



Identification of the Finnish species of *Paragus* Latreille, 1804 subgenus *Pandasyothalmus* Stuckenberg, 1954 (Diptera, Syrphidae)

Antti Haarto

The differential diagnostics for the *Paragus* females of the Finnish species of the subgenus *Pandasyothalmus* are presented. The distributional range and the frequency of the species are discussed.

Paragus constrictus ilmoitettiin Suomelle uutena vuonna 2013. Samana vuonna Ali Karhu löysi Liperistä lajin runsaan esiintymän, josta kerättyjen yksilöiden perusteella kuvataan lajien *P. constrictus* ja *P. tibialis* naaraiden väliset erot. Alasukuun *Pandasyothalmus* kuuluvista lajeista Suomesta on tavattu myös *P. haemorrhous*. Kaikkien kolmen lajin koiraat määritetään yleensä genitaalien avulla. Naaraat ja myös koiraat voidaan kuitenkin määrittää myös takaruumiin karvojen värien ja asentojen avulla. *Paragus haemorrhous* on lajeista laajimmalle levinnyt. Lajia *P. tibialis* on pidetty lajeista yleisimpänä, mutta täksi lajiksi aikaisemmin määritetyistä yksilöistä osa on osoittautunut kuuluvan lajeihin *P. haemorrhous* ja *P. constrictus*. Siten erityisesti lajien *P. tibialis* ja *P. constrictus* levinneisyysalueesta ja yleisyydestä Suomessa tarvitaan lisää tietoa. Lajin *P. constrictus* elinympäristöjä Suomessa ovat lämpimät hiekkaiset alueet.

Key words. Syrphidae, *Paragus*, *Pandasyothalmus*, differential diagnostics.

Zoological Museum, Section of Biodiversity and Environmental Science, University of Turku, FI-20014 Turku, Finland. Email: ahaarto@gmail.com



Fig. 1. Male of *Paragus constrictus*. Finland: Kb: Liperi, airport of Joensuu, 6953:3633, 8.8.2014, Ali Karhu leg., specimen id AHa14-002092. Photo: Ali Karhu.

Kuva 1. Vapaana luonnossa lentävä *Paragus constrictus* koiras. Finland: Kb: Liperi, Joensuun lentokenttä, 6953:3633, 8.8.2014, Ali Karhu leg., yksilön tunnus AHa-002092. Valokuva: Ali Karhu.

Introduction

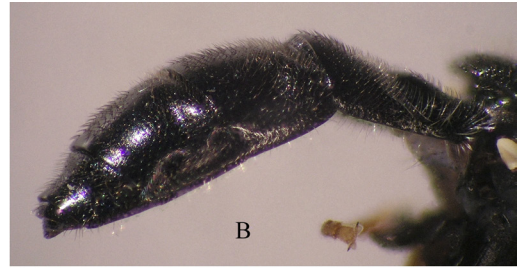
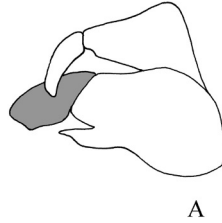
A *Paragus* species similar to *Paragus tibialis* (Fallén, 1817) was described from Yugoslavia in 1986, named as *Paragus constrictus* (Šimić 1986). At first the global distribution of this new species was not clear. The known distribution was expanded when *P. constrictus* was reported from new regions, for example from Germany (Speight & Chandler 1995), Denmark (Bygebjerg 2004), Sweden (Bartsch et al. 2009, Bygebjerg & Sörensson 2009), Norway (Falck 2011) and finally from Estonia and Finland (Kerppola 2013). The distributional knowledge of *P. constrictus* was for a long time poorly known because it was mixed with *P. tibialis* in many collections. Until now the additional difficulty has been that the fe-

Fig. 2.

Paragus haemorrhous.
A) male genitalia and
B) female abdomen.

Kuva 2.

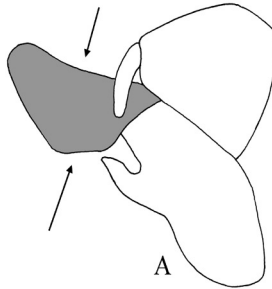
Paragus haemorrhous.
A) Koiraan genitaalit ja
B) naaraan takaruumis.

**Fig. 3.**

Paragus constrictus.
A) male genitalia and
B) female abdomen.

Kuva 3.

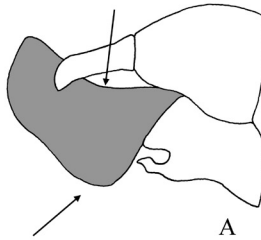
Paragus constrictus.
A) Koiraan genitaalit ja
B) naaraan takaruumis.

**Fig. 4.**

Paragus tibialis.
A) male genitalia and
B) female abdomen.

Kuva 4.

Paragus tibialis.
A) Koiraan genitaalit ja
B) naaraan takaruumis.



males of *P. constrictus* and *P. tibialis* could not be differentiated with certainty (Speight 2013).

Material and methods

An abundant population of *P. constrictus* was found by Ali Karhu, at Finland: Kb: Liperi, airport of Joensuu in 2013. Material collected from Liperi included 6 male and 4 female specimens. These female specimens were identical with each other but differed from the female specimens of *P. tibialis* in the collection of A. Haarto by the arrangement of the piles on the abdomen. The collection of Iiro Kakko was used for verifying the differences of the females of the subgenus *Pandasyothalmus* where these species belong. These differences are included

in this article especially for identification of the females of *P. constrictus* and *P. tibialis*.

Determination

The species of the subgenus *Pandasyothalmus* have an entirely black scutellum and uniformly coloured piles on the eyes, while other species of *Paragus* have dark and pale coloured piles on the eyes, arranged in vertical stripes. Males can be identified by the genitalia and both males and females by the colour and the arrangement of the piles on the abdomen. Since males typically have shorter piles than females, the different arrangement is less easily noticed in males. The male of *P. haemorrhous* is usually determined by the genitalia which have a

Table 1. Comparison of abdominal pilosity between species *P. haemorrhous*, *P. constrictus* and *P. tibialis*. All species have white and erect piles on the anterior part of terga 2-4.

Taulukko 1. Takaruumiin karvoituksen vertailua lajeilla *P. haemorrhous*, *P. constrictus* ja *P. tibialis*. Kaikilla lajeilla tergiittien 2-4 etuosan karvat ovat valkoisia ja pystyjä.

	<i>P. haemorrhous</i>	<i>P. constrictus</i>	<i>P. tibialis</i>
Piles on posterior part of terga 2-3	Black. Semi-erect.	White and frequently some black on posterior margin. Adpressed.	White. Erect and a few semi-erect on posterior margin.
Piles on posterior part of tergum 4	Black. Semi-erect.	White. Adpressed.	White. Erect and a few semi-erect on posterior margin.
Piles on tergum 5	White mixed with a few black. Semi-erect.	White. Adpressed.	White. Semi-erect.

small postgonite (Fig. 2A) while that of *P. constrictus* and *P. tibialis* is large (Figs. 3A and 4A). The postgonite of *P. constrictus* is nearly straight dorsally and the base relatively slender ventrally (Fig. 3A), that of *P. tibialis* is distinctly concave dorsally and the base ventrally broad (Fig. 4A).

The female of *P. haemorrhous* has the posterior part of the terga 2-4 covered with semi-erect black piles (Fig. 2B) but the females of *P. constrictus* and *P. tibialis* have the piles totally white at least on the tergum 4 (Figs. 3B and 4B). Thus, the female of *P. haemorrhous* can easily be differentiated from the other species of the subgenus *Pandasyophthalmus* known from Finland. The female of *P. tibialis* has mainly erect piles on the terga 2-4 but has a few semi-erect piles on the posterior margin of the terga 2-4 and entirely semi-erect piles on the tergum 5 (Fig. 4B). The female of *P. constrictus* differs from the female of *P. tibialis* having adpressed piles widely on the posterior part of the terga 2-4 and on the tergum 5 (Fig. 3B). The abdomen of *P. tibialis* is totally covered with white piles while *P. constrictus* frequently has some black piles on the posterior part of the terga 2-3. The specimen of *P. constrictus* in the Fig. 3B does not have any black piles on the abdomen. The colour and the arrangement of the piles on the abdomen for the

three species are shown in the Table 1. The males of these species have a similar colouration and arrangement of piles.

Discussion

Three species of the subgenus *Pandasyophthalmus* were formerly known from Finland, *P. constrictus*, *P. haemorrhous* and *P. tibialis*. Earlier *P. tibialis* was considered to be the most common species of these in Finland (Haarto & Kerppola 2007). Now it seems that most of the specimens identified before 2007 as *P. tibialis* belong to *P. haemorrhous* and *P. constrictus*. *P. haemorrhous* appears now to be the most common and widespread species in Finland. *P. constrictus* appears to be locally abundant on warm sandy habitats, and its range extends in north at least to *Om*: Lohtaja. Surprisingly *P. tibialis* seems to be the rarest species of *Pandasyophthalmus* and its distributional range in Finland might be restricted to the southern coast and southwestern archipelago. More information on the distributional range and frequency of the species are needed especially for the species *P. constrictus* and *P. tibialis*.

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