

## ***Pherbellia annulipes* (Zetterstedt, 1846) :** **a snail-killing fly new to Belgium** **(Diptera : Sciomyzidae)**

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### **Abstract**

*Pherbellia annulipes* (Zetterstedt, 1846) is recorded for the first time in Belgium. This is an atypical *Pherbellia*, parasitizing on terrestrial snails and occurring mainly in forests in contrast to most of its congeners which inhabit aquatic habitats, parasitizing on aquatic snails. Its discovery in Belgium was expected. Ecology, phenology, habitat preference and distribution of this species in Belgium are discussed.

**Keywords** : faunistics, new species for Belgium, ecology.

### **Samenvatting**

*Pherbellia annulipes* (Zetterstedt, 1846) is voor het eerst in België gevonden. Dit is een atypische *Pherbellia* parasiterend op landslakken. In tegenstelling tot andere *Pherbellia*-soorten die waterslakken parasiteren en in aquatische habitats voorkomen, wordt de soort *P. annulipes* vooral aangetroffen in bossen. Ecologie, fenologie, habitatvoorkeur en verspreiding van deze soort in België worden besproken.

### **Résumé**

*Pherbellia annulipes* (Zetterstedt, 1846) est rapportée pour la première fois de Belgique. C'est une *Pherbellia* atypique car elle parasite les mollusques terrestres, alors que la plupart des Sciomyzidae s'attaquent aux mollusques aquatiques. L'écologie, la phénologie, l'habitat et l'occurrence en Belgique sont discutés.

### **Introduction**

*Pherbellia* is by far the largest Sciomyzidae genus in the Palearctic region : 42 species of *Pherbellia* are known (KNUTSON & VALA, 2011) which is nearly 25% of all Palearctic Sciomyzidae. In Belgium, 13 species of *Pherbellia* are known (MORTELMANS, unpublished data ; MORTELMANS & VAN DE MEUTTER, 2013) a number which will undoubtedly increase in the following years. Here, *Pherbellia annulipes* is mentioned for the first time from Belgium.

### **Results**

#### **MATERIAL EXAMINED.**

i) *Pherbellia annulipes* : one male, 15.V.2013. Eupen (prov. Liège), det., leg., coll. J. Mortelmans.

One male was seen on a dead tree stump on which a lot of moss is growing. The location is some 5 km east of Eupen, in a highly forested area with lots *Fagus* and dead wood of *Fagus*.



Fig. 1. Rivalry and showoff of *P. annulipes* photographed in the Netherlands (photo : Ben Hamers)

ii) *Pherbellia annulipes* : one female, 18.V.2013. Steenbergse bossen, Zottegem (prov. East Flanders), det., leg., coll. J. Mortelmans

The location in the Steenbergse bossen is characterized by moist seepage of calcareous water. It was swept from *Carex sylvatica* in a half open vegetation. The area is rich in dead trees, both standing and lying trunks being mostly poplar (*Populus sp.*). Little beech (*Fagus*) is present.

## Discussion

### Recognition of the species

The genus *Pherbellia* is characterized by a bristle above the first coxa, generally broad genae, the anal vein reaching to the wing margin, a mainly dusted body and a frontal stripe which is in most cases well visible. *Pherbellia annulipes* is a small species ranging from 3.4 to 5.3 mm (VALA, 1989). The specimens caught were 4.8 and 5 mm in size. The species has infuscated cross veins and small genae. The front legs are darkened extensively and middle and hind legs yellowish, although with a black ring before the knees. The abdomen is black with clear grey to white bands. A small resemblance is to be found with *Pherbellia nana* (Fallen, 1820), which is smaller in size, has more extensively darkened wings and occurs in moist areas only. Sometimes, *P. annulipes* is mistaken with *Pteromicra* due to the small genae (BEUK, 2012).

### Ecology

*Pherbellia annulipes* is an atypical Sciomyzidae, not linked to aquatic environments like most other *Pherbellia*, but with terrestrial habits (VALA, 1989). It is mostly encountered in open beech woods where the species can be seen running on bark of dead and living trees (KNUTSON & BERG, 1971; VALA, 1989 ; BARTAK, 1998 ; KASSEBEER, 2000 ; STUKE, 2008). Here, it often co-occurs with species of *Clusiodes* Coquillett, 1904 a genus of flies whose larvae live in dead wood (SMIT & HAMERS, 2012). Recent publications mention the species being swept from low vegetation in forests rich in dead wood (STUKE, 2005 ; MERZ & KOFFLER, 2006). Adults are often seen above tree stumps rich in mosses where eggs are laid. Larvae will actively hunt for snails and multiple snails can be consumed (BRATT *et al.*, 1969). Finally, larvae will pupate within its host after which it needs a diapause (BRATT *et al.*, 1969). For reproduction, it seems to be linked to snails of the genus *Discus*, a common and widespread genus in Belgium. This host specificity has only been seen in lab conditions and for now, no adult flies were ever reared (REVIER & VAN DER GOOT, 1989).

Most striking characters, the abdomen, the front legs and the wings, are used to scare of other flies and to attract females (SMIT & HAMERS, 2012). Males often run agitated on tree bark or moss, swinging their front legs in front of them and twisting their abdomen (Fig. 1). The wings are held open with markings clearly visible (FRITZ, 2013 ; SMIT & HAMERS, 2012). These characters were filmed and made available online by FRITZ (2013).

Often, this species seems to occur in big numbers (GIBBS, 2002, REVIÉ & VAN DER GOOT, 1989). On the other hand VALA (1989), reports it to occur only rarely and in low numbers. In general, only rarely more than 2 individuals are seen during one field trip. At both Belgian locations, only one individual was encountered.

## Phenology

A phenologic graph is created based on records from surrounding countries (Fig. 2). Data indicate that *P. annulipes* flies from the end of April to the end of August. In May, June and July, the species reaches highest densities. The species probably has only one generation a year as suggested by BRATT *et al.* 1969. VALA (1989) mentions the species from May till October. The pupa needs a diapause.

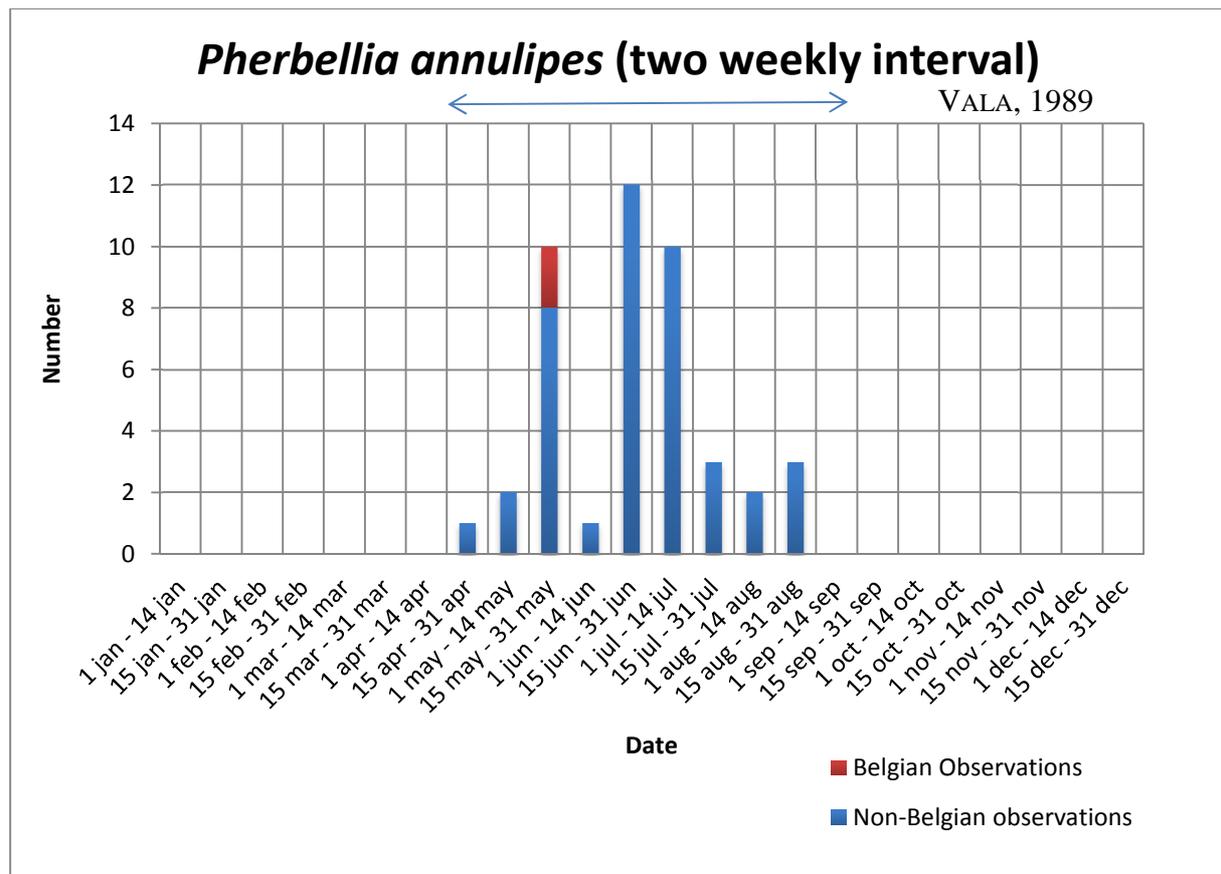


Fig. 2. Phenology of *Pherbellia annulipes* : The Belgian records are presented in red, and additional records from Germany : KASSEBEER (2000), STUKE (2005), STUKE (2008), The Netherlands : SMIT & HAMERS (2012) BEUK (2012) and northern France VALA (1989) are given in blue. On top, the phenology as given in VALA (1989).

## Distribution

*Pherbellia annulipes* is restricted to the West-Palaearctic realm only (VALA, 1989 ; ROZKOSNY, 1991). Nevertheless, records from America and Canada were published by MELANDER (1920). The validity of these records was rightfully questioned by VALA (1989). More recent, REVIÉ & VAN DER GOOT (1989) also published the species to occur in America, however as there is no citation present, it is assumed this record refers to the false record of MELANDER (1920).

Despite its wide West-Palaearctic distribution, it has only been recorded in the Netherlands in 2012 by SMIT & HAMERS (2012) and BEUK (2012), who published the arrival simultaneously.

In Belgium, the arrival of *P. annulipes* was expected and specific search for the species has been conducted. All known locations from the Netherlands are from the region of Maastricht. The two presented Belgian records are from the Hautes fagnes region (prov. Liège) and the Steenbergse bossen (prov. East Flanders). These two areas are located far apart, indicating the species is probably

widespread in Belgium and can be found at the right locations (e.g. Zonienwoud and maybe also the Voerstreek near Maastricht).

With the discussed discovery included, the genus *Pherbellia* now counts 14 species within Belgium. Comparing to neighboring countries, this number is likely to increase toward 18 species. Probably species like *Pherbellia knutsoni* Verbeke, 1967, *Pherbellia sordida* (Hendel, 1902), *Pherbellia rozkosnyi* Verbeke, 1967 might soon be discovered in Belgium. We hope that this discovery can be seen as an eye-opener to current Sciomyzidae research.

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