

## NEW RECORDS OF NON-BITING MIDGES (DIPTERA: CHIRONOMIDAE, ORTHOCLADIINAE) FROM MALLORCA, SPAIN

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### Abstract

Ten species of non-biting midges belonging to the subfamily Orthocladiinae were found in samples from predominantly macrolithic habitats in Mallorca, Spain. One species, *Bryophaenocladus nidorum* (Edwards, 1929), has not previously been recorded from Spain, while *Smittia pratorum* (Goetghebuer, 1927), *Bryophaenocladus inconstans* (Brundin, 1947), *Orthocladus (O.) maius* Goetghebuer, 1942, *Paracladius conversus* (Walker, 1856) and *Paraphaenocladus impensus* (Walker, 1856) are recorded for the first time from the Balearic Islands.

### Introduction

Non-biting midges (Diptera, Chironomidae) from the Mediterranean are of particular interest for taxonomists, biogeographers and ecologists due to the unique history of the region during the Paleogene and Neogene, as well as the high degree of the local endemism (Laville and Reiss 1992, Moubayed-Breil et al. 2012). Considerable attention has been given to the chironomid faunas of the Mediterranean islands in connection with studies on island biogeography and the ecology of intermittent rivers (Álvarez et al. 2010, Raposeiro et al. 2009).

However, from the Balearic Islands, the only Chironomidae studies are based on immature stages, mainly larvae and pupal exuviae (Álvarez et al. 2010, Malo and Garcia-Aviles, 1999). Here we present new records of adult Chironomidae from Mallorca.

### Material and Methods

Specimens were sampled at nine locations in Mallorca (Fig. 1) in February 2015 using sweep nets and aspirators and preserved in 70-100% ethanol. All material was collected by Gunnar M. Kvitte. For subsequent identification, males were slide-mounted in Euparal following the procedure in Langton and Pinder (2007).

Nomenclature is according to Ashe and O'Connor (2012); distributions follow Soriano et al. (1997), Ashe and O'Connor (2012) and Spies and Sæther (2013). Specimens were identified using the keys in Langton and Pinder (2007), Cranston et al. (1989), Brundin (1947), Du et al. (2011) and Moller Pilot (2008). Voucher specimens are deposited in the Natural History collections at the University Museum of Bergen, Bergen, Norway (ZMBN).



Figure 1. Collection sites at Mallorca.

### Results

Ten species of Orthocladiinae were found. One of them - *Bryophaenocladus nidorum* (Edwards, 1929), have not previously been recorded from Spain, while five additional species, *Orthocladus (O.) maius* Goetghebuer, 1942, *Paracladius conversus* (Walker, 1856) and *Paraphaenocladus impensus* (Walker, 1856), *Smittia pratorum* (Goetghebuer, 1927), *Bryophaenocladus inconstans* (Brundin, 1947) are recorded for the first time from the Balearic Islands.

#### *Bryophaenocladus nidorum* (Edwards, 1929)

Localities: Spain, Mallorca, Campos, 1 km from city centre, 39.425695°N, 2.957022°E, 7♂♂, 06 February 2015, garden; Esporles, Torrent de San Vic, 39.670459°N, 2.569193°E, 1♂, 10 February 2015, stream edges; Esporles, Son Tria, 39.663051°N, 2.573698°E, 1♂, 09 February 2015, recreational area; Banyalbufar, 39.690612°N,

2.525107°E, 1♂, 09 February 2015, shaded ditch between Banyalbufar and Esporles.

Distribution: Austria, Finland, France (Incl. Corsica), Germany, Great Britain, Mongolia, Norway, Novaya Zemlya (Russia), Netherlands, Romania, Russia (Northern European part), Sweden, Switzerland (Ashe and O'Connor 2012, Spies and Sæther 2013). New to Spain inclusive the Balearic Islands.

***Bryophaenocladus* sp. cf. *scanicus* (Brundin, 1947) *sensu* Langton and Pinder 2007**

Locality: Spain, Mallorca, Puigpunyent, between Ma-1041-11 and 12, 39.614133°N, 2.553593°E, 1♂, 12 February 2015, waterfall and stream edges near bridge.

The species recorded here is the same as the one illustrated by Langton and Pinder (2007), which appears to be quite different from the *B. scanicus sensu stricto* redescribed and illustrated in Du et al. (2011). *Bryophaenocladus scanicus sensu stricto* is listed as occurring in Spain (Soriano et al. 1997, Ashe and O'Connor 2012), but the species must be considered as new to the fauna of the Balearic Islands. However, further studies of *Bryophaenocladus* sp. cf. *scanicus sensu* Langton and Pinder 2007 is required to clarify its status and distribution.

***Bryophaenocladus inconstans* (Brundin, 1947)**

Locality: Spain, Mallorca, Banyalbufar, 39.690612°N, 2.525107°E, 2♂♂, 09 February 2015, shaded ditch between Banyalbufar and Esporles.

Distribution: Finland, Germany, Great Britain, Italy, Norway, Romania, Russia (East Siberia), Sweden, Spain (Sierra Nevada) (Ashe and O'Connor 2012, Spies and Sæther 2013, Casas et al., 2013). New to Balearic Islands.

***Cricotopus* sp.**

Locality: Spain, Mallorca, Puigpunyent, between Ma-1041-11 and 12, 39.614133°N, 2.553593°E, 1♀, 12 February 2015, waterfall and stream edges near bridge.

***Corynoneura* sp.**

Locality: Spain, Mallorca, Puigpunyent, between Ma-1041-11 and 12, 39.614133°N, 2.553593°E, 1♂, 12 February 2015, waterfall and stream edges near bridge.

***Limnophyes minimus* (Meigen, 1818)**

Localities: Spain, Mallorca, Puigpunyent, between Ma-1041-11 and 12, 39.614133°N, 2.553593°E, 10♂♂, 10♀♀, 12 February 2015, waterfall and

stream edges near bridge; Esporles, Torrent de San Vic, 39.670459°N, 2.569193°E, 3♂♂, 1♀, 10 February 2015, stream edges; Banyalbufar, 39.690612°N, 2.525107°E, 3♂♂, 09 February 2015, shaded ditch between Banyalbufar and Esporles; Deia, loc. 1, 39.748072°N, 2.643385°E, 9♂♂, 08 February 2015, water-through and stream near hygropetric surface; Deia, loc. 2, 39.750554°N, 2.642722°E, 1♂, 08 February 2015, rock surface with sparse vegetation and some moisture; Deia, loc. 3, 39.752634°N, 2.642415°E, 1♂, 08 February 2015, half-dry streambed with rocks and bryophytes.

Distribution: Cosmopolitan; previously recorded from Balearic isles (Ashe and O'Connor 2012, Malo and Garcia-Avilès 1999, Soriano et al. 1997).

***Orthocladus* (*O.*) *maius* Goetghebuer, 1942**

Locality: Spain, Mallorca, Esporles, Torrent de San Vic, 39.670459°N, 2.569193°E, 2♂♂, 10 February 2015, stream edges.

Distribution: Austria, Czech Republic, Germany, Great Britain, Italy, Spain, Sweden (Ashe and O'Connor 2012, Spies and Sæther 2013). New to the Balearic Islands.

***Paracladius conversus* (Walker, 1856)**

Locality: Spain, Mallorca, Deia, loc. 2, 39.750554°N, 2.642722°E, 1♂, 08 February 2015, rock surface with sparse vegetation and some moisture.

Distribution: Widespread in the Holarctic region (Ashe and O'Connor 2012, Spies and Sæther 2013, Soriano et al 1997). New to the Balearic Islands.

***Paraphaenocladus impensus* (Walker, 1856)**

Locality: Spain, Mallorca, Puigpunyent, between Ma-1041-11 and 12, 39.614133°N, 2.553593°E, 1♂, 12 February 2015, waterfall and stream edges near bridge.

Distribution: Widespread in the Holarctic region (Ashe and O'Connor 2012, Spies and Sæther 2013, Soriano et al. 1997). New to the Balearic Islands.

***Smittia pratorum* (Goetghebuer, 1927)**

Locality: Spain, Mallorca, Esporles, Torrent de San Vic, 39.670459°N, 2.569193°E, 1♂, 10 February 2015, stream edges; Cala Figuera, 39.330871°N, 3.165476°E, 2♂♂, 1♀, 10 February 2015, forest glade in front of hotel; Banyalbufar, 39.690612°N, 2.525107°E, 1♂, 09 February 2015, shaded ditch between Banyalbufar and Esporles.

Distribution: Widely distributed in the Holarctic region; occurring in Oriental China, and possibly

also in Argentina in the Neotropical region. In Spain, the species was previously recorded in the Sierra Nevada (Ashe and O'Connor 2012, Spies and Sæther 2013). New to Balearic Islands (Ashe and O'Connor 2012, Spies and Sæther 2013, Soriano et al. 1997).

Remarks: The male collected at Banyalbufar exhibits a curious abnormality in the development of the anal point as the apex of the anal point is bifurcate and Y-shaped (Fig. 2). We have not found similar examples in the literature, but a wide variety of other developmental abnormalities resulting from parasites or gene or chromosomal mutations have been thoroughly documented (see Rempel 1940; Martin and Lee 2000).

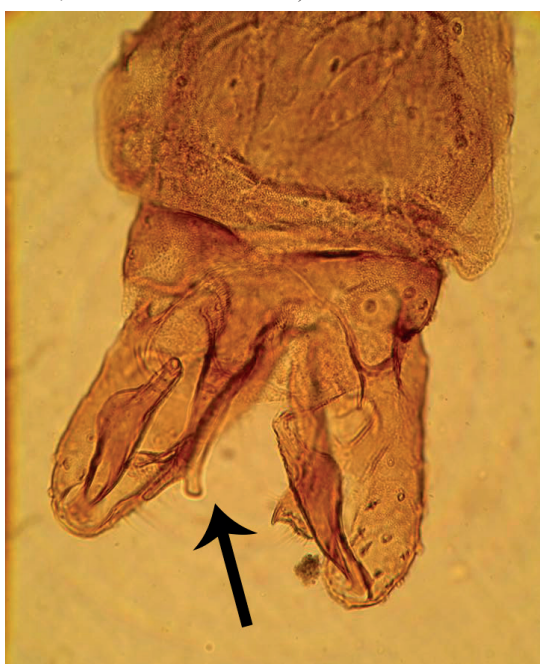


Figure 2. Hypopygium of *Smittia pratorum* (Goetghebuer, 1927) male with abnormal anal point. Black arrow pointing to the bifurcation in anal point.

### Concluding remarks

The present study is based on a small sample of chironomids collected as by-catch in a study targeted at moth flies (Diptera, Psychodidae) and emphasis was thus on macicolous habitats (Kvifte et al. 2016). Chironomidae from such habitats have received a lot less attention than those of larger aquatic habitats such as lakes and rivers (Przhiborov and Baranov, 2014). The records of six new species records for the Balearic Islands from such a small sample highlights that macicolous habitats in the Mediterranean accommodate a large and still comparatively poorly understood diversity of Chironomidae.

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