

New records of Pteromalidae (Hymenoptera, Chalcidoidea) from Norway

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The following five species of the family Pteromalidae are reported for the first time from Norway: *Gastrancistrus autumnalis* (Walker, 1834), *Gastrancistrus picipes* (Nees, 1834), *Glyphognathus laevis* (Delucchi, 1953), *Tricyclomischus celticus* Graham, 1956 and *Apelioma pteromalinum* (Thomson, 1878). This brings the total number of Norwegian pteromalids up to 276. Comments on biology and distribution for each species are given. The aim of this report is to highlight the occurrence of the family in Norway and to contribute to a complete check-list of the Norwegian species.

Key words: Hymenoptera, Chalcidoidea, Pteromalidae, new records, Norway, pan-traps, malaise traps.

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Introduction

The family Pteromalidae is considered as one of the largest families in the order Hymenoptera with about 3506 described species distributed on 588 genera and 31 subfamilies (Noyes 2017). The European species are treated in detail by Graham (1969) and Bouček & Rasplus (1991). The life histories known to the species are diverse, with members developing as solitary or gregarious parasitoids mainly of larvae and pupae of Diptera, Coleoptera, Hymenoptera, Lepidoptera and Siphonaptera. Many members attack hosts inhabiting plant tissue such as leaf miners, gall inducers, and stem and wood borers (Graham 1969, Bouček & Rasplus 1991, Polaszek 2004, Noyes 2017). Ottesen (1993) estimated the number of pteromalid species in Norway to 500, but little effort has yet been put into studying the Norwegian Pteromalidae fauna relative to neighboring countries. While 692 species have been recorded from Sweden (Dyntaxa 2017), only 271 species have been recorded from Norway (Artsdatabanken 2017), and only 57 of these are

mentioned in publications (Noyes 2017). The aim of this report is to highlight the occurrence and distribution of this family in Norway, and to contribute to a check-list of the Norwegian species.

Material and methods

The material was collected in white and yellow pan-traps and Malaise traps, and preserved in ethanol. The specimens were later dried using hexamethyldisilazane (HMDS) to prevent shrinking, card mounted and identified following the keys in Graham (1969) and Bouček & Rasplus (1991). Photos were taken through a Zeiss Discovery v20 stereo microscope with an Axiocam 506 color camera and the software Zeiss ZEN. Stacking of the photos was performed using the software Zerene Stacker. Faunistic divisions within Norway follow Økland (1981), and are given in bold. Coordinates are given in decimal degrees (Grid: *Lat/Lon hddd.dddd*°; datum: *WGS84*). The taxonomy follows Noyes (2017). Data on biology

and distribution is extracted from Noyes (2017) and Mitroiu (2017), and for distribution in Europe all countries are listed, but not for other regions. All records refer to fully labeled specimens deposited in the collections at the Natural History Museum of Oslo.

List of species

PIRENINAE

Gastrancistrus autumnalis (Walker, 1834)

(Figure 1)

Material examined: AUST-AGDER coastal [AAY], Grimstad: Rønnes, Osterkilen (Oak forest), [N58.338255° E8.612404° ± 10m], 1♀ 10 May–11 September 2016, Malaise trap, leg. Jon Peder Lindemann.

Biology: Known to occur on leaves of *Fagus sylvatica* L. in the autumn, and an unspecified cecidomyiid (Diptera: Cecidomyiidae) associated with *Fagus* have been suggested as primary host (Graham 1969, Noyes 2017).

Distribution: «Czechoslovakia», Germany, Ireland, Netherlands, Spain, Sweden and England (Noyes 2017).



FIGURE 1. *Gastrancistrus autumnalis* (Walker, 1834) ♀, Osterkilen, Grimstad, 10 May–1 September 2016. Photo: Geir Søli, Natural History Museum, Oslo.

Gastrancistrus picipes (Nees, 1834) (Figure 2)

Material examined: AUST-AGDER coastal [AAY], Grimstad: Rønnes, Tollholtheia (Pine forest) [N58.340969° E8.609948° ± 10m] 1♀ 15 June–3 August 2015, Malaise trap, leg. Jon Peder Lindemann.

Biology: Known to occur in association with *Betula* sp. and *Fagus sylvatica* L., but the host is unknown (Graham 1969, Noyes 2017).

Distribution: Germany, Sweden and England (Noyes 2017).



FIGURE 2. *Gastrancistrus picipes* (Nees, 1834) ♀, Tollholtheia, Grimstad, 15 June–3 August 2015. Photo: Geir Søli, Natural History Museum, Oslo.

MISCOGASTRINAE

Glyphognathus laevis (Delucchi, 1953)

(Figure 3)

Material examined: NORDLAND southern interior [NSI], Grane: Laksfors, Leirbekkøra (rivershore) [N65.630831° E13.270049° ± 35m] 1♀ 14 July 2016; yellow pan-traps, leg. Jon Peder Lindemann.

Biology: Leaf-mining flies in the genus *Phytomyza* Fallen, 1810 (Diptera: Agromyzidae) are reported as primary hosts (Noyes 2017). It is known to attack *Phytomyza solidaginis* Hendel, 1920, a leaf miner of *Solidago virgaurea* L. (Graham 1969, Noyes 2017).

Distribution: Croatia, Czech Republic,



FIGURE 3. *Glyphognathus laevis* (Delucchi, 1953) ♀, Leirbekkøra, Grane 14 July 2016. Photo: Geir Søli, Natural History Museum, Oslo.

Hungary, Netherlands, Sweden and England (Noyes 2017).

***Tricyclomischus celticus* Graham, 1956**

(Figure 4)

Material examined: AUST-AGDER coastal [AAY], Grimstad: Roresanden (sand pit), [N58.347342° E8.533309° ±35m] 2♀♀ 24 July 2016, white pan-traps, leg. Jon Peder Lindemann.

Biology: Known to occur in association with *Laburnum anagyroides* Medikus, 1787 but the host is unknown (Noyes 2017).

Distribution: Czech Republic, Ireland, Sweden, England and Scotland (Mitroiu 2017, Noyes 2017).

PTEROMALINAE

***Apelioma pteromalinum* (Thomson, 1878)**

(Figure 5)

Material examined: AUST-AGDER coastal [AAY], Grimstad: Marivold, Rossevika (mixed forest) [N58.335066° E8.624813° ±10m], 2♀♀ 10 May–11 September 2016, Malaise trap, leg. Jon Peder Lindemann.

Biology: *Phaenops cyaneus* (Fabricius 1775)



FIGURE 4. *Tricyclomischus celticus* Graham, 1956 ♀, Roresanden, Grimstad, 24 July 2016. Photo: Geir Søli, Natural History Museum, Oslo.



FIGURE 5. *Apelioma pteromalinum* (Thomson, 1878) ♀, Rossevika, Grimstad, 10 May–11 September 2016. Photo: Geir Søli, Natural History Museum, Oslo.

(Coleoptera: Buprestidae) is reported as primary host (Noyes 2017). The beetle develops on inner bark and cambium of *Pinus* spp. at warm and sun exposed habitats (Ciesla 2011).

Distribution: Belgium, Croatia, Czech Republic, Denmark, Hungary, Slovakia, Sweden and England (Sedivy 1989, Mitroiu 2017, Noyes 2017).

Discussion

Five species of Pteromalidae not previously recorded from Norway were reported in this paper. This increases the number of Norwegian species to 276. Ottesen (1993) estimated the number in Norway to 500 which indicates that the list of species is far from complete and that several more species can be expected to be found in the future.

White and yellow pan-traps have shown to be an efficient collecting method of pteromalids, and can be used successfully to cover large geographical areas and to retrieve exact information on flight time. Information on collecting sites can be valuable when analyzed in terms of habitat preferences. *Solidago virgaurea* were abundant on the collecting site of *G. laevis*, and its host is therefore likely to have been the agromyzid fly *P. solidaginis*. The collecting site of *A. pteromalinum* is a warm south facing spot, overgrown with pine (*Pinus sylvestris*), and should therefore meet the requirements of the known host, *P. cyanus*. While *G. autumnalis* is a known associate with beech (*Fagus sylvatica*) (Graham 1969), the place it was collected from in this case is rather overgrown with oak (*Quercus* sp.), and a suggestion can be that the host is associated with oak (*Quercus* sp.). The same applies to *G. picipes* which also previously have been recorded in association with beech, but in this study was collected at a site populated by pine and a few oak trees. It is likely that their hosts belong to Cecidomyiidae, as *Gastrancistrus* spp. are almost exclusively recorded from cecidomyiid hosts (Noyes 2017). Finally *T. celticus* is previously reported to occur on *Laburnum anagyroides* (Noyes 2017), a tree that is quite common in Norwegian gardens, and it is therefore possible that the species could have originated from a garden nearby.

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