

Developmental stages of the tribe *Eristalini* (Diptera, Syrphidae)

ZDENĚK DOLEŽIL

Czechoslovak Entomological Society, Praha

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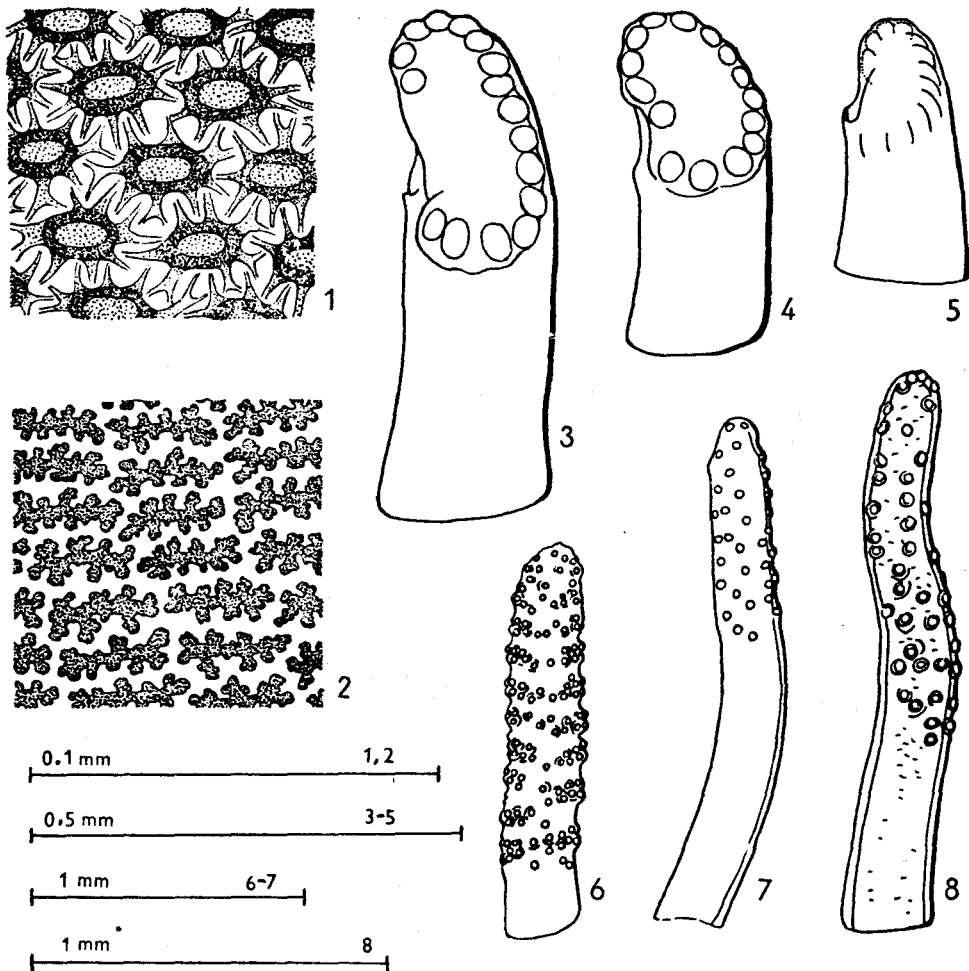
Descriptions of larvae and puparia of the tribe *Eristalini*, varying in extent and detail, have been published by a number of authors (e.g. BELING, 1888; BECKER, 1882; HENNIG, 1952; LUNDBECK, 1916; SACK, 1921, 1931; METCALF, 1913a, b; VIMMER, 1925; JOHANNSEN, 1935; KLEIN-KRAUTHEIM, 1936; KRÜGER, 1926; GÄBLER, 1930, 1932; DUNAVAN, 1929; WEISSE, 1938; SMART, 1948). However, most of these descriptions are so general that it is usually impossible to distinguish individual species. More detailed and usable descriptions have been published by DIXON (1960) for *Eristalis* (*Lathyrrophthalmus*) *aeneus*, *Eristalis* (*Eristalis*) *tenax* and *Helophilus* (*Helophilus*) *pendulus*. Papers by certain authors are summarized by DUŠEK & LÁSKA (1961). The greatest comparatively to our knowledge of the larvae and puparia of the tribe *Eristalini* is a study by HARTLEY (1961) presenting rather detailed descriptions of 17 species. The large number of species examined enabled him to construct the most complete key to larva available hitherto.

In the years 1965—1968 I bred 13 species and obtained their developmental stages; this allowed me to check HARTLEY's characters and their applicability. Besides the larvae and puparia of *Eristalis* (*Eristalis*) *arbutorum*, *E. (E.) intricarius*, *E. (E.) nemorum*, *E. (E.) tenax*, *E. (E.) sepulcralis*, *Myathropa florea*, *Helophilus* (*Helophilus*) *hybridus*, *H. (H.) pendulus*, *Helophilus* (*Anasimyia*) *transfugus* and *Helophilus* (*Parhelophilus*) *versicolor* which were already known, I succeeded in obtaining larvae and puparia of *Eristalis* (*Eristalis*) *horticola*, *E. (E.) rupium* and *Helophilus* (*Helophilus*) *trivittatus* which had not previously been described. Consequently, the key to the larvae has been modified; besides HARTLEY's (1961) characters I am using new ones and include 3 newly described larvae. The key enables identification of all the 3rd instar larvae so far described of European species of the tribe *Eristalini*.

My thanks are due to RNDr. R. Rozkošný, CSc. for giving me the larvae of *Helophilus* (*Helophilus*) *pendulus*, making photographs, for the loan of literature and valuable comments.

## MATERIAL AND METHODS

The material of developmental stages was obtained by breeding, excepting *H. (H.) pendulus*. The almost entire development was observed in a laboratory. Mated females captured in the field were put in 41 jars and fed with a mixture of honey, yeast and water; hay infusion in a smaller jar placed in the breeding one served as medium for oviposition and the development of larvae. Most of the females were captured in Ostrava, predominantly in Ostrava-Heřmanice by ponds (with newly described developmental stages exact localities are given after the descriptions). The material of adults on which the identification is based is deposited in the entomological collections of the Department of Human and Animal Biology, Faculty of Natural History, J. E. Purkyně University in Brno.



Figs. 1-2. The surface sculpture of egg chorion: 1 - *Eristalis (Eristalis) rupium*, 2 - *Helophilus (Helophilus) trivittatus*. Figs. 3-5. Larval prothoracic spiracles: 3 - *E. (E.) horticola*, 4 - *E. (E.) rupium*, 5 - *H. (H.) trivittatus*. Figs. 6-8. Pupal spiracles: 6 - *H. (H.) trivittatus*, 7 - *E. (E.) horticola*, 8 - *E. (E.) rupium*.

For work on larval material it is useful or necessary to make some preparative modifications. The middle part of the breathing tube, important for identification, is often retracted into the anterior part in fixed material; in freshly fixed material (but sometimes also in material several years old) it can be made accessible by extending the breathing tube. Anal papillae in fixed material are practically always retracted, but if live material is available, they can be forced out by gently squeezing the body of the larva immediately after killing it in 50° C warm water, and fixed in 70% alcohol.

### Terminology

In the descriptions and key I mostly follow HARTLEY's (1961) terminology. A brief survey of the terms used is given for their precise delimitation.

## Larva

Anal papillae: simple or branching tubes protrusible from the anal fold; their arrangement is bilaterally symmetrical, and for one symmetrical half it is expressed by a formula in which each numeral indicates the number of tubes having one trachea in common which branches out of the basal trachea, e.g. 2 : 2 : 4 : 2 (Fig. 21). Antenno-maxillae: a branching sensory organ above the mouth (Fig. 10). Breathing tube: a telescopic tube beginning in the 8th abdominal segment; 3 parts of a gradually diminishing diameter can be distinguished; the anterior and posterior parts with circular striation, the middle one is longitudinally striated. Crochets: sclerotized hooks on prolegs (e.g. Figs. 13—15; 25—28). Prolegs: 1st pair on mesothorax, the other 6 pairs on the 1st—6th abdominal segments. Primary crochets: the first row of crochets on abdominal prolegs. Prothoracic spiracles: dorsal horn-like structures on prothorax bearing respiratory orifices arranged on a spiracular plate (e.g. Figs. 3—5). Pubescence: spines and hairs on cuticle; these are stronger on the prothorax, mostly darkly pigmented and hooked = prothoracic spinules. Sensillae: branching sensory organs regularly arranged on segments, with varying numbers of setae (Fig. 20). Tracheal trunks are situated dorsolaterally from the prothoracic spiracles to the breathing tube.

## Puparium

Facets = openings: produced structures bearing respiratory orifices on pupal spiracles. Prothoracic spiracles of puparia: dried original larval prothoracic spiracles situated on the front of the puparium. Pupal spiracles: horn-like structures situated dorsally on the 1st abdominal segment of the puparium (Figs. 6—8).

### DESCRIPTIONS OF DEVELOPMENTAL STAGES

Eggs, mature larvae and puparia of *Eristalis* (*Eristalis*) *horticola*, *E. (E.) rupium* and *Helophilus* (*Helophilus*) *trivittatus* are described.

#### *Eristalis* (*Eristalis*) *horticola* (DE GEER, 1776)

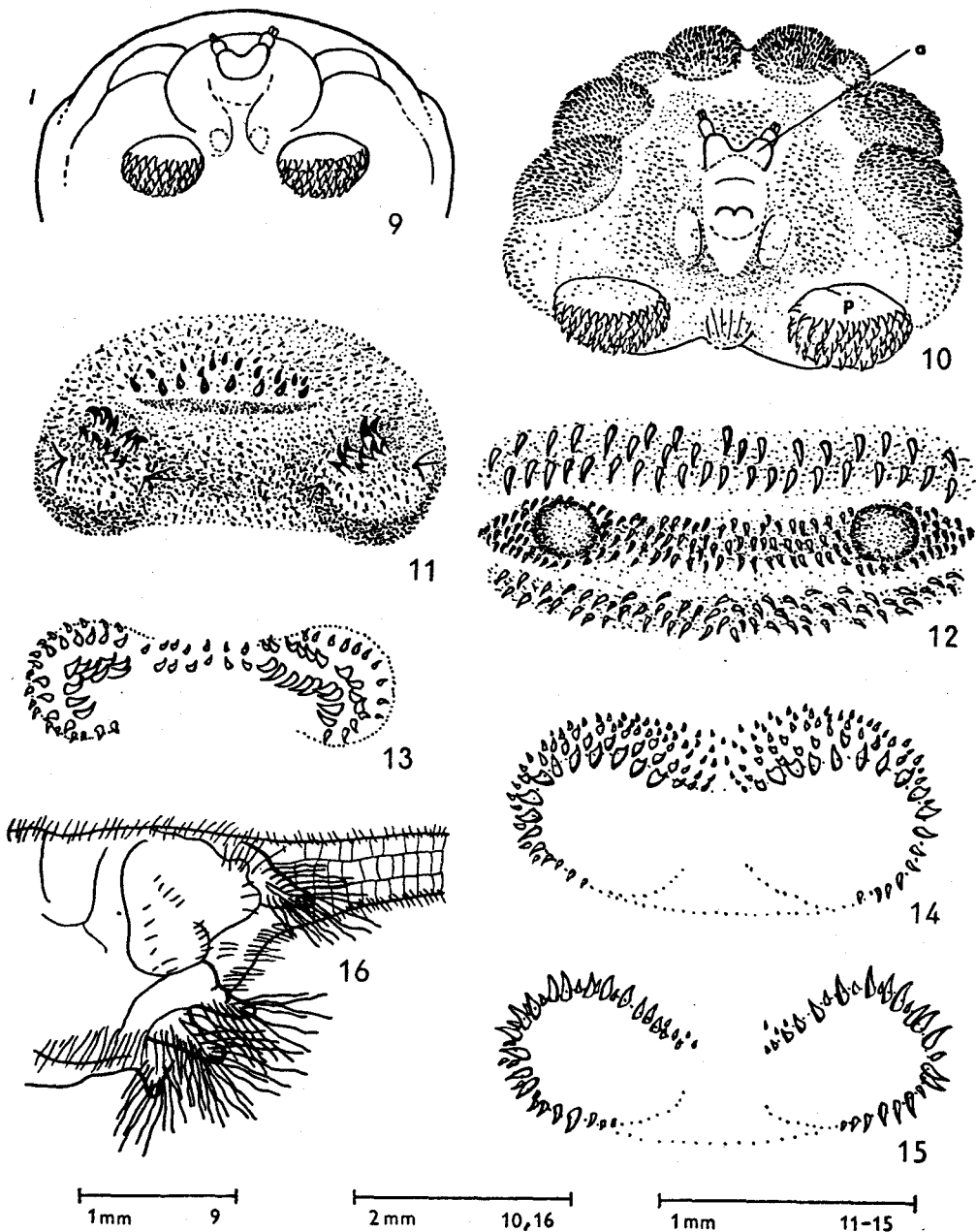
##### Egg

Shape oval, elongate, length 2.07—2.17 mm diameter 0.75—0.80 mm. Colour white. Chorion with a fine surface structure formed by star-shaped fields [similarly as in *E. (E.) rupium* (Fig. 1)].

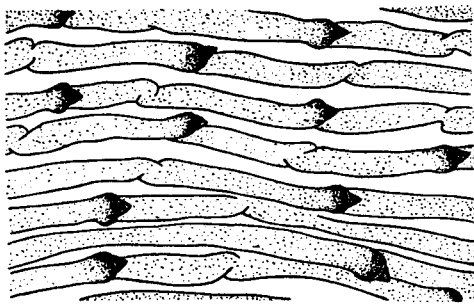
##### IIIrd larval instar (Plate I, Fig. 1)\*

Length 20 + 20 mm, width 4 mm. Body shape typical of larvae of the genus *Eristalis*, approximately cylindrical, with a long breathing tube. Live larvae are white. Dorsal and lateral surface of prothorax simple, without lobes (Fig. 9). Pubescence on thorax consisting of spines becoming gradually finer and paler posteriorly (prothoracic spinules are the most pigmented). On fleshy lappets surrounding mouth under the antenno-maxillar

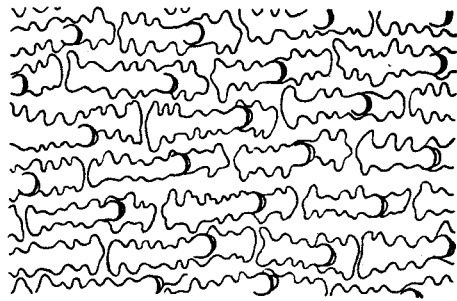
\*The Plate I will be found at the end of this issue.



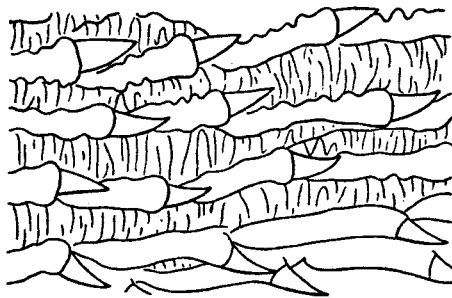
Figs. 9-10. Dorsal and lateral surface of prothorax: 9 - *Eristalis (Eristalis) horticola*, 10 - *Helophilus (Helophilus) trivittatus*; a - antenno-maxillar complex; p - metathoracic proleg. Fig. 11: 6th pair of abdominal prolegs of the larva of *Eristalis (Eristalinus) sepulchralis*. Fig. 12: 1st abdominal segment of the larva of *Eristalis (Eristalis) arbustorum* in dorsal view. Figs. 13-15. 6th pair of larval abdominal prolegs: 13 - *Helophilus (Anasimyia) transfugus*, 14 - *Helophilus (Helophilus) trivittatus*, 15 - *H. (H.) hybridus*. Fig. 16: The posterior region of the larva of *H. (H.) pendulus* with fleshy lappets.



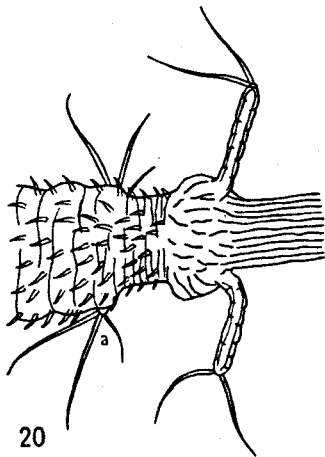
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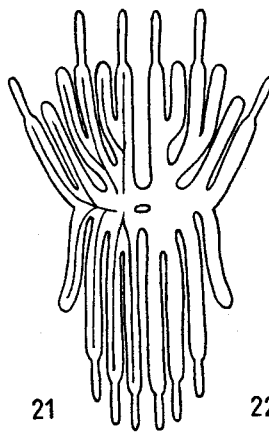
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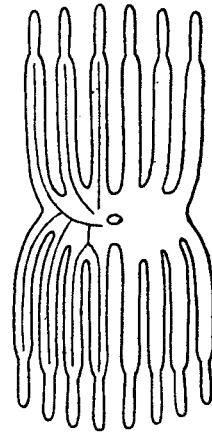
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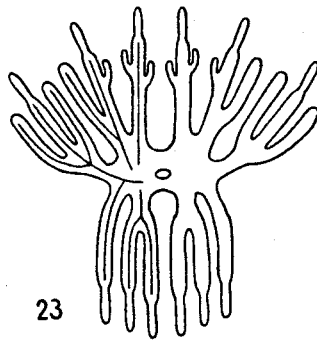
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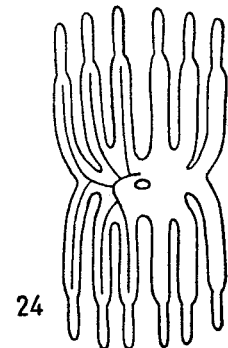
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22



23



24

0.1 mm 17-19  
4 mm 23,24

1 mm 20

5 mm 21,22

Figs. 17-19. The surface of the middle part of breathing tube: 17 - *Eristalis (Eristalis) nemorum*, 18 - *Helophilus (Helophilus) trivittatus*, 19 - *Myathropa florea*. Fig. 20: Transition between the anterior and middle parts of breathing tube of the larva of *Helophilus (Parhelophilus) versicolor* with protuberances; a - sensilla. Figs. 21-24. Anal papillae: 21 - *Eristalis (Eristalis) horticola*, 22 - *Myathropa florea*, 23 - *Eristalis (Eristalis) arbustorum*, 24 - *Helophilus (Helophilus) trivittatus*.

complex the pubescence is longest, consisting of slender spines the narrow apices of which are pigmented. On the ventral side of metathorax, between mesothoracic prolegs and prolegs of 1st abdominal segment there are two groups of brown spines. The abdominal pubescence grows gradually longer posteriorly and is formed by more or less fine, white, non-pigmented hairs. Middle part of breathing tube with brown setae. Prolegs well developed; mesothoracic prolegs approximately twice the size of abdominal ones. Primary crochets of prolegs long and narrow, about twice as long as their width at the base; only the distal quarter (exceptionally third) of crochet pigmented. Abdominal prolegs bearing mostly 6–7 primary crochets. Prothoracic spiracles (Fig. 3) light brown, spiracular plate about 2.5 times as long as wide. Apical region of breathing tube dark brown along approximately three of four times as much as its diameter, terminal setae of tube slightly plumose. Tracheal trunks straight. Anal papillae arranged in the 2 : 2 : 4 : 2 pattern (Fig. 21).

**Taxonomic characters.** The live larva is pure white, differing thus from most of the other *Eristalis* larvae which are usually greyish, yellowish or even brown. From *E. (E.) nemorum* it differs in the colouring of the cuticle, which in *E. (E.) nemorum* bears brown polygonal patterns. The larva can be distinguished from *E. (E.) arbustorum* and *E. (E.) intracarius* by abdominal pubescence, which is in both of these species more or less spinose and at least slightly pigmented brown, whereas the abdominal pubescence of *E. (E.) horticola* consists of more or less fine, rather long, non-pigmented hairs. From the larvae of *E. (E.) rupium* and *E. (E.) pertinax* it differs by prothoracic spiracles. (Note: The order of the characters described follows HARTLEY's (1961) so that the description can be easily compared with the descriptions of other species.)

**Puparium** (Plate I, Fig. 2)

Length 10.3–11.2 mm, width 4.8–5 mm (4 puparia were measured). The overall macroscopic habitus smooth, dark brown. Dorsal and ventral sides of puparium convex, the dorsal side more conspicuously so. Anterior end of the puparium more or less straight, not concave in lateral view. Pupal spiracles (Fig. 7) about 1.9 mm long, in approximately 3/5 of their length slightly bent ventrally. Facets on only the distal 2/5 of the spiracles, situated on their dorsal, lateral and ventral sides. Larval prothoracic spiracles distinct; their visible part equaling about 1/6 of the length of pupal spiracles.

Two cultures were set up. First culture: One female captured 4. vii. 1966 in Suchá Rudná (Jeseníky Mtn.). First batch of about 30 eggs 6. vii, second batch of about 20 eggs 7. vii. Larvae from the first batch hatched on the night 8–9. vii.; one larva pupated 19. vii. (the others died). Adults emerged 30. vii. The female died 10. vii. Second culture: One female captured 18. viii. 1966 in Ostrava-Heřmanice. Only one batch of 35–40 eggs 21. viii., larvae hatched 23. viii. Pupariation recorded from 3. ix. 1966 on, emergence of adults from 12. ix. 1966.

*Eristalis (Eristalis) rupium* (FABRICIUS, 1805)

**Egg**

Shape oval, elongate, length 2.35–2.50 mm, diameter 0.85–0.93 mm. Colour white. Chorion with a fine starshaped structure (Fig. 1).

### IIIrd larval instar

Length 17 + 20 mm, width 3.5 mm. Body cylindrical, with a long breathing tube. Cuticle pale. Dorsal and lateral surface of prothorax simple, without division into lobes. Pigmented prothoracic spinules are gradually replaced on meso- and metathorax by finer non-pigmented hairs. On the ventral side of metathorax there are at least slightly pigmented brown spines. Abdominal pubescence more or less fine, consisting of non-pigmented hairs growing gradually longer posteriorly. Mesothoracic prolegs approximately twice size of abdominal ones. Primary crochets narrow and long, their length being about twice width at base, pigmented in distal quarter to third. Abdominal prolegs with mostly 6 primary crochets. Prothoracic spiracles (Fig. 4) light to dark brown, spiracular plate about 1.5 times as long as wide. Middle part of breathing tube with spines pigmented brown. Apex of breathing tube pigmented brown along four to six times as much as its diameter, terminal setae of tube plumose. Tracheal trunks straight. Anal papillae of the same type as in *E. (E.) horticola*, pattern 2 : 2 : 4 : 2.

Taxonomic characters. The live larva is pale. The larva of *E. (E.) rupium* is distinguished from the other species of the subgenus *Eristalis* by the same characters as the larva of *E. (E.) horticola*. The larvae of *E. (E.) rupium* and *E. (E.) horticola* can be distinguished from each other by their prothoracic spiracles (see the key to larvae).

### Puparium

Length 8—10 mm, width 4—5 mm (3 puparia were measured). Colour brown to dark brown. Dorsal side of puparium more convex than the ventral. Pupal spiracles (Fig. 8) about 1.6 mm long, facets situated laterally, dorsally and ventrally on distal 3/5 of spiracles. Length of larval prothoracic spiracles equaling about 1/4 of length of pupal spiracles.

The culture was set up with 6 females captured in Čeladná (Beskydy) 28. vii. 1967. From 29. vii. on the females laid a number of small batches in a few days, in total about 40 eggs. First larvae hatched 31. vii., first pupation 17. viii., adults emerged at the end of August (exact dates were not recorded).

*Helophilus (Helophilus) trivittatus* (FABRICIUS, 1805)

### Egg

Shape oval, elongate, more so than in *E. (E.) rupium* and *E. (E.) horticola*, length 1.26—1.32 mm, diameter 0.44—0.47 mm. Colour white. Chorion with a fine surface structure formed by elongate and finely lobular fields (Fig. 2).

### IIIrd larval instar

Length 20 + 10 mm, width 4.5 mm. Cuticle pale. Body approximately cylindrical, posteriorly elongated into breathing tube. Dorsal and lateral surface of prothorax distinctly divided into 6 main lobes (2 dorsal and 4 lateral), with 2 smaller lobes joining them from behind (they are inserted between the lateral and dorsal lobes — Fig. 10). On 7th abdominal segment laterally of anus are 2 pairs of small fleshy lappets with longer pubescence. In addition there is a 3rd pair of fleshy lappets derived from 8th abdominal segment and situated on the sides of the base of breathing tube, also bearing longer pubescence. A crest of longish hairs is situated ventrolaterally at the end of the body, beginning at the level of 6th abdominal pair of prolegs, continuing over the fleshy lappets at the sides of anus and ending at base of

breathing tube medially of the 3rd pair of fleshy lappets. Pubescence very short, minutely spinulose, longer and of a setose character only posteriorly on the lappets and in the ventrolateral crest. Prothoracic spinules very thick, pigmented brown. Middle part of breathing tube with tiny non-pigmented obtuse papillae (Fig. 18). Prolegs well developed, mesothoracic about twice the size of abdominal ones. Primary crochets long and narrow, with approximately distal quarter pigmented. Abdominal prolegs bearing, besides primary crochets, 6—7 rows of gradually diminishing crochets. Crochets of 6th pair of abdominal prolegs forming a more or less continuous strip (4—6 rows) running from one proleg to the other (Fig. 14). Prothoracic spiracles yellow brown, short (Fig. 5). Terminal setae of breathing tube moderately plumose. Apex of breathing tube pigmented for a distance equal to its diameter. Tracheal trunks undulating. Anal papillae simple (Fig. 24), pattern 1 : 1 : 2 : 2.

**Taxonomic characters.** The strip of crochets running between prolegs of the 6th abdominal pair, consisting of 4—6 rows of crochets, is diagnostically important in distinguishing this larva from other larvae of the genus *Helophilus* (including the subgenera *Anasimyia* SCHINER, *Eurimyia* BIGOT and *Parphelophilus* GIRSCHNER). Larvae of the subgenera *Anasimyia*, *Eurimyia* and *Parphelophilus* have only 2 rows of crochets between the 6th abdominal pair of prolegs (Fig. 13), in *H. (H.) hybridus* and *H. (H.) pendulus* the crochets of both prolegs form two distinctly separate groups (Fig. 15). Minute non-pigmented papillae in the middle part of the breathing tube (Fig. 18) are a typical character of the larva of *H. (H.) trivittatus*; they are not developed in any of the other species examined by me.

**Puparium** (Plate I, Fig. 3)

Length 10.3—12.5 mm, with 4.5—4.7 mm (4 puparia measured). Colour brownish grey. Dorsal and ventral convexity of puparium approximately the same. Posterior region of puparium broadly rounded in dorsal as well as lateral view. Pupal spiracles (Fig. 6) about 1.5 mm long, only slightly diverging from the longitudinal axis of the puparium in upper view. Facets on about the distal 4/5, arranged in more or less incomplete circles. Facets lacking ventromedially. Length of larval prothoracic spiracles equaling about 1/7 the length of pupal spiracles. Crochets between the 6th abdominal pair of prolegs mostly well visible; the puparium can be identified by them (see 6th pair of prolegs in the larva — Fig. 14).

Several females captured at the beginning of September, 1965 in Ostrava were kept in the laboratory. Batches of 100—150 eggs laid on 8, 14 and 30 September. Larvae invariably hatched two days after oviposition. Most of the larvae kept at room temperature (20° C) died, only a few pupariated in November. Other larvae, reared at the beginning at outdoor temperature and from the first frost until April in a cellar with temperature above 0° C, still accepted food in April; these larvae pupated from 21 April 1966 on. Adults emerged about a fortnight after pupation.

#### Key to larvae of the IIIrd instar

Larvae of the tribe *Eristalini* can be distinguished from larvae of the other tribes of the family *Syrphidae* by their saprophagy and a long (longer than the body), telescopic breathing tube (DUŠEK & LÁSKA, 1961; HARTLEY, 1961).



Characters on the prothorax and in the middle part of the breathing tube are of particular importance for distinguishing the genera *Eristalis*, *Myathropa* and *Helophilus*; HARTLEY (1961) uses as diagnostic key characters only the differing structure of the tracheal trunks and the arrangement of crochets on the prolegs, but those are often difficult to see. Tracheal trunks, distinctly showing through the cuticle in most live larvae, are often invisible in fixed material.

The larva of *Eristalis* (*Eristalis*) *pertinax*, which I have not examined, is characterized in the key by the prothoracic spiracle and structure of the anal papillae; it will probably be difficult to distinguish it from *E. (E.) arbustorum* by the structure of the prothoracic spiracle (character used by HARTLEY, 1961) unless the arrangement of the anal papillae has been ascertained.

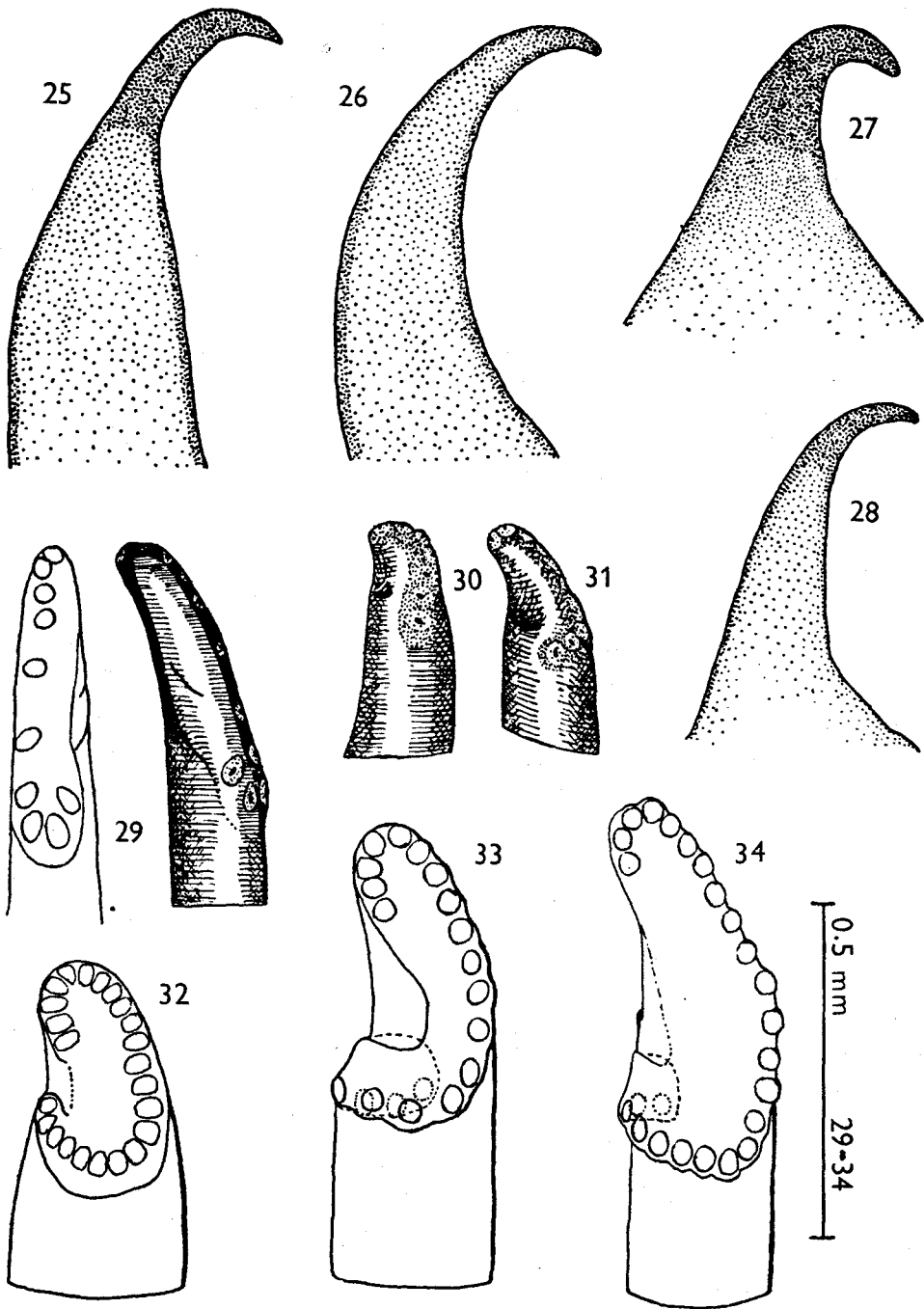
The larva of *Eristalis* (*Eristalis*) *abusivus* has not been included in the key, since according to my material I think that for the time being the possibility of distinguishing it from *E. (E.) arbustorum* is doubtful. HARTLEY (1961) states that both larvae are very similar in all characters but pubescence:

- a) Pubescence on dorsum of abdomen and between prolegs grouped into short transverse lines of two or three spinules ..... *Eristalis* (*Eristalis*) *abusivus* (COLLIN, 1931)
- b) Pubescence not grouped ..... *Eristalis* (*Eristalis*) *arbustorum*

In some larvae of *E. (E.) arbustorum* in my material there was a tendency to the group arrangement of the pubescence.

When constructing the key to the larvae I kept in mind that fixed material is not always of the same quality, e.g. contraction of muscles at the moment of death may cause a change of shape or retraction of some parts of the body, as a result of which some usually typical characters may hardly be utilized. Therefore I have used several characters whenever possible.

1. Last 6 abdominal segments without dorsal pubescence; sensillae conspicuous, each with 10–15 radially arranged setae; anal papillae with 12 branches ..... *Mallota cimbiciformis* (FALLÉN, 1817)
- Last 6 abdominal segments dorsally covered with pubescence; if pubescence is lacking there are crochets bent anteriorly between the last pair of prolegs; sensillae inconspicuous, each with less than 8 setae ..... 2
2. Tracheal trunks straight; dorsal and lateral surface of prothorax simple (Fig. 9); crochets of 6th pair of abdominal prolegs forming 2 distinct groups; the middle part of breathing tube with conspicuous pubescence formed by strong, pigmented or non-pigmented spines on papillae (Figs. 17 and 19) ..... 3
- Tracheal trunks undulating; dorsal and lateral surface of prothorax lobate (Fig. 10); if dorsal and lateral surface of prothorax not thus distinctly shaped there are 2 rows of crochets between 6th abdominal pair of prolegs (Fig. 13); middle part of breathing tube without pubescence or with sparse non-pigmented hairs, or pubescence is replaced by inconspicuous non-pigmented papillae (Fig. 18); anal papillae always with 12 branches ..... genus *Helophilus* MEIGEN... 12
3. 2 rows of crochets pointing anteriorly before 6th pair of abdominal prolegs (Fig. 11); anal papillae with 12 branches ..... 4
- 2 rows of crochets lacking before 6th pair of abdominal prolegs ..... 5
4. 7–9 larger crochets in the back row (Fig. 11) ..... *Eristalis* (*Eristalinus*) *sepulchralis* (LINNAEUS, 1758)
- Only 5 larger crochets in the back row *Eristalis* (*Lathyrophthalmus*) *aeneus* (SCOPOLI, 1763)
5. Spines in the middle part of breathing tube pigmented brown (Fig. 17); anal papillae with 20 or 24 branches (Figs. 21 and 23) ..... subgenus *Eristalis* LATREILLE ... 6
- Spines in the middle part of breathing tube without pigmentation (Fig. 19); anal papillae with 14 branches (Fig. 22) ..... *Myathropa florea* (LINNAEUS, 1758)
6. Cuticle on dorsum pigmented, with a mesh-like or reticulate pattern of brown fields; anal papillae with 20 branches ..... *Eristalis* (*Eristalis*) *nemorum* (LINNAEUS, 1758)
- Cuticle on dorsum without the mesh-like or reticulate pattern ..... 7



Figs. 25-28. After Hartley (1961) Primary crochets: 25 - *Helophilus (Anasimyia) transfugus*, 26 - *H. (A.) lunulatus*, 27 - *Eristalis (Eristalis) tenax*, 28 - *E. (E.) pertinax*. Figs. 29-34. After Hartley (1961) Larval prothoracic spiracles: 29 - *Helophilus (Eurimyia) lineatus*, 30 - *Helophilus (Pachelophilus) versicolor*, 31 - *H. (P.) frutetorum*, 32 - *Eristalis (Eristalis) intricarius*, 33 - *E. (E.) pertinax*, 34 - *E. (E.) arbustorum*.

7. Primary crochets strong, broad, markedly bent, their length scarcely exceeding their width at base; distal 2/5 of crochets darkly pigmented (Fig. 27); anal papillae with 20 branches ..... *Eristalis (Eristalis) tenax* (LINNAEUS, 1758)
- Primary crochets long and thin, slightly bent, almost twice as long as their width at the base; distal 1/4 (exceptionally 1/3) of crochets more or less pigmented (Fig. 28) ..... 8
8. Prothoracic spiracle formed as shown in Fig. 33, with the lower part of spiracular plate widened; widened lower part of plate encircling half the perimeter of spiracle; anal papillae with 20 branches ..... *Eristalis (Eristalis) pertinax* (SCOPOLI, 1763)
- Spiracular plate of prothoracic spiracle not widened in the lower part (Figs. 3, 4); if lower part of plate is widened, the widened part encircles only one third of the perimeter of spiracle (Fig. 34) and anal papillae have 24 branches ..... 9
9. A strip of spines, anteriorly and posteriorly isolated from the rest of pubescence by a more or less bare space, is situated between rounded fields on 1st abdominal segment through which pupal spiracles penetrate after pupation; spines between fields distinctly smaller than spines in 2—3 rows anteriorly of the fields (Fig. 12); for prothoracic spiracle see Fig. 34; anal papillae with 24 branches ..... *Eristalis (Eristalis) arbustorum* (LINNAEUS, 1758)
- Pubescence between rounded fields on 1st abdominal segment different ..... 10
10. Pubescence of dorsal and lateral parts of abdomen more or less spinose, at least slightly pigmented brown (particularly at bases of spines); for prothoracic spiracle see Fig. 32; anal papillae with 20 branches ..... *Eristalis (Eristalis) intricarius* (LINNAEUS, 1758)
- Pubescence of dorsal and lateral parts of abdomen more or less fine, longer, hairs pale, without pigmentation ..... 11
11. Spiracular plate of prothoracic spiracle about 2.5 times as long as wide, the plate incurved approximately above the proximal third (distal part of plate about twice as long as the proximal, Fig. 3); anal papillae with 20 branches ..... *Eristalis (Eristalis) horticola* (DE GEER, 1776)
- Spiracular plate of prothoracic spiracle about 1.5 times longer than wide, its proximal and distal parts approximately the same length (plate incurved approximately in the middle, Fig. 4); anal papillae with 20 branches ..... *Eristalis (Eristalis) rupium* (FABRICIUS, 1805)
12. Crochets of each abdominal proleg forming a separate group (Fig. 15) ..... 13
- Crochets of both abdominal prolegs of 6th pair not separated, forming a more or less continuous strip running from one proleg onto the other (Figs. 13 and 14) ..... 14
13. Strongly developed paired fleshy lobes on sides of anus, their length approaching diameter of base of breathing tube; length of thick pubescence on all three pairs of fleshy lobes approximately equaling diameter of anterior part of breathing tube (Fig. 16); middle part of breathing tube with sparse, fine, non-pigmented hairs, particularly in its proximal part ..... *Helophilus (Helophilus) pendulus* (LINNAEUS, 1758)
- Paired fleshy lobes on sides of anus small, usually shorter than half diameter of base of breathing tube; sparser pubescence on all three pairs of lobes equals approximately half diameter of anterior part of breathing tube; middle part of breathing tube without pubescence and papillae ..... *Helophilus (Helophilus) hybridus* (LOEW, 1846)
14. Between 6th abdominal pair of prolegs a strip of crochets formed by 4—6 rows of crochets (Fig. 14); middle part of breathing tube with obtuse, rounded, non-pigmented papillae (Fig. 18) ..... *Helophilus (Helophilus) trivittatus* (FABRICIUS, 1805)
- Only 2 rows of crochets between 6th abdominal pair of crochets (Fig. 13) ..... 15
15. Prothoracic spiracle dark brown, elongate (Fig. 29); pubescence often reduced and replaced by small papillae ..... *Helophilus (Eurimyia) lineatus* (FABRICIUS, 1787)
- Prothoracic spiracle light yellow brown, short (Figs. 30 and 31) ..... 16
16. Length of sensillae near end of abdomen equaling diameter of anterior part of breathing tube; beginning of middle part of breathing tube with conspicuous bare protuberances bearing sensillae; protuberances longer than diameter of middle part of breathing tube and 6—7 times longer than their own diameters (Fig. 20) ..... 17
- Sensillae near end of abdomen shorter than half diameter of anterior part of breathing tube; protuberances at beginning of middle part of breathing tube approximately as long as half diameter of middle part; protuberances 3—4 times longer than their diameters ... 18
17. Prothoracic spiracles straight, with wide truncate apices (Fig. 30) ..... *Helophilus (Parhelophilus) versicolor* (FABRICIUS, 1794)
- Prothoracic spiracles with thin, slightly hooked apices (Fig. 31) ..... *Helophilus (Parhelophilus) frutetorum* (FABRICIUS, 1775)
18. Crochets strongly pigmented in the apical 1/4 (Fig. 25) ..... *Helophilus (Anasimyia) transfugus* (LINNAEUS, 1758)
- Crochets strongly pigmented only at the apex (Fig. 26) ..... *Helophilus (Anasimyia) lunulatus* (MEIGEN, 1822)

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Author's address: Z. Doležil, Vančurova 32, Ostrava-Muglinov, Czechoslovakia.