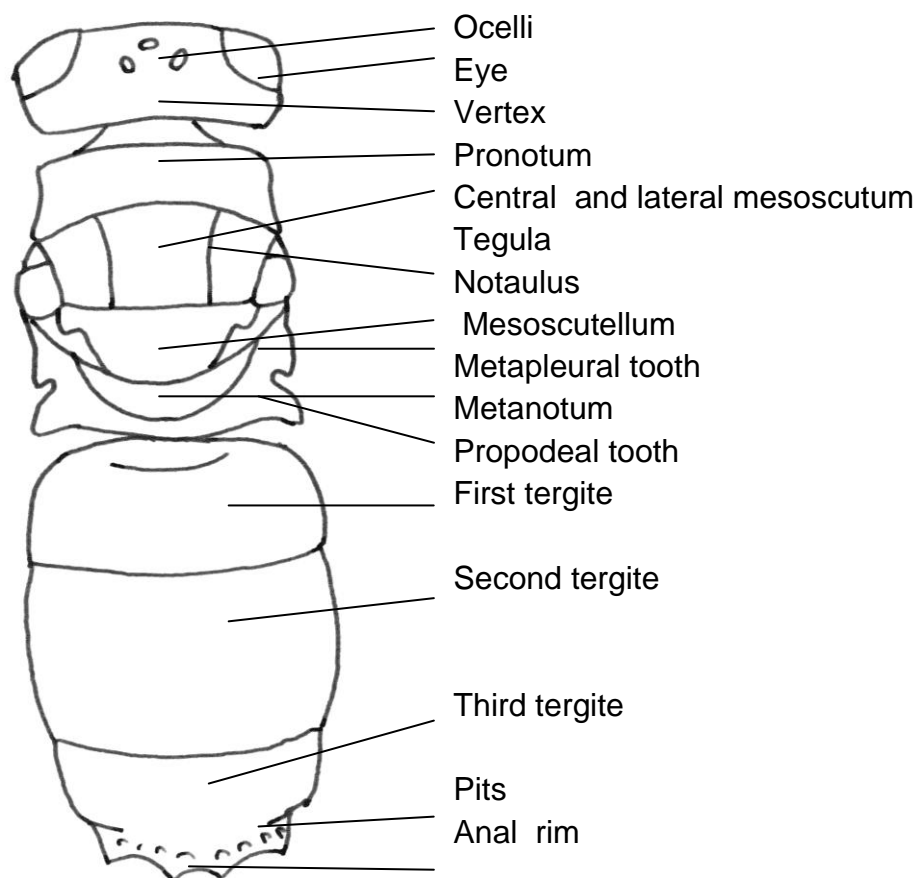


Fig. 1B – View of frontal head

Key to the Subfamilies

1A. Metasoma with four (female) or five (male) visible tergites, ventral surface convex. Pronotum with anterior transverse groove bounded by distinct anterior bulbous collar. (Fig. 2).**Cleptinae**



Fig. 2 – Dorsal view of *Cleptes*

1B. Metasoma with three visible tergites, ventral surface concave. Pronotum without anterior transverse groove and anterior bulbous collar (Fig. 1A). ...**Chrysidinae**2

2A. Discoidal cell of fore wing absent, or considerably less distinct than other surrounding cells (Fig. 3A, e.g. *Pseudomalus*). Third tergite lacking a transverse row of pits. Lateral edges of metapleuron and propodeum continuous (Fig. 4A). Claws either forked at apex, or several teeth behind the apex, or with one very small median tooth. (Fig. 5).....**Elampini**

2B. Discoidal cell as distinct as other cells in the fore wing (Fig. 3B, e.g. *Chrysis*). Third tergite with a transverse row of pits. Lateral edges of metapleuron and propodeum interrupted with a metapleural tooth (Fig. 4B). Claw simple, with no additional teeth behind the apex.**Chrysidini**

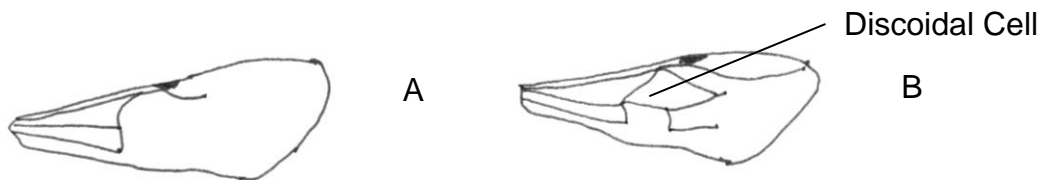


Fig. 3 – Dorsal view of fore wing: A – *Pseudomalus*, B - *Chrysis*

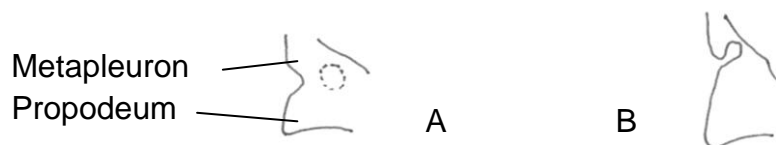


Fig 4 – Dorsal view of metapleuron and propodeum: A - *Pseudomalus*, B - *Chrysis*



Fig. 5 – View of claws: A – *Omalus*, B – *Hedychrum*, C – *Hedychridium*, D – *Holopyga*

A B C D

Key to the species of *Cleptes*

- 1A. Pronotum posteriorly with continuous deep row of punctures. Female mesoscutum metallic golden-red. ***C. semiauratus* (Linnaeus)**
 1B. Pronotum posteriorly without row of punctures. Female mesoscutum black.
 ***C. nitidulus* (Fabricius)**

Key to the tribe of Elampini

- 1A. Metanotum posterodorsally produced as a horizontal tongue-like flange.
 (Posteromedian notch of third metasomal tergite with wide horse-shoe shaped prominent rim (Fig.6A)). ***Elampus***
 1B. Metanotum posterodorsally not produced, at most conically raised.2
 2A.Third tergite notched at apex centrally (Fig. 6B).3
 2B.Third tergite not notched at apex centrally.5
 3A. Posterior of third tergite with a rim above central notch (fig. 6A). Margin of third tergite wavey towards the apex. ***Philoctetes truncatus* (Dahlbom)**
 3B. Posterior of third tergite without a rim above central notch (Fig 6B). Margin of third tergite not wavey towards the apex.4

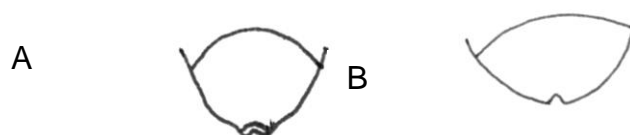


Fig. 6 – Dorsal view of third tergite: A – *Philoctetes*, B - *Omalus*

- 4A. The front edge of bow of head in dorsal view deeply curved (Fig. 7A). Dorsal surface of mesoscutum, mesoscutellum, metanotum and propodeum with numerous hairs which are longer than antennal flagellomere four. In profile, side of mesopleuron expanded ventrally.**Pseudomalus**
- 4B. The front edge of bow of head in dorsal view only slightly curved (Fig. 7B). Dorsal surface of mesoscutum, mesoscutellum, metanotum and propodeum with few hairs which are shorter than antennal flagellomere four. In profile, side of mesopleuron not expanded ventrally.**Omalus**

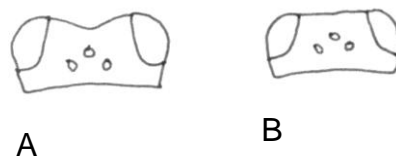


Fig. 7 – Dorsal view of head: A – *Pseudomalus*, B - *Omalus*

- 5A. Median vein of fore wing almost right-angled near mid-point (Fig. 8A). Claws with several teeth behind apex (Fig. 5D).**Holopyga generosa Förster**
- 5B. Median vein of fore wing, at most, curved (Fig. 8B & 8C). Claws without several Teeth behind apex (Fig. 5B, 5C).6

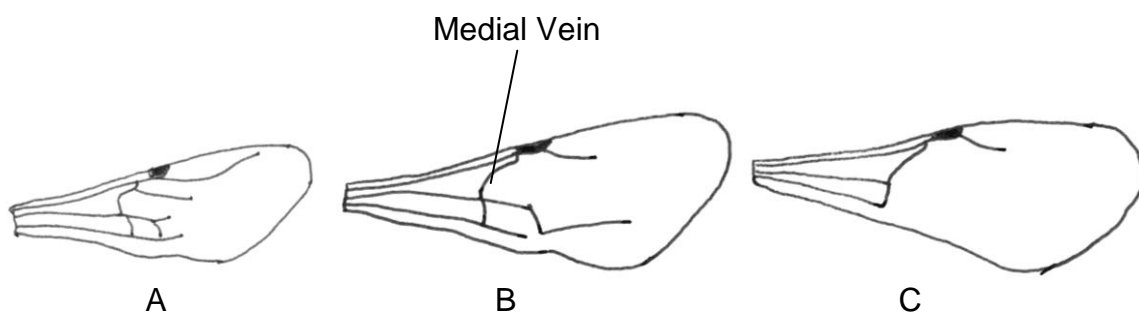


Fig. 8 – Dorsal view of fore wing: A – *Holopyga*, B – *Hedychridium*, C – *Hedychrum*

- 6A. Medial vein not curved (Fig. 8C). Claws with second tooth almost as large as apical tooth and very close to it, so that tip appears forked (Fig. 5B).**Hedychrum**
- 6B. Medial vein curved (Fig. 8B). Claws with one tooth widely separated from apex, without forked appearance (Fig. 5C, difficult to see).**Hedychridium**

Key to the species of *Elampus*

1A. Lateral margin of third tergite with a narrow notch between apical truncation and semi-transparent lateral protrusion (Fig. 9A). Apical margin of third tergite horseshoe-shaped with nearly straight ventral margin (Fig. 10A).

.....***Elampus panzeri* (Fabricius)**

1B. Lateral margin of third tergite slightly convex or almost straight (Fig. 9B). Apical truncation with rounded margins. (Fig. 10B).***Elampus foveatus* (Mocsáry)**



Fig. 9 – Lateral view of third tergite: A – *E. panzeri*, B – *E. foveatus*



Fig. 10 - Posterior-dorsal view of truncation: A – *E. panzeri*, B – *E. foveatus*

Key to the species of *Omalus*

1A. Mesoscutum mostly without or with tiny punctures and only laterally with short pubescence. If punctures coarser, then flagellomeres slightly longer than broad. Setae laterally on pronotum less than twice as long as diameter of mid-ocellus.

.....***Omalus aeneus* (Fabricius)**

1B. Mesoscutum with relatively coarse punctures and long pubescence. Setae laterally on pronotum at least twice as long as diameter of mid-ocellus.

Flagellomeres no longer than broad.***Omalus puncticollis* (Mocsáry)**

Key to the species of *Pseudomalus*

1A. Metasoma red, males may appear greenish. Postero-median notch of third tergite about as wide as deep (Fig. 11A).***Pseudomalus auratus* (Linnaeus)**

1B. Metasoma violet. Postero-median notch of third tergite wider than deep. (Fig. 11B)***Pseudomalus violaceus* (Scopoli)**

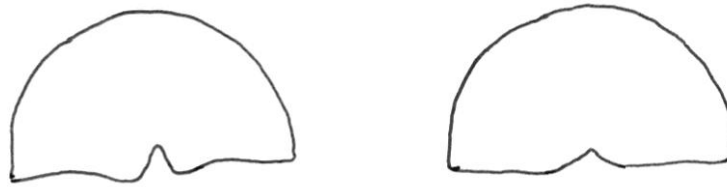


Fig. 11 – Dorsal view of third tergite: A – *P. auratus*, B – *P. violaceus*

Key to the species of *Hedychridium*

- 1A. Mesoscutum with widely scattered punctures and smooth shiny areas. Mesoscutum conspicuously less densely and coarsely sculptured than dorsal propodeum.***Hedychridium cupreum* (Dahlbom)**
- 1B. Mesoscutum with closely-packed punctures which are adjacent and not separated by broad smooth areas. Mesoscutum almost or quite as densely and coarsely sculptured as dorsal propodeum.2
- 2A. Metasoma dull orange without metallic colours or reflections. Scapal basin strongly striate, striate area each side of mid-line about equal to width of scape.***Hedychridium roseum* (Rossi)**
- 2B. Metasoma never dull orange, always with bright metallic colours and reflections. Scapal basin weakly and sparsely striate, striate area each side of the mid-line less than width of scape.3
- 3A. Punctuation of pronotum, mesoscutum and mesoscutellum with distinct ridges formed by the alignment of puncture margins. Malar space length less than basal width of mandible.***Hedychridium coriaceum* (Dahlbom)**
- 3B. Punctuation of pronotum, mesoscutum and mesoscutellum separated, without ridges formed by alignment of puncture margins. Malar space length equal to basal width of mandible.***Hedychridium ardens* (Latreille)**

Key to the species of *Hedychrum*

- 1A. Male. Only three visible sternites2
- 1B. Female. With at least four visible sternites.4
- 2A. Lateral edge of third gastral tergite with right-angled tooth. Hairs on head and mesosoma pale. Often head and dorsally on pronotum, mesoscutum and mesoscutellum with coppery to greenish colour. ***Hedychrum rutilans* Dahlbom**
- 2B. Lateral edge of third gastral tergite with small rounded prominence. Hairs on head and mesosoma dark brown to black. Head and mesosoma completely or nearly completely green-bluish.3

- 3A. Groove on inner surface of mesotibia shallow and narrow, indistinctly delimited (Fig. 12A). Digitus of genitalia longer than cuspis (Fig. 13A). Body usually larger 6-10mm.***Hedychrum nobile* (Scopoli)**
- 3B. Groove on inner surface of mesotibia deep and oval and distinctly delimited (Fig. 12B). Digitus of genitalia not longer than cuspis (Fig.13B).
.....***Hedychrum niemelai* Linsenmaier**
- 4A. Third sternite without apical-medial tubercle. Body usually smaller 5-8mm.
.....***Hedychrum rutilans* Dahlbom**
- 4B. Third sternite with apical-medial tubercle.5
- 5A. Tubercle of third sternite larger, apically slightly rounded, not divided. Body usually larger 6-10mm. (Fig 14A).***Hedychrum nobile* (Scopoli)**
- 5B. Tubercle of third sternite smaller, apically divided in the middle. Body usually smaller 5-8mm. (Fig 14B).***Hedychrum niemelai* Linsenmaier**

Fig. 12 – Inner surface of male mesotibia:

A – *H. nobile*

B – *H. niemelai*

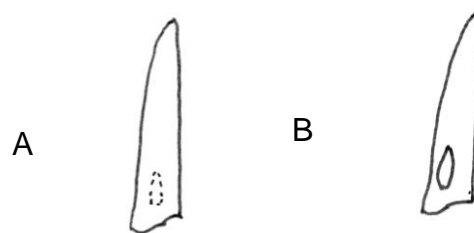
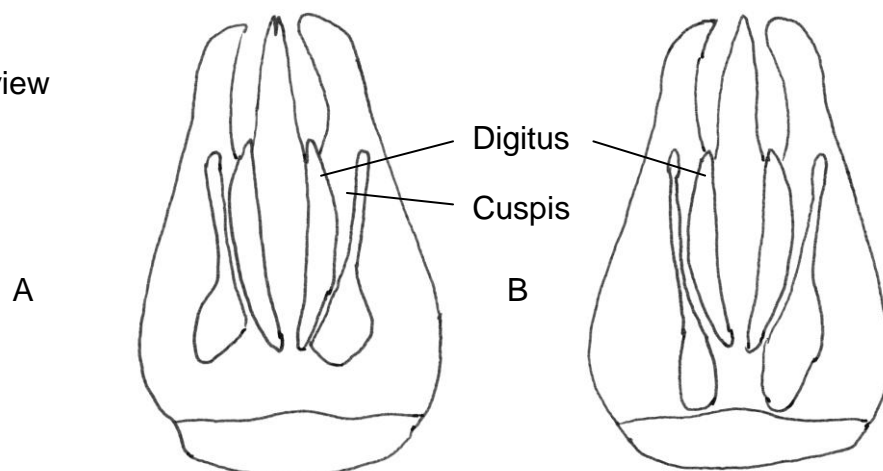


Fig. 13 – Ventral view of genitalia:

A – *H. nobile*

B – *H. niemelai*



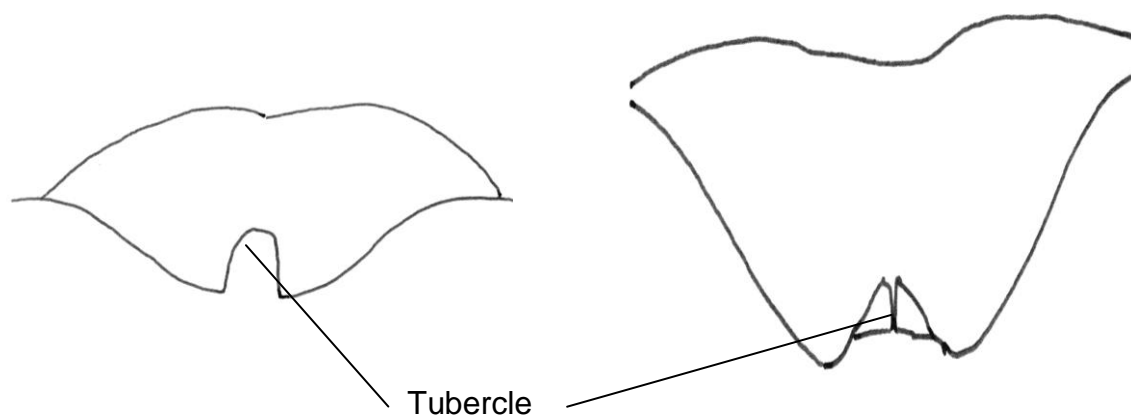


Fig 14 –View of female third sternite: A – *H. nobile*, B – *H. niemelai*

Key to the tribe of Chrysidini

- 1A. Posterior margin of third tergite with prominences or conspicuous pointed or rounded teeth (Fig. 15A, B, C).2
 1B. Posterior margin of third tergite smooth, shallowly concave to evenly convex but without teeth or angular prominences (Fig. 15D).3

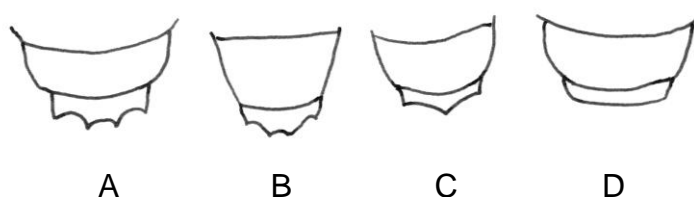


Fig 15 – Dorsal view of third tergite: A & B – *Chrysis*, C – *Trichrysis*, D - *Chrysura*

- 2A. Posterior margin of third tergite with three prominences, median prominence centrally placed. (Fig. 15C). Whole insect dark green or blue.
***Trichrysis cyanea* (Linnaeus)**
 2B. Posterior margin of third tergite without three prominences and without centrally placed prominence (Fig. 15A, B). At least in part insect red or golden.***Chrysis***

- 3A. In full face antennal sockets positioned on line connecting lower margins of eyes. Radial cell open (Fig. 16).***Pseudospinolia neglecta* (Shuchaed)**
 3B. In full face antennal sockets distinctly below line connecting lower margins of eyes. Radial cell closed, or very nearly so (Fig. 16).4

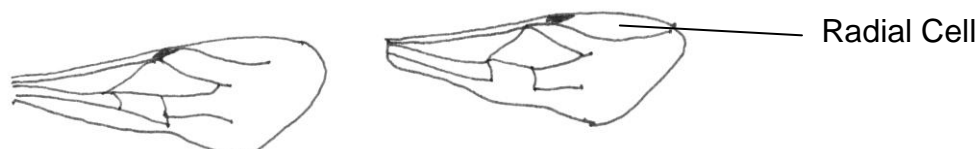


Fig. 16 – Dorsal view of fore wing: Left – *Pseudospinolia*, Right - *Chrysura*

4A. Gena carina extends well above lower margin of eye (Fig. 17A). In profile dorsal surface of mesosoma forms single continuous curved surface.

.....***Chrysis gracillima* (Förster)**

4B. If present, genal carina does not extend above lower margin of eye. In profile (Fig. 17B), dorsal surface of mesosoma distinctly undulate, not forming single curved surface

Chrysura

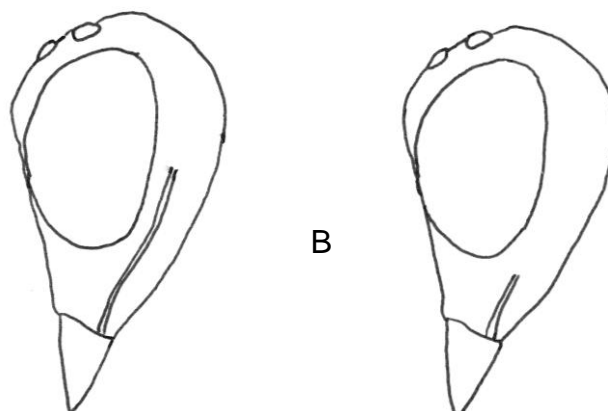
Fig. 17 – Lateral view of head:

A – *C. gracillima*

B – *Chrysura*

A

B



Key to species of *Chrysis*

Species with the margin of third tergite without distinct teeth.

1A. Dorsally mesosoma entirely metallic blue-green (Central area of scapal basin striate; see genus key).***Chrysis gracillima* (Förster)**

1B. Dorsally mesosoma not entirely metallic blue-green.2

2A. Central area of scapal basin striate. Third tergite blue-green. Dorsal mesosoma except for propodeum mainly golden-red.***Chrysis viridula* Linnaeus**

2B. Central area of scapal basin not striate, smooth and shiny. Third tergite not only blue-green. Only dorsal mesoscutum and part of pronotum golden-red.3

3A. Malar space at most 0.75 basal width of mandible. Metanotum sub-conically raised in profile. Black spot of second sternite strongly oblique posterior particularly in female (Fig. 18A). Third tergite with longitudinal ridge. ***Chrysis bicolor* Lepeletier**

3B. Malar space equal to basal width mandible. Metanotum rounded in profile. Black spot on second sternite not strongly oblique (Fig. 18B). Third tergite centrally without a central ridge or with only slight longitudinal ridge, not as pronounced as *C. bicolor*

***Chrysis illigeri* (Wesmael)**

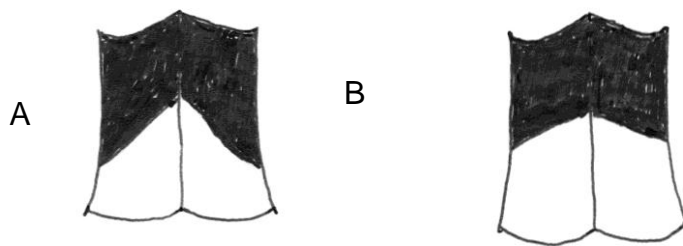


Fig 18 – View of female second sternite: A – *C. bicolor*, B – *C. illigeri*

Species with the posterior margin of third tergite with distinct teeth which have sharp or rounded tips. Three species can be considered in the following order with the species with very distinctive characters considered separately.

First tergite blue-black, often with violet reflections. Male also with anterior part of second tergite blue-black.***Chrysis fulgida* Linnaeus**

Following species with first and second tergites golden-red or red.

Spurs of mesotibia approximately equal in length. Large dense punctures on anterior-dorsal surface of second tergite arranged to form distinct longitudinal central ridge. Female metatarsus shorter than metatibia. Usually body length 9mm. or more.***Chrysis pseudobrevitarsis* Linsenmaier**

Following species with spurs of metatibia unequal in length. Anterior-dorsal surface of second tergite without distinct central longitudinal ridge. Female metatarsus longer than metatibia. Usually body length shorter.

Frontal carina medially with four tooth-like tubercles. .***Chrysis terminata* Dahlbom** (Punctuation of tergites often coarse throughout. Apical teeth of anal rim long and sharp, third tergite bulbous, ovipositor narrow, male genitalia with curved inner edges to the parameres.)

The remaining species of *Chrysis*, without four tooth-like tubercles on the frontal carina, are now considered as a dichotomous key. Four species, *C. leptomandibularis*, *C. borealis*, *C. parietis* and *C. horridula* have not yet been recorded from the British Isles or the Channel Islands have been added.

The following characters can be helpful in the determination of the following species.

- The anterior punctures of the second tergite can be of similar or smaller size to those of the first tergite.
- The arrangement of punctures may be less dense (inter-puncture distance greater than puncture diameter), dense (inter-puncture distance similar to

puncture diameter or denser (inter-puncture distance less than puncture diameter).

- The anterior punctures of the second tergite may be larger or denser than the posterior punctures except for *Chrysis ruddii*. The extent of the larger or denser punctures may extend from about one-third to nearly all of the second tergite.

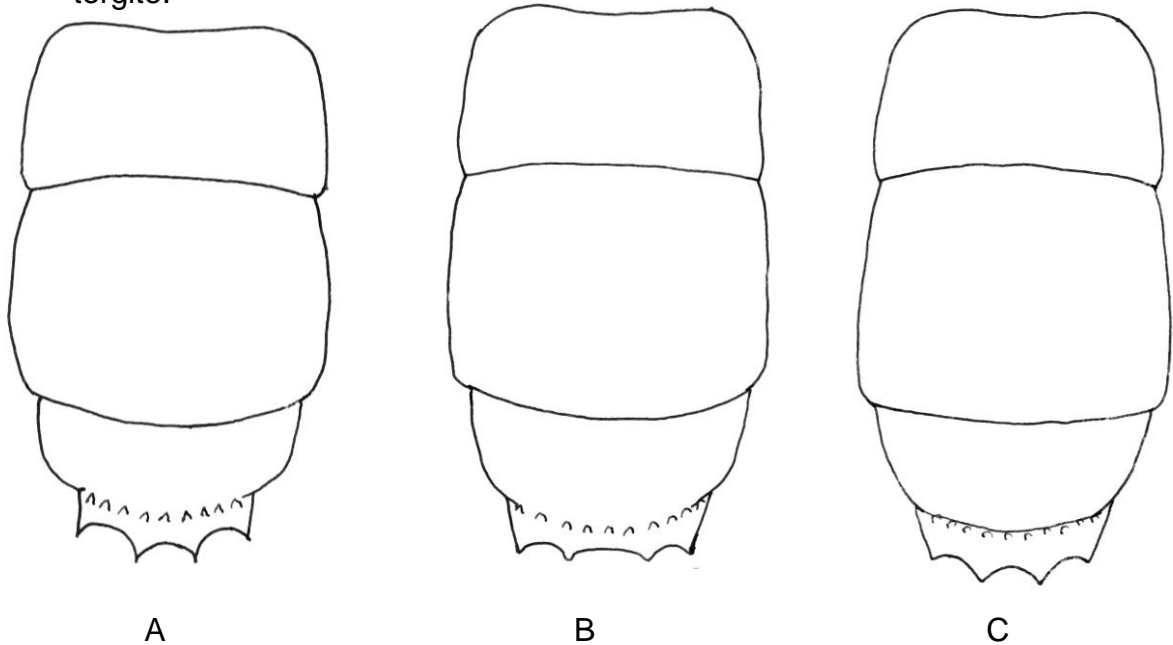


Fig. 19 – Dorsal view of metasoma: A – *C. ignita*, B – *C. Impressa*, C – *C. mediata*

- The posterior margin of the third tergite before the apical rim may be bulbous showing a change in direction approaching a right angle (Fig. 19A), rounded with no change in direction (Fig. 19C) or moderately bulbous with a margin between rounded and bulbous (Fig. 19B).
- The mandibles should be opened so that the medial width is visible (Fig. 20).
- Usually the female ovipositor and male genitalia need to be exposed.

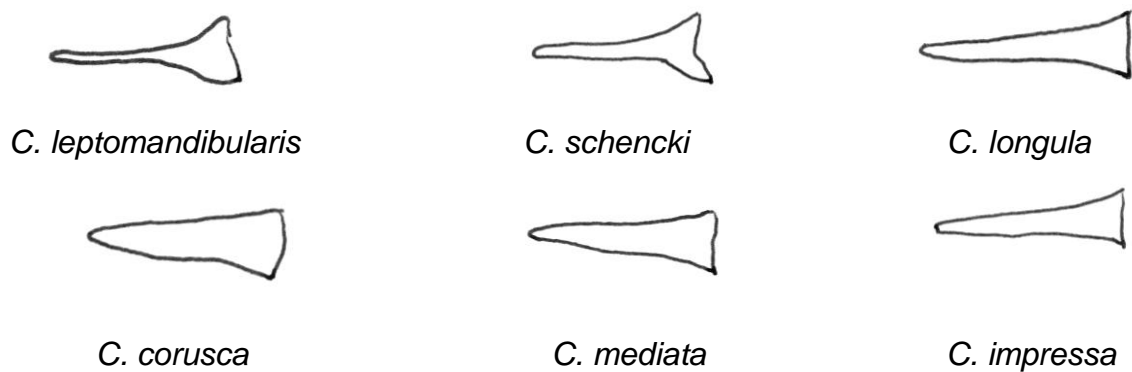


Fig. 20 – The medial view of female's mandibles.

- 1A. Female; in profile the third tergite is concave (Fig. 21A).2
 1B. Male; in profile the third tergite is convex (21B).13

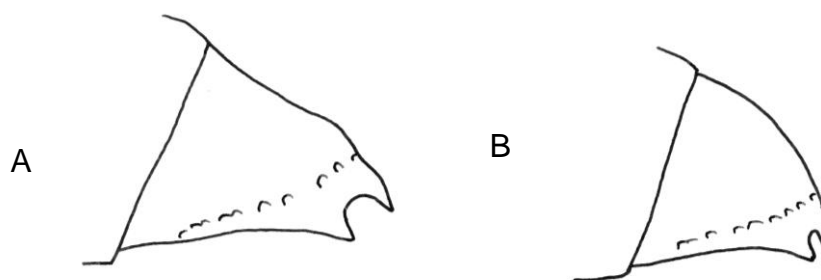


Fig. 21 – Lateral view of third tergite: A – Female, B - Male

2A. Pronotum short, length less than one-quarter of its width. Malar space long, approximately as long as broad. First flagellomere without metallic sheen. (Ovipositor narrow, apical margin of third tergite rounded).3

2B. Pronotum longer, length more than one-quarter of its length. Malar space short, wider than long. First flagellomere usually with metallic sheen.4

3A. Punctures of second tergite fine, dense and uniform so appearing evenly granular, smaller than punctures on first tergite. Sternites and legs coppery-red in colour. Often clypeus, pronotum, pedicel, tegulae, mesoscutellum and ventral mesosoma with coppery-red colouration.***Chrysis ruddii* Shuckard**

3B. Anterior punctures of second tergite dense and similar to punctures of first tergite, posteriorly punctures of second tergite become distinctly sparser. Teeth of third tergite acute. Second sternite mostly green with some coppery-red colouration. Body colour usually darker with mesoscutellum usually black, violet or blue. Head and pronotum green with coppery-red colouration. Mid and hind legs blue-green or green, at most partly reddish. (Propodeal teeth distinctly projecting, Fig. 22B).
***Chrysis vanlithi* Linsenmaier**

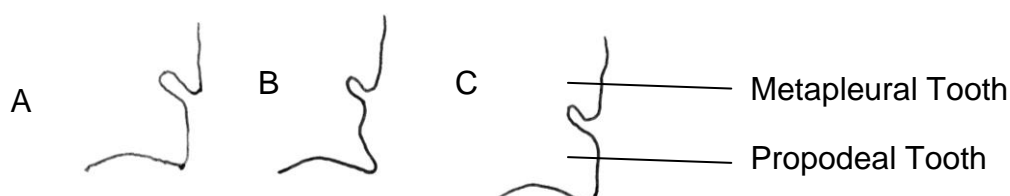


Fig. 22 – Projection of propodeal tooth relative to metapleural tooth. A – *C. angustula*, B – *C. vanlithi*, C – *C. mediata*

4A. Body long and slender with almost parallel sides. Propodeal teeth not projecting beyond the metapleural teeth (Fig. 22A). Anterior punctures on second tergite smaller than on first tergite, the posterior half become sparser. Mandible in

lateral view thin with medial width about one third or less of its base. (The posterior margin of the third tergite rounded).5
 4B. Body not long and slender. Individuals with different set of characters (Fig. 22C).
6

5A. In lateral view, mandible extremely thin and medial width about one quarter of its basal width and conspicuously swelling towards its base (Fig. 20). Dorsally mandible bare or with barely visible punctures and yellowish in part. Second tergite anteriorly with less dense or dense punctures. Dark patches on second sternite smaller and rounded (Fig. 23A). Lateral propodeal teeth less prominent with posterior margin perpendicular to the mesosoma.***Chrysis leptomandibularis* Niehuis**

5B. In lateral view, mandible not extremely thin, medial width about one third of its basal and gradually swelling towards its base. Dorsally mandible with visible punctures and coloured black. Second tergite anteriorly with denser punctures. Dark patches on second sternite larger and more angular (Fig. 23B). Lateral propodeal teeth more prominent with posterior margin not perpendicular to mesosoma.***Chrysis angustula* Schenck**

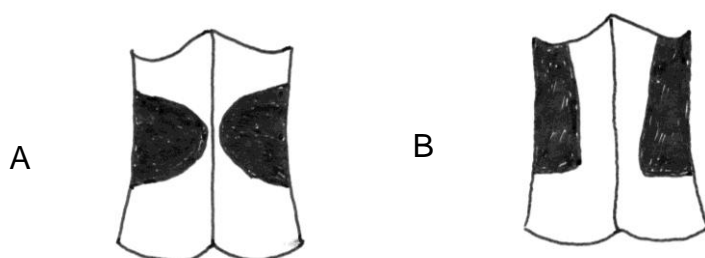


Fig. 23 – View of black spots of second sternite. A – *C. leptomandibularis*, B *C. angustula*

6A. Ovipositor broad (Fig. 24B). Second sternite blue-green with rounded black spots. Mandible thick, in lateral view about half of its basal width. Apical rim long. (The anterior punctures of the second tergite smaller than the punctures on the first tergite. The larger anterior punctures of the second tergite occupy about one-third of the tergite. The posterior margin of third tergite rounded, sometimes moderately bulbous for *C. mediata*.7

6B. Ovipositor narrow (Fig. 24A). Colouration of second sternite and thickness of mandible variable. Apical rim usually shorter.8

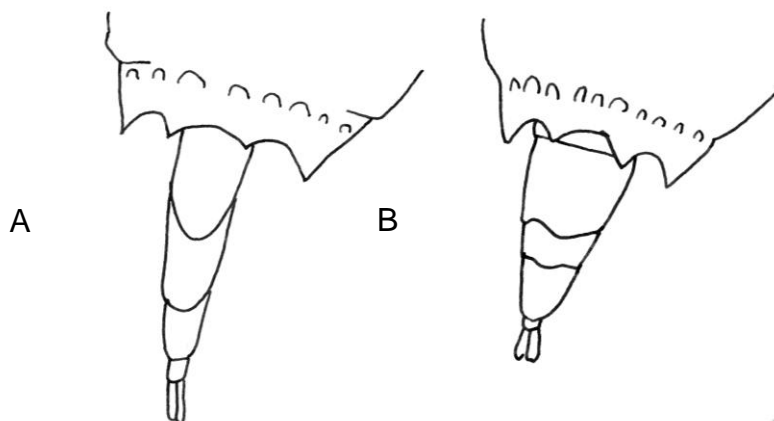


Fig. 24 – View of ovipositors. A – *C. vanlithi*, B – *C. mediata*

7A. Punctuation of second tergite sparser and finer with shining interstices. Head narrow, in front view only slightly broader than high. Usually larger species (6-10mm). Hosts soil-nesting species of *Odynerus*.***Chrysis mediata* Lisenmaier**

7B. Punctuation of second tergite denser and coarser without shining interstices. Head broader, in frontal view distinctly broader than high. Usually smaller species (5-9mm). Hosts cavity-nesting species of *Ancistrocerus* and *Euodynerus*.

.....***Chrysis solida* Haupt**

8A Metasoma with almost parallel sides appearing narrower and longer (Fig. 25). ...9

8B Metasoma with more convex sides appearing broader and shorter (Fig. 19). ...10

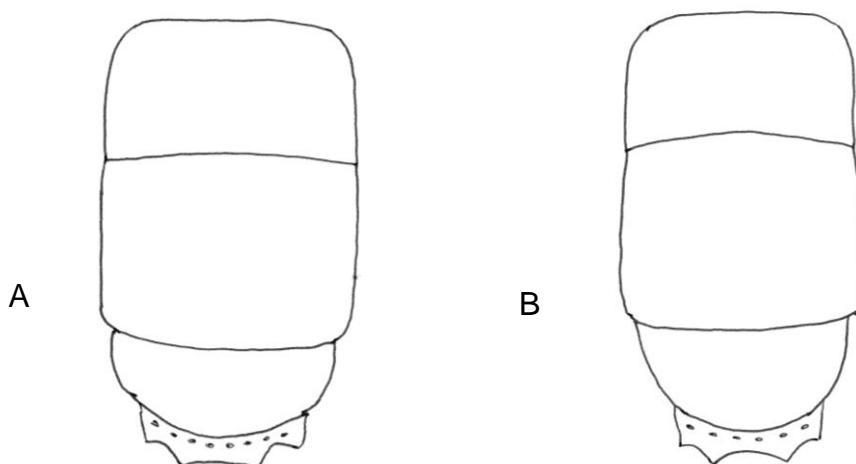


Fig. 25 –Dorsal view of metasoma. A – *C. longula*, B – *C. corusca*

9A. Second sternite red. Second tergite anteriorly with dense, deep and coarse punctuation, punctures becoming much sparser and finer posteriorly, Mandible in medial view longer and thinner, less than half of its basal width (Fig. 20). Usually

larger species (10-13mm). (The anterior punctures of second tergite of similar size to those of first tergite. The posterior margin of third tergite rounded.)

.....***Chrysis longula* Abeille de Perrin**

9B. Second sternite greenish. Second tergite anteriorly with somewhat sparser and finer punctuation, punctures becoming slightly sparser and finer posteriorly

Mandible shorter and thicker, medial width about one-half of basal width (Fig. 20).

Usually smaller species (7-9mm). (The anterior punctures of the first tergite smaller or of similar size to those of first tergite. The larger anterior punctures of second tergite occupy about one-half of tergite. The posterior margin of third tergite

rounded.***Chrysis corusca* Valkeila**

10A. Mandible thinner, laterally medial width not more than one third of its basal width, basally strongly narrowing in lateral view (Fig. 20). Scapal basin with sparse and well defined punctuation. Mesoscutum dark blue to almost black. (The anterior punctures of the first tergite smaller or of similar size to those of first tergite. The larger anterior punctures of second tergite occupy about one-third to one-half of tergite. The posterior margin of third tergite moderately bulbous).

.....***Chrysis schencki* Linsenmaier**

10B. Mandible thicker, laterally medial width more than one third of its basal width, gradually widening towards the base. Scapal basin with denser and more coriaceous punctuation. Colour of mesoscutum variable.11

11A. Apical teeth of third tergite sharply produced and apical rim with almost parallel lateral margins (Fig. 19A). Punctuation of second and third tergites coarse throughout. (The anterior punctures of the first tergite of similar size to those of first tergite. The posterior margin of third tergite bulbous (Fig. 19A). Punctures of the third tergite well defined and coarse near the mid line).

.....***Chrysis ignita* (Linnaeus) *C. parietis* Budrys, *C. horridula* Orlovskytė**
(*C. horridula*, 26A) may be separated from *C. ignita* and *C. parietis* (26B) by the character of black spots on second sternite.)

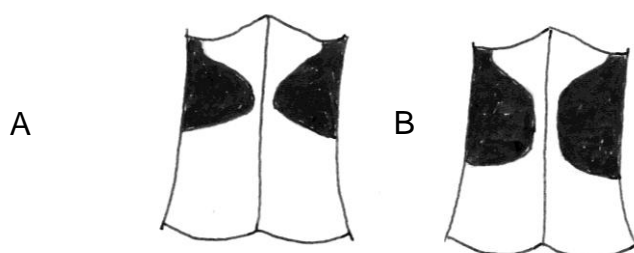


Fig. 26 – View of black spots on second sternite, A – *C. horridula*, B – *C. parietis*

11B. Apical teeth of third tergite not as sharply produced and apical rim with more angled lateral margins (Fig 19B). Punctuation of second and third tergites finer throughout and larger anterior punctures of second tergite occupy about one-third to one-half of tergite. (The anterior punctures of the first tergite of similar or smaller size

to those of first tergite. The posterior margin of third tergite moderately bulbous Fig 19B. Punctures of the third tergite finer or ill-defined near the mid line).12

12A. Mesoscutum with variable coloration of violet, green and black. Antennal first flagellomere 1.3-1.5 times as long as second flagellomere . Second sternite usually with rounded black spots (Fig. 27B). Usually vertex narrower (POD/OOD>0.89)
.....***Chrysis impressa* Schenck**

12B. Mesoscutum entire blue, violet or black. Antennal first flagellomere 1.5-1.7 times as long as second flagellomere. Second sternite with almost rectangular black spots (Fig. 27A). Usually vertex wider (POD/OOD < 0.89). .
.....***Chrysis borealis* Paukkunen et al.**

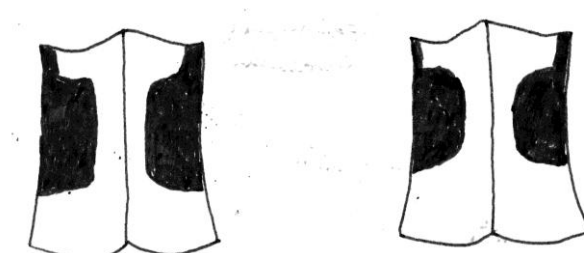


Fig. 27 – View of black spots on second sternite, A – *C. borealis*, B – *C. impressa*

13A. Pronotum short, less than one-quarter of its width. Brow carina indistinct, thinner or absent. Impressions of first and second flagellomeres indistinct. (Genitalia with curved inner edge to the parameres).....14

13B. Pronotum longer, more than one-quarter its width. Brow carina distinct. Impressions of the first flagellomere distinct.15

14A. Punctures of the second tergite fine, dense and uniform so appearing evenly granular, smaller than punctures on first tergite. Sternites and legs coloured coppery-red. Often pronotum, pedicel, tegulae and mesoscutellum with coppery-red colouration. (The posterior margin of third tergite rounded).***Chrysis ruddii* Shuckard**

14B. Anterior punctures of second tergite dense and similar to punctures of first tergite. Posteriorly punctures of second tergite become distinctly sparser. Pronotum laterally and mesoscutum violet of dark blue. Mesoscutum median dark coloured and laterally with some coppery-red colouration.***Chrysis vanlithi* Linsenmaier**

15A. Body slender and parallel. Propodeal teeth insert of metapleural teeth (Fig. 22A). Punctuation of second tergite anteriorly usually smaller than on first tergite, becoming sparser posteriorly. (The posterior margin of third tergite moderately bulbous or bulbous).16

15B. Body more robust. Propodeal teeth not insert of metapleural teeth (Fig. 22 C). Punctuation of second tergite variable.17

16A. In lateral view mandible thinner medial width about one third of its base, dorsally smooth, without or with only barely visible punctures and yellow in part. Anterior punctures of second tergite less dense or dense. Dark patches on second sternite smaller (Fig. 23A). Second sternite greenish.

..... ***Chrysis leptomandibularis* Niehuis**

16B. In lateral view mandible thicker, medial width more than one third of its basewidth, dorsal surface always with small punctures and coloured black. Anterior punctures on second tergite denser. Dark patches on second sternite larger (Fig. 23B). Second sternite green sometimes with red reflections.

..... ***Chrysis angustula* Schenck**

17A. Genitalia with right-angled corner on inner edge of parameres (Fig. 28A). The anterior punctures anteriorly of second tergite usually finer than punctures of first tergite. Second sternite usually greenish with relative short spots. Mandibles relatively thick, in lateral view, medial width more than half its base (Fig. 20 C. *mediata*). (The larger anterior punctures of second tergite occupy about one-third of tergite. The posterior margin of third tergite is moderately bulbous.).18

17B. Genitalia with curved inner edge to parameres (30B). Punctures anteriorly of second metasomal tergite usually not finer than punctures of first metasomal tergite. Second metasomal sternite green, golden or red with often larger black spots. Mandible thick or thin.....19

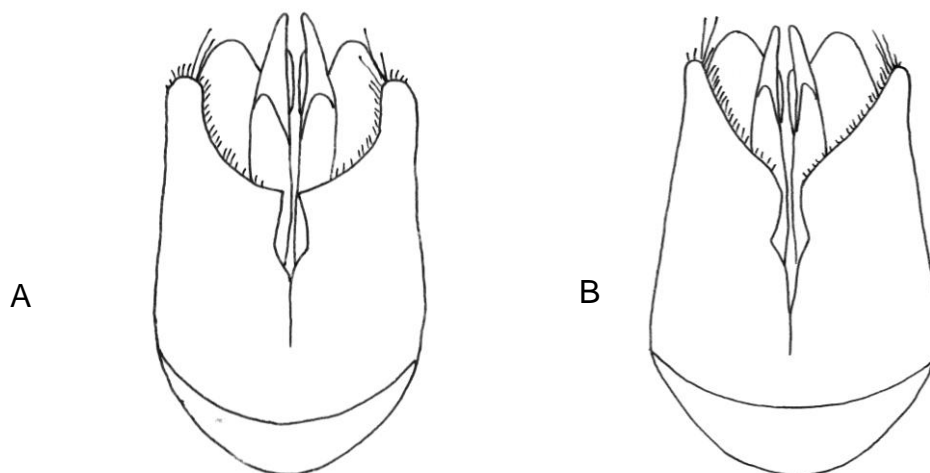


Fig. 28. Dorsal view genitalia. A – *C. mediata*, B – *C. vanlithi*

18A. Metasoma with slightly convex sides. Head narrower, in frontal view only slightly broader than high. Head behind the eyes usually broader, as broad as width of eye (Fig. 29A). Colour of mesosoma predominately lighter, often greenish. Usually larger species (6-10mm). Hosts soil-nesting species of *Odynerus*.

..... ***Chrysis mediata* Linsenmaier**

18B. Mesosoma with more parallel sides. Head narrower, in frontal view distinctly broader than high. Head behind the eyes generally shorter, less than width of eye (Fig. 29B). Colour of mesosoma predominately darker, violet, blue or blue-green. Usually smaller species (5-9mm). Hosts cavity-nesting species of *Ancistrocerus* and *Euodynerus*. ***Chrysis solida* Haupt**

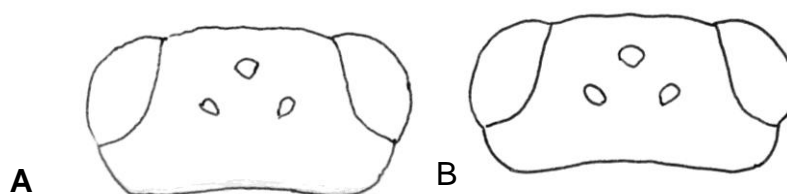


Fig. 29 Dorsal view of head. A – *C. mediata*, B – *C. solida*

19A. Metasoma with more parallel sides (fig. 25). First flagellomere longer than second Flagellomere. 20

19B. Metasoma with more convex sides (Fig. 19). First flagellomere longer than or as long as second flagellomere.21

20A. Second sternite mainly red or golden. Propodeal teeth usually laterally concave ***Chrysis longula* Abeille de Perrin**

20B. Second sternite mainly green. Propodeal teeth usually laterally straight or convex. (The anterior punctures of second tergite are smaller or similar size to those on first tergite. The larger anterior punctures on second tergite occupy about one-half of tergite. The posterior margin of third tergite moderately bulbous or bulbous). ***Chrysis corusca* Valkeila**

21A. Mandible thinner, its margins basally concave in lateral view. First flagellomere 1.2-1.4 times as long as third flagellomere. (The anterior punctures of second tergite are smaller or similar size to those on first tergite. The larger anterior punctures on second tergite occupy about one-third to one-half of tergite. The posterior margin of third tergite bulbous). ***Chrysis schencki* Linsenmaier**

23B. Mandible thicker, its margins basally almost straight in lateral view. First flagellomere 1.2-1.5 times as long as second flagellomere.22

22A. First flagellomere as long as or slightly longer than (not more than 1.2) longer than second flagellomere. Second and third tergites coarsely punctured throughout. Apical teeth of anal rim long and sharp. (The anterior punctures of second tergite are of similar size to those on first tergite. The posterior margin of third tergite bulbous. Punctures on the third tergite coarse and well defined near the mid-line).

..... ***Chrysis ignita* (Linnaeus), *C. parietis* Budrys, *C. horridula* Orlovskytė**

22B. First flagellomere 1.2-1.5 times as long as second flagellomere. Second tergite more finely punctured, punctures becoming slightly sparser posteriorly. Punctuation of third tergite finer. Apical teeth of anal rim may not be as sharp. (The anterior

punctures of second tergite are smaller or similar size to those on first tergite. The larger anterior punctures on second tergite occupy about one-half of tergite. The posterior margin of third tergite bulbous. Punctures on the third tergite finer or ill-defined near the mid-line).23

23A. First flagellomere 1.2-1.4 times as long as second flagellomere. Punctuation of mesoscutum coarser, punctures often with lighter colour to interstices. Size of black spots second metasomal sternites variable. POD/OOD usually > 0.89.

.....***Chrysis impressa* Schenck**

23B. First flagellomere 1.3-1.5 times as long as second flagellomere. Punctuation of mesoscutum finer, punctures not differing from interstices. Size of black spots second metasomal large. POD/OOD usually < 0.89. (1 specimen seen).

.....***Chrysis borealis* Paukkunen et al.**

Key to the species of *Chrysura*

1A. Larger punctures of first tergite same size as those on pronotum. Mid and fore tibiae without black hairs. Viewed dorsally, metapleuron with prominent but without distinct tooth.***Chrysura radians* (Harris)**

1B. Larger punctures of first tergite about half size those on pronotum. Mid and fore tibiae with black hairs. Viewed dorsally, metapleuron with distinct tooth.
.....***Chrysura hirsuta* (Gerstäcker)**