

**A STUDY OF THE GENUS TRYCHOSIS FOERSTER
IN EUROPE
(HYMENOPTERA, ICHNEUMONIDAE, CRYPTINAE)**

by

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With 45 text-figures

INTRODUCTION

This study was undertaken to prepare keys to the European species of the genus *Trychosis* Foerster. The older keys by Schmiedeknecht (1890 and 1904-1906), mostly based on Tschek's keys in his study of the genus *Cryptus* (1870b), do not lead to satisfactory results. This is due to the fact that several characters used by Tschek are not critical, while several of the species described by him have turned out to be identical with others. Nevertheless Tschek's pioneer work in this group deserves our admiration.

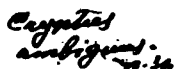


Fig. 1. Handwriting of Carl Tschek.

When I had advanced somewhat with the interpretation of Tschek's type material, I became curious about the species described by some other authors, viz. Thunberg, Gravenhorst and Thomson. I had the opportunity to study some of their type specimens.

It should be said here that probably the Gravenhorst collection at Wroclaw (Poland) still has some surprises in store, but I had no opportunity to study the collection in situ.

There still remain some species inquirendae, these are listed on page 39.

ACKNOWLEDGEMENTS

It is a pleasure to thank the following persons: Dr. Max Fischer, Naturhistorisches Museum, Vienna, for loan of the Tschek *Trychosis* collection; Mr. Sten Jonsson, Uppsala Universitet, for loan of a Thunberg type specimen; Mr. W. J. Pulawski, Zoological Institute, Wroclaw, for loan of several Gravenhorst type specimens; Fil. lic. Hugo Andersson, Dept. of Entomology, Lund University, for loan of C. G. Thomson's *Goniocryptus* type material; Dr. Børge Petersen, Universitetets Zoologiske Museum, Co-

penhagen, for loan of C. G. Thomson's type material; Dr. Henry Townes, Ann Arbor (U.S.A.), for loan of a type specimen; Dr. M. Lieftinck, Rijksmuseum van Natuurlijke Historie, Leiden, for loan of *Trychosis* material; Dr. G. Kruseman, Zoologisch Museum, Amsterdam, for loan of *Trychosis* material; Prof. Dr. J. de Wilde and Mr. K. W. R. Zwart biol. drs., Entomologisch Laboratorium, Landbouwhogeschool, Wageningen, for hospitality, generous loan of material and help; Mr. H. Landsman, Natuurhistorisch Museum, Rotterdam, for loan of material from the Lindemans collection; Dr. S. J. van Ooststroom, Oegstgeest, for loan of private material; Dr. L. B. Holthuis, Rijksmuseum van Natuurlijke Historie, Leiden, for advice on nomenclatorial problems; Mr. P. A. A. Loof, biol. drs., Landbouwhogeschool, Wageningen, for helpful discussions; Mr. C. A. W. Jeekel, biol. drs., Zoologisch Museum, Amsterdam, for help. Finally I wish to thank Prof. O. W. Richards D.Sc., Imperial College, London, for reading the manuscript, and for critical remarks and correction of the English text.

MATERIAL AND METHODS

Base of this study was the important set of *Cryptus* types of Carl Tschek in the Vienna Museum. Much other material was brought together from institutes and private collections named above. The following abbreviations are used in the text of this paper.

- ML — Dept. of Entomology, Lund University;
- ELW — Entomologisch Laboratorium, Wageningen;
- NMW — Naturhistorisches Museum, Vienna;
- MR — Natuurhistorisch Museum, Rotterdam;
- PD — Plantenziektenkundige Dienst, Wageningen;
- RMNH — Rijksmuseum van Natuurlijke Historie, Leiden;
- MC — Universitetets Zoologiske Museum, Copenhagen;
- UU — Uppsala Universitet;
- MA — Zoologisch Museum, Amsterdam.

External measurements were taken with an ocular micrometer (1 cm at 10 ×) on a Zeiss binocular low power microscope. All total sizes were taken at 10 × enlargement (head + thorax + gaster); the size of the ovipositor is always given apart. All relative measurements, made for comparison of parts, were taken at an enlargement of 40 ×. For length : breadth relations, e.g. of the postannellus, I have often used the word "index" (fig. 14).

To study the male genitalia, the apex of the gaster was cut off at the 6th

segment after relaxing the specimens for 24 hours. The apex was then boiled in potassium hydroxide (10 %) for about 15 minutes. The subgenital plate, sclerites of the 10th tergite and the genital apparatus were severed under the binocular, washed in water and passed through the routine steps of alcohol for dehydration and finally brought into alcohol benzilicus and mounted in Venetian turpentine. Slides were made of cover-glasses and mounted on the pin of the specimen. Drawings of parts of the genitalia were made with a drawing mirror at an enlargement of 130 X.

It turned out that the male genitalia do not offer much help for the separation of species, as has been stated by other authors for related groups. As I have done the work of mounting I have given some illustrations, but in my opinion one should not attach too much value to these characters.

For terms I have made use of the book by Richards (1956). For the sake of simplicity I have used the old nomenclature for some of the wing cells.

Diagrams of parts of insects I also made with the drawing mirror. These drawings were later touched up by Mr. A. Noordijk.

NOMENCLATURE

The Cryptine genus *Trychosis* was proposed by Foerster in 1868, without naming species. In 1873 Thomson used the name *Goniocryptus* for the same group of species. Schmiedeknecht (1890) was the first author who used the name *Trychosis*, placing 16 species in this generic taxon. He stated clearly that he considered *Cryptus titillator* Gravenhorst to be the type. As this is an apparent misidentification in the sense of the Code (art. 70a) I have made a proposal (Van Rossem, 1965) to the International Commission on Zoological Nomenclature to set aside all previous designations of type species for the genus *Trychosis* Foerster, 1868, and to designate as the type species *Cryptus mesocastanus* Tschek, 1870a, conform to the intention of Schmiedeknecht, since *Cryptus titillator* auctorum non Linné, 1758, is the same as *Cryptus mesocastanus* Tschek.

By kindness of Mr. W. J. Pulawski at Wroclaw I was able to study a specimen of *Cryptus titillator* from Gravenhorst's original collection which proved to be a female of *Cryptus mesocastanus* Tschek. For this species Gravenhorst (1829) used the binomen *Cryptus titillator* with Linné as the author. From the research of Roman (1932), however, it became clear that Linné's *Ichneumon titillator* is a species later described by Fabricius (1804) under the name *Cryptus recreator*, which in modern literature is still assigned to the genus *Cryptus* Fabricius, 1804. Thus the name *Trychosis* Foerster would have to disappear as a junior synonym of *Cryptus* Fabricius if *C. titillator* sensu Linné were taken as type species.

TAXONOMY

Keys for the identification of the Cryptine genera were given by Pratt (1945) and Townes & Townes (1962). After gaining some experience, the much older key by Schmiedeknecht (1904-1906) can also still be used. A full description of the genus *Trychosis* was recently given by Townes & Townes (1962: 333).

Within the genus *Trychosis* at least two palaeartic species take a special position viz., *T. tristator* (Tschek) and *T. glabricula* (Thomson). According to Townes & Townes two nearctic species viz., *T. cyperia* Townes and *T. anagnus* Townes share the same unique character. The species group in question is characterized by an elevation of the vertical carina on the anterior epinemium (prepectus, fig. 3). The two European species in the group have several characters which separate them from the other species in the genus, e.g. a strongly developed microsculpture of the gastral tergites, which shows best on the hind margin of tergite 2 of the female. The antennal scrobes have conspicuous transverse ridges and finally the nervellus is intercepted well above the middle (this last mentioned character was also observed by Tschek).

A second group of related species is the *T. gradaria*-*T. atripes*-*T. pauper*-complex. These three species all have a conspicuously thickened front femur (fig. 4).

A third group of species is the *T. mesocastana*-*T. legator*-*T. neglecta*-group. These three species seem to be closely related. Of *T. legator* (Thunberg) I distinguish three forms.

In total I found 9 palaeartic species, at least one of which is dubious (*T. ingrata* (Tschek)).

The present revision by no means pretends to be final, though I have perhaps introduced some revolutionary lumping (e.g., 7 synonyms of *T. legator*). There still remain difficulties with respect to the interpretation of certain variable characters in several species. These could perhaps only be solved by careful breeding, but here special difficulties arise. *Trychosis* species do not seem to be very abundant, at least not in the northern regions of Europe and it might be difficult to obtain sufficient living material for breeding purposes. Some *Trychosis* species are spider parasites, of others nothing is known. I have not tried to give an exhaustive review of the literature on the biology as this falls outside the scope of this work.

KEY TO THE FEMALES OF TRYCHOSIS FOERSTER

1. Gaster with very broad laterotergites (fig. 2). Spiracle of tergite 2 of gaster at least as far from lateral margin as from hind margin. Postannellus elongated, index about 5 *neglecta*

- Gaster with normal laterotergites (in cases of doubt, and if the postannellus is short, index 3-3.3; see couplet 6). Spiracle of tergite 2 of gaster nearer to lateral margin than to hind margin 2
- 2. Vertical carina on anterior part of epicnemium developed into a rounded tooth-like

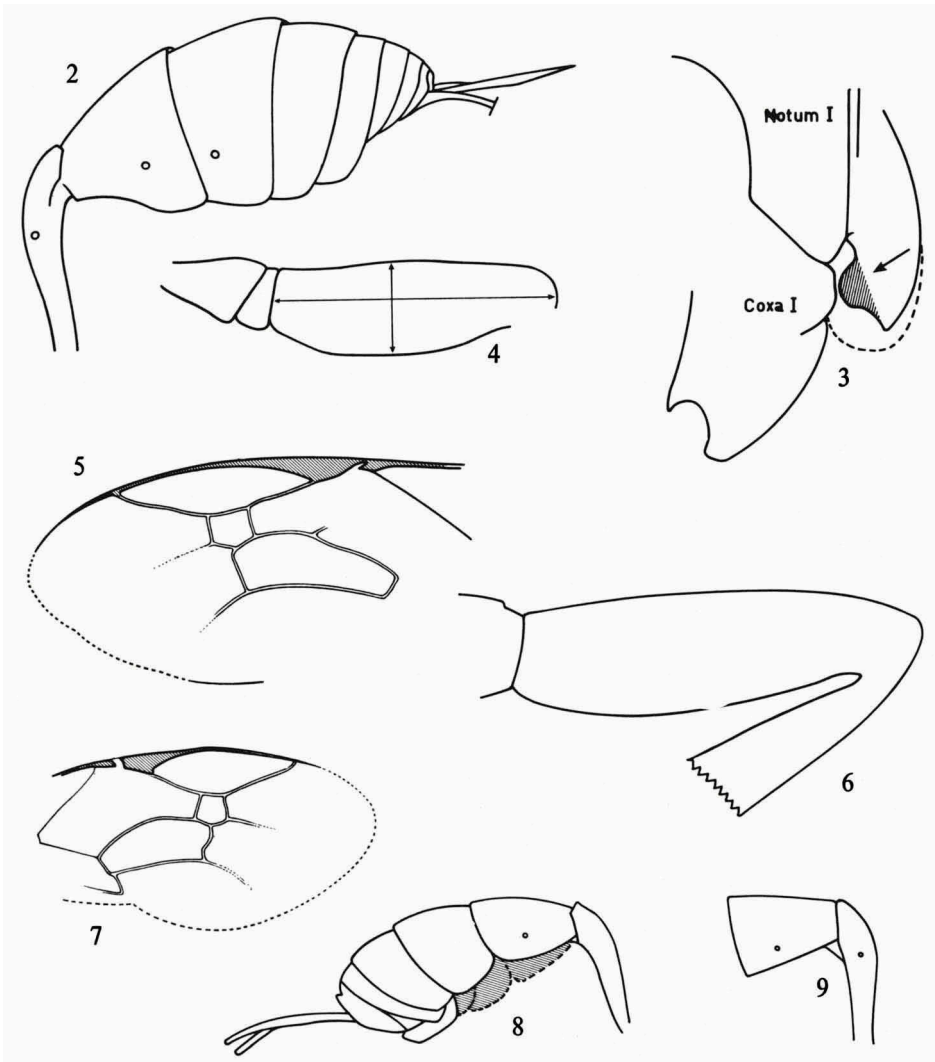


Fig. 2-9. Various details of *Trychosis*. 2, *T. neglecta* (Tschek), ♀ lectotype, gaster; 3, *T. tristator* (Tschek), ♀ lectotype, anterior part of epicnemium (tooth-like structure indicated by arrow); 4, *T. atripes* (Gravenhorst), ♀ holotype, front femur; 5, *T. gradaria* (Tschek), ♀ holotype, left front wing; 6, *T. gradaria* (Tschek), ♀ holotype, front femur; 7, *T. atripes* (Gravenhorst), ♀ holotype, right front wing; 8, *T. atripes* (Gravenhorst), ♀ lectotype of *T. castaniventris* (Tschek), gaster; 9, *T. pauper* (Tschek), ♀ neotype, 2nd gastral tergite.

- structure, lying immediately opposite posterior corner of notum I (fig. 3)¹). Hind margin of tergite 2 of gaster finely coriaceous. Nervellus intercepted above the middle 3
- Vertical carina on anterior part of epicnemium present or absent, but never developed into a conspicuous tooth. Hind margin of tergite 2 of gaster almost polished, at most with vague indication of microsculpture 4
3. Larger specimens of about 12 mm. Central part of face with normal rugose or coarse punctation, if microsculpture is present between the punctures, it is very vague *tristator*
- Smaller specimens of 6.2-9.2 mm. Central part of face with conspicuous microsculpture between and in the punctures *glabricula*
4. Front femur thick, not more than 3.6 × as long as broad (fig. 4). In cases of doubt, the index of postannellus is not exceeding 3.3 5
- Front femur more elongated, longer than 3.6 × the breadth. In cases of doubt, the index of postannellus is exceeding 3.5 7
5. Radial cell (3R 1) long. Breadth²): length, 1 : 4.7 (fig. 5). Larger specimens up to 11.5 mm *gradaria*
- Radial cell more bulging. Breadth: length, 1 : 3.8 (fig. 7). Specimens of 7-8 mm 6
6. Laterotergites somewhat broadened (fig. 8). Spiracle of tergite 2 of gaster 2 × as far from hind margin as from lateral margin (20 : 11) *atripes*
- Laterotergites normal (fig. 9). Spiracle of tergite 2 of gaster 2.5 × as far from hind margin as from lateral margin *pauper*
7. With the following characters in combination. Ovipositor reaching the length of 1st segment of gaster. Postannellus slender, index > 5. Gena polished with scattered punctures. Specimens of 8.5-10.8 mm *ingrata*
- Not agreeing entirely with the above characters 8
8. A line drawn between the bottoms of the compound eyes runs above the clypeal bulge (fig. 10-11). Specimens between 7-11.5 mm. Head either narrowed or rounded behind the compound eyes. Antennal scrobes rather deep, circular, polished and more often with radiate ridges. Index of postannellus 3.6-4.5. Index of front femur 3.6-5.4. Nervellus intercepted more often in the middle. Microsculpture of gastral tergites 2 and 3 vague, hind margin of tergite 2 almost polished. Gaster varying in colour between entirely orange and orange and black *legator*
- A line drawn between the bottoms of the compound eyes at least cuts through the upper part of the clypeal bulge (fig. 12-13). Large to very large species of 10-14 mm. Anterior margin of clypeus more often straight. Postannellus slender, index 4.5-5.5. Flagellum more often with a white band. Nervellus often intercepted below the middle. Microsculpture of gastral tergites 2 and 3 vague, hind margin of tergite 2 polished *mesocastana*

KEY TO THE MALES OF TRYCHOSIS FOERSTER

The males of *Trychosis gradaria* (Tschek), *T. aripes* (Gravenhorst) and *T. ingrata* (Tschek) are unknown.

1. Vertical carina on anterior part of epicnemium with a strong, rounded tooth-like structure opposite the posterior corner of notum I 2
- Vertical carina on anterior part of epicnemium present or absent but never developed into a conspicuous tooth 3
2. Larger specimens of ± 10 mm. Face coarsely punctured to rugose, microsculpture

1) This differential character breaks down in a sample from Spain (RMNH). These specimens are tentatively assigned to *T. legator* (Thunberg).

2) Measured above the areola (2Rs).

- in and between punctures vague. Index of postannellus 3.2 *tristator*
 — Smaller specimens of ± 8 mm. Face closely punctured with conspicuous micro-
 sculpture in and between the punctures. Index of postannellus 4.1. Correlation of
 sexes tentative (description based on one specimen) *glabricula*
 3. Postannellus not more than $2.5 \times$ as long as broad distally. Nervellus intercepted

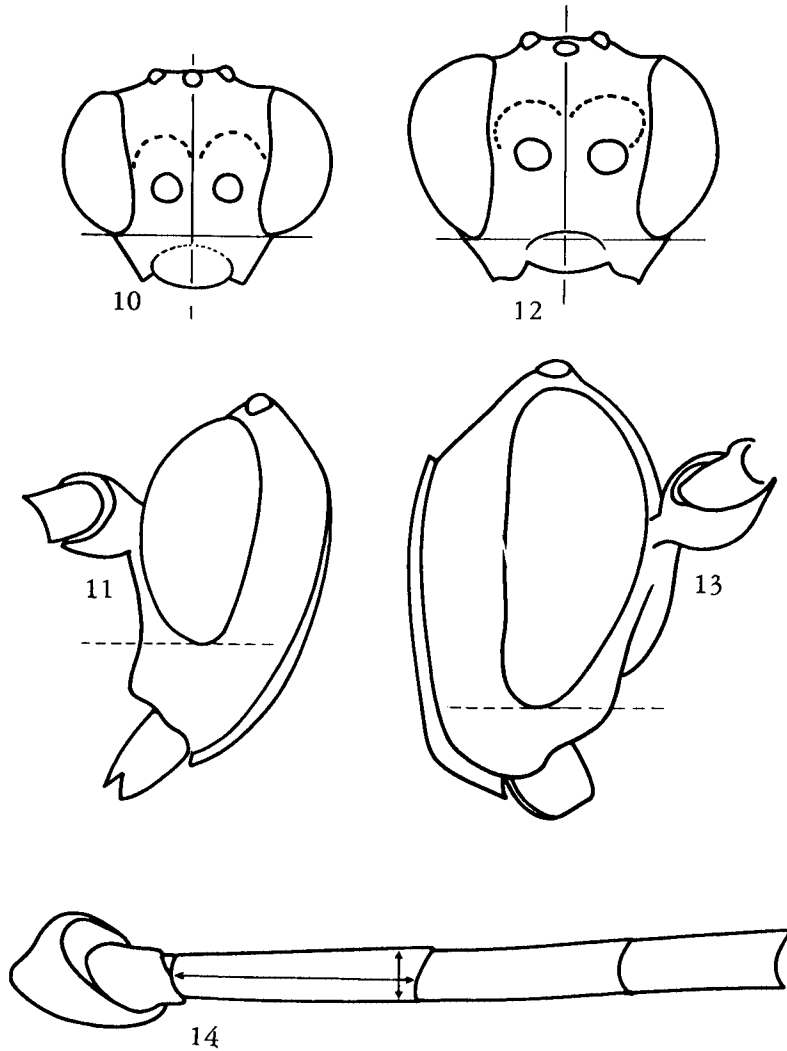


Fig. 10-14. Various details of *Trychosis* heads. 10, *T. legator* (Thunberg) f. *plebeja* (Tschek), ♀ Brindisi (NMW), frontal aspect of head; 11, *T. legator* (Thunberg), f. *plebeja* (Tschek), ♀ Brindisi, lateral aspect of head; 12, *T. mesocastana* (Tschek), ♀ paralectotype, frontal aspect of head; 13, *T. mesocastana* (Tschek), ♀ paralectotype, lateral aspect of head; 14, *T. mesocastana* (Tschek), ♀ lectotype, base of antenna.

- far below the middle *pauper*
- Postannellus more than 2.5 × as long as broad distally 4
4. A line drawn between the bottoms of the compound eyes runs through the clypeal bulge. Maxillary palpi white, often white spots on trochanters I and II. Tyloidae on antennal segments 15-21 (variation 16-21) *mesocastana*
- A line drawn between the bottoms of the compound eyes runs above the clypeal bulge or through the epistomal suture, rarely through the upper part of the clypeus 5
5. Antennae with tyloidae on segments 12-18 (variations: 11-19, 12-17, 13-17). Index of postannellus between 2.5-3.5. Antennal scrobes circular, polished, mostly with radiating ridges. Nervellus intercepted in the middle or slightly above. Specimens of 5.5-9 mm *legator*
- Antennae with tyloidae on segments 15-23 (variations: 15-24, 16-23). A line drawn between the bottoms of the compound eyes runs above the clypeal bulge. Clypeus deplanate. Nervellus intercepted in the middle. Specimens of 10-12 mm . . . *neglecta*

T. *neglecta* (Tschek, 1870)

Cryptus neglectus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 149.
Goniocryptus annulitarsis Thomson, 1873, Opusc. ent. **5**: 492.

According to the original description, the type series of *Cryptus neglectus* Tschek comprises 9 specimens of which 8 are females. In the Tschek collection there are 14 specimens. Two females bear the label "Type" in red (probably in Tschek's handwriting). One of these is *Trychosia atripes* Gravenhorst and this specimen has to be excluded. The other 10 females all agree with Tschek's interpretation of the species. They all bear the printed label "Piesting" and were taken between 1869 and 1872. As the lectotype I have chosen a specimen with an original label of Tschek giving the date on which it was taken.

Characteristics of the lectotype of *Cryptus neglectus*. Female of 10.7 mm. Labels: 22.7.69, Tschek, Piesting (printed), lectotype, hereby designated and labelled.

Head black. Antennae dark brown. Length body: length antennae, 10.7 : 8. Right antenna missing beyond pedicel. Postannellus elongated, 5.2 × as long as broad distally. Maxillary palpi brown. Mandibular teeth dark red. Clypeus weakly convex. Epistomal suture obliterated. Breadth mandibular base: malar space, 1 : 1. Breadth gena: breadth compound eye, 3 : 4. Head flat in the antero-posterior line. Face and frons coarsely rugose. Antennal scrobes circular, polished with vertical ridges. Vertex polished, with close hairs. Lower part of gena coarsely rugose. Genal carina developing downwards into a broad lamella, almost 0.5 of the breadth of the gena. Entire head with scattered erect hairs. Head narrowed behind the compound eyes.

Thorax black. Protonum coarsely rugose. Crista bending forward and meeting the lamella-like anterior limitation of notum 1. Lateral parts of notum 1 with longitudinal ridges. Mesoscutum closely and deeply punctured,

between the punctures polished. Prescutal sutures broad, almost a shallow fossa. Episternum 2 with coarse longitudinal ridges, between these coarsely punctured. Epicnemial carina well-developed, running up about 0.5 between sternaulus and subalar prominence. Propodeum coarsely rugose. Propodeal transverse carinae well-developed. Posterior carina interrupted medially. Between the carinae strong longitudinal ridges. Entire thorax with grey erect hairs. Legs: all coxae ferruginous. Front and middle tibiae and tarsi yellowish. Posterior femora, tibiae and basitarsi reddish brown. Posterior tarsal segments 2, 3 and 4 partly white.

Gaster. Petiole ferruginous. Postpetiole, tergites 2, 3 and 4 orange. Apex of gaster black. Postpetiole slender, length: breadth, 3.5 : 3. Laterotergites of segments 2, 3, 4 and 5 very broad (fig. 2). Spiracles of tergite 2 further from lateral margin than from hind margin (2.5 : 2). Ovipositor 2.0 mm.

Male not known with certainty. In Tschek's collection there are 3 males under the label *Cryptus neglectus*. A brief description of one of these follows below.

In the Smits van Burgst collection (ELW) there are 4 males under *Gonio-cryptus neglectus* (Tschek), which in broad lines are identical with Tschek's males. Smits van Burgst collected his material at Bolzano (Italy) in 1913 and 1914, also 2 females of the same locality and dates are present in his collection. As these males, considering their size, cannot easily be placed elsewhere, there is some reason to presume them to belong to *Trychosis neglecta*.

I have placed this male in the key, after excluding the other species and used the only available character, viz., the position of the tyloidae, which in any case separates this male from *T. legator*.

Male of 11.5 mm (apex of gaster cut off behind 5th segment). Labels: "Type" (in red ink), Tschek 1872 Piesting (printed).

Head black. Antennae with distal parts of segments 3-7 somewhat reddish, dorsally with adpressed reddish hairs. Antennae broken off behind the 9th segment, thus the position of the tyloidae cannot be ascertained.

Thorax black. Sculpture resembling lectotype. Propodeum coarsely rugose. Anterior transverse carina only present medially. Posterior transverse carina obliterated. Posterior legs with tarsus 2, 3 and 4 white. Head and thorax with erect greyish pubescence.

Gaster. Petiole reddish. Postpetiole, segments 2, 3 and 4 orange. Apex brownish. Postpetiole slender, length : breadth, 3 : 2.3, resembling female. Position of spiracle of tergite 2 between anterior and posterior margin 7 : 5, lying slightly away from lateral margin. Subgenital plate, fig. 29-30.

The type series of *Goniocryptus annulitarsis* is in the C. G. Thomson collection in the Department of Entomology of the Zoological Institute at Lund, Sweden. The material is identical with *Trychosis neglecta* (Tschek).

Characteristics of the lectotype of *Goniocryptus annulitarsis*. Female of 10.7 mm. Labels: Böks 21/6 (? = Bökestad = Bögstad, Skåne, Sweden). Lectotype hereby designated and labelled.

Gaster. Laterotergites of segments 2, 3, 4 and 5 very broad, almost meeting ventrally. Distance of spiracle of tergite 2 from lateral margin: hind margin, 5 : 4. By this the species is recognized.

Distribution. — Austria: Kaiserau bei Admont, 1200 m, vii (Heinrich, 1951); ♂♀, Piesting, leg. Tschek (NMW); ♀, Ostkarawanken, Ebriach, 580-750 m, vii.1964, leg. Van Rossem (PD). Finland: ♀, Lojo and Eno, vi-vii (Von Essen, 1910). France: ♀, Castellar, 25.vii.1958 (Aubert, 1960a); ♀, La Londe, 29.viii.1961 (Aubert, 1963a). Germany: ♀, Garmisch, 800-900 m, vii.1927 (Habermehl, 1929); ♂♀, Franken, v-viii (Bauer, 1958); Rheinland (Aerts, 1957). Italy: ♂♀, Bolzano, vi.1913 & 1914, leg. Smits van Burgst (ELW). Spain: ♂♀, Cataluña (Ceballos, 1931). Sweden: ♀, Skåne, Bögstad (ML) (Thomson, 1873).

T. tristator (Tschek, 1870)

Cryptus tristator Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 148-149.

Cryptus tristator Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 423.

Goniocryptus pleuralis Thomson, 1896, Opusc. ent. **21**: 2358.

The original description of this species was based on one male and two females.

The Tschek material of *Cryptus tristator* comprises 5 specimens, 2 females of which bear Tschek's label "Type". These two cannot be the lectotype as they bear labels with a collecting date falling after the date of publication. The remaining female is thus the lectotype. A brief description follows below. The specimen is unsuitable for a full description as the antennae are missing.

Characteristics of the lectotype of *Cryptus tristator*. Female of 11.5 mm. Antennae missing beyond pedicel. Annellus, postannellus and one segment glued to head. Labels: 31.7.1866 (ink), Tschek 1872 Piesting (printed), lectotype hereby designated and labelled.

Head black. Index of postannellus 5.4. Antennal scrobes undep, with strong transverse ridges.

Thorax black. Prepectus with a rounded tooth-like structure opposite the posterior corner of notum 1 (fig. 3). Nervellus intercepted above the middle.

Gaster. Petiole blackish red. Postpetiole, tergites 2 and 3 orange. Anterior

and posterior margin of tergite 4 orange. Apex black. Tergites finely coriaceous. This microsculpture is especially clear on posterior margin of tergite 2. Lateral part of petiole with distinct vertical wrinkles. Ovipositor 1.5 mm.

A full description of a second, completely undamaged specimen in Tschek's collection follows now to complete the description.

Female of 12.4 mm. Labels: "Type" in red, 13.7.1870 (ink), Tschek 1872 Piesting (printed).

Head. Antennae long and slender, brown, distally brownish, slightly shorter than the body. Postannellus long and slender, index 5.2. Labial and maxillary palpi dark brown. Breadth mandibular base: length malar space, 5 : 4. Clypeus slightly convex, well defined, rugose. Face rugose. Antennal scrobes vaguely defined, with conspicuous transverse ridges. Frons with transverse ridges, frontal line indicated. Vertex smooth, finely punctured, slightly pubescent. Temple and gena finely striate towards occipital carina. Genal carina collar-like. Gena rugose towards mandibular base. Compound eyes large. Breadth gena: breadth compound eye, 3 : 5. Head strongly narrowed behind compound eyes.

Thorax black. Notum 1 coarsely rugose, with crista. Anterior part of epinemium with a rounded tooth-like structure opposite posterior corner of notum 1. Mesoscutum and episternum 2 roughly punctured to rugose. Scutellum smooth with scattered large punctures. Propodeum large, slightly convex, almost circular in shape, coarsely rugose. Anterior transverse carina complete. Posterior transverse carina only laterally developed into a broad tooth-like keel. Legs: all coxae black. Wings light brownish to clear (Tschek's "stark getrübt" is misleading). In the hind wing nervellus intercepted above the middle.

Gaster. Petiole black. Postpetiole partly orange. Spiracles of tergite 1 tooth-like. Tergites 2 and 3 red, rest of gaster black. Postpetiole and all tergites finely coriaceous. Ovipositor 2 mm.

Male. — Length 8.5 mm, apex of gaster cut off through 5th segment. Labels: H. Wand, 31.6.1866, Tschek 1872 Piesting (printed), paralectotype hereby designated and labelled.

Head black. Antennae black. Index of postannellus 3.2. Antennal segments 15-20 with tyloidae. Labial and maxillary palpi brown. Breadth mandibular base: length malar space, 1 : 1. Clypeus elliptic convex. Apical margin arcuate, polished and flat. Face coarsely punctured, microsculpture in the punctures vague. Frons coarsely rugose. Antennal scrobes with transverse ridges. Vertex, temples and genae closely pubescent. Temple towards occi-

pital carina rugose. Gena towards mandibular base coarsely rugose. Genal carina towards mandibular base developed into a collar-like lamella.

Thorax black. Notum 1 with crista, coarsely rugose. Anterior epicnemium with strong, rounded, tooth-like structure, opposite posterior corner of notum 1. Epicnemial carina strongly developed. Mesoscutum closely punctate. Episternum 2 rugosely punctate. Propodeum weakly convex, coarsely rugose. Anterior transverse carina complete. Posterior transverse carina only sublaterally developed. Legs: all coxae blackish brown. Segments 2, 3 and 4 of hind tarsi white. Wings: nervellus intercepted above the middle.

Gaster. Petiole blackish red. Hind margin of postpetiole, tergites 2 and 3 orange. Apex black. Subgenital plate, fig. 31. Sclerites of 10th tergite, fig. 32.

Remark. — After finishing the manuscript I received from the Dept. of Entomology at Lund a specimen which is most probably the type of *Goniocryptus pleuralis* Thomson. It undoubtedly belongs to *T. tristator* (Tschek) and is easily recognized by the strong tooth on the anterior part of the epicnemium.

Holotype hereby labelled. Female of 12.5 mm, ovipositor 1.7 mm. Labels: a small brown label "871", a small white label "21", "*Goniocryptus tristator* for *pleuralis*" (Roman's handwriting?).

Distribution. — Austria: ♂♀, Piesting?, leg. Tschek (NMW). Denmark: ♂, Strandmøllen, leg. Drewsen (MC). France: ♀, St. Aygulf, 14.viii.1956 (Aubert, 1960a); ♀, Castellar (A.M.), 12.viii.1956 (Aubert, 1960a); ♂, Carpentras (Vaucl.), 24-27.v.1952 & 1-3.viii.1953, leg. Verhoeff (PD); ♀, Corse, Corte, 18.viii.1959 (Aubert, 1961). Germany: ♀, Franken, Rathsborg, 4.vii.1952 (Bauer, 1958); ♀, Nürnberg, vii-viii (Bauer, 1961); Rheinland (Aerts, 1957). Netherlands: ♀, Apeldoorn, 16.vii.1891, leg. Oudemans (MA); ♀, Hulshorst, vii-viii.1934, leg. Lindemans (MR); ♀, Hulshorst, vii.1943, leg. Klaassen (MA). Spain: El Escorial (Madrid) (Ceballos, 1931); citado de Campodón, Viladrau y Osormort (Cataluña) (Ceballos, 1931).

T. glabricula (Thomson, 1873)

Goniocryptus glabriculus Thomson, 1873, Opusc. ent. 5: 491-492.

The lectotype was labelled by J. F. Aubert in 1960³⁾. A brief description of this type is given here.

Characteristics of the lectotype. Female of 7.8 mm. Labels: Norl. (Norrland, Sweden), lectotype label of J. F. Aubert.

Head black. Entire antennae fuscous ferruginous, slender and sleek. Index

3) As far as I could trace the designation was not published.

of postannellus 4.3. Face closely and finely punctured with conspicuous microsculpture between and in the punctures. Antennal scrobes shallow, with conspicuous transverse ridges.

Thorax. Anterior part of epicnemium with a strong, rounded, tooth-like structure opposite the posterior corner of notum 1. Epicnemial carina well-developed. Propodeum convex. Anterior transverse carina complete, posterior transverse carina only sublaterally developed. Legs ferruginous, except the front tibia which is yellow. Wings infusate, ramellus indicated. Nervellus intercepted above the middle.

Gaster. Petiole blackish red. Margin of postpetiole, tergites 2 and 3 orange. Apex brownish orange. Ovipositor 1.2 mm.

Male. — The correlation of the sexes is tentative. Though Thomson mentions the male I have not seen it in his type series. In Tschek's type series of *T. tristator* there is a rather small male which has the microsculpture of the face in common with the *T. glabricula* female.

A description of this specimen follows here. Length 7.5 mm, gaster cut off through 6th segment. Specimen damaged by the pin. Labels: "Type" (in red), 13.7.70 (written), Tschek 1872 Piesting (printed).

Head black. Index of postannellus 4.1. Antennal segments 14-19 with tyloidae. Breadth mandibular base: length malar space, 1 : 1. Labial and maxillary palpi brown. Clypeus somewhat convex, rather polished, well-defined. Face closely punctate, between and in the punctures with conspicuous microsculpture. Antennal scrobes circular, with strong transverse ridges. Frons coarsely rugose. Vertex and temple polished, pubescent. Gena towards genal carina striate, rugose towards mandibular base. Genal carina developed into a lamella towards mandibular base. Breadth gena: breadth compound eye, 1 : 1.5. Head rounded behind the compound eyes.

Thorax black. Notum 1 laterally with longitudinal ridges. Crista present. Anterior epicnemium with rounded tooth-like structure opposite posterior corner of notum 1. Mesoscutum closely punctured. Scutellum smooth with scattered punctures. Episternum 2 rugose. Propodeum rugose, with an indication of an area superomedia. Both transverse carinae developed. Legs: all coxae dark reddish brown. Segments 3 and 4 of middle tarsi white. Segments 2, 3 and 4 of hind tarsi white. Wings slightly infusate. Nervellus intercepted above the middle.

Gaster slender. Petiole reddish black. Hind margin of postpetiole, tergites 2 and 3 orange. Apex brownish black. All tergites with adpressed hairs. Tergite 2 as long as tergite 3 and 4 combined. Subgenital plate, fig. 33; 10th tergal sclerites lost.

Distribution. — Austria: ♂, Piesting, 13.vii.1870, leg. Tschek (NMW). Denmark: Seland and Jylland (Thomson, 1873). Finland: (Hellén, 1937). France: ♀, Vendresse (Ardennes), 23.viii.26 (Cavro, 1954); ♀, Rouffach (Haute-Rhin), 12.ix.26 (Seyrig, 1927); ♀, Cestas (Gironde), 26.v.1961, leg. Van der Vecht (RMNH); ♀, Cestas (Gironde), 28.vi.1961, leg. Van der Vecht (RMNH); ? ♂, Corse, Calvi, 7.viii.1959 (Aubert, 1961). Germany: ♀, Nürnberg (Franken), viii (Bauer, 1958). Sweden: ♀, Norrland (Skåne), leg. Thomson (ML); ♀, Ryssiöholm, leg. Thomson (ML); Sällsynt (Thomson, 1873).

T. gradaria (Tschek, 1870)

Cryptus gradarius Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 151-152.

Cryptus gradarius Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 424.

Gonicryptus nitidulus Thomson, 1896, Opusc. ent. **21**: 2359.

Trychosis gradaria (Tschek) is closely related to *T. atripes* (Gravenhorst) and *T. pauper* (Tschek). These three species have the thick anterior femur in common (not more than 3.6 × as long as broad). *T. gradaria* is distinct from *T. atripes* and *T. pauper* by the long radial cell (3R 1), which is four or more times as long as broad. Also *T. gradaria* is bigger in total size.

There are in Tschek's collection only two specimens. One of these is mentioned by Tschek (1870b: 424) in a later paper. As the other specimen bears his red label "Type", and the original description was based on one female, I consider this to be the holotype.

The scarce material does not give the species a very thorough foundation, nevertheless it is quite possible to distinguish it.

Characteristics of the holotype of *Cryptus gradarius*. Female of 12.0 mm, right posterior leg broken off behind tibia. Labels: "Type" (in red), holotype, hereby labelled.

Head black. Antennae somewhat shorter than the body (7 mm), flagellar segments short and broad. Index of postannellus 2.7. Segments 10-13 dorsally white, yellow-brown ventrally. Flagellum distally reddish brown. Labial and maxillary palpi brown. Breadth mandibular base: length malar space, 15 : 19. Face broad, distance between compound eyes: anterior margin clypeus to antennal sockets, 4.5 : 3.2. Clypeus deplanate, taking up half the space between anterior margin of clypeus and antennal sockets. Antennal scrobes deep, polished, circular. Frons rugose. Vertex polished, with hairs arising from fine punctures. Breadth gena: breadth compound eye, 2 : 2.5. Head little narrowed behind the compound eyes. Temple and gena polished, with scattered punctures.

Thorax black. Notum 1 laterally rugose. With crista. Mesoscutum shallowly punctured. Episternum 2 coarsely punctured and rugose. Epicnemial carina

running up $\frac{4}{7}$ of distance between sternaulus and subalar prominence. Sternaulus vague. Propodeum coarsely punctured and rugose. Anterior propodeal carina vague, posterior transverse carina obliterated except for small lateral keels. Legs: all coxae brownish red. Index of front femur 3.5 (fig. 6). Wings almost clear. Radial cell (3R 1) long, breadth: length, 1 : 4.7 (fig. 5).

Gaster. Petiole reddish black. Postpetiole orange; length: breadth, 1 : 1. Tergites 2, 3 and 4 orange, 5 brownish black, 6 and 7 brownish black with hind margins yellow. Spiracle of 2nd tergite $3 \times$ as far from hind margin as from lateral margin. Laterotergites rather large. Ovipositor 1.7 mm.

Already Thomson himself remarked that his *Goniocryptus nitidulus* could be the same as *C. gradarius* Tschek. This fact can now be affirmed as the holotype of *G. nitidulus* (Thomson mentions only one female) is identical with the holotype of *C. gradarius* Tschek.

Characteristics of the holotype of *Goniocryptus nitidulus*. Female of 10.8 mm. Labels: Dgb (Degeberga, Skåne, Sweden), a red rimmed label *nitidulus* (!) m, holotype hereby labelled. Index of postannellus 3.2. Index of front femur 3.6. Index of radial cell 3.9 (somewhat short). Ovipositor 1.6 mm.

Remark. — In the type series of *Cryptus plebejus* I found a female specimen which must belong to the *gradaria-atripes-pauper* group as it has the anterior femur thick, it further has a long radial cell, but it is somewhat different from the holotype of *T. gradaria*.

Distribution. — None of the specimens in Tschek's collection bears a locality label. Germany: ♀, Baiern (Tschek, 1870b: 424, no specimen in his collection). Italy: ♀, Brindisi, leg. Erber (NMW); ♀, Bozen (Bolzano), vi.1913, leg. Smits van Burgst (ELW). Sweden: ♀, Degeberga, Skåne, leg. Thomson (ML). Switzerland: ♀, Chur (Tschek, 1870b: 424, no specimen in his collection).

Biology. — *T. gradaria* is probably a spider parasite. One of the two specimens in Tschek's collection bears the cocoon of the wasp on the pin. On the exterior of the cocoon silky material is fixed, probably remains of a spider's egg-sack. The label mentions "ex Drassus Eisäcke Juni 1863".

T. atripes (Gravenhorst, 1829)

Cryptus atripes Gravenhorst, 1829, Ichneumonologia Europaea 2 (2): 615, ♀ (no. 127).

Cryptus castaniventris Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 151.

Cryptus castaniventris Tschek, 1870b, Verh. zool.-bot. Ges. Wien 20: 426.

Cryptus curvipes Tschek, 1870a, Verh. zool.-bot. Ges. Wien 20: 152.

Cryptus curvipes Tschek, 1870b, Verh. zool.-bot. Ges. Wien 20: 426.

The holotype of *Cryptus atripes* Gravenhorst is a female specimen (unicum individuum) in Gravenhorst's collection in the Zoological Institute at Wrocław (Poland). It was kindly sent to me by Mr. W. J. Pulawski. The specimen is badly damaged by Dermestids, but it is nevertheless recognizable. It is identical with Tschek's *Cryptus castaniventris* and *C. curvipes*.

Characteristics of the holotype of *Cryptus atripes*. Female of 8.7 mm. Labels: none (except a label added by Pulawski), holotype, hereby labelled.

Head black. Apices of both antennae broken off. Antennae brownish to reddish, segments 9, 10 and 11 dorsally white. Index of postannellus 3. Labial and maxillary palpi light brown. Breadth mandibular base: length malar space, 5 : 4. Clypeus strongly convex. Face closely and coarsely punctured. Antennal scrobes shallow, smooth, with vague indication of ridges. Frons coarsely rugose. Breadth gena: breadth compound eye, 1 : 1. Temple polished, with rough punctures, interspaces wider than diameter of punctures. Gena towards mandibular base coarsely rugose. Genal carina developed into a lamella. Head pubescent, especially the gena.

Thorax black. Badly damaged. Notum 1 laterally with longitudinal ridges. Mesoscutum almost completely obliterated. Episternum 2 polished, with longitudinal ridges, punctured between. Propodeum coarsely rugose. Both transverse carinae well developed. Legs: all coxae with Dermestid damage. Index of front femur 3.1 (fig. 4). Index of femur II 3.7. Hind legs dark ferruginous. Wings almost hyaline (fig. 7). Index of radial cell 3.3. Nervellus intercepted in the middle.

Gaster. First segment robust. Postpetiole square. All other segments badly damaged by Dermestids, only parts of tergites 2, 3 and 4 remaining. Spiracles of tergite 2 lost. The right spiracle of tergite 3 however is undamaged and from its position with respect to the anterior corner of tergite 3 it can be gathered that the specimen is identical with *Cryptus castaniventris* Tschek.

In Tschek's collection there are three female specimens of *Cryptus castaniventris*, all bearing his red label "Type". One of these specimens has a partly red thorax and is thus more or less a variety. From the two remaining females I choose as the lectotype the specimen which agrees most with Tschek's description. All three females belong to *Trychosis atripes* (Gravenhorst).

In the collection I found two other *T. atripes* specimens, viz., one in the type series of *Cryptus neglectus*, the other under *Cryptus pauper*. *Trychosis*

pauper is very close to *T. atripes*. In his key, Tschek (1870b: 426) separated *C. pauper* and *C. castaniventris* only on a difference in colour. This is rather surprising since in his description he defined *C. castaniventris* by the position of the spiracle on the second gastral tergite.

Characteristics of the lectotype of *Cryptus castaniventris*. Female of 8.0 mm. Labels: 5/6 866 (1866) (written), "Type" (in red ink), lectotype, hereby designated and labelled.

Head black. Antennae black with postannellus $3.2 \times$ as long as distally broad. Antennal segments 3-7 somewhat thickened distally. Left antenna broken off beyond 5th segment. Apex of right antenna missing. Labial and maxillary palpi brown. Mandibular teeth dark red. Breadth mandibular base: length malar space, 1 : 1. Clypeus convex with scattered punctures. Epistomal suture obliterated. Face deeply punctured. Frons rugose. Antennal scrobes meeting, forming a deep fossa. Vertex polished. Outer orbits and temples with scattered fine punctures. Gena towards mandibular base coarsely rugose. Breadth gena: breadth compound eye, 1 : 1. Genal carina developed into a lamella. Head rounded behind the compound eyes.

Thorax black. Notum 1 closely and deeply punctured, laterally rugose. Crista present. Anterior margin of pronotum keel-like. Mesoscutum polished, roughly punctured. Prescutal sutures indicated. Scutellum polished with scattered fine punctures. Episternum 2 polished, with strong punctures, somewhat striate. Sternaulus indicated. Epicnemial carina developed, running up not quite $0.5 \times$ the distance between stermaulus and subalar prominence. Propodeum rugose. Transverse carinae vague. Propodeum dropping rather steeply behind the posterior transverse carina. Legs: all coxae dark reddish. Index of front femur 3. Femora, tibiae and tarsi reddish brown to yellowish.

Gaster. Petiole blackish. Postpetiole, tergites 2, 3, 4 and 5 of gaster dirty orange. Apex brown. Laterotergites broad (fig. 8). Spiracle of tergite 2 of gaster $1.8 \times$ as far from hind margin as from lateral margin (9 : 5). Ovipositor 1.4 mm.

According to the original description the type series of *Cryptus curvipes* comprises three females. In Tschek's collection in the Vienna Museum there are two females under *Cryptus curvipes*, both belonging to *Trychosis atripes* (Gravenhorst).

The character ("tibiis omnibus curvatis"), on which Tschek separated this species from his *C. castaniventris* and *C. pauper* is in fact weak. Of his supposed *C. curvipes* all tibiae are bent, but I suspect the bending of parts of the legs to have something to do with the dehydration of the specimen.

Characteristics of the lectotype of *Cryptus curvipes*. Female of 8.0 mm, belonging to *Trychosis atripes* (Gravenhorst). Labels: 1.8.69 (written), "Type" (in red ink), Tschek 1872 Piesting (printed), lectotype, hereby designated and labelled. The specimen has a thick front femur (index 3.2). The laterotergites are somewhat broadened, while the spiracle of tergite 2 of gaster is $2 \times$ as far from the hind margin as from the lateral margin of tergite. Ovipositor 1.5 mm.

Distribution. — Austria: ♀, Piesting, leg. Tschek (NMW); ♀, Wien, Mauer, Veranda, 2.vii.1956, leg. Fulmek (NMW). France: ♀, Ile du Levant, 13.viii.1954 (Aubert, 1957). Germany: ♀, Rheinland (Aerts, 1957). Italy: ♀, Bolzano, 1914, leg. Smits van Burgst (ELW). Spain: ♀, Toledo, 28.vii.1963, leg. Verhoeff (identification dubious) (PD); El Escorial y Ribas (Madrid) (Ceballos, 1931).

T. pauper (Tschek, 1870)

Cryptus pauper Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 150.

Cryptus pauper Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 424, 426.

Gonicryptus lapponicus Thomson, 1894, Opusc. ent. **19**: 2116.

Gonicryptus lapponicus Thomson, 1896, Opusc. ent. **21**: 2160.

Trychosis pictulus (!) Heinrich, 1951, Bonn. zool. Beitr. **2**: 287.

The original description of *Cryptus pauper* was based on one female which is thus the holotype. In Tschek's collection there are three specimens under *Cryptus pauper*, viz., two females and one male, all three bearing Tschek's red label "Type". None of these specimens can be the holotype for the following reasons. The male is in any case excluded. One female belongs to *Cryptus pauper* in the sense of Tschek, it is undoubtedly the specimen which Tschek mentioned in a later addition (1870b: 424) from Botzen (Bozen) Mann (1867). The specimen bears a label "*C. pauper* n. sp. var.". The other female is a specimen of *Cryptus castaniventris* Tschek (= *Trychosis atripes* (Gravenhorst)). There is no indication whatever that this specimen is the holotype. In his description of the holotype Tschek mentions "plica ventrali nigra", while this specimen has the ventral fold orange. But there is even stronger reason to suspect this specimen, as Tschek in his description of *C. castaniventris* says "die Luftlöcher des 2. liegen vom Endrande mindestens noch einmal so weit entfernt als vom Seitenrande". Now the position of the spiracles of tergite 2 of the specimen in question exactly conforms with this statement. It is almost out of the question that Tschek overlooked this point. I have therefore taken the standpoint that the holotype is missing.

On the whole the differences that I find between *Trychosis atripes* and *T. pauper* are not very convincing while the male of *T. atripes* has not yet

turned up. The *T. pauper* male of Tschek could very well be the male of both "species". As long as the material remains poor I think it is best to allow for both species. The indication of a neotype for *Cryptus pauper* Tschek is necessary to fix definitely the identity of this species.

Characteristics of the neotype of *Cryptus pauper*. Female of 8.0 mm. Labels: "Type" in red ink, Mann Bozen 1867 (printed), *C. pauper* n. sp. var. (Tschek's handwriting), *Trychosis (Goniocryptus) pauper* Tschek det. J. F. Aubert. Neotype herewith designated and labelled.

Head black. Antennae with postannellus $3.2 \times$ as long as distally broad. Antennal segments 9-11 white dorsally. Antennal segments 3-8 somewhat thickened distally. Labial and maxillary palpi brown. Face and frons coarsely rugose. Epistomal suture obliterated. Breadth compound eye: breadth gena, 3 : 2. Head somewhat narrowed behind the compound eyes. Vertex polished, with scattered punctures, rugose towards the occipital carina, temple polished, gena coarsely rugose towards the mandibular base. Genal carina developed into a lamella.

Thorax black. Notum 1 closely and deeply punctured, laterally rugose. Crista present. Anterior margin of pronotum keel-like. Mesoscutum polished, roughly punctured. Episternum 2 with longitudinal ridges, strongly punctured between. On both sides badly fractured. Mesosternum closely punctured. Sternaulus indicated. Scutellum completely obliterated by pin. Propodeum coarsely rugose. Both transverse carinae well developed. Wings infusate. Cell 3R 1 (radial cell) with length: breadth, 4 : 1. Legs brown to yellowish. Front femur thick, index 3.

Gaster. Petiole blackish. Postpetiole orange, about $3 \times$ as broad as base of petiole, polished. Tergites 2, 3 and part of 4 orange. Apex of gaster brown. Tergites 7 and 8 with narrow yellow margins. Spiracles of 2nd tergite $2.5 \times$ as far from hind margin as from lateral margin (fig. 9). Ovipositor 1.2 mm.

Male. — The correlation of the sexes is tentative. The male of this species was described by Tschek on one specimen. The only tenable character mentioned by him is the index of the postannellus ($2 \times$ as long as distally broad). This of course is no arresting evidence for the identity of the *pauper* male. The subgenital plate (fig. 34) of Tschek's specimen is distally (opposite the apodeme) very flat, and on the whole differs from the subgenital plate of *T. legator* (fig. 36-44).

I have tried to associate the short postannellus and the flat subgenital plate, but found only very few specimens with these two characters in combination. A brief description of the male of Tschek's *T. pauper* may follow here.

Male of 6.7 mm (apex of gaster cut off through 5th segment of gaster). Labels: "Type" in red ink, 15.5.70 (Tschek's handwriting), Tschek 1872 Piesting (printed), *Trychosis (Goniocryptus) pauper* Tschek repréparé det. J. Aubert.

Head black. Antennae dark brown, both apices missing. Postannellus short, $2.1 \times$ as long as distally broad. Dorsally with adpressed hairs. Tyloidae on segments 12-22 (last three little developed). Antennal scrobes polished. Labial and maxillary palpi light brown. Breadth mandibular base: length malar space, 1 : 1. Face and frons coarsely punctured to rugose. Vertex polished, finely punctured at insertions of hairs. Outer orbits polished, towards genal carina with deep punctures. Genal carina developed into a lamella. Head rounded behind the compound eyes. Entire head strongly pubescent.

Thorax black. Pronotum with crista. Notum 1 coarsely punctured to rugose, especially the lateral part. Episternum 2 regularly and deeply punctured, in the centre finely striate. Scutellum less closely punctured, polished. Propodeal transverse carinae well developed. Thorax covered with greyish pubescence. Legs with all coxae reddish brown. Anterior and middle femora and tibiae brownish to yellowish. Posterior legs red brown.

Gaster. Base of petiole black. Postpetiole, tergites 2 and 3 dirty red. Tergite 4 and apex dark brown. Spiracles of segment 1 standing out. Postpetiole length: breadth, 4 : 3. Position of spiracle of tergite 2 between anterior and posterior margin of tergite 22 : 15, lying on the lateral margin. Subgenital plate, fig. 34; 10th tergal sclerites, fig. 35.

In 1894 Thomson for the first time used the binomen *Goniocryptus lapponicus* citing "Holmgren in litt." as the author. Holmgren recognized the species and listed it in his written catalogue, but it seems not to have been published by him. In 1896 Thomson once again listed this species, but now he gives his own name as the author. Thomson is the author of *T. lapponica* since he gave the first valid description. His name, however, is antedated by *Cryptus pauper* Tschek, 1870.

Characteristics of the lectotype of *Goniocryptus lapponicus*. Female of 7.7 mm. Labels: Lapp (printed), a red rimmed written label *lapponicus*, lectotype, hereby designated and labelled.

Head black. Antennae with postannellus $3.6 \times$ as long as distally broad. Antennae dark brown. Labial palpi light brown. Clypeus convex. Face densely punctured. Frons rugose. Breadth compound eye: breadth gena, 17 : 15. Vertex polished, densely pubescent. Gena rugose towards mandibular base. Genal carina towards mandibular base developed into a lamella.

Thorax black. Notum 1 rugose, with crista. Mesoscutum polished, with rough punctures. Distance between the punctures about equal to their diameter. Episternum 2 with longitudinal ridges and rough punctures. Propodeum rugose, with a tendency towards ferruginous, both transverse carinae well developed. Wings infusate. Radial cell, length: breadth, 3.3:1. Nervellus intercepted far below the middle. Legs with front femur thick, length: breadth, 3.3:1. All coxae ferruginous.

Gaster. Petiole ferruginous. Postpetiole almost square, orange. Segments 2, 3 and base of 4 orange. Apex brown, with narrow hind margins of tergites yellow. Spiracle of 2nd tergite $2.4 \times$ as far from hind margin as from lateral margin. Ovipositor 1.4 mm.

Male. — Thomson's type series of *Goniocryptus lapponicus* includes one other specimen, a male, which very much affirms my view of the *T. pauper* male. Thomson's specimen is identical with the only male in Tschek's type series of *T. pauper*. Labels: Lapp (printed), paralectotype, hereby labelled. Index of postannellus 2.3 (2.1 in Tschek's ♂). Nervellus intercepted far below the middle.

The holotype of *T. pictula* is kept in the collection of Dr. H. Townes at Ann Arbor (Mich.) U.S.A. It was kindly sent to me by Dr. Townes.

The specimen is identical with *Trychosis pauper* (Tschek).

Characteristics of the holotype of *Trychosis pictula*. Female of 7.2 mm. Labels: Stmk., Bösensteinmassiv, 1700 m, 21.7.50, Typus (red label), *Trychosis pictulus* Hein. (ink), Type no. 40 (yellow label), labelled *Trychosis pauper* (Tschek) by the present author.

Head. Index of postannellus 3.

Thorax. Index of left front femur 3.4, somewhat more slender than in the neotype of *Trychosis pauper*.

Gaster. Spiracle of 2nd tergite $2.5 \times$ as far from hind margin as from lateral margin. Ovipositor 1.3 mm. By this the species is recognized.

Distribution. — Austria: ♂, Piesting, leg. Tschek (NMW); ♀, Steiermark, Bösensteinmassiv, 1700 m, 21.vii.1950, leg. Heinrich. France: ♀, Peira Cava (Aubert, 1963a); ♂, Carpentras (Vaucluse), 24-27.v.1952, leg. Van Rossem (RMNH); ♂, 1 km north of St. Mars de Coustais (Loire inf.), 30.v.1955 (RMNH). Germany: ♀, Rheinland (Aerts, 1957); Bauer (1961) mentions *T. atripes* (Gravenhorst) = *pauper* (Tschek) from Franken. Hungary: Hadad (Zilahi Kiss, 1915). Italy: ♀, Bolzano, leg. Mann, 1867 (NMW); ♀, Bolzano vi.1913, leg. Smits van Burgst (ELW). Netherlands: ♀, Hulshorst, 14.vi.1932, leg. Lindemans (MR). Spain: Madrid (Ceballos,

1931); ♀, Burgos (Burgos), 850 m, 26.vi.1961 (RMNH); ♀, Tornavacas (Caceres), 1200 m, 22.vi.1961 on *Oenanthe lachenalii* C. C. Gmel, leg. Van der Vecht (RMNH). Sweden: ♂♀, Lappland, leg. C. G. Thomson (ML).

T. legator (Thunberg, 1822)

Ichneumon legator Thunberg, 1822, Zap. imp. Akad. Nauk **8**: 268.

Ichneumon legator Thunberg, 1824, Zap. imp. Akad. Nauk **9**: 331.

Cryptus abnormis Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 146.

Cryptus abnormis Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 419.

Cryptus plebejus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 147.

Cryptus plebejus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 419-421.

Cryptus inimicus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 147-148.

Cryptus simulator Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 149.

Cryptus simulator Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 423.

Cryptus rusticus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 421-422.

Goniocryptus pictus Thomson, 1873, Opusc. ent. **5**: 494.

Goniocryptus clypearis Thomson, 1873, Opusc. ent. **5**: 494.

Much confusion in European *Trychosis* material has been caused by the great variability of *Trychosis legator* (Thunberg). Two important characters, viz. the head rounded or the head narrowed behind the compound eyes at first sight lead in the direction of two species. Further analysis of such specimens does not give satisfactory results as the shape of the head behind the eyes can not be associated with other useful characters. De Beaumont (1943) showed that morphological features of adult Hymenoptera aculeata can vary a great deal. He gave instructive examples of the shape of the head which are analogous to the problem we are facing here (fig. 15, after De Beaumont).

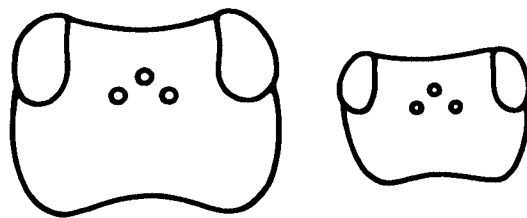


Fig. 15. *Pemphredon rugifer* (Dahlb.), dorsal aspect of head of two females, after De Beaumont.

Ichneumon legator Thunberg, 1822, was synonymized by Roman (1912) with *Cryptus plebejus* Tschek. This is correct, however, the shape of the head behind the eyes is rounded in Thunberg's original specimen (fig. 23). Tschek's *Cryptus rusticus* resembles Thunberg's specimen more closely. Nevertheless within the type series of *Cryptus rusticus* there is obviously rather strong variation in the shape of the temples. Within a series of speci-

mens in Koornneef's collection at Wageningen (ELW), probably from one population, one finds specimens of true *plebejus* character and others with tendencies towards *T. rusticus* (fig. 19-21). This also holds for other series.

When studying *Trychosis legator* I had a comparatively large material available and it was possible to associate the extremes of the shape of the head by a connecting series of individuals. The holotype of *Trychosis legator* takes almost an average position. I propose to indicate this form as *T. legator* f. *legator* (Thunberg), while the forms with the head narrowed behind the eyes will stand as *T. legator* f. *plebeja* (Tschek). Three specimens in Tschek's material of *Cryptus rusticus*, viz. the lectotype (fig. 28) and two syntypes (fig. 26-27) are extremes of the thick head and I have labelled them as *T. legator* f. *rustica* (Tschek). These specimens represent in the strict sense Tschek's concept of *Cryptus rusticus*. Other specimens of this kind may turn up here and there.

Some specimens under *Cryptus plebejus* in Tschek's collection, collected in southern Europe, viz. Brindisi (2), Epirus (1), Corfu (1) and one with a label "Piesting, Tschek", are not closely identical with Thunberg's holotype. Tschek already noted the strong variation in his *C. plebejus* and (1870b: 419-420) discussed this problem rather lucidly: "und am Ende der Reihe stehen Formen, die man, wären sie nicht durch Zwischenglieder so deutlich vermittelt, für eine besondere Art anzusehen versucht wäre". I have only to add that I agree with Tschek and that it would not be opportune to describe new species as long as more material is not brought in.

It should be remarked here that large specimens of *T. legator* (> 10 mm) may resemble *T. mesocastana* (Tschek).

Tschek (1870b: 422) himself was aware of the fact that certain specimens belonging to *Cryptus rusticus* are difficult to separate from *C. pauper*. This has been confirmed, especially with respect to the index of the postannellus, as I found specimens of *T. pauper* with an index of postannellus (3.6) falling within the range of *T. legator*. In such cases the index of the front femur can be decisive. Table 1 gives the indices of femur I and the postannellus of some important specimens.

TABLE I

Indices of femur I and postannellus of some female specimens

	femur I	postannellus
holotype <i>legator</i>	3.6	—
lectotype <i>rusticus</i>	4.0	3.8
paralectotype <i>rusticus</i>	4.0	4.2
lectotype <i>plebejus</i>	4.0	4.5
paralectotype <i>plebejus</i>	3.8	3.6

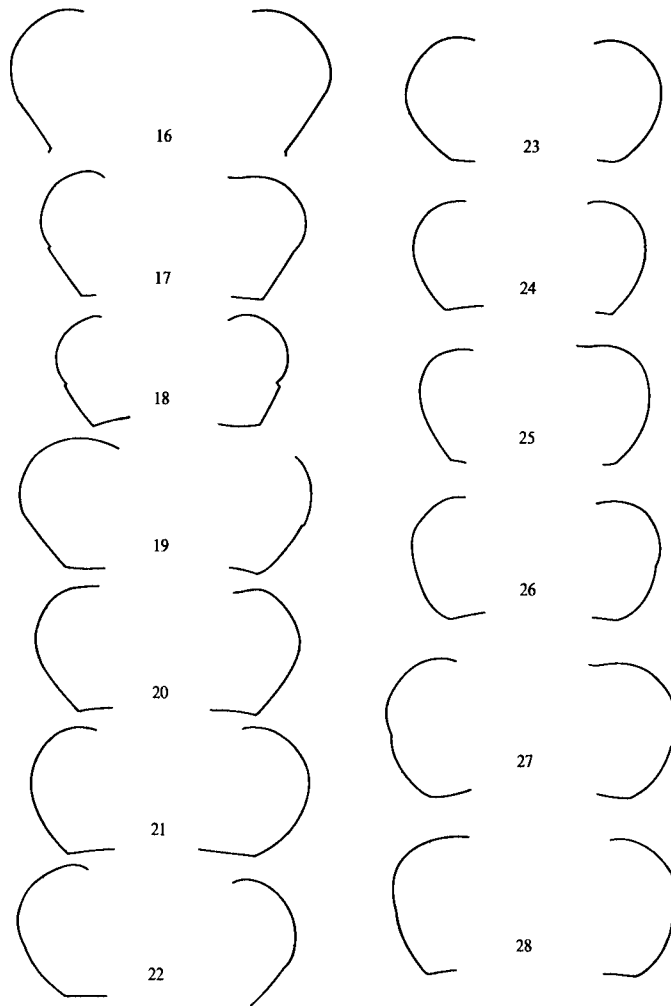


Fig. 16-28. Dorsal aspects of heads of *Trychosis legator* (Thunberg). 16, *T. legator* f. *plebeja* (Tschek), ♀ Corfu (NMW); 17, *T. legator* f. *plebeja* (Tschek), ♀ lectotype; 18, *T. legator* f. *plebeja* (Tschek), ♀ paralectotype; 19, *T. legator* f. *plebeja* (Tschek), ♀ Rhenen, Netherlands, 1.vii.36 (ELW); 20, *T. legator* f. *plebeja* (Tschek), ♀ Rhenen, 24.vi.36 (ELW); 21, *T. legator* f. *legator* (Thunberg), ♀ Rhenen, 2.vii.36 (ELW); 22, *T. legator* f. *legator* (Thunberg), ♀ Tunis, iv. 1911 (ELW); 23, *T. legator* f. *legator* (Thunberg), ♀ holotype (UU); 24, *T. legator* f. *legator* (Thunberg), ♀ paralectotype *C. rusticus* (Tschek); 25, *T. legator* f. *legator* (Thunberg), ♀ Piesting (NMW); 26, *T. legator* f. *rustica* (Tschek), ♀ Piesting (NMW); 27, *T. legator* f. *rustica* (Tschek), ♀ Piesting (NMW); 28, *T. legator* f. *rustica* (Tschek), ♀ lectotype.

The holotype of *I. legator* is a female in Thunberg's collection, kept in the Zoological Institute of the Uppsala University. The specimen was kindly sent to me by Mr. Sten Jonsson.

Characteristics of the holotype of *Ichneumon legator*. Female of 8.7 mm. Labels: the specimen bears only one label in ink with Roman's handwriting "*Goniocryptus legator* Thbg". Holotype hereby labelled.

Head black. Dermestid damage on the left gena. Repaired. Antennae, labial and maxillary palpi missing. Mandibular teeth reddish brown. A line drawn between the bottoms of the compound eyes runs above the clypeal bulge. Clypeus convex. Epistomal suture obliterated. Compound eyes convex. Breadth compound eye: breadth gena, 1.9 : 1.3. The head is flattened in the antero-posterior line and it is proportionally small. Face rugose with shallow large punctures. Malar space coriaceous. Antennal scrobes circular, polished, with radiate ridges. Frons coarsely rugose, frontal line indicated by a keel. Vertex polished, finely punctured. Outer orbits polished, towards genal carina more coarsely punctured and gradually coarsely rugose near mandibular base. Genal and hypostomal carina developed into a lamella, hyaline brownish in colour. Head rounded behind the compound eyes (fig. 23).

Thorax black. Pronotum, pleural and sternal regions coarsely punctate to rugose. Propodeum coarsely rugose. Pronotum with crista. Mesoscutum with vague prescutal sutures. Sternaulus short. Epicnemial carina well developed, running up somewhat less than $0.5 \times$ the distance between sternaulus and subalar prominence. Speculum indicated. Propodeal transverse carinae parallel. Posterior transverse carina interrupted medially. Wings infuscate, ramellus developed. Nervellus intercepted somewhat below the middle. Legs with all coxae and trochanters black. Index of first femur 3.6, dorsally yellowish, ventrally brownish. Middle and posterior femora brownish with reddish basal rings. Front and middle tibiae yellowish. Posterior tibiae brown.

Gaster. Base of petiole black. Postpetiole, segments 2, 3 and 4 orange. Segment 5 and further black. Postpetiole almost square. Spiracles of segment 1 of gaster standing out. Spiracles of tergite 2 much nearer to the lateral margin than to the posterior margin of the tergite (7 : 20). Ovipositor 1.4 mm.

Male. — The figures 36-40, all after specimens from Rhenen, Netherlands, coll. Koornneef (ELW), show the variation in the shape of the male subgenital plate, though all belong to the same population. From these figures I conclude that the shape of the subgenital plate in the male has no taxonomical value. Neither do the 10th tergal sclerites offer any help. For

description of the *T. legator* male I have taken one of the two *Cryptus plebejus* males from Tschek's collection.

Description of the male. Specimen of 8 mm (apex of gaster cut off

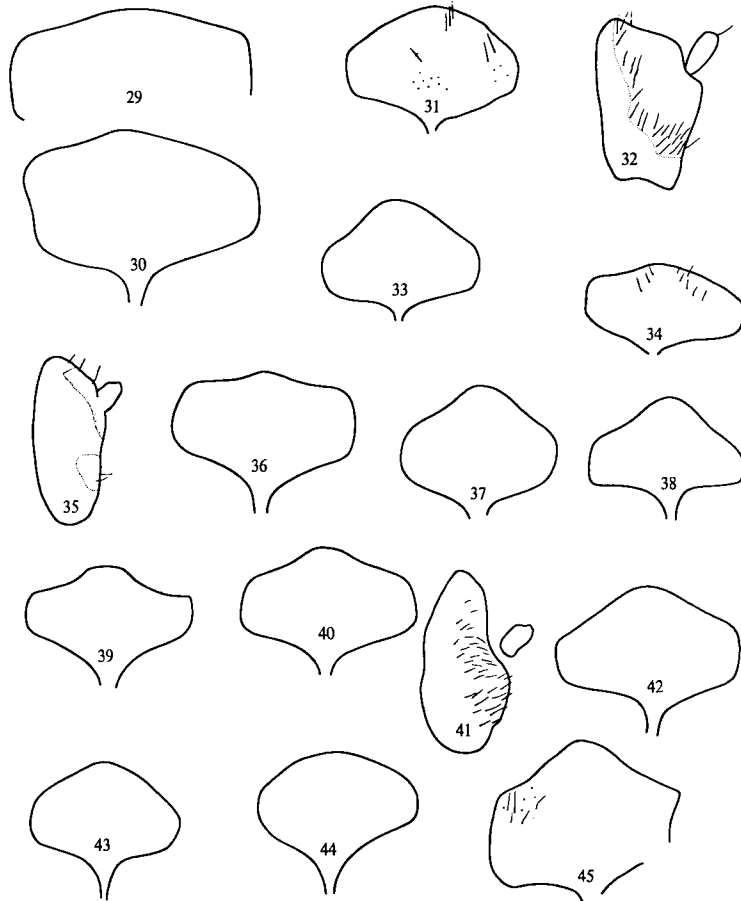


Fig. 29-35. Details of male genitalia of *Trychosis*. 29-30, *T. neglecta* (Tschek), Piesting (NMW), subgenital plate; 31, *T. tristator* (Tschek), paralectotype, subgenital plate; 32, *T. tristator* (Tschek), paralectotype, sclerite of 10th tergite; 33, *T. glabricula* (Thomson), Piesting (NMW), subgenital plate; 34, *T. pauper* (Tschek), Piesting (NMW), subgenital plate; 35, *T. pauper* (Tschek), Piesting (NMW), sclerite of 10th tergite.

Fig. 36-44. Details of male genitalia of *Trychosis legator* (Thunberg). 36, Rhenen, Netherlands, 2.vii.36 (ELW), subgenital plate; 37, Rhenen, 8.vii.36 (ELW), subgenital plate; 38, Rhenen, 24.vi.36 (ELW), subgenital plate; 39, Rhenen, 7.vii.36 (ELW), subgenital plate; 40, Rhenen, 1.vii.36 (ELW), subgenital plate; 41, Rhenen, 1.vii.36 (ELW), sclerite of 10th tergite; 42, *C. plebejus* Tschek, paralectotype, subgenital plate; 43, Tunis, 1911 (ELW), subgenital plate; 44, Tunis, 1911 (ELW), subgenital plate.

Fig. 45. *T. mesocastana* (Tschek), lectotype of *C. ambiguus* Tschek, subgenital plate.

through 6th segment). Labels: Type (in red), Tschek 1872 Piesting (printed), paralectotype hereby designated and labelled.

Head black. Antennae reddish brown, labial and maxillary palpi light brown. Mandibular teeth red. Flagellum with tyloidae on antennal segments 12-18. Clypeus slightly convex. Epistomal suture obliterated. Compound eyes standing out. Breadth compound eye: breadth gena, 1 : 1. Head flat in the antero-posterior line. Face rugose. Malar space coriaceous. Antennal scrobes circular, polished, with vague indication of ridges. Frons coarsely rugose. Vertex polished, sparsely punctured. Outer orbits polished, towards genal carina more coarsely punctured and gradually coarsely rugose towards mandibular base. Genal and hypostomal carinae developed into a lamella, transparent reddish in colour. Head narrowed behind the compound eyes. Face and genae pubescent.

Thorax black. Pronotum, pleural and sternal regions coarsely punctate to rugose. Pronotum with crista. Mesoscutum with shallow but clear pre-scutal sutures. Epicnemial carina well developed, running up $0.5 \times$ the distance between sternaulus and subalar prominence. Propodeal carinae well developed. Wings slightly infusate. Ramellus almost point-like. Nervellus intercepted in the middle. Coloration of legs similar to holotype of *T. legator* but tarsal segments 3 and 4 of posterior legs whitish.

Gaster. Coloration similar to holotype of *T. legator*. Segment 4 of gaster with hind margin of tergite black. Spiracles of segment 1 standing out. Postpetiole with length: breadth, $2.5 : 2$. Spiracles of tergite 2 lying on the lateral margin $2 \times$ as far from anterior margin as from hind margin of tergite. Subgenital plate, fig. 42.

Both specimens of *C. abnormis* in Tschek's collection, viz., a male and a female, belong to *Trychosis legator* (Thunberg). The "abnormalities" of these specimens are the drawn out spiracles of the gastral segment 1. The variability of this character is discussed by Aubert (1960b). The lectotype is undoubtedly the male mentioned by Tschek.

Characteristics of the lectotype of *Cryptus abnormis*. Male of 8.7 mm. Labels: 10.7.1866, Type (in red), Tschek 1872 Piesting (printed), lectotype hereby designated and labelled.

Head black. Left antenna broken off beyond postannellus. Right antenna broken off beyond segment 5.

Thorax black. Tarsi of middle legs broken off beyond tibiae. Posterior legs malformed, especially right tibia and basitarsus.

Gaster. Spiracles of gastral segment 1 strongly dentate, slightly asymmetric, viz., left tooth smaller than right.

The type series of *Cryptus plebejus* comprises four specimens, viz., one male and three females (Tschek, 1870a: 147). Of the material in Tschek's collection only two females come into consideration as these fall into the range of size given by Tschek (♀, 7-8.5 mm). Of the two available females only one has the "annulo antennarum albo" mentioned by the author and this specimen is thus the lectotype. The remaining male and female were labelled "paralectotype" by the present author. Lectotype and both paralectotypes are *T. legator* (Thunberg).

Characteristics of the lectotype of *Cryptus plebejus*. Female of 8.8 mm. Labels: 22.6.1866, Tschek, Piesting (printed), lectotype hereby designated and labelled.

Head black. Apices of antennae broken off. Antennae brownish to reddish, segments 10-11 dorsally whitish. Labial and maxillary palpi brown. Breadth mandibular base: length malar space, 5 : 6. Index of postannellus 4.5. A line drawn between the bottoms of the compound eyes runs above the clypeal bulge. Clypeus convex, slightly transversely striate. Face coarsely and closely punctured. Frons coarsely rugose. Antennal scrobes shining, with radiate ridges. Vertex and temples smooth with scattered punctures. Gena with longitudinal striae. Genal carina collar-like. Head narrowed behind the compound eyes (fig. 17). Breadth compound eye: gena, 5 : 3. Head pubescent.

Thorax black. Notum 1 coarsely rugose, with crista. Mesoscutum shining, closely punctured. Prescutal sutures indicated. Scutellum shining with scattered punctures. Propodeal anterior transverse carina developed only mesally. Posterior transverse carina only indicated by short lateral keels. Propodeum with longitudinal ridges, starting and spreading fan-like from the propodeal orifice. Legs with all coxae and rest of legs reddish brown. Index of anterior femur 4. Wings slightly infusate. Ramellus indicated. Nervellus (Cu 1) intercepted somewhat below the middle. Thorax and coxae with short pubescence.

Gaster. Base of petiole reddish black. Rest of petiole, postpetiole, tergites 2, 3 and 4 bright orange. Apex of gaster brownish black. Ovipositor 1.5 mm. Position of spiracle on tergite 2, distance to hind margin: distance to lateral margin, 20 : 7.

The holotype of *Cryptus inimicus* is in Tschek's collection; it is a female of *T. legator* (Thunberg). Tschek (1870a: 148) himself already suggested that this species might be a "variety" of *C. plebejus*.

Characteristics of the holotype of *Cryptus inimicus*. Female of 7.6 mm. The size of the specimen is given as 7 mm. The difference of 0.6 mm is

accounted for by measuring head, thorax and gaster separately. Labels: 24.7.(18)69, Type (in red), holotype hereby labelled.

Head reddish. Antennae repaired with clot of white glue. Antennae proximally orange, distally more brownish. Right antenna broken off beyond 6th segment.

Thorax black. Legs including all coxae reddish. Wings almost clear.

Gaster. Base of petiole dark red. Postpetiole, tergites 2, 3 and 4 orange. Apex of gaster brownish black.

The holotype of *Cryptus simulator* is a female of *T. legator* (Thunberg).

Characteristics of the holotype of *Cryptus simulator*. Female of 9.4 mm. Labels: 24.7.(18)69, Type (in red), Tschek 1872 Piesting (printed), holotype hereby labelled.

Head black. Left antenna broken off beyond 8th segment, apex of right antenna missing. Index of postannellus 4.5. A line drawn between the bottoms of the compound eyes runs above the clypeal bulge. Clypeus convex, roughly punctured. Face roughly punctured. Frons coarsely rugose.

Thorax black. Vertical carina on anterior part of epicnemium strongly developed. Legs: tarsi of both posterior legs broken off beyond basitarsus, as mentioned by Tschek. Wings rather strongly infusate.

Gaster. Anterior part of 2nd tergite compressed, tergite thus bell-shaped.

According to the original description there were 8 males and 9 females in the type series of *Cryptus rusticus* Tschek. In Tschek's collection in the Vienna Museum there are now 3 males and 9 females. The original set of females is for the greater part still there. One specimen bears a collection date falling after the date of publication.

I have discussed the position of *C. rusticus* on page 25. The specimen which I have chosen as the lectotype undoubtedly represents Tschek's concept of *C. rusticus* in the strict sense. A description of this specimen follows below.

Tschek (1870b: 422) stated that his female *C. rusticus* agrees with *C. titillator* Gravenhorst. This remark makes it clear that Tschek had no idea of the real identity of Gravenhorst's material.

Characteristics of the lectotype of *Cryptus rusticus*. Female of 9.5 mm. Labels: Tschek 1872 Piesting (printed), 15.5.70 (written), lectotype hereby designated and labelled. The specimen represents *T. legator* (Thunberg) f. *rustica* (Tschek).

Head black. Antennae rufous to brown, segment 9 with a small white spot, segments 10-11 dorsally white. Both apices missing. Index of postannellus 3.8. Labial and maxillary palpi brown. Breadth mandibular base: length malar space, 1 : 1. Clypeus in the same plane as face. Clypeus, face

and frons rugose. Antennal scrobes polished. Vertex and temples polished and with fine hairs. Outer orbits polished. Gena towards mandibular base with coarse punctures, towards genal carina with indication of ridges. Genal carina towards mandibular base with very weak lamella. Breadth compound eye: breadth gena, 1 : 1. Temples convex ("capite pone oculos rotundato") (fig. 28). Head including the mandibles pubescent.

Thorax black. Notum 1 coarsely rugose with punctures between. Crista present. Mesoscutum regularly punctured, interspaces polished. Episternum 2 with longitudinal rugosity, punctured between. Propodeal spiracles broadly oval (length: breadth, 2.5 : 1). Both transverse carinae developed. Posterior transverse carina medially somewhat obliterated, sublateral portions well developed. Propodeum rugose. Wings subhyaline, ramellus indicated. Nervellus intercepted in the middle. Legs with all coxae black. Tarsi rufous. Index of first femur 4.0.

Gaster. Petiole dark red. Postpetiole, tergites 2, 3 and 4 orange. Spiracle of 2nd tergite $2.8 \times$ as far from hind margin as from lateral margin of tergite. Apex of gaster brownish black. The length of the ovipositor could not be measured.

Specimens with entirely orange coloured antennae occur amongst sets of *T. legator* (Thunberg). Both Tschek and Thomson have described this form as a species, but there is no reason to maintain it. I have noted the form in Swedish, Danish, Dutch, French and North African populations of *T. legator*.

In the Thomson collection at Lund there are three specimens under *Goniocryptus pictus*, viz., a female, and two males with only a small green label on the pin, both belonging to *T. legator* (Thunberg). There is no certainty that the female is a syntype, though it agrees with Thomson's description. I have not labelled it as a lectotype. Some data concerning this specimen follow below. Female of 7.7 mm belonging to *T. legator* (Thunberg). Labels: 19/6-73 (ink), a red rimmed written label *pictus*. Flagellum orange coloured. Propodeum and coxae ferruginous, rest of legs orange. Ovipositor 1.2 mm.

In the University Zoological Museum at Copenhagen a single female specimen from the Jensen collection is kept. This specimen is undoubtedly a syntype, as it is mentioned by Thomson (1873: 494). I designate this specimen to be the lectotype.

Characteristics of the lectotype of *Goniocryptus pictus*. Female of 7.8 mm, identical with *T. legator* (Thunberg). Labels: ♀ 29.5.1870, Horsens (Jutland), O. Jensen (ink), Danmark ex coll. Schiødte (printed), "Type" a red, printed Museum label, lectotype herewith designated and labelled.

Head black. Scapus brown, flagellum yellowish to ferruginous. Index of postannellus 4.2. Labial and maxillary palpi brown. Clypeus convex, epistomal suture obliterated. Face and frons rugose. Antennal scrobes polished with transverse ridges. Vertex, temple and gena polished, with punctures from which hairs arise. Gena polished towards mandibular base⁴). Head rounded behind the compound eyes.

Thorax. Lateral part of notum 1, episternum 2, propodeum and all coxae ferruginous. Only the mesoscutum is black. Mesoscutum closely punctured, interspaces about as wide as diameter of punctures, polished. Legs orange.

Gaster. Petiole, postpetiole, tergites 2, 3 and base of 4 orange. Apex brown. Ovipositor 1.5 mm.

The lectotype of *Goniocryptus clypearis* is in the Thomson collection in the Department of Entomology of the Zoological Institute at Lund, Sweden. The pin carries two specimens of which the upper specimen is chosen as the lectotype.

Characteristics of the lectotype of *Goniocryptus clypearis*. Female of 8.7 mm. Labels: Dgb (= Degeberga, Skåne, Sweden). Lectotype hereby designated and labelled. The specimen is closely similar to the holotype of *Trychosis legator* (Thunberg).

Head. Left antenna broken off behind segment 6.

Distribution. — The Palaearctic Region from Kamtchatka (Habermehl, 1930) to Britain (Morley, 1907). From Sweden and Finland in the north, to Greece (Corfu and Epirus) in the south. The most common species of *Trychosis*.

T. mesocastana (Tschek, 1870)

Cryptus mesocastanus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 144.

Cryptus mesocastanus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 418-419, 425.

Cryptus ambiguus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 145.

Cryptus ambiguus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 419, 425.

Cryptus molestus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 146.

Cryptus molestus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 419, 425.

Goniocryptus annulicornis Thomson, 1896, Opusc. ent. **21**: 2357.

Cryptus titillator auctorum, non Linné (1758).

Linné's name, *Ichneumon titillator*, cannot be retained for this species since Roman (1932) showed that *I. titillator* is a species of *Cryptus* (*C. recreator* F.).

4) This appears to be an individual character. Two females from the Netherlands, otherwise resembling *T. picta*, show the normal rugosity of the gena towards the mandibular base of *T. legator*.

By the kindness of W. J. Pulawski (Zool. Inst. Wroclaw, Poland) I had the opportunity to investigate a female specimen of *C. titillator* sensu Gravenhorst, which proved to be *Trychosis mesocastana* (Tschek). As Gravenhorst used the name *titillator* (1829: 567) with Linné as the author, this apparently is a misidentification. Tschek's name for this species, *Cryptus mesocastanus*, is the next one available.

The material of *C. mesocastanus* in Tschek's collection comprises 5 specimens, viz., 4 females and 1 male. Two of the females bear Tschek's label "Type" (in red). In his description Tschek does not specially indicate the type. One of these specimens bears a label "Mann", I have chosen the other as the lectotype.

Characteristics of the lectotype of *Cryptus mesocastanus*. Female of 10.1 mm. Somewhat damaged, pleuron 1 pushed forward by the pin. Labels: "Type" (in red), Tschek 1872 Piesting (printed), lectotype hereby designated and labelled.

Head black. A line drawn between the bottoms of the compound eyes at least cuts through the upper part of the clypeal bulge (fig. 12 and 13, paralectotype). Postannellus $4.8 \times$ as long as distally broad (fig. 14, lectotype). Antennal segments 9-12 dorsally white, ventrally brown. Labial and maxillary palpi brown. Breadth mandibular base: length malar space, 3 : 2. Anterior margin of clypeus almost a straight line, clypeus deplanate, scarcely defined, in the same plane as face. Face rugosely punctured. Frons with vague punctures. Antennal scrobes forming deep fossa. Vertex and temple polished, with scattered punctures. Gena towards mandibular base almost smooth. Genal carina with weak lamella. Head strongly pubescent. Breadth compound eye: breadth gena, 1 : 1.

Thorax black. Notum 1 closely punctured, between the punctures finely coriaceous ⁵⁾. Crista present. Mesoscutum closely punctured. Scutellum closely punctured and coriaceous between the punctures ⁵⁾. Episternum 2 closely punctured and partly coriaceous between ⁵⁾. Epicnemial carina running up $0.5 \times$ the distance between the sternaulus and subalar prominence. Sternaulus vague. Propodeal transverse carinae well developed, posterior transverse carina obliterated medially. Sloping part of propodeum behind posterior transverse carina somewhat concave with longitudinal ridges. Wings almost clear. Ramellus indicated. Nervellus intercepted below the middle. Legs with all coxae ferruginous.

Gaster. Petiole blackish red. Postpetiole, tergites 2, 3 and 4 dirty orange. Apex of gaster brown. Postpetiole with length: breadth, 1 : 1, spoon-shaped.

5) Apparently an individual character.

Spiracle of 2nd tergite $0.5 \times$ as far from lateral margin as from hind margin of tergite. Ovipositor 1.7 mm.

TABLE 2

Relation between body length and index of postannellus of 5 female specimens of *T. mesocastana* from Tschek's collection

1. 13.5 mm—5	4. 10.3 mm—4.5
2. 11.7 mm—4.5	5. 10.0 mm—4.6
3. 11.2 mm—5.5	

Male. — For description of the male of *T. mesocastana* I have taken a specimen from Tschek's series of *Cryptus ambiguus*, which I designate the lectotype of the latter species.

Characteristics of the lectotype of *Cryptus ambiguus*. Male of 9.1 mm, gaster cut off through 6th segment. Labels: "In Eichenblad Purkersdorf" (pencil), Frld (printed), 1869 (ink), *Cryptus ambiguus* n. sp. (writing of Tschek, fig. 1), lectotype of *Cryptus ambiguus* Tschek hereby designated and labelled.

The cocoon of the wasp is fixed on the pin. Remains of a spider's egg-sack are still visible on the cocoon. It is undoubtedly this specimen about which Tschek (1870a: 145) wrote "auf der Nadel des ♂ steckt ein grauer eiförmiger Cocon zwischen 2 weisslichen sehr dünnen, Muschelschalen ähnlichen Blättchen (Eiersack einer Spinne)".

Head black. Antennae black. Left antenna repaired. Index of postannellus 3.3. Tyloidae on antennal segments 15-21. Antennae somewhat shorter than the body (7.5 : 9.1). Maxillary palpi white. Labial palpi brown. Breadth mandibular base: length malar space, 12 : 7. Clypeus deplanate, elliptic. Epistomal suture vague. Face coarsely punctate. Frons rugose. Antennal scrobes polished, circular, with transverse ridges between them. Vertex and gena with fine ridges, finely punctured, strongly pubescent. Breadth gena: breadth compound eye, 3 : 4.

Thorax black. Notum 1 rugose, with crista, anterior furrow with strong longitudinal ridges. Mesoscutum closely and deeply punctured. Scutellum with scattered punctures. Episternum 2 closely and roughly punctured, with indication of longitudinal ridges. Propodeum very coarsely rugose. Anterior transverse carina completely developed. Posterior transverse carina medially obliterated. Wings slightly infusate, with long ramellus. Nervellus intercepted in the middle. Legs slender. All coxae ferruginous. Anterior and middle trochanters with white spot. Hind femora and tibiae brown. Base of hind basitarsus brown, rest of basitarsus and tarsal segments 2, 3 and 4

white. Tarsus 5 brown. Thorax, all coxae, anterior and middle femora pubescent.

Gaster. 1st segment of gaster long and slender. Petiole reddish black. Postpetiole dirty orange; length: breadth, 25 : 17. Tergites 2, 3 and base and hind margin of 4 dirty orange. Apex of gaster brownish black. Subgenital plate, fig. 45.

In his description Tschek stated that he had one female of *Cryptus ambiguus*, when he received a couple from Von Frauenfeld. In the Vienna Museum there are three specimens under *C. ambiguus*. The only female is undoubtedly Tschek's single female, while there are further two males. One of these males is the specimen mentioned by Tschek as the one received from Von Frauenfeld. This specimen is thus a syntype and I have made it the lectotype (see above). A full description is found above.

Schmiedeknecht (1904-1906) and Morley (1907) have both placed *C. ambiguus* Tschek under *Goniocryptus titillator* auctorum. Both authors identify the male on the conspicuous white palps.

According to the original description the type series of *Cryptus molestus* comprised one male and one female. These two specimens are not in Tschek's collection and I have not seen them. Under *Cryptus molestus* in the Vienna Museum is one female which is mentioned by Tschek (1870b: 419).

As in the case of *Cryptus curvipes*, Tschek based this species on the curved posterior tibiae ("tibiis posticis curvatis"), but as I have said under *C. curvipes*, I think this character does not hold (page 19). About the one specimen under discussion, Tschek remarked: "die Hintertibien sind bei diesem Stücke etwas heller und ein wenig schwächer gebogen".

Female belonging to *Trychosis mesocastana* (Tschek). Labels: Wthm (printed) = Winthem collection, Type (in red ink), Madrid 7 Aug., *C. molestus* m. (handwriting of Tschek).

In 1896 Thomson described *Goniocryptus annulicornis* on one female, which is thus the holotype. This specimen is kept in the Dept. of Entomology at Lund and it undoubtedly belongs to *T. mesocastana* (Tschek).

Characteristics of the holotype of *Goniocryptus annulicornis*. Female of 13.5 mm. Labels: Ringsjö (printed) (= Rinsjön, Skåne, Sweden, the type locality), a red rimmed label *annulicornis*, holotype hereby labelled.

Head black. Index of postannellus 5. A line drawn between the bottoms of the compound eyes reaches the clypeal bulge. Flagellum with a white band.

Gaster. Ovipositor 1.8 mm.

Distribution. — The whole of Europe, including Britain.

Biology. — There are several data on the biology of this species. The remarkable point is that these indicate a wide host range, viz., spiders, Lepidopterous larvae and even in one case Hymenoptera (Morley, 1907). The question remains whether all these data are reliable, considering the difficulties in identification of the parasite. Perhaps there is a correlation between spider's egg-sacks and the silky structure of *Zygaena*-cocoon.

T. ingrata (Tschek, 1870)

Cryptus ingratus Tschek, 1870a, Verh. zool.-bot. Ges. Wien **20**: 148.

Cryptus ingratus Tschek, 1870b, Verh. zool.-bot. Ges. Wien **20**: 422-423.

Gonicryptus macrourus Thomson, 1873, Opusc. ent. **5**: 492.

Gonicryptus macrurus (!) Thomson, 1896, Opusc. ent. **21**: 2358.

I compared the type material of Tschek's *Cryptus ingratus* (1870) and Thomson's *Gonicryptus macrourus* (1873) and I have come to the conclusion that the lectotypes are identical. *T. ingrata* is a rather narrowly founded species, it stands between *T. legator* and *T. mesocastana* and it is difficult to be recognized.

The type series of *Cryptus ingratus* Tschek comprises three females. One of these is *T. legator*, the two others agree with Tschek's concept of *C. ingratus*.

Characteristics of the lectotype of *Cryptus ingratus*. Female of 8.9 mm. Labels: Type (in red ink), lectotype herewith designated and labelled.

Head black. Antennae slender, light brown to fuscous. Index of post-annellus 5.6. Clypeus convex. Face and frons coarsely punctured to rugose. Antennal scrobes with some transverse ridges. A line drawn between the bottoms of the compound eyes runs through the upper part of the clypeal bulge. Vertex polished, pubescent, with some rugosity. Gena towards the mandibular base with scattered punctures, polished.

Thorax black. Notum 1 with crista, coarsely rugose. Mesoscutum and episternum 2 coarsely punctured, with surface between the punctures polished. Lateral carinae of scutellum almost reaching apex of scutellum (a character mentioned by Tschek, but it is an individual character). Propodeum coarsely rugose, rather strongly convex. Anterior transverse carina weak, but complete. Posterior transverse carina indicated by short sublateral keels. Legs with all coxae, femora II and III ferruginous. Wings yellowish infusate. Ramellus indicated. Nervellus intercepted in the middle.

Gaster. Petiole blackish red. Postpetiole partly, tergites 2, 3 and half of 4 orange. Apex black. Microsculpture of tergites 2 and 3 more strongly developed than in the average individual of *T. legator*. Ovipositor 1.8 mm.

Male. — In Thomson's collection at Lund there is a single male under

Goniocryptus macrourus, but there is not the least certainty that this correlation is correct. *T. ingrata* is a rare species of which very little material is available, for this reason I have not inserted the male in my key.

In the University Zoological Museum at Copenhagen there are three specimens which can be regarded as type material of *Goniocryptus macrourus* Thomson, viz. 1 female from Strandmøllen (North Sealand) (coll. Drewsen) and 1 female from Horsens 29.5.1870 (Jutland) (coll. Jensen). There is also 1 male in the Drewsen collection but this is a specimen of *Trychosis tristator* (Tschek). Both females are undoubtedly syntypes.

Characteristics of the lectotype of *Goniocryptus macrourus*. Female of 10.6 mm, identical with *Trychosis ingrata* (Tschek). Labels: female Strandmø Drewsen (ink), Danmark ex coll. Schiødte, Type (a red, printed Museum label), lectotype herewith designated and labelled.

Head black. Antennae slender, entirely ferruginous. Left antenna repaired. Index of postannellus 5.5. Clypeus convex. Face and frons closely and coarsely punctured to rugose. Antennal scrobes with transverse ridges. A line drawn between the bottoms of the compound eyes runs through the upper part of the clypeal bulge. Vertex and gena polished, with scattered punctures, pubescent. Genal carina developed into a weak lamella.

Thorax black. Notum 1 with crista, coarsely punctured to rugose. Mesoscutum and episternum 2 closely punctured. Propodeum rugose, anterior transverse carina complete, posterior transverse carina indicated by sub-lateral keels. Legs with all coxae ferruginous. Index of front femur 4. Femora II and III ferruginous.

Gaster. Postpetiole, tergites 2, 3 and base of 4 orange. Apex black. Microsculpture of tergites 2 and 3 more strongly developed than in *T. legator*. Gaster slender, with long, conspicuous ovipositor (2.4 mm).

Remark. — In Thomson's collection, kept in the Dept. of Entomology of the University at Lund, there are no syntypes of *G. macrourus* according to information kindly given to me by Fil. lic. H. Andersson. Students of *Trychosis* will find a conspicuous female of *T. ingrata* from Linz in the Thomson collection.

Distribution. — Austria: ♀, Piesting, leg. Tschek (NMW); ♀, Linz, 19.vii.1867, leg. Kriechbaumer (ML). Denmark: ♀, Strandmøllen, leg. Drewsen (MC); ♀, Horsens, 29.v.1870, leg. Jensen (MC). Finland: (Hellen, 1939). France: ♀, Ecueil (Marne), 19.v.1954 (Aubert & Shaumar, 1963b). Germany: ♀, Franken, vii and viii (Bauer, 1958); ♀, Krefeld (Aerts, 1957). Spain: ♀, Barcelona (Ceballos, 1931). Sweden: Småland (Thomson, 1896).

SPECIES INQUIRENDAE

Of the following species the author has not seen the types.

Goniocryptus parvulus Kriechbaumer, 1894, An. Soc. esp. Hist. nat. **23**: 239-253.

The type is not in the Zoologische Sammlung des Bayerischen Staates at München where Kriechbaumer's collection is kept.

Goniocryptus punctatus Szépligeti, 1916, Ann. hist. nat. Mus. nat. Hung. **14**: 225-380.

Goniocryptus niger Telenga, 1930, Russk. ent. Obozr. **24**: 104-108.

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