

# Review of the genus *Phylloecus* (Hymenoptera: Cephidae) in Belgium and Western Europe

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**Abstract.** Based on existing literature, data from citizen science portals and new findings in the field, the genus *Phylloecus* Newman, 1838 (= *Hartigia* Schiødte, 1839) is reviewed. Apart from details of the local distribution in Belgium, other aspects are investigated more extensively. The reproduction mechanisms of *P. faunus* are discussed: it seems to be parthenogenetic in the northern parts of Europe (1). We confirm the morphological diversification of the *P. niger* species complex living on *Rosa* spp. (2). Having found and reared *Phylloecus linearis* and *P. xanthostoma*, new illustrative material is provided of both larvae and their ecology (3). A morphological table compares the similarities and differences between the four species currently known in Western Europe (4).

**Samenvatting.** Op basis van de bestaande literatuur, data uit portalen als Waarnemingen.be en nieuwe vondsten in het veld, wordt het genus *Phylloecus* Newman, 1838 (= *Hartigia* Schiødte, 1839) herbekeken. Naast de lokale verspreiding in België worden ook meer specifieke aspecten onderzocht. De (a)seksuele voortplanting van *P. faunus* wordt bijvoorbeeld besproken, die parthenogenetisch blijkt te zijn in de meer noordelijke regio's van Europa (1). We bevestigen de morfologische diversificatie van *P. niger* op *Rosa* spp. (2) Door het vinden en uitkweken van larven van *Phylloecus linearis* en *Phylloecus xanthostoma* wordt nieuw beeldend materiaal getoond van de larven en hun ecologie (3). Tot slot moet een morfologische tabel de gelijkenissen en verschillen tussen de vier West-Europese soorten verduidelijken (4).

**Résumé.** Sur base de la littérature existante, de données provenant de différents portails d'encodage en ligne comme observations.be et de nouvelles découvertes de terrain, le genre *Phylloecus* Newman, 1838 (= *Hartigia* Schiødte, 1839) est revu. Mis à part les détails de la répartition pour la Belgique, des informations plus spécifiques sont fournies. La reproduction (a)sexuée de *P. faunus* est discutée; elle semble être parthénogénétique dans les zones les plus septentrionales de l'Europe (1). Nous confirmons la diversification morphologique de *P. niger* vivant sur *Rosa* spp. (2). Suite à la découverte et à l'élevage de larves de *Phylloecus linearis* et *P. xanthostoma*, de nouvelles illustrations sont fournies tant pour les larves que pour leur écologie (3). Finalement, un tableau comparatif met en évidence les ressemblances et les différences morphologiques entre les quatre espèces d'Europe de l'Ouest (4).

**Key words:** Ecology – Distribution – *Hartigia* – Larvae – Morphology – Sawfly – Stem-borers.

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## Introduction

Stem-borers of the genus *Phylloecus* Newman, 1838 (= *Hartigia* Schiødte, 1839) belong to the family Cephidae, one of the smaller families of Symphyta, sawflies. At present, four species are known from Europe. The species are well described in literature (see esp. Jansen 1998). However, quite recently the genus was revised taxonomically by Liston & Prous (2014), who synonymised *Hartigia* and *Phylloecus*. Moreover, apart from some remarks in the studies by Wolf (1968) and Burggraaf-van Nierop & van Achterberg (1990), the situation in Belgium has never been studied in depth. Using citizen science portals (*in casu* www.waarnemingen.be) and literature, we are now able to receive new insights on distribution. We also want to introduce *P. faunus* (= *H. helleri*). This species has not yet been discovered in Belgium, but is very likely to be present, having been found already in France and The Netherlands (pers. comm. A. Mol).

Some aspects related to the sawflies' ecology are shared by all four species. The larvae feed within the stems of herbaceous plants. Distributional details are closely associated with the presence (or absence) of such plants. Cephids are univoltine, and adults are mainly active from May to June. Exceptionally, adults can be found in April (pers. comm. A. De Ketelaere 2020) or in the late summer (e.g. a specimen of *P. niger* was caught on 24 August; Magis 2007). Using phenological statistics from the compiled data (in particular, *P. niger*; see Diagramme

1), it is clear that males tend to emerge before the females.

At least 25% of the recorded specimens based on photographic evidence were feeding on the flowers of a variety of plants, including *Cornus* and *Euphorbia* spp., but generally seemed to favour umbellifers (Apiaceae), especially *Anthriscus sylvestris*, and more occasionally *Heracleum sphondylium* and *Daucus carota*; see Fig. 3a).

From the summer onwards, larvae can be found in the often withered stems of host plants. The final instar larva spins a cocoon at the end of its gallery, in which it hibernates (see also Fig. 5c). Pupation takes place only a few weeks before its emergence as an adult (Bruzzeze 1982). The larvae are often parasitized, and a lot of cases have been reported (i.e. Bruzzeze 1982 for *P. faunus*, De Jong 1964 for *P. niger*, etc.).

## *Phylloecus faunus* Newman, 1838 Schijn-bramenstengelboorder Morphology

*Phylloecus faunus* belongs to species-complex A (see Table I) and closely resembles the sister-species *P. niger*. However, it can be distinguished paying attention to certain details. Microscopic features are differences in the colouration of the mandibles (middle part whitish) and differences in punctuation of frons and prothorax (shiny). The clearest difference is that of the length of the vertex,

Table I. Morphology of *Phylloecus* spp. in Western Europe based on personal findings and Muche (1981), van Nierop & van Achterberg (1990), Jansen (1998) and Liston & Prous (2014).

<b>Complex A</b>	<b><i>P. faunus</i></b>	<b><i>P. niger</i></b>
<b>Length</b>	♀♀ 10–18 mm ♂♂ 11–15 mm	♀♀ 9–18 mm ♂♂ 9–17 mm
<b>Antennal segments</b>	♀♀ 24–28 (black) ♂♂ 26–27 (black) ♀♂ Proportion 3 <sup>th</sup> to 4 <sup>th</sup> antennal segment: 10: 8.6 ( $\pm$ 0.4)	♀♀ 22–29 (black/brown); see remarks ♂♂ 26–27 (black/brown); see remarks ♀♂ Proportion 3 <sup>th</sup> to 4 <sup>th</sup> antennal segment: 10: 7.8 ( $\pm$ 0.4)
<b>Mandibles</b>	♀♂ Middle part whitish	♀♀ Middle part dark brown ♂♂ Middle part yellow
<b>Head</b>	♀♂ Distance of vertex (ocelli – hind margin of the head) to the largest eye diameter 10: 13.5 dorsally ♂♂ Two yellow markings on clypeus, with a black spot in the middle	♀♂ Distance of vertex to the largest eye diameter 10: 10.4 dorsally ♂♂ Clypeus black or completely yellow
	♀♀ Sparsely punctuated, shiny ♂♂ Sparsely punctuated, very shiny	♀♀ Frons strongly punctuated but matt (c. clypeus) ♂♂ Frons punctuated
<b>Thorax</b>	♀♂ Black	♀♂ Black
	♀♂ Prothorax and pronotum shiny	♀♂ Prothorax and pronotum matt
<b>Legs</b>	♀♂ Coxae, trochanters and femora black	♀♂ Coxae, trochanters and femora black ♂♂ Posterior side of front legs yellow
	♀♀ Knees, tibiae and tarsi brownish-yellow to red-brown ♂♂ Knees, tibiae and tarsi red-brown	♀♀ Knees, tibiae and tarsi brownish-yellow ♂♂ Knees, tibiae and tarsi yellow
<b>Abdomen</b>	♀♀ Black, with limited amount of yellowish-white stains on T3–T6. Stain on T5 sometimes completely reduced ♂♂ Black, with ivory stains on the hind margins of T3–T7. Spot on T5 is very small (only the outermost corner is spotted), together with T6 sometimes greatly reduced	♀♂ Black, with broader (light) yellowish-white markings on T3, T4 and T6
<b>Wing venation (these characteristics need further confirmation)</b>	♀♂ Basal slightly dull, distal clear, other veins dark brown. Pterostigma dark brown, but brightened in the middle ♀♀ Costa bright brown ♂♂ Costa red-brown	♀♂ Basal and distal clear, other veins dark brown, costa yellow ♀♀ Pterostigma brownish-yellow ♂♂ Pterostigma dark brown

<b>Complex B</b>	<b><i>P. linearis</i></b>	<b><i>P. xanthostoma</i></b>
<b>Length</b>	♀♀ 10–18 mm ♂♂ 10–17 mm	♀♀ 10–17 mm ♂♂ 10–17 mm
<b>Antennal segments</b>	♀♀ 23–27 ♂♂ 24–27 ♀♂ Proportion 3th to 4 <sup>th</sup> antennal segment: 10: 7.5 (± 0.3)	♀♀ 24–29 ♂♂ 22–26 ♀♂ Proportion 3th to 4 <sup>th</sup> antennal segment: 10: 6.5 (± 0.4)
<b>Mandibles</b>	♀♀ Dots on the outer margin ♂♂ Dots can be found on several places, except for the browner tips	♀♀ Dots reaching outer margin ♂♂ Dots sometimes reaching mandibles, having browner tips
<b>Head</b>	♀♂ Black, with (large) yellow dots on clypeus ♂♂ Upper side of clypeus with one yellow spot, enclosing a triangular shaped black spot in the middle	♀♂ Black, occasionally with small yellow dots on clypeus ♂♂ Upper side of clypeus with one yellow spot, enclosing a triangular shaped black spot in the middle
	♀♂ Sparsely punctuated, very shiny; vertex behind ocelli arched	♀♀ Punctuated, very shiny ♂♂ Sparsely punctuated, very shiny ♀♂ Vertex behind ocelli flat
<b>Thorax</b>	♀♂ Black	♀♂ Black
	♀♂ Pronotum margins yellow ♀♀ At least yellow dots on scutellum	♀♂ Pronotum margins yellow
<b>Legs</b>	♀♂ Coxae, trochanters and femora black; fore and hind coxae with resp. little and larger yellow dot	♀♂ Coxae, trochanters and femora black; fore and hind coxae with resp. little and larger yellow dot
	♀♂ Knees, tibiae and tarsi yellow	♀♂ Knees, tibiae and tarsi yellow
<b>Abdomen</b>	♀♀ Black, with yellow stains on T2 and T5. Broader yellow markings on T3, T4, T6 and T7. Narrower on T8. T9 with one yellow spot in the middle of the tergite ♂♂ Black, with yellow stains on T2 and T5. Broader yellow markings on T3, T4, T6–T8. T9 with a narrower marking on the hind margin	♀♀ Black, with yellow markings on T3, T4, T6–T8 ♂♂ Black, with yellow stains on T2 and T5. Broader yellow markings on T3, T4, T6–T8. T9 with a narrower marking on the hind margin
<b>Wing venation</b>	♀♂ Wings slightly yellow, with veins brown. Pterostigma brown, but front margin somewhat brighter, costa yellow	♀♀ Costa (light) brown, wings slightly infusate, pterostigma brown, but brightened in the middle ♂♂ Costa yellow, wings slightly yellow, pterostigma brown, but front margin somewhat brighter

the distance between the ocelli and the hind margin of the head, which is longer in *P. faunus*. For photographic facets, we have to distinguish between females and males, the latter in some populations being extremely rare (see Remarks under the debate about males). Although soft characteristics females generally appear to have yellowish-white stains (Fig. 1a) instead of broader stripes or markings on their abdomen in the case of *P. niger* (Fig.

3a). According to Jansen (1998) the posterior side of the front legs of *P. niger* is yellow, while it is black in *P. faunus*. Finally, in both sexes of *P. faunus*, the costa is stated to be bright reddish-brown, but yellow in *P. niger*; this feature needs further study because it has been shown to be difficult to use in several cases.

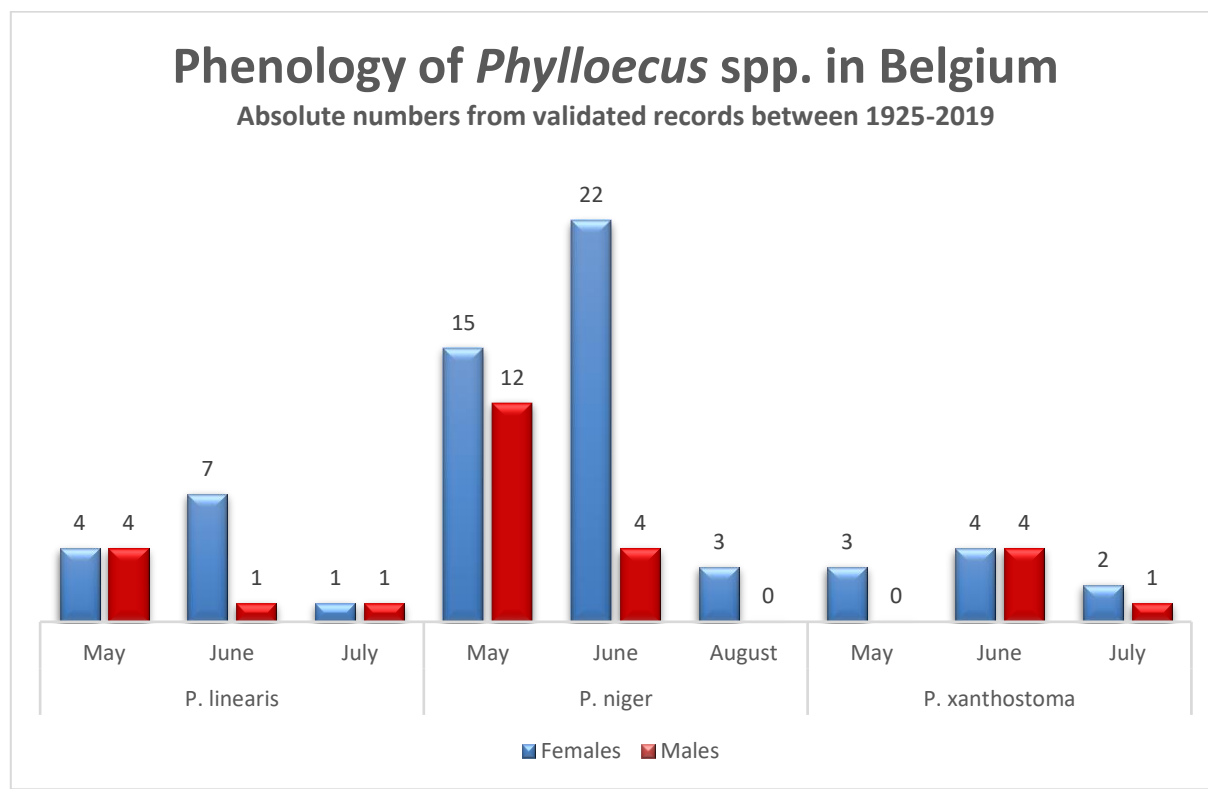


Diagramme 1. Phenology of *Phylloecus* spp. in Belgium.

## Distribution

Liston & Prous (2014) synonymised *Phylloecus faunus* with *Hartigia helleri* Taschenberg, 1871, also known as *Hartigia albomaculata* (Stein, 1876). Closer to the Low Countries, it is known to occur in Austria, Italy, Spain, Switzerland, and in France, especially along the coast line (Chevin 1993; Jansen 1998; Chevin & Chevin 2007). Recently it was discovered in The Netherlands (pers. comm. A. Mol).

## Remarks

The close relationship between *P. faunus* and *P. niger* has resulted in them being referred to as species-complex A. In contrast to the other species-complex, the differences in host material are minimal. Both *P. faunus* and *P. niger* are known to use *Rubus fruticosus* agg. as a host plant. Hence, 'Schijn-bramenstengelboorder' is proposed here as the Dutch vernacular name, respecting the historical name of the other species. According to Bruzzese (1982), who studied the species profoundly, only

primocanes (vigorous first year canes) are used, although stems are usually biennial. Furthermore, it was stated to be common to find two or sometimes three groups of several larvae boring in different sections of the same primocane.

There is no real consensus at this moment about the sexual reproduction of the species. Reviewing literature, males seem to be (extremely) rare in Western Europe, with only a few reports by Chevin (1993) and Jansen (1998). Bruzzese (1982), having reared about thousand specimens, explicitly stated parthenogenetic reproduction. It is concluded that the incidence of sexual reproduction seems to differ depending on the locality. Specifically, sexual reproduction is highly probably in North-Africa, with gender-ratios sometimes reaching 50/50 (pers. comm. A. Liston) – closer to the Equator, while parthenogenetic reproduction is more typical in northern populations (see also Benson 1950).



Fig. 1a. *Phylloecus faunus* ♀, coll. Senckenberg Deutsches Entomologisches Institut (SDEI); Saint-Rémy-de-Provence, 10–19.vi.1989. © A. Liston.



Fig. 1b. *Phylloecus faunus* ♀, coll. Senckenberg Deutsches Entomologisches Institut (SDEI); South of France, 1978, ex *Rubus fruticosus*. © A. Liston.

### ***Phylloecus linearis* (Schränk, 1781)**

#### **Agrimoniestengelboorder**

#### **Reported specimens**

1 ♂; Diest, VB; 29 Jul. 1932; Crèvecoeur & Maréchal 1933 • 3 ♀ 4 ♂; Sterrebeek, VB; 21 May 1936; Wolf 1968 • 1 ♀; Loën (Montagne St-Pierre), LG; 29 Jul. 1936; Wolf 1968 • 1 ♀; Destelbergen, OV; 20 Jun. 1941; Wolf 1968 • 1 ♀; Sint-Genesius-Rode, VB; 4 Jun. 1942; Wolf 1968 • 1 ♀; Hombourg, LG; 30 Jun. 1950; Wolf 1968 • 1 ♀; Gembloux, NA; 22 May 1965; Wolf 1968 • 1 ♀; Ciergnon, NA; 11 Jun. 1966; Wolf 1968 • 1 ♀; Rosport, LX; 17 Jun. 1977; Magis 2013; J. Petit leg.; on *Cornus sanguinea* • 1 ♂;

Holzwarche, LG; 10 Jun. 1978; Magis 1980 • 1 ♀; Somal, NA; 13 Jun. 2010; Libert & Magis 2015; P-N. Libert leg. coll.; on *Heracleum sphondylium* • 1 ♀; Sart-en-Fagne, NA; 1 Apr. 2019; observations.be; R. Meert leg.; F. Verheyde coll.; reared ex *Agrimonia eupatoria* • 1 larva; Rochefort, NA; 20 Sept. 2019; observations.be; R. Meert leg.



Fig. 2a. *Phylloecus linearis* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Agrimonia eupatoria*. © F. Verheyde.



Fig. 2b. *Phylloecus linearis* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Agrimonia eupatoria*. © F. Verheyde.



## Morphology

Belonging to species-complex B (see Table 1), *Phylloecus linearis* closely resembles *P. xanthostoma*. Females of *P. linearis* always have yellow dots on the scutellum (Figs. 2a-b.) and the yellow dots on the clypeus are rather large and more or less clear (Fig. 2c). Males are very hard to distinguish; apart from a small difference in the shape of the vertex behind the ocelli (Burggraaf-van Nierop & van Achterberg 1990) and the length of the fourth antennal segment, no clear differences are known. This is why 'Hartigia spec.' on citizen science portals mostly contains males of the *Hartigia linearis/xanthostoma*-complex.



Fig. 2c. *Phylloecus linearis* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Agrimonia eupatoria*. © F. Verheyde.

## Distribution

Due to the relative rarity of the host plant *Agrimonia eupatoria*, in high densities, *P. linearis* will probably be the rarest of the three reported species at present. Following the distribution of the host (and its density on some places), recent observations are mainly confined to calcareous localities in Wallonia.

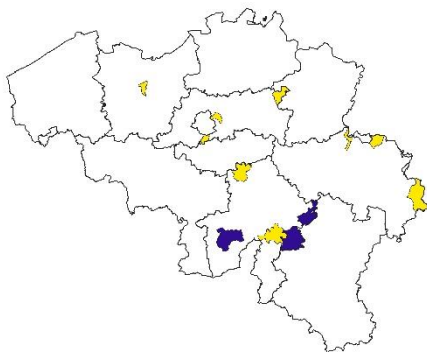


Fig. 2d. Distribution of *Phylloecus linearis* (purple = observations after 2000).

## Remarks

In February 2019, one larva of *P. linearis* was found in an older stem of *Agrimonia eupatoria* by the second author. The plant containing the *P. linearis* larva was found along a southwest facing forest edge in Sart-en-Fagne (Namur). The larval observations showed many

similarities to those of *P. xanthostoma* (Fig. 6, see below). The larva was reared successfully in breeding conditions and emerged as a female, with minor damage to the wing structure.

## *Phylloecus niger* (M. Harris, 1779)

### Bramenstengelboorder

### Reported specimens

• 1 ♂; Plainevaux, LG; 12 May 1925; Carpentier et al. 1925; P. Maréchal leg. coll. • 1 ♀ 1 ♂; Kinkempois, LG; 21 May 1926; Crèvecoeur & Maréchal 1927; P. Maréchal leg. coll. • 1 ♀; Loën, LG; 26 May 1931; Wolf 1968 • 2 ♀; Sterrebeek, VB; 6 Jun. 1937; Wolf 1968 • 1 ♀; Everberg, VB; 9 Jun. 1942; Wolf 1968 • 2 ♂; Loën (Montagne St-Pierre), LG; 28 May 1949; Wolf 1968 • 1 ♀; Everberg, VB; 4 Jun. 1951; Wolf 1968 • 1 ♂; Rochefort, NA; 17 Jun. 1951; Magis 2007; P. Maréchal leg. coll. • 2 ♀; Ukkel, BR; 3 Aug. 1951; Wolf 1968 • 1 ♀; Han-sur-Lesse (Thier de la Chapelle), NA; 14 Jun. 1955; Magis 2007 • 1 ♀; Hombourg, LG; 21 Jun. 1955; Wolf 1968 • 1 ♂; Eben-Emael, LG; 14 May 1959; Magis 2007; P. Maréchal leg. coll.; on *Anthriscus sylvestris* • 1 ♀; Bilstain (Forêt Domaniale de Grunhaut), LG; 20 Jun. 1961; Wolf 1968 • 1 ♀; Vivy, LX; 2 Jun. 1962; Wolf 1968 • 1 ♂; Rhisnes, NA; 4 Jun. 1962; Wolf 1968 • 1 ♀; La Roche-en-Ardenne, LX; 7 Jun. 1964; Wolf 1968 • 1 ♂; Neuchâteau, LX; 23 May 1965; Wolf 1968 • 1 ♀; Louveigné (Sendrogne), LX; 19 Jun. 1965; Wolf 1968 • 1 ♀; Musson, LX; 30 May 1966; Wolf 1968 • 1 ♂; Beaufays, LG; 12 May 1979; Magis 1983 • 1 ♀; Beaufays, LG; 28 May 1979; Magis 1983 • 2 ♀; Sart Tilman, LG; 2 Jun. 1979; Magis 2007; A. Pauly leg. coll. • 1 ♀; Beaufays, LG; 7 Jun. 1979; Magis 1983 • 1 ♀; Beaufays, LG; 19 Jun. 1979; Magis 1983 • 1 ♂; Bomal, LX; 18 May 1982; Magis 1983 • 1 ♀; La Louvière, HA; 10 May 1987; Magis 2007 • 1 ♂; Eben-Emael, LG; 24 May 1996; Magis 2007 • 1 ♀; Grand-Manil, NA; 5 May 2000; Magis 2007 • 1 ♀; Ukkel, BR; 24 May 2004; Magis 2007 • 1 ♀; Somal, NA; 24 Aug. 2006; Magis 2007; P.-N. Libert leg. coll.; on *Daucus carota* • 1 ♀; Somal, NA; 16 May 2010; Libert & Magis 2015 • 1 ♀; Brussel, BR; 23 Jun. 2010; observations.be; J. Soors leg. • 1 ♂; Arlon, LX; 26 May. 2012; observations.be; M. Pédrion leg. • 1 ♀; Heverlee, VB; 26 May. 2012; observations.be; J. R. leg. • 1 ♀; Evere, BR; 9 Jun. 2013; observations.be; B. Hanssens leg. • 1 ♀; Tellin, LX; 12 May 2017; observations.be; J. Preud'homme leg. • 1 ♀; Roosdaal, VB; 12 Jun. 2017; observations.be; K. Geeraerts leg. • 1 ♂; Kortrijk, WV; 22 May 2018; observations.be; C. Delbaere leg. • 1 ♀; Spa, LX; 31 May 2018; observations.be; C. Devillers leg. • 1 ♀; Bevere, OV; 8 Jun. 2018; observations.be; W. Van Heddegem leg. • 1 ♀; Willebroek, AN; 16 May 2019; observations.be; M. Mergaerts leg. • 1 ♂; Lozer, OV; 21 May 2019; observations.be; J. Raes leg. • 1 ♀; Rotselaar, VB; 23 May 2019; observations.be; M. Mergaerts leg. • 1 ♀; Nazareth, OV; 1 Jun. 2019; observations.be; J. Raes leg. • 1 ♀; Vresse-sur-Semois, NA; 8 Jun. 2019; observations.be; D. Duytschaever leg. • 1 ♂; Kanne, LI; 13 Jun. 2019; observations.be; J. Slaats leg. • 1 ♀; Schoten, AN; 14 Jun. 2019; observations.be; K. Bracke leg. • 1 ♀; Melsen; 18 Jun. 2019; observations.be; J. Raes leg.

*Rosa*-type specimen (see Remarks)

1 ♀; Aarschot, VB; 5 Jun. 2016; observations.be; R. Vandenhoudt leg.; oviposition on *Rosa* spp. • 1 ♀; Roeselare, WV; 11 May 2018; observations.be; L. Feys leg. • 1 ♀; Oudenaarde, OV; 15 May 2018; observations.be; J. Raes leg.

## Morphology

Belonging to species-complex A (see Table I), *P. niger* closely resembles *P. faunus*. Microscopic features are differences in the colouration of the mandibles (middle part dark brown in females, yellow in males), differences in punctuation of frons and prothorax (matt) and the length of the vertex. Adults raised from *Rosa* spp. are recognised by having red brown antennal segments apically (see remarks). For photography, as with *P. faunus*, we have to distinguish between females and males, the latter in some populations being extremely rare. Females generally appear to have somewhat broader stripes or markings instead of stains, often completely white or creamy. Males are harder to distinguish on superficial features. According to Jansen (1998) the posterior side of the front legs of *P. niger* is yellow, but black in *P. faunus*.

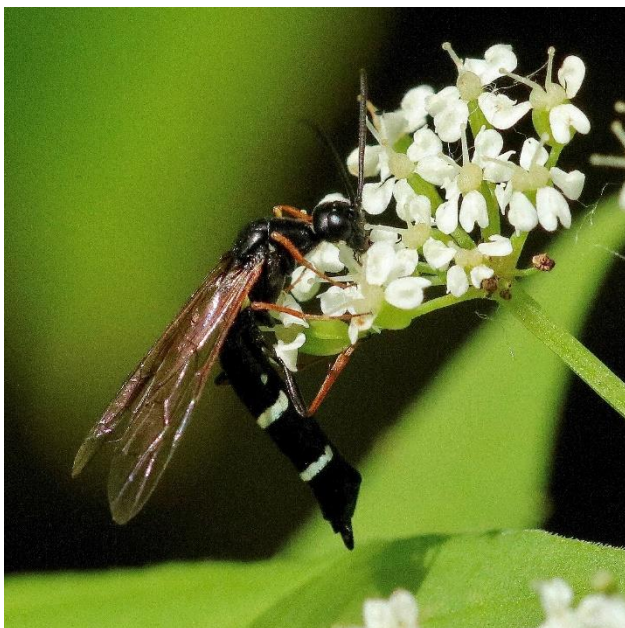


Fig. 3a. *Phylloecus niger* ♀, leg. K. Geeraerts; Belgium, Roosdaal, 12 Jun. 2017, © K. Geeraerts.

## Distribution

Accepting the possible difficulties in identification, *P. niger* seems at present to be the common species in Belgium. So far, as mentioned above, *P. faunus* has yet to be reported here. In fact, of the whole genus, *P. niger* is most commonly seen. However, older data is largely missing for Flanders, with the exception of some specimens collected around Brussels (Fig. 3b). Even then, gaps can be identified in our records: between 1966 and 1979 no data are available and between 1982 and 2010 records are scarce. Recently the tables turned with the new citizen science portal observations.be. From 2010

onwards 21 new records have become available from all Provinces (but most from Flanders), thus constituting nearly half of the 51 records in total.

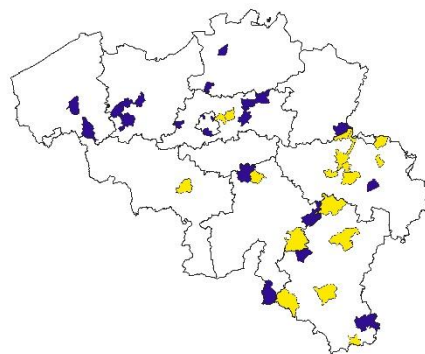


Fig. 3b. Distribution of *Phylloecus niger* (purple = observations after 2000).

## Remarks

Distribution and frequency of *P. niger* is largely based on its ecology. The other species are mostly restricted to a single plant species. *P. niger* can not only be found on many *Rubus*-species, including *R. idaeus* as well as *R. fruticosus* agg., but also on *Rosa* spp. This is also why the Dutch vernacular name 'Brame[n]stengelboorder' or Blackberry-stemborer (De Jong 1964) – in fact, as one of the oldest vernacular names for a sawfly in Dutch – is a bit ambiguous.



Fig. 3c. *Phylloecus niger* ♀ '*Rosa*-type', leg. R. Vandenhoudt; Belgium, Aarschot, 5 Jun. 2016. © R. Vandenhoudt.

Having reared adults from *Rosa* spp. (Scheibelreiter 1973), it was noticed that the antennal segments of adults are red brown, in contrast to those associated with *Rubus* sp. which have black antennae (Jansen 1998). We are able to confirm this difference. One female specimen was photographed ovipositing on *Rosa* spec. (Fig. 3c) and the antennae are certainly different in this respect (Fig. 3d). However, we are able to specify in more detail: the first three flagellomeres are blackish, the distal part is red brown. This is also visible on other photographs, and if the difference turns out to be constant, its taxonomic significance will require investigation. At this stage it is still not clear whether this is merely a variation, or whether



the morph merits subspecific or even specific status (which we could call 'Rozenstengelboorder').

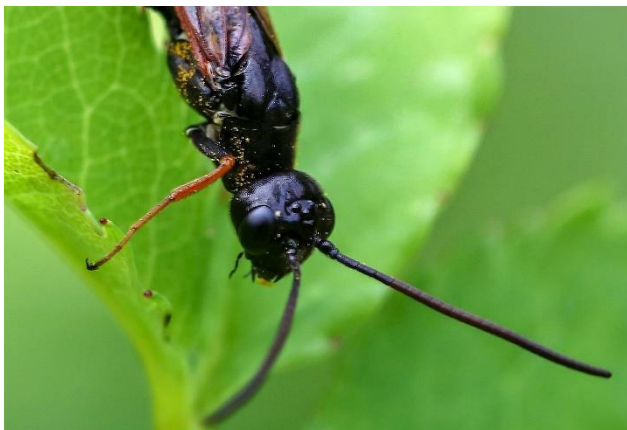


Fig. 3d. *Phylloecus niger* ♀ 'Rosa-type', leg. R. Vandenhoult; Belgium, Aarschot, 5 Jun. 2016. © R. Vandenhoult.

### ***Phylloecus xanthostoma* (Eversmann, 1847)** **Moerasspireastengelboorder** **Reported specimens**

• 1 ♀; Loën, LG; 21 Jul. 1933; Crèvecoeur & Maréchal 1940 • 1 ♂; Barvaux-sur-Ourthe, LX; 9 Jun. 1934; Crèvecoeur & Maréchal 1939 • 1 ♀; Bombaye, LG; 12 Jun. 1934; Crèvecoeur & Maréchal 1940 • 1 ♀; Comblain-au-Pont, LG; 9 Jul. 1935; Crèvecoeur & Maréchal 1939 • 1 ♀; Lanaye, LG; 14 Jul. 1935; Wolf 1968 • 1 ♂; Melle, OV; 15 Jun. 1944; Wolf 1968 • 1 ♂; Lixhe (Montagne St-Pierre), LG; 1 Jul. 1944; Crèvecoeur & Maréchal 1939 • 2 ♂; Heusden, OV; 10 Jun. 1945; Wolf 1968 • 1 ♀; Spa, LX; 1 Jun. 2008; observations.be; C. Devillers leg. • 1 ♀; Somal, NA; 6 May 2011; Libert & Magis 2015 • 1 ♀; Heverlee, VB; 4 Jun. 2011; observations.be; J. R. leg. • 1 ♀; Marchin (Triffoy), LG; 29 May 2015; observations.be; P. Vanmeerbeeck leg. • 1 ♀; Denderbelle, OV; 13 Mar. 2019; observations.be; R. Meert leg.; F. Verheyde coll.; reared • 1 ♀; Kalken, OV; 19 May 2019; observations.be; G. Van Heghe leg. • 1 ♀; Schulte, LI; 6 Jun. 2019; observations.be; K. Hustinx leg. • 1 larva; Rochefort, NA; 20 Sept. 2019; observations.be; R. Meert leg.

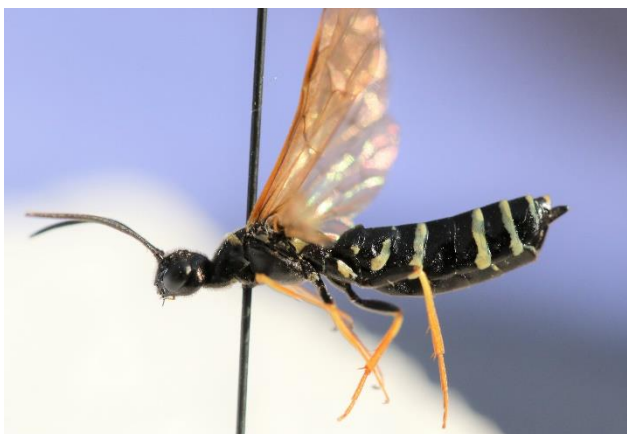


Fig. 4a. *Phylloecus xanthostoma* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Denderbelle 2019, ex *Filipendula ulmaria*. © F. Verheyde.

## **Morphology**

Belonging to species-complex B (see Table II), *P. xanthostoma* closely resembles *P. linearis*. Females of *P. xanthostoma* always have a black scutellum (Figs. 4a-b.) and the yellow dots on the clypeus are rather small and scattered, or obsolescent (Fig. 4c). Males are very hard to distinguish; except for a small difference in the shape of the vertex behind the ocelli (Burggraaf-van Nierop & van Achterberg 1990) and the length of the fourth antennal segment, no clear differences are known. This is why 'Hartigia spec.' on citizen science portals mostly contains males of the *Hartigia linearis/xanthostoma*-complex.



Fig. 4b. *Phylloecus xanthostoma* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Denderbelle 2019, ex *Filipendula ulmaria*. © F. Verheyde.



Fig. 4c. *Phylloecus xanthostoma* ♀, coll. F. Verheyde; leg. R. Meert, Belgium, Denderbelle 2019, ex *Filipendula ulmaria*. © F. Verheyde.

## **Distribution**

With *Filipendula ulmaria* as a host plant, *P. xanthostoma* should be more common than *P. linearis*, especially in Flanders (Fig. 4d). This shows on our



distributional map, but from a broader perspective differences remain small.

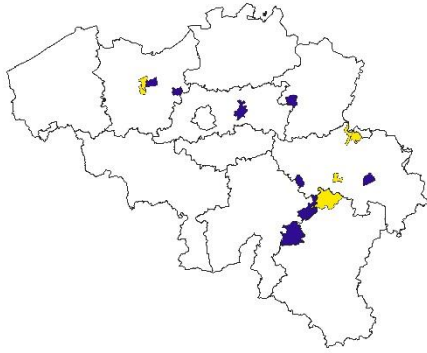


Fig. 4d. Distribution of *Phylloecus xanthostoma* (purple = observations after 2000).



Fig. 5c. *Phylloecus xanthostoma* larva on host plant; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Filipendula ulmaria*. © R. Meert.



Fig. 5a. *Phylloecus xanthostoma* larva on host plant; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Filipendula ulmaria*. © R. Meert.



Fig. 5d. *Phylloecus xanthostoma* larva on host plant; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Filipendula ulmaria*. © R. Meert.

## Remarks

In September 2018, three full grown larvae of *P. xanthostoma* were found in a stem of *Filipendula ulmaria* by the second author. Not surprisingly, bearing in mind the preferences of this plant, the plants were growing in wet conditions at the waterside of the river Dender in Denderbelle (East Flanders). All larvae were final instars and were located in the centre of the stem of the host plant. One stem of *F. ulmaria* contained two larvae of *P. xanthostoma*, thus confirming the grouping of larvae stated in literature. A transparent white cocoon up to 6 cm was made, having the same diameter as the central hole in the stem. In the cocoon, the larva was resting head upwards (Fig. 5c).

In other parts of the stem, brown frass was noticed (see also Fig. 5b). Pupae were not checked during rearing to prevent a possible failure of the breeding experiments. To leave the feeding place, the adult gnawed a hole in the stem close to the top of the cocoon. Larvae of the micromoth *Monochroa lutulentella* (Zeller, 1839) can be found in the same host plant and period as *P. xanthostoma*, but they live in the rootstock and the very base of the stem (personal observations from the second author).



Fig. 5b. *Phylloecus xanthostoma* larva on host plant; leg. R. Meert, Belgium, Sart-en-Fagne 2019, ex *Filipendula ulmaria*. © R. Meert.



Fig. 6. *Phylloecus linearis* larva on host plant; leg. R. Meert, Belgium, Rochefort 2019, ex *Agrimonia eupatoria*. © R. Meert.

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