

**ON SEASONAL VARIATION IN *Eristalis pertinax*
(SCOPOLI) AND THE STATUS OF *E. flavitarsis* (MALM)
(Dipt., Syrphidae)**

Vítězslav Bičík¹, Tore R. Nielsen² and Jiří Holinka³

¹Department of Zoology, Natural Science Faculty, Palacký University, Tř. Svobody 26,
771 46 Olomouc, Czech Republic (*e-mail: Flagell@risc.upol.cz*)

²Sandvedhagen 8, N-4300 Sandnes, Norway
(*e-mail: Nito.sandnes-vgs@rogaland-f.kommune.no*)

³Department of Clinical Biology & Biochemistry, University of Pardubice,
Strossova 239, 530 03 Pardubice, Czech Republic (*e-mail: Holinka@pol.upce.cz*)

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E. lucorum

Abstract

Specimens of *Eristalis pertinax* collected in spring differ from summer specimens in having longer hairs, a more shiny mesonotum, and in other characteristics. Material from Scandinavia and Central Europe has been studied and compared with types of related species. A neotype has been selected and designated for *E. pertinax*. *E. inca* Bigot was found to be synonymous with *pertinax*, *nov. syn.*

Introduction

Eristalis pertinax (Scopoli) is a well-known Palaearctic hoverfly with a wide distribution in Europe. This rather big, short-haired and slender *Eristalis* species is easily recognized by the yellow tarsi on its fore and middle legs.

Two of us (TRN, VB) found differences in Norwegian specimens collected in spring (April–June) and in summer – autumn (July–October). The present authors have studied a large material of *E. pertinax* and have examined available types of related and possible synonymic species.

Methods

From a study on Norwegian material of *E. pertinax*, it was obvious that two forms existed: a shaggy, but rather shiny form flying in spring, and a shorthaired, more dusted form in summer and autumn. A larger material of *E. pertinax* from Scandinavia, Central and Southern Europe was studied to discover whether the observed differences between the forms were significant, giving the forms a species status.

Results

Differences in two forms of *E. pertinax* are summarised in Table 1.

Table 1. Differences between spring and summer forms of *E. pertinax*

| Spring form (f. flavitarsis) | Summer form (f. pertinax) |
|--|---|
| Head and eyes more longhaired (Fig. 1). | Head and eyes with shorter hairs (Fig. 2). |
| Hairs of arista shorter and less numerous than in summer form. The hairs also occupy a smaller part of arista: on dorsal part about 45 % of its length, on ventral part about 60 % (Fig. 3). | Hairs of arista longer and more numerous than in spring form. The hairs also occupy a greater part of arista: on dorsal part about 70 % of its length, on ventral part about 75 % (Fig. 4). |
| 3 rd antennal segment more rounded. The sensory pit usually not so close to the underside as in the summer form. | 3 rd antennal segment more longish. The sensory pit usually closer to the underside. |
| Mesonotum shining brownish black, almost without traces of dusting. | Mesonotum obviously dulled by greyish dusting, especially in frontal and hind part and more so in the female. |
| Body with longer hairs (Fig. 5). | Body with shorter hairs (Fig. 6). |
| Tergite 3 with the medial, dorsoapical hairs erect and as long as or longer than 3 rd antennal segment. | Tergite 3 with the medial, dorsoapical hairs suppressed and as long as about half the length of 3 rd antennal segment. |
| Front tibia laterally with hairs which are as long as tibia is thick. Apical 1/4 of hind femur with hairs which are as long as corresponding hairs of hind tibia. | Front tibia laterally with hairs which are shorter than tibia is thick. Apical 1/4 of hind femur with hairs which are usually shorter than corresponding hairs of hind tibia. |

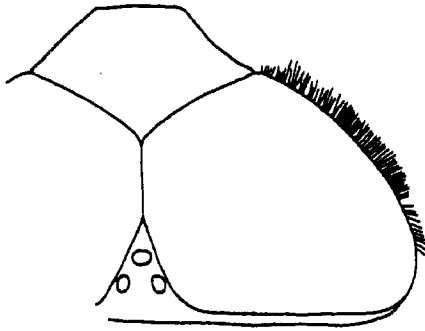


Fig. 1: *E. flavitarsis* (male lectotype):
hair length of eyes

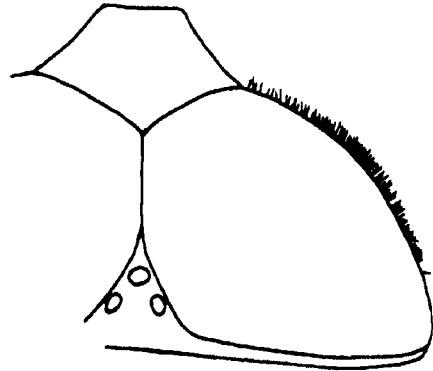


Fig. 2: *E. pertinax* (male neotype):
hair length of eyes

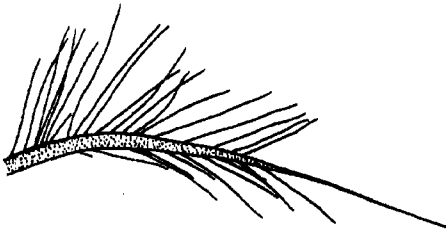


Fig. 3: *E. flavitarsis* (male lectotype):
left arista

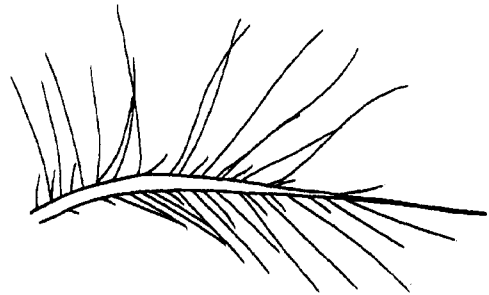


Fig. 4: *E. pertinax* (male neotype):
left arista

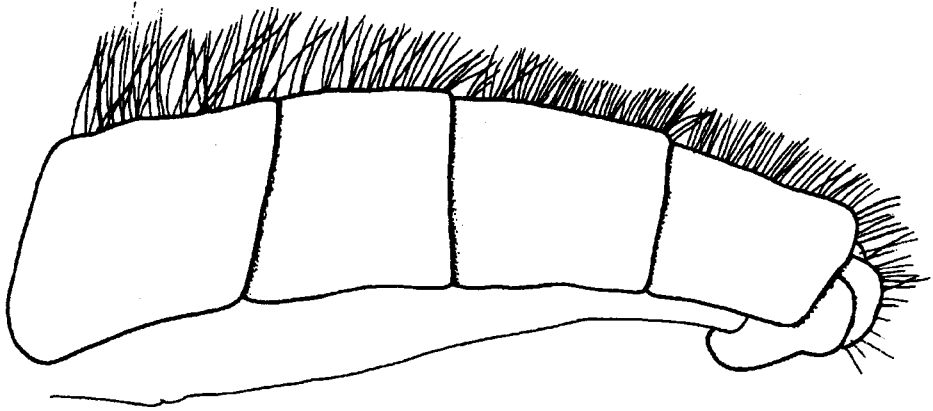


Fig. 5: *E. flavitarsis* (male lectotype): abdomen

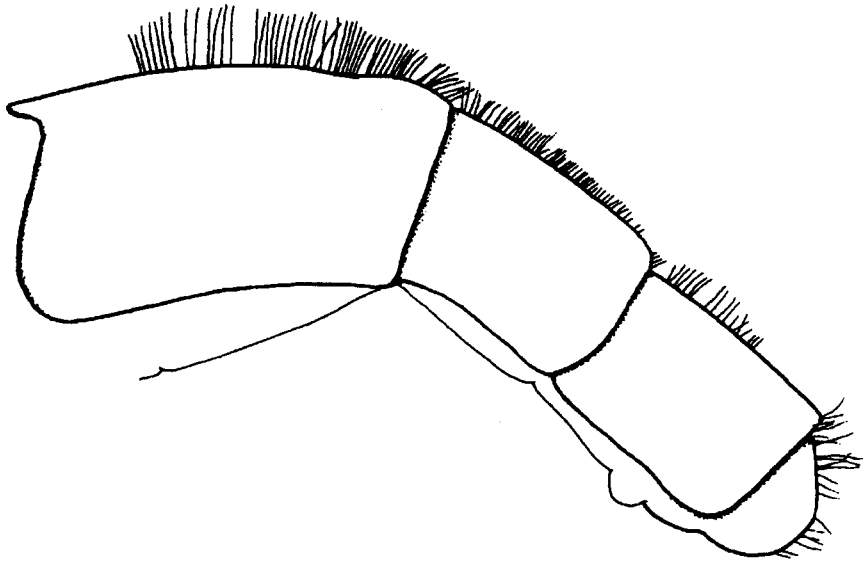


Fig. 6: *E. pertinax* (male neotype): abdomen

After we found the differences between spring (*flavitorsis*) and summer–autumn (*pertinax*) forms, the shape of the surstylus, paramere, base of phallus and aedeagus were examined in detail in both forms. Using non-parametric χ^2 -test we did not find any significant binding among morphological features and male genitalia ($p < 0.05$). The differences between the male genitalia of both forms were only indiscernible and relatively variable. But during evaluation of variability of morphological features we also proved sporadically the existence of intermediate individuals.

Type material studied

Eristalis flavitorsis (Malm)

Syrphus flavitorsis Malm, 1863: 17.

There are two specimens, a male and a female under this name in Malms collection in Gothenburg (Ted von Proschwitz, pers. comm.). They are not marked as types, but correspond well with Malms description of this species. We have designated the male, labeled „♂“, „Göteborg“ and „A. Malm leg. et det.“ as lectotype and the female (accordingly labeled) as paralectotype, hereby designated. Both specimens are identical with the longhaired *pertinax* collected in spring. We, therefore, support it to be synonymic, as quoted by Lundbeck (1916) and Sack (1932).

Eristalis inca Bigot

Eristalis inca Bigot, 1880: 217.

Bigot gave this name to a female specimen kept in BMNH, London. Unfortunately it has lost its antennae (described as „chète plumeux“), but it has yellow front and middle tarsi and other characteristics of the summer form specimens of *pertinax*. Bigot reported it from Peru, which we believe must be due to mislabeling. **Nov. syn.**

Eristalis lucorum Meigen

Eristalis lucorum Meigen, 1838: 143.

Female holotype with „Meigen“ written on a greyish, round label and „lucorum ♀ Cuynon (?)“ on a yellowish grey, square label. Both labels are with Meigens handwriting. The specimen lacks its antennae, but it has yellow tarsi on front and middle legs. We agree with previous authors that it is synonymous with *pertinax* Scopoli.

Eristalis pertinax (Scopoli)

Conops pertinax Scopoli, 1763: 352 (types lost).

Eristalis fossarum Meigen, 1822: 392 (uncertain synonym as types are lost).

Eristalis lucorum Meigen, 1838: 148.

Syrphus flavitorsis Malm, 1863: 17.

Eristalis inca Bigot, 1880: 217 (**nov. syn.**)

The type of *pertinax* is lost, and Scopoli did not give any locality name in his description of the species. According to Dr. Ignac Sivec, Ljubljana (pers. comm.) Scopoli most probably used material from the vicinity of the town Idrija, Slovenia (UTM VL 29), where he lived. No *pertinax* specimens from this area exist either in Ljubljana, Novi Sad or Vienna museum

collections. We therefore have chosen a specimen from Trnovski gozd (some 20 kms west of the assumed area) for a neotype.

Neotype data: male collected by Dr. Ignac Sivec, dated „YU-Slovenija, Trnovski gozd 18. 8. 1973“ and „*Eristalis pertinax* (Scopoli), neotype“, hereby designated. The specimen is kept in the collections of the Slovene Museum of Natural History, Ljubljana.

Conclusion

Our study shows that *E. flavitarsis* (Malm) is not a valid species, but only seasonal variation of *E. pertinax*. It might be named *E. pertinax f. flavitarsis*. This shaggy form occurs frequently in spring in Scandinavia, while its occurrence in Central Europe is rather rare. The summer / autumn generation of *E. pertinax* is abundant both in Scandinavia and Central Europe.

The question arises whether development of larvae or puparia under different light or thermal conditions might be the cause of the long-haired form in spring. To answer this question we will try to breed larvae and puparia under different laboratory conditions.

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