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On Scottish sawflies, with results of the 14th International Sawfly Workshop, in the southern Highlands, 2010

(Hymenoptera, Symphyta)

With 15 figures and 1 table

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Summary

Results of fieldwork are presented from the 14th International Sawfly Workshop, held in the southern Highlands of Scotland, mostly in Perthshire. Some records of Symphyta from other parts of Scotland are included. First records in the British Isles are given for eight tenthredinid species: *Amauronematus mimus*, *Phyllocolpa alienata*, *P. erythrogyga*, *P. plicalapponum*, *P. plicaphylicifolia*, *P. prussica*, *Pristiphora thalictri* and *Tenthredo ignobilis*. *A. mimus* is also recorded from Ireland. *Amauronematus stenogaster* is removed from the list of British Isles Symphyta. Recorded for the first time in Scotland are one cephid (*Hartigia xanthostoma*) and ten tenthredinids (*Claremontia uncta*, *Dolerus brevicornis*, *Empria basalis*, *Empria parvula*, *Parna apicalis*, *Pristiphora decipiens*, *Pristiphora leucopus*, *Pristiphora testacea*, *Tenthredo mandibularis* and *Tenthredopsis ornata*). Characters useful for the distinction of some species are illustrated. The type locality of *Nematus herbaceae* CAMERON, 1876 is clarified. *Geranium pratense* is confirmed as a host of *Macrophya albipuncta*. *Salix reticulata* is a host of *Amauronematus mcluckieae* [mandatory correction of spelling of species name]. *Sedum rosea* may be a host of *Tenthredo ignobilis*. General conclusions: high species richness of Perthshire sawfly fauna compared to other regions of Scotland, including several species only known in British Isles from there; importance to conservation of rock-ledge habitats; large data deficits for many species, particularly on hosts, phenology and distribution; high value of Malaise traps in faunal survey of Symphyta, because spectrum of taxa captured differs from that recorded by hand-netting; as indicated by species and sex composition of 'fall-out' on snow patches, adult sawflies undertake active dispersal, within landmasses, to a greater extent than is often assumed.

Zusammenfassung

Die Ergebnisse der Feldarbeit aus dem 14. Internationalen Sawfly Workshop werden vorgestellt. Dies fand im südlichen schottischen Hochland, überwiegend in Perthshire, statt. Einige Nachweise von Pflanzenwespen aus anderen Teilen von Schottland sind enthalten. Erstnachweise für die Britischen Inseln werden für acht tenthredinide Arten erbracht: *Amauronematus mimus*, *Phyllocolpa alienata*, *P. erythrogyga*, *P. plicalapponum*, *P. plicaphylicifolia*, *P. prussica*, *Pristiphora thalictri* und *Tenthredo ignobilis*. *A. mimus* ist auch aus Irland nachgewiesen. *Amauronematus stenogaster* ist aus der Liste der Symphyta der Britischen Inseln zu entfernen. Erstmals sind in Schottland eine Cephiden-Art (*Hartigia xanthostoma*) und zehn Tenthrediniden gefunden worden (*Claremontia uncta*, *Dolerus brevicornis*, *Empria basalis*, *Empria parvula*, *Parna apicalis*, *Pristiphora decipiens*, *Pristiphora leucopus*, *Pristiphora testacea*, *Tenthredo mandibularis* und

Tenthredopsis ornata). Merkmale für die Unterscheidung einzelner Arten werden dargestellt. Der Locus typicus von *Nematodes herbaceae* CAMERON, 1876 ist geklärt. *Geranium pratense* ist als Wirtspflanze von *Macrophya albipuncta* bestätigt. *Salix reticulata* ist eine Wirtspflanze von *Amauronematus mcluckieae*. *Sedum rosea* kann eine Wirtspflanze von *Tenthredo ignobilis* sein. Allgemeine Schlussfolgerungen: hoher Artenreichtum der Pflanzenwespenfauna von Perthshire im Vergleich zu anderen Regionen in Schottland, darunter mehrere Arten, die auf den Britischen Inseln nur von dort bekannt sind; die Wichtigkeit der Erhaltung der Lebensräume von Felssimsen; große Defizite in unseren Kenntnissen bei vielen Arten, insbesondere zu Wirtspflanzen, Phänologie und Verbreitung; hoher Wert der Malaise-Falle in faunistischen Untersuchungen von Symphyta, weil das Spektrum von erfassten Taxa sich unterscheidet von dem was mit Streifnetz erfasst wird; Zusammensetzung des 'fall-out' auf Schneeresten deutet darauf hin, dass Pflanzenwespen in einem größeren Ausmaß als bisher angenommen, aktiver Dispersion innerhalb von Landmassen unterliegen.

Key words

British Isles, Cephidae, Pamphiliidae, Tenthredinoidea, hosts, phenology, distribution.

Introduction

An annual international field meeting of entomologists interested in Hymenoptera Symphyta has been held since 1997. The informal gatherings facilitate exchange of information and encourage co-operation in future research. The 'International Sawfly Workshops' have so far only been held in Europe, mainly because a majority of entomologists interested in sawflies live there. The combined effort of specialists in investigating the fauna of relatively restricted areas during these workshops, has led to numerous improvements in our knowledge of the distribution and biology of European sawflies. Some of the results have already been published (e.g. ROLLER et al. 2006, LISTON et al. 2007, BOEVÉ et al. 2009). Furthermore, fresh material of rarely sampled species has been obtained for use in ongoing and future studies.

The 14th International Sawfly Workshop was held at Kindrogan Field Centre, near Pitlochry, Perthshire, from 4.vi-9.vi.2010. A main objective was to sample a variety of sites located in the southern Highlands, an area which though a hotspot of biodiversity in Scotland, has been neglected by most entomologists in recent decades. As far as presently possible (some taxa belong to groups that require taxonomic revision), this paper presents the results of our fieldwork. Co-authors of this publication are mostly participants of the Kindrogan meeting. Keith Bland, who could not attend, contributed data on many poorly known species, including reared gall-makers, collected throughout the Scottish mainland, but also on Orkney and some of the Western Isles.

Several participants arrived in Scotland on 2.vi.2010, before the formal start of the workshop. The more interesting records made during this period, also spent in the southern Highlands, are included here as a matter of convenience, as are those made by Liston after the workshop ended, during a stay in Scotland until the end of June. His excursions were mostly in Edinburgh and the Lothians, but one day each was spent at three more upland localities, two of which were repeat visits to sites in the southern Highlands investigated during the workshop.

Methods, material, weather and study sites

Unless otherwise stated adult sawflies were caught with sweep nets, killed with ethyl acetate vapour and mostly pinned during the evening of the day of collection. A few, for sequencing, were drowned and kept in vials of 96 % ethanol. Most specimens were collected by general sweeping or sweeping of particular plant species, with some netted individually 'on sight'. Additionally, three Malaise traps were operated by Grearson from 4-6.vi. near to Kindrogan Field Centre. The sample bottles, filled with distilled water containing a little domestic detergent, were emptied each day, sorted, and the more obviously interesting sawflies immediately mounted. Others were stored temporarily in 70 % isopropanol before mounting.

The keys by BENSON (1951, 1952, 1958) were mostly used for initial identification of species. Attempts were made, seldom leading to conclusive results, to key problematic specimens in ZHELOCHOVTSEV & ZINOVJEV (1988, 1993). Publications that enable the identification of some more recently recognized taxa are cited in the notes on species. Responsibility for the identification usually rests with those who collected the specimen: exceptions are mentioned. Note that numerous specimens, particularly male Nematinae, remain so far undetermined and are omitted from the present results. Nomenclature follows principally TAEGER et al. (2010) and LISTON & SHEPPARD (in preparation).

Material examined is deposited in the private collections of Trond-Elling Barstad, Jean-Luc Boevé, K. John Grearson, Andrew Halstead, Erik Heibo, Hans-Joachim Jacobs, Ewald Jansen, Malte Jänicke and Olle Lønnve, as well as the following institutional collections (abbreviations follow EVENHUIS 2011, where available):

Hunterian Museum, Glasgow University, Glasgow (HMUG) (Fiedler)

Kelvingrove Art Gallery and Museum, Glasgow (Robinson)

National Museums of Scotland, Edinburgh (RSME) (Bland, some duplicates from Liston)

Senckenberg Deutsches Entomologisches Institut, Müncheberg (SDEI) (Blank, Liston & Taeger)

World Museum, National Museums, Liverpool (NML) (Knight)

Zoological Museum of the University of Tartu, Tartu (TUZ) (Prous)

In referring to other material used for comparison the Naturhistorischen Museum Berlin (ZMHUB), Zoological Museum, University of Copenhagen (ZMUC) and the Zoologische Staatssammlung, Munich (ZSM) are also mentioned.

Single mid legs of several taxa identified in this study have been or will be submitted for barcoding in Barcode of Life Data Systems [BOLD 2011], in the project 'Barcodes of Symphyta', where images of complete specimens may also be viewed online. See under *Empria tridens* for details of more extensive sequencing.

Weather conditions in the southern Highlands during the months preceding our visit in June 2010 were unusual. Following a cold winter with much snow, a prolonged drought set in through May, only broken during the last days of the workshop. It should be borne in mind that these atypical conditions may have resulted in phenological patterns which differ from those previously observed. The dry conditions did however allow us easy access to crags and steep slopes that normally would have been difficult.

On the workshop excursions we experienced extremes of weather, from the warm and sunny but breezy day on Meall nan Tarmachan (5.vi.) to the cool and foggy visit in constant rain to Corrie Fee (8.vi.). Bridge of Garry (6.vi.) started cool with some light showers and the planned afternoon visit to Glenfender Meadows was rained off before we left the surroundings of Old Bridge of Tilt.

On 7.vi. several of us went out into the sodden surroundings of Kindrogan and found a large number of species, including some that were unexpected. On the last day (8.vi.) the majority of workshop participants chose not to visit Corrie Fee because of the rain, but of the few who did go, at least Knight and Lønnve obtained an impressive number of species by sweeping. Heibo and Lønnve stayed for a further day (9.vi.) and visited Glenfender Meadows.

The locality data supplied by Bland, including OS grid co-ordinates and vice-county numbers, differs from the pattern otherwise used in the present work (decimal latitude and longitude and name of traditional [greater] county). Probably his co-ordinates are more precise than the generalized loci given for the collections made during the sawfly workshop. To avoid corruption of these label data, they are presented verbatim, except for minor standardization of the data sequence (locality, date, collector).

Localities that are mentioned in the list of species (Table 1) or more than once in 'Notes on species' are delimited more precisely in alphabetical order below, including a brief characterization of the site; coordinates are either for the approximate centre of an area, or for the point where we parked our vehicles at the edge of the area):

Baddoch: Aberdeenshire; +56.881, -3.410; lower slopes of Cairnwell and Glas Maol, around Devil's Elbow on highest point of A93; montane heath / grassland, with many wet flushes and small watercourses. Altitude ca. 700 m.

Balerno Common (comprises Red Moss and Bavelaw Marsh): Edinburgh, Balerno; +55.856, -3.339; Site of Special Scientific Importance; the Red Moss is a very fine example of a raised bog; Bavelaw Marsh has extensive fen and carr woodland (quality of former possibly in recent years adversely affected by consistently low water level in the reservoir). The Common is fringed by a small scale patchwork of scrub woodland (mostly birches, willows and alder) and more or less wet, open areas. Altitude ca 250 m.

Ben Lawers Visitor Centre: Perthshire; +56.514, -4.262; collecting was mainly in the fenced areas planted with young broadleaved trees and shrubs. Altitude ca. 500 m.

Bridge of Garry: Perthshire; +56.728, -3.778; lower valley sides and in gorge, but also roadsides; deciduous woodland with much oak. Altitude ca. 150 m.

Claybokie: Aberdeenshire; +56.992, -3.502; in Linn of Dee, west of Braemar; open woodland of birch and pine on lower slopes, along the river denser woods with several additional tree species (some of which are planted exotics). Altitude ca. 350 m.

Corrie Fee: Angus; +56.861, -3.231; National Nature Reserve, of outstanding importance for its rare subarctic (-subalpine) plant species. On 8.vi.2010 Heibo, Knight, Lønnve and Prous collected mainly around the burn and on the floor of Corrie Fee, whilst Liston concentrated on the lower crags at the entrance to Corrie Sharroch. On 23.vi.2010 Liston worked down from the upper lip at head of Corrie Sharroch, through the most conspicuous stands of *Salix lapponum* and *S. lanata*. Altitude ca. 500-800 m.

Glenfender Meadows: Perthshire; +56.788, -3.826; 11 km NW of Pitlochry; calcareous grassland. Altitude ca. 290 m.

Kilichonan: Perthshire; +56.681, -4.481; 6 km west of Kilichonan, on edge of valley floor mostly north of road; open deciduous woodland with marshy areas. Altitude ca. 200 m.

Kindrogan: Perthshire; +56.748, -3.547; valley woodland and damp meadows with diverse ground flora, rich in ferns. Altitude ca. 280 m.

Longniddry Bents: East Lothian; +55.989, -2.896; herb rich calcareous grassland on coast. Altitude 2-7 m.

Malleny Woods: Edinburgh, Balerno; +55.877, -3.332; mixed woodland and open spaces (particularly around ponds in the grounds of the educational institute to S. of Balerno, a few hundred meters east of road to Marchbanks (Redmoss). Altitude ca. 200 m.

Meall nan Tarmachan: Perthshire; +56.526, -4.302; National Nature Reserve; below and on crags west of Lochan na Lairige, above the dam; a site of long-recognized importance because of its rich rock-ledge communities of grazing-intolerant plants (see also discussion). Altitude ca. 500-650 m.

Rannoch Station: Perthshire; +56.685, -4.577; moorland, marshes, conifer plantations. Altitude ca. 300 m.

Roseburn: Edinburgh; +55.947, -3.234; Water of Leith below Coltbridge; broadleaved valley woodland, with many planted exotic trees and more or less naturalised non-woody plants. Altitude ca. 60 m.

Results

Table 1 lists all species group taxa recorded at 10 of the localities [Balerno Common, Ben Lawers Visitor Centre, Bridge of Garry, Claybokie, Corrie Fee, Glenfender Meadows, Kilichonan, Kindrogan, Meall nan Tarmachan and Rannoch Station] visited during or just before and after the 14th International Sawfly Workshop. The notes following the table serve two purposes. Firstly, they highlight and sometimes briefly discuss aspects of individual records in Table 1 that are of special interest. Secondly, records are presented from localities not included in Table 1, or for specimens collected in other years.

Table 1: List of species and number of individuals collected at 10 sites (see introduction for details). Taxa names suffixed with an asterisk (*) see 'Notes on species'.

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
Cephiidae											
<i>Calameuta pallipes</i> (Klug, 1803)	1 ♀ 2 ♂ ♂ ADL, 15.vi ¹										
<i>Hartigia xanthostoma</i> * (Eversmann, 1847)								1 ♀ KJG(MT), 5.vi			
Pamphiliidae											
<i>Pamphilius gyllenbali</i> * (Dahlbom, 1835)								1 ♀ OL,4.vi		1 ♀ BLT, 3.vi	
<i>Pamphilius stramineipes</i> * (Hartig, 1837)								1 ♀ EH,4.vi			
<i>Pamphilius varius</i> (Serville, 1823)											
<i>Cephalcia lariciphila</i> * (Wachtl, 1898)			2 ad, JLB, 6.vi 1 ♂ CF,6, vi	1 ♂ HJJ, 4.vi	1 ♂ ADL, 23.vi ³			1 ♂ AJH,4.vi 1 ♀ 1 ♂ GTK, 7.vi			*
Argidae											
<i>Arge ciliaris</i> (Linnaeus, 1767)							1 ♂ 1 ♀ BLT, 3.vi	1 ♀ 1 ♂ OL,4.vi 1 ♀ 1 ♂ HJJ,7.vi			
<i>Arge expansa</i> (Klug, 1834)			1 ♀ BLT, 6.vi					1 ♀ 1 ♂ OL,4.vi 1 ♂ OL,7.vi			
<i>Arge fuscipes</i> (Fallén, 1808)				2 ♂ ♂ BLT, 4.vi					1 ♂ EJ,5.vi		
<i>Arge gracilicornis</i> (Klug, 1814)								1 ♂ HJJ,7.vi			
<i>Arge ustulata</i> (Linnaeus, 1758)		1 ♀ AJH, 5.vi						1 ♂ EJ,7.vi			
<i>Sterictiphora geminata</i> (Gmelin, 1790)								1 ♀ EH,4.vi			

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
Cimbicidae											
<i>Abia candens</i> Konow, 1887	1 ♀ ADL, 26.vi ¹			1 ♀ BLT, 4.vi							
<i>Abia sericea</i> (Linnaeus, 1758)	1 ♂ ADL, 15.vi ²					1 ♀ 1 ♂ BLT, 3.vi ¹¹ 1 ♀ HJJ, 3.vi				1 ♂ HJJ, 3.vi	
<i>Cimbex femoratus</i> (Linnaeus, 1758)		1 ♂ AJH, 5.vi									
<i>Trichosoma lucorum</i> (Linnaeus, 1758) ¹⁶									2 ♂ ♂ BLT, 5.vi 1 ♀ 3 ♂ ♂ KJG, 5.vi 2 ♂ ♂ E], 5.vi 1 ♀ OL, 5.vi	1 ♀ BLT, 3.vi	
<i>Trichosoma sorbi</i> Hartig, 1840		1 ♂ AJH, 5.vi							8 ♂ ♂ BLT, 5.vi 1 ♂ EH, 5.vi	1 ♀ HJJ, 3.vi	
Dipterionidae											
<i>Microdiprion pallipes</i> * (Fallén, 1808)				1 ♀ MJ, 4. vi							*
Tenthredinidae:											
Allantinae											
<i>Allantus rufocinctus</i> (Retzius, 1783)								3 ♂ ♂ KJG (MT), 5.vi			
<i>Ametastegia carphini</i> (Hartig, 1837)						1 ♀ 1 ♂ OL, 9.vi		1 ♀ AJH, 4.vi 1 ♀ EH, 4.vi 2 ♀ ♀ KJG(MT)			
<i>Ametastegia equiseti</i> (Fallén, 1808)								1 ♂ EH, 4.vi			

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Ametastegia pallipes</i> (Spinola, 1808)							1 ♀ HJJ, 3.vi	1 ♀ GTK, 7.vi 1 ♀ KJG(MT), 5.vi 1 ♀ KJG(MT), 6.vi	1 ♀ BLT, 5.vi 2 ♀ ♀ EH, 5.vi 1 ♀ GTK, 5.vi 3 ♀ ♀ 1 ♂ OL, 5.vi		
<i>Ametastegia tenera</i> (Fallén, 1808)			1 ♂ GTK, 6.vi					8 ♂ ♂ KJG (MT), 5.vi		1 ♂ BLT, 3.vi	
<i>Athalia circularis</i> (Klug, 1815)							1 ♀ ,EJ, 3.vi	1 ♂ EH, 4.vi 1 ♂ KJG(MT), 5.vi 1 ♀ EJ, 7.vi			
<i>Athalia cordata</i> Serville, 1823								1 ♀ 5 ♂ ♂ EH, 4.vi 1 ♂ OL, 7.vi 1 ♂ AH, 7.vi 1 ♀ EJ, 7.vi 1 ♀ 3 ♂ ♂ GTK, 7.vi 1 ♂ OL, 7.vi			*
<i>Athalia liberta</i> (Klug, 1815)											*
<i>Athalia lugens</i> (Klug, 1815)								1 ♂ EH, 4.vi			
<i>Athalia rosae</i> * (Linnaeus, 1758)	1 ♀ ADL, 26.vi										
<i>Empria alector</i> Benson, 1938								1 ♀ 1 ♂ EH, 4.vi ⁷ 1 ♂ KJG, 4.vi 3 ♀ ♀ GTK, 4.vi 2 ♀ ♀ OL, 4.vi 2 ♀ ♀ HJJ, 7.vi 1 ♀ GTK, 7.vi			

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Empria pallimacula</i> (Serville, 1823)		1 ♂ AJH, 5.vi	1 ♂ GTK, 6.vi			1 ♀ EH,9.vi		1 ♀ AJH,4.vi 2 ♀ ♀ 2 ♂ EH, 4.vi ⁷ 1 ♀ 2 ♂ ♂ OL, 4.vi 1 ♂ HJJ,7.vi ⁷ 1 ♂ EJ,7.vi 1 ♀ 3 ♂ ♂ GTK, 7.vi 2 ♀ ♀ 2 ♂ ♂ OL, 7.vi	1 ♀ 1 ♂ AJH, 5.vi		
<i>Empria parvula</i> * (Konow, 1892)								1 ♂ KJG,5.vi			
<i>Empria pumila</i> * (Konow, 1896)	1 ♂ ADL, 15.vi ¹						1 ♀ BLT,3.vi	1 ♀ EH,4.vi ⁸ 1 ♂ GTK,7.vi		1 ♀ BLT, HJJ	
<i>Empria sexpunctata</i> (Serville, 1823)								1 ♀ AJH,4.vi 2 ♂ ♂ EH,4.vi ⁷ 1 ♂ GTK,4.vi 1 ♂ KJG(MT), 5.vi 1 ♂ GTK,7.vi	1 ♀ BLT,5.vi ⁷ 1 ♀ 2 ♂ ♂ OL, 5.vi 1 ♀ MP,5.vi 1 ♂ TN/AMR, 5.vi ⁷		
<i>Empria tridens</i> * (Konow, 1896)								1 ♀ KJG,4.vi 1 ♂ KJG(MT), 5.vi 1 ♀ BLT,7.vi ⁵ 1 ♂ EJ,7.vi			
<i>Eriocampa ovata</i> (Linnaeus, 1760)											*
<i>Monsoma puberatum</i> (Retzius, 1783)				1 ♀ BLT, 4.vi	1 ♀ GTK, 8.vi				1 ♀ GTK,5.vi		
<i>Taxonus agrorum</i> (Fallén, 1808)								1 ♂ KJG(MT), 5.vi			

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
Tenthredinidae: Blennocampinae											
<i>Blennocampa phyllocolpa</i> Viitasaari & Vikberg, 1985								imm.A H,6.vi 1♂OL,7.vi	2♀♀BLT, 5.vi		
<i>Claremontia alchemillae</i> (Cameron, 1877)						1♀EH,9.vi		1♀1♂OL,4.vi 1♀1♂KJG (MT),5.vi 2♀♀1♂GTK, 7.vi	1♂EH,5.vi 2♀♀GTK, 5.vi 1♂OL, 5.vi		
<i>Claremontia brevicornis</i> (Brischke, 1883) = <i>puncticeps</i> (Konow, 1886)								1♀OL,4.vi	1♀BLT,5.vi 2♀♀CF,5.vi 5♀♀EH,5.vi 1♀HJJ,5.vi 3♀♀EJ,5.vi 7♀♀1♂GTK, 5.vi 3♀♀OL,5.vi		
<i>Claremontia tenuicornis</i> (Klug, 1816)						1♂EH,9.vi		1♀A H,4.vi 1♀1♂GTK, 7.vi 1♂OL,7.vi	1♂OL,5.vi		
<i>Claremontia uncta</i> * (Klug, 1816)								1♂EH,4.vi 1♀OL,4.vi			*
<i>Claremontia walldheimii</i> * (Gimmerthal, 1847)				1♀EJ,4.vi				1♂EH,4.vi 1♀OL,4.vi			
<i>Eutomostethus ephippium</i> (Panzer, 1798)											
<i>Eutomostethus gogathinus</i> * (Klug, 1816)	ADL (Liston 2011) ¹					1♀EH,9.vi					

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybookie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Heterarthrus aceris</i> * (Kaltenbach, 1856)			1 ♀ EH, 6.vi								
<i>Heterarthrus vagans</i> (Fallén, 1808)									1 ♀ GTK,5.vi		
<i>Parna apicalis</i> * (Brischke, 1888)											*
Tenthredinidae: Nematinae											
<i>Amauronematus fasciatus</i> * Konow, 1897								1 ♀ AJH,4.vi			
<i>Amauronematus beastroemi</i> * Malaise, 1931									3 ♀ ♀ GTK,5.vi		
<i>Amauronematus hispidus</i> (Serville, 1823)							1 ♀ BLT, 3.vi				
<i>Amauronematus lateralis</i> * Konow, 1895								1 ♀ KJG(MT), 5.vi	1 ♂ EH,5.vi		
<i>Amauronematus mcluckiteae</i> * Benson, 1935									1 ♂ KPB,13.vii. 1996		
<i>Amauronematus minus</i> * Schmidt, 1997									3 ♀ ♀ BLT,5.vi 1 ♀ EH,5.vi 3 ♀ ♀ GTK,5.vi		
<i>Amauronematus vittatus</i> (Serville, 1823)								2 ♀ ♀ OL,4.vi	2 ♀ ♀ 1 ♂ BLT,5.vi 1 ♂ KJG,5.vi	4 ♀ ♀ 2 ♂ ♂ BLT,3.vi	
<i>Anoplonyx destructor</i> Benson, 1952			1 ♀ E], 6.vi					2 ♀ ♀ EH,4.vi 1 ♀ GTK,7.vi			
<i>Cladius brullei</i> (Dahlbom, 1835)				2 ♀ ♀ BLT, 4.vi			2 ♂ ♂ KJG,4.vi 1 ♂ KJG(MT), 6.vi				

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybookie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Hemicbroa australis</i> (Serville, 1823)	1 ♀ ADL, 15.vi ^{2,10}										
<i>Hemicbroa crocea</i> (Geoffroy, 1785)								1 ♀ OL, 4.vi			
<i>Hoplocampa pectoralis</i> Thomson, 1871											*
<i>Nematinius caledonicus</i> * (Cameron, 1882)								1 ♂ AJH, 7.vi	1 ♀ OL, 5.vi		
<i>Nematinius fuscipennis</i> (Serville, 1823)	1 ♀ 1 ♂ ADL, 15.vi ¹ 4 ♂ ♂ ADL, 26.vi ¹										
<i>Nematinius luteus</i> (Panzer, 1803)				1 ♂ BLT, 4.vi 1 ♀ HJJ, 4.vi							
<i>Nematius ? cadderensis</i> * Cameron, 1875			1 ♂ imm. KJG, 6.vi								
<i>Nematius bergmanni</i> Dahlbom, 1835				1 ♀ BLT, 4.vi				1 ♀ EH, 4.vi	1 ♀ BLT, 5.vi	1 ♀ BLT, 3.vi	
<i>Nematius brevivulvis</i> * Thomson, 1871								8 ♂ ♂ KJG (MT), 5.vi			
<i>Nematius fagi</i> Zaddach, 1876											*
<i>Nematius flavescens</i> Stephens, 1835								1 ♂ KJG (MT), 5.vi 1 ♀ AJH, 7.vi		1 ♀ BLT, 3.vi	
<i>Nematius frenalis</i> * Thomson, 1888								1 ♀ AJH, 4.vi 1 ♂ GTK, 7.vi	1 ♀ KJG, 5.vi		*

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Pachynematus clibrichellus</i> * (Cameron, 1878)					1 ♀ 4 ♂ ♂ ADL, 23.vi ⁴				1 ♂ EH, 5.vi		*
<i>Pachynematus clitellatus</i> * (Serville, 1823)					5 ♂ ♂ ADL, 23.vi ³ 2 ♂ ♂ OL, 8.vi	2 ♂ ♂ EH, 9.vi	1 ♂ BLT, 3.vi 1 ♂ HJJ, 3.vi	1 ♀ OL, 4.vi	1 ♂ BLT, 5.vi 1 ♀ GTK, 5.vi	1 ♀ HJJ, 3.vi	*
<i>Pachynematus lichuanardi</i> * Konow, 1903					1 ♂ OL, 8.vi		1 ♀ 1 ♂ HJJ, 3.vi	1 ♂ EH, 4.vi	1 ♀ BLT, 5.vi	1 ♀ BLT, 3.vi	
<i>Pachynematus obductus</i> (Hartig, 1837)								1 ♀ EH, 4.vi 1 ♀ GTK, 7.vii 1 ♀ OL, 7.vi	1 ♀ BLT, 5.vi 1 ♀ CE5, vi ⁹ 1 ♀ GTK, 5.vi		
<i>Pachynematus vagus</i> (Fabricius, 1781)				1 ♀ BLT, 4.vi				1 ♀ AJH, 4.vi	1 ♀ CE5, vi 1 ♀ AJH, 5.vi 1 ♀ EH, 5.vi 2 ♀ ♀ GTK, 5.vi		
<i>Phyllocolpa alienata</i> * (Förster, 1854)					4 ♀ ♀ GTK, 8.vi			6 ♀ ♀ 1 ♂ BLT, 5.vi 9 ♀ ♀ 6 ♂ ♂ EH, 5.vi 1 ♂ KJG, 5.vi 2 ♀ ♀ EJ, 5.vi 8 ♀ ♀ 14 ♂ ♂ GTK, 5.vi			
<i>Phyllocolpa carinifrons</i> * (Benson, 1940)	2 ♀ ♀ ADL, 15.vi ¹										
<i>Phyllocolpa erythropyga</i> * (Förster, 1854)	2 ♀ ♀ ADL, 15.vi ¹		1 ♀ KJG, 6.vi				1 ♀ BLT, 3.vi	4 ♀ ♀ 12 ♂ ♂ EH, 4.vi 1 ♀ EJ, 7.vi	10 ♂ ♂ BLT, 5.vi 1 ♂ GTK, 5.vi	3 ♀ ♀ 1 ♂ BLT, 3.vi 1 ♂ 1 ♂ HJJ, 3.vi	

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Phyllocolpa ischnocera</i> * (Thomson, 1863)					imm. KPB, 2.viii. 1992			1 ♀ EH,4.vi		1 ♀ BLT, 3.vi	*
<i>Phyllocolpa plicatopponum</i> * Kopelke, 2007									1 ♀ 2 ♂ ♂ GTK,5.vi		
<i>Phyllocolpa plicaphylicifolia</i> * Kopelke, 2007					5 ♀ ♀ GTK, 8.vi				6 ♀ ♀ 12 ♂ ♂ BLT, 5.vi 2 ♀ ♀ 4 ♂ ♂ CF, 5.vi ^p 5 ♀ ♀ KJG,5.vi 1 ♀ EH,5.vi 4 ♀ ♀ 2 ♂ ♂ GTK, 5.vi		
<i>Phyllocolpa prussica</i> * (Zaddach, 1883)								1 ♀ EH,4.vi			
<i>Pikonema scutellatum</i> (Hartig, 1837)								1 ♀ 2 ♂ ♂ EH, 4.vi		1 ♂ HJJ, 3.vi	
<i>Platycampus luridiventris</i> (Fallén, 1808)	1 ♀ ADL, 26.vi ¹		1 ♀ EH, 6.vi								
<i>Pontania brevicornis</i> * (Förster, 1854)						1 ♀ EH, 9.vi				2 ♀ ♀ BLT 3.vi	
<i>Pontania bridgmanii</i> (Cameron, 1883)			imm. KJG,6.vi								
<i>Pontania herbariae</i> * (Cameron, 1876)											*
<i>Pontania lapponicola</i> * Kopelke, 1994					9 ♀ ♀ 2 ♂ ♂ ADL, 23.vi ³ imm. 1 ♀ 2 ♂ ♂ KPB, 29.vii. 1999 ^{3,5}						*

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Pontania myrsiniticola</i> * Kopelke, 1991									<i>imm.</i> 1 ♂ KPB, 27.viii.1995		*
<i>Pontania nigricantis</i> * Kopelke, 1986							<i>imm.</i> MJ, 3.vi	1 ♀ GTK, 4.vi			*
<i>Pontania peduncul</i> (Hartig, 1837)											
<i>Pontania pustulator</i> Forsius, 1923									8 ♂ ♂ CF, 5.vi ⁹ 2 ♂ ♂ EH, 5.vi 3 ♂ ♂ GTK, 5.vi		
<i>Pontania saliciscineriae</i> (Retzius, 1783)								1 ♀ KJG(MT), 5.vi			
<i>Pristiphora (Lygaeotus) sp.</i> *											*
<i>Pristiphora armata</i> (Thomson, 1863)								1 ♂ GTK, 7.vi			
<i>Pristiphora breadalbanensis</i> * (Cameron, 1882)					2 ♂ ♂ ADL, 3.vi ³ 4 ♂ ♂ ADL, 23.vi ³						*
<i>Pristiphora carinata</i> (Hartig, 1837)				1 ♀ HJJ, 4.vi			1 ♂ BLT, 3.vi				
<i>Pristiphora cincta</i> Newman, 1837					1 ♀ ADL, 23.vi ^{3,14}				1 ♂ BLT, 22.vi ¹³		
<i>Pristiphora compressa</i> (Hartig, 1837)					1 ♀ GTK, 8.vi						
<i>Pristiphora decipiens</i> * (Enslin, 1916)								1 ♀ KJG(MT), 6.vi			
<i>Pristiphora groenblomi</i> * (Lindqvist, 1952)											*
<i>Pristiphora laricis</i> (Hartig, 1837)								1 ♂ GTK, 7.vi			
<i>Pristiphora lativentris</i> (Thomson, 1871)					8 ♂ ♂ ADL, 23.vi ³						

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<i>Pristiphora leucopus</i> * (Hellén, 1948)											*
<i>Pristiphora melanocarpa</i> (Hartig, 1837)									1 ♂ E], 5.vi		
<i>Pristiphora mollis</i> (Hartig, 1837)				3 ♀ ♀ 1 ♂ BLT, 4.vi 1 ♀ HJJ, 4.vi							*
<i>Pristiphora pallidiventris</i> (Fallén, 1808)							1 ♀ HJJ, 3.vi	1 ♀ OL, 7.vi	1 ♀ OL, 5.vi 1 ♀ HJJ, 5.vi 1 ♀ ADL, 22.vi		
<i>Pristiphora staudingeri</i> (Ruthe, 1859)					2 ♀ ♀ 2 ♂ ♂ ADL 23.vi ^{3,15}						
<i>Pristiphora testacea</i> * (Jurine, 1807)									1 ♂ E], 5.vi		
<i>Pristiphora thalictri</i> * (Kriechbaumer, 1884)									1 ♂ BLT, 5.vi 1 ♀ CF5, vi ⁹		
<i>Pseudodineura enslini</i> * (Hering, 1923)						<i>imm.</i> KPB, 7.vi. 1998, 3.viii. 1999			<i>imm.</i> ADL, 22.vi		*
<i>Pseudodineura fuscula</i> * (Klug, 1816)											
Tenthredinidae: Selandriinae											
<i>Aenigmeneus fuer- stenbergensis</i> (Konow, 1885)							1 ♀ BLT, 3.vi				
<i>Brachylops flavens</i> (Klug, 1816)	1 ♀ ADL, 15.vi ¹				1 ♀ ♂ ♂ GTK, 8.vi 1 ♀ 1 ♂ OL, 8.vi		1 ♂ HJJ, 3.vi		1 ♀ BLT, 5.vi 1 ♂ EH, 5.vi 2 ♀ ♀ 2 ♂ ♂ GTK, 5.vi		

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Dolerus brevicornis</i> * Zaddach, 1859					1 ♂ GTK, 8.vi 2 ♀ ♀ OL, 8.vi		1 ♀ BLT,3.vi		1 ♀ BLT,5.vi 1 ♂ EH,5.vi 2 ♀ ♀ OL,5.vi		
<i>Dolerus cothurnatus</i> Serville, 1823	2 ♀ ♀ ADL, 15.vi ¹ 1 ♀ GTK, 3 ♀ ♀ ADL, 26.vi ¹				1 ♀ EH,8.vi 1 ♀ GTK, 8.vi 1 ♀ OL,8.vi		1 ♀ BLT,3.vi				
<i>Dolerus eversmanni</i> Kirby, 1882	3 ♀ ♀ ADL, 15.vi ¹										
<i>Dolerus ferrugatus</i> Serville, 1823								1 ♂ EH,4.vi			
<i>Dolerus fumosus</i> Stephens, 1835						1 ♂ EH,9.vi 1 ♂ OL,9.vi		1 ♀ GTK,7.vi			
<i>Dolerus gessneri</i> * André, 1880	1 ♀ 2 ♂ ♂ ADL, 15.vi ¹ 2 ♀ ♀ ADL, 26.vi ¹				1 ♀ EH, 8.vi			1 ♂ EH,4.vi 2 ♀ ♀ OL,4.vi	1 ♂ HJJ,5.vi 1 ♀ GTK,5.vi 1 ♂ OL,5.vi		
<i>Dolerus gonager</i> (Fabricius, 1781)			1 ♂ MP, 6.vi ⁸	1 ♂ BLT,4.vi 1 ♀ HJJ,4.vi 2 ♀ ♀ E],4.vi	1 ♀ 1 ♂ EH, 9.vi 2 ♀ ♀ 1 ♂ OL,9.vi		3 ♀ ♀ 2 ♂ ♂ BLT,3.vi 1 ♀ HJJ,3.vi	1 ♀ AJH,4.vi 1 ♀ 3 ♂ ♂ EH,4.vi 1 ♂ OL,4.vi 1 ♂ AJH,7.vi 1 ♂ GTK,7.vi	4 ♀ ♀ BLT,5.vi 1 ♀ TN,5.vi ⁸	1 ♀ BLT, 3.vi	
<i>Dolerus haematodes</i> (Schrank, 1781)								1 ♂ EH,4.vi			
<i>Dolerus liogaster</i> Thomson, 1871					1 ♀ OL, 8.vi			1 ♀ GTK,4.vi 1 ♀ GTK,7.vi 1 ♀ OL,7.vi			
<i>Dolerus madidus</i> (Klug, 1818)				1 ♀ HJJ, 4.vi				1 ♂ EH,4.vi			

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybookie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Dolerus niger</i> (Linnaeus, 1767)	1 ♀ ADL, 26.vi ¹		1 ♀ AJH, 6.vi 1 ♀ HJJ, 6.vi 1 ♀ OL, 6.vi	1 ♀ BLT, 4.vi	1 ♂ GTK, 8.vi	2 ♂ ♂ EH, 9.vi		2 ♀ ♀ EH, 4.vi 1 ♂ KJG(MT), 6.vi 2 ♀ ♀ 2 ♂ ♂ GTK, 7.vi	9 ♂ ♂ HJJ, 5.vi 1 ♂ OL, 5.vi		
<i>Dolerus nigratus</i> (Müller, 1776)		1 ♂ AJH, 5.vi						1 ♀ 1 ♂ EH, 4.vi 1 ♀ 1 ♂ OL, 4.vi 1 ♀ GTK, 7.vi			
<i>Dolerus picipes</i> (Klug, 1818)				1 ♀ 2 ♂ ♂ HJJ, 4.vi 2 ♀ ♀ EJ, 4.vi				1 ♂ BLT, 5.vi			
<i>Dolerus possilensis</i> Cameron, 1882				1 ♀ HJJ, 4.vi							
<i>Dolerus pratensis</i> (Linnaeus, 1758)				1 ♂ EJ, 4.vi							
<i>Dolerus puncticollis</i> Thomson, 1871		1 ♂ AJH, 5.vi				1 ♀ OL, 9.vi					
<i>Dolerus schmidti</i> Konow, 1884				1 ♀ HJJ, 4.vi ⁵ 1 ♀ MP, 4.vi ⁸	1 ♀ OL, 8.vi		1 ♀ HJJ, 3.vi	1 ♀ EH, 4.vi 1 ♀ OL, 4.vi			
<i>Dolerus stygius</i> * Förster, 1860								1 ♀ AJH, 4.vi 1 ♀ 2 ♂ ♂ EH, 4.vi 2 ♀ ♀ BLT, 7.vi 1 ♀ GTK, 7.vi			
<i>Dolerus varispinus</i> Hartig, 1837							2 ♀ ♀ BLT, 3.vi	1 ♀ EH, 4.vi			
<i>Dolerus vestigialis</i> * (Klug, 1818)			1 ♂ EH, 6.vi		1 ♀ GTK, 8.vi	1 ♀ 1 ♂ EH, 9.vi		1 ♀ 1 ♂ EH, 4.vi 1 ♀ OL, 4.vi	1 ♂ EH, 5.vi		

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Dolerus yukonensis</i> * (Norton, 1872)	1 ♀ ADL, 15.vi ¹				1 ♀ GTK, 8.vi 1 ♀ ADL, 23.vi ³			1 ♀ EH, 4.vi 1 ♂ GTK, 4.vi 5 ♀ ♀ 1 ♂ EH, 5.vi 7.vi 1 ♀ OL, 7.vi	1 ♀ 1 ♂ BLT, 5.vi 1 ♀ CH, 5.vi ⁷ 6 ♀ ♀ 1 ♂ EH, 5.vi 3 ♀ ♀ HJJ, 5.vi 4 ♀ ♀ 2 ♂ ♂ EJ, 5.vi 2 ♀ ♀ 2 ♂ ♂ GTK, 5.vi 1 ♀ OL, 5.vi 1 ♀ 2 ♂ ♂ TN/MB, 5.vi ⁸		
<i>Nesoselandria morio</i> (Fabricius, 1781)	3 ♀ ♀ ADL, 26.vi ¹										
<i>Selandria serva</i> (Fabricius, 1793)					2 ♀ ♀ GTK, 8.vi 1 ♂ ADL, 23.vi ³	1 ♂ EH, 9.vi		1 ♂ AJH, 4.vi 1 ♀ EH, 4.vi 1 ♀ GTK, 7.vi			
<i>Stromboceros delicatulus</i> (Fallén, 1808)			1 ♂ BLT, 6.vi 1 adJLB, 6.vi 1 ♀ CF, 6. vi 3 ♂ ♂ OL, 6.vi 1 ♀ KJG, 6.vi					1 ♀ EH, 4.vi 2 ♂ ♂ KJG (MT), 5.vi 1 ♀ BLT, 7.vi 3 ♂ ♂ EJ, 7.vi 1 ♀ GTK, 7.vi 1 ♀ 3 ♂ ♂ OL, 7.vi			
<i>Strongylogaster macula</i> (Klug, 1817)									1 ♀ BLT, 5.vi 1 ♀ AJH, 5.vi 1 ♀ OL, 5.vi	3 ♀ ♀ BLT, 3.vi	

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<i>Pachyprotasis antennata</i> (Klug, 1817)						1 ♀ EH, 9.vi 1 ♂ OL, 9.vi					
<i>Pachyprotasis rapae</i> (Linnaeus, 1767)			1 ♂ BLT, 6.vi 2 ad JLB, 6.vi			3 ♀ ♀ 3 ♂ ♂ EH, 9.vi 2 ♂ ♂ OL, 9.vi		1 ♂ AJH, 4.vi 2 ♀ ♀ KJG, 4.vi 4 ♂ ♂ 2 ♀ ♀ EH, 4.vi 4 ♂ ♂ 1 ♀ OL, 4.vi 6 ♂ ♂ KJG (MT), 5.vi 3 ♂ ♂ KJG (MT), 6.vi 3 ♀ ♀ TEB, 6.vi 1 ♀ 1 ♂ AJH, 7.vi 1 ♀ 1 ♂ GTK, 7.vi 2 ♀ ♀ 12 ♂ ♂ HJJ, 7.vi 1 ♀ 1 ♂ OL, 7.vi	1 ♀ 3 ♂ ♂ BLT, 0.5.vi 2 ♀ ♀ EH, 5.vi 2 ♂ ♂ GTK, 5.vi		
<i>Pachyprotasis variegata</i> (Fallén, 1808)						1 ♀ OL, 7.vi					
<i>Perinena rubi</i> (Panzer, 1803)				1 ♀ 2 ♂ ♂ BLT, 4.vi 1 ♂ HJJ, 4.vi				1 ♀ AJH, 4.vi 2 ♀ ♀ KJG, 4.vi 1 ♂ GTK, 4.vi 2 ♂ ♂ OL, 5.vi 6 ♂ ♂ KJG (MT), 5.vi 3 ♂ ♂ KJG (MT), 6.vi			
<i>Rhogogaster chamberi</i> Benson, 1947									1 ♂ GTK, 5.vi		
<i>Rhogogaster chlorosoma</i> (Benson, 1943)									1 ♂ BLT, 5.vi 1 ♂ KJG, 5.vi		

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Rhogogaster genistae</i> Benson, 1947											*
<i>Rhogogaster punctulata</i> (Klug, 1817)				2 ♂ BLT, 4.vi 2 ♂ HJJ, 4.vi				1 ♂ E], 7.vi	2 ♀ 1 ♂ TEB, 5.vi 1 ♀ BLT, 5.vi		
<i>Rhogogaster viridis</i> (Linnaeus, 1758)		1 ♀ 1 ♂ AJH, 5.vi		1 ♂ E], 4.vi	2 ♀ ♀ OL, 8.vi	1 ♂ OL, 9.vi		2 ♀ 1 ♂ EH, 4.vi 1 ♀ OL, 4.vi 1 ♀ AJH, 7.vi 1 ♀ OL, 7.vi	5 ♀ ♀ 22 ♂ ♂ BLT, 5.vi 1 ♀ KJG, 5.vi 1 ♀ AJH, 5.vi 4 ♂ ♂ EH, 5.vi 10 ♂ ♂ E], 5.vi 1 ♀ 5 ♂ ♂ GTK, 5.vi 3 ♂ ♂ OL, 5.vi		
<i>Sciapteryx soror</i> * Konow, 1890											*
<i>Tenthredo arcuata</i> Forster, 1771						7 ♀ ♀ 3 ♂ ♂ EH, 9.vi 3 ♀ ♀ OL, 9.vi		1 ♀ AJH, 4.vi 3 ♀ ♀ EH, 4.vi 3 ♀ ♀ OL, 4.vi 1 ♀ KJG(MT), 5.vi 1 ♀ BLT, 7.vi 1 ♀ AJH, 7.vi 1 ♀ GTK, 7.vi 14 ♀ ♀ 1 ♂ E], 7.vi 2 ♀ OL, 7.vi			

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<i>Tenthredo atra</i> Linnaeus, 1758	1 ♀ ADL, 15.vi ¹								7 ♀ ♀ 1 ♂ BLT, 5.vi 1 ♀ KJG, 5.vi 1 ♀ 3 ♂ ♂ HJJ, 5.vi 3 ♀ ♀ E], 5.vi 2 ♀ ♀ GTK, 5.vi 5 ♀ ♀ 6 ♂ ♂ ADL, 22.vi		
<i>Tenthredo balteata</i> Klug, 1817		1 ♂ AJH, 5.vi	1 ♂ AJH, 6.vi						6 ♀ ♀ 10 ♂ ♂ BLT, 5.vi 1 ♂ KJG, 5.vi 1 ♂ AJH, 5.vi 2 ♀ ♀ 7 ♂ ♂ EH, 5.vi 1 ♀ 3 ♂ ♂ HJJ, 5.vi 3 ♀ ♀ 7 ♂ ♂ E], 5.vi 6 ♀ ♀ 4 ♂ ♂ GTK, 5.vi 3 ♀ ♀ 1 ♂ OL, 5.vi	1 ♀ BLT, 3.vi	
<i>Tenthredo brevicornis</i> (Konow, 1886)						3 ♀ ♀ EH, 9.vi		1 ♀ 1 ♂ EH, 4.vi			
<i>Tenthredo colon</i> Klug, 1817	1 ♀ 1 ♂ ADL, 15.vi ¹							1 ♂ OL, 4.vi 1 ♀ AJH, 7.vi 1 ♀ OL, 7.vi			
<i>Tenthredo ferruginea</i> Schrank, 1776	1 ♂ ADL, 15.vi ¹		1 ♂ GTK, 6.vi			1 ♀ OL, 9.vi			1 ♂ BLT, 5.vi 1 ♀ 1 ♂ EH, 5.vi 5 ♀ ♀ 6 ♂ ♂ HJJ, 5.vi 1 ♂ GTK, 5.vi		

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Tentredo ignobilis</i> * Klug, 1817			3 ♀♀ 1 ♀ TEB, 6.vi						3 ♀♀ 3 ♂♂ BLT, 5.vi 1 ♂ 1 ♀ EH, 5.vi 3 ♀♀ 4 ♂♂ EJ, 5.vi 4 ♀♀ OL, 5.vi 5 ♀♀ 7 ♂♂ ADL, 22.vi		
<i>Tentredo livida</i> Linnaeus, 1758			1 ♂ BLT, 6.vi 1 ♂ OL, 6.vi			1 ♀ OL, 9.vi		1 ♂ EH, 4.vi 1 ♀ OL, 4.vi 4 ♀♀ 3 ♂♂ HJJ, 7.vi 1 ♀ GTK, 7.vi	1 ♀ BLT, 5.vi		
<i>Tentredo maculata</i> * Geoffroy, 1785			1 ♀ 1 ♂ TEB, 6.vi			1 ♀ OL, 9.vi			1 ♂ BLT, 5.vi		
<i>Tentredo mandibularis</i> * Fabricius, 1804											*
<i>Tentredo mesomela</i> Linnaeus, 1758						1 ♀ EH, 9.vi 1 ♀ OL, 9.vi		1 ♂ EH, 4.vi 3 ♂ OL, 4.vi 1 ♀ 1 ♂ HJJ, 7.vi 2 ♂♂ EJ, 7.vi 2 ♂♂ OL	1 ♂ BLT, 5.vi 1 ♂ AJH, 5.vi 1 ♂ EH, 5.vi 1 ♂ GTK, 5.vi		
<i>Tentredo mioceras</i> (Enslin, 1912)									7 ♀♀ 8 ♂♂ BLT, 5.vi		
<i>Tentredo moniliata</i> * Klug, 1817	1 ♀ ADL, 15.vi ¹										*
<i>Tentredo notha</i> Klug, 1817						1 ♀ OL, 9.vi		1 ♂ EH, 4.vi 1 ♀ OL, 4.vi 1 ♀ BLT, 7.vi 1 ♀ AJH, 7.vi 6 ♀♀ 2 ♂♂ EJ, 7.vi 1 ♀ OL, 7.vi			

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<i>Tenthredo olivacea</i> Klug, 1817				1 ♀ HJJ, 4.vi	1 ♀ EH, 8.vi 1 ♀ GTK, 8.vi			1 ♀ 1 ♂ HJJ, 7.vi 1 ♀ 1 ♂ EJ,5.vi	15 ♀ ♀ 5 ♂ ♂ BLT, 5.vi 1 ♀ CE5.vi ⁹ 2 ♀ ♀ 1 ♂ KJG, 5.vi 6 ♀ ♀ 1 ♂ EH,5.vi 4 ♀ ♀ 4 ♂ ♂ EJ,5.vi 5 ♀ ♀ 1 ♂ GTK, 5.vi 3 ♀ ♀ 1 ♂ OL,5.vi		
<i>Tenthredo velox</i> Fabricius, 1798	1 ♂ ADL, 15.vi ¹							3 ♀ ♀ 4 ♂ ♂ OL, 4.vi 1 ♀ KJG(MT), 5.vi 1 ♀ OL,7.vi	1 ♂ BLT, 5.vi		
<i>Tenthredopsis coquebertii</i> (Klug, 1817)		1 ♂ AJH, 5.vi							1 ♀ BLT,5.vi 1 ♂ HJJ,5.vi 1 ♂ GTK,5.vi		
<i>Tenthredopsis fritsei</i> * (Konow, 1884)	1 ♂ ADL, 26.vi ²	1 ♂ BLT, 5.vi	2 ♂ ♂ BLT, 6.vi								
<i>Tenthredopsis literata</i> (Geoffroy, 1785)											*
<i>Tenthredopsis nassata</i> * (Linnaeus, 1767)	2 ♀ ♀ ADL, 15.vi			1 ♀ 3 ♂ ♂ BLT,3.vi		4 ♂ ♂ OL, 9.vi	6 ♀ ♀ 3 ♂ ♂ BLT,3.vi 1 ♀ 2 ♂ ♂ HJJ,3.vi 2 ♀ ♀ EJ,3.vi	1 ♀ 1 ♂ AJH,4.vi 2 ♀ ♀ EH,4.vi 3 ♀ ♀ 2 ♂ ♂ OL, 4.vi 2 ♂ ♂ KJG,4.vi 1 ♂ KJG(MT), 4.vi 1 ♀ 6 ♂ ♂ KJG (MT),6.vi 1 ♂ GTK,7.vi	1 ♂ GTK, 5.vi	1 ♀ BLT, 3.vi	

	Balerno Common	Ben Lawers Visitor Centre	Bridge of Garry	Claybokie	Corrie Fee	Glenfender Meadows	Kilichonan	Kindrogan	Meall nan Tarmachan	Rannoch Station	Other localities (* see notes)
<i>Tenthredopsis ornata</i> * (Serville, 1823)			4♂♂EH, 6.vi 2♂♂BLT, 6.vi 3♂♂OL, 6.vi			1♀6♂♂ EH,9.vi 1♀5♂♂ OL,9.vi		1♂2♂♂EH, 4.vi 2♂♂OL,4.vi 1♀KJG(MT), 5.vi 4♂♂HJJ,7.vi 1♂AH,7.vi 1♂GTK,7.vi 1♂OL,7.vi			
<i>Tenthredopsis scutellaris</i> (Fabricius, 1804)			1♀EJ, 6.vi								

Collectors

- ADL Andrew Liston
- AJH Erik Heibo
- AJH Andrew Halstead
- EJ Ewald Jansen
- AMR Anna-Maija Ruotsalainen
- GTK Guy Knight
- AT Andreas Taeger
- GYN Geng-Yun Niu
- BLT SMB, ADL & AT
- HJJ Hans-Joachim Jacobs
- GF Catherine Fiedler
- IM Jain MacGowan
- JLB Jean-Luc Boevé
- KJG John Greason
- KJG(MT) Malaise trap operated by KJG
- RPB Keith Bland
- MCW Mei-Cai Wei
- MJ Malte Jänicke
- MP Marco Proux
- OL Ole Lønnve
- SMB Stephan Blank
- TEB Trond-Elling Barstad
- TNY Tommi Nyman

Abbreviations

- * these taxa are discussed further under 'Notes on species'
- records in *titalis* are included from previous recording and discussed further under 'Notes on species'
- imm. record based on larvae, galls, mines or feeding signs
- ad. record of adult(s) of unspecified sex
- Where the year is not stated specimens were collected in 2010

Notes

- ¹Records refer to Bavelaw Marsh (Balerno Common)
- ²Records refer to Red Moss (Balerno Common)
- ³Records refer to crags at head of Corrie Sharroch, Corrie Fee NNR
- ⁴Records refer to the summit of Mayar and upper lip of crags at head of Corrie Sharroch
- ⁵Determined by ADL
- ⁶Determined by AT
- ⁷Determined by MP
- ⁸Determined by Mikko Heidemaa
- ⁹Determined by GTK
- ¹⁰*Cladius compressicornis*, *Hemichroa australis* - swept from birch
- ¹¹*Abia sericea* - in copula
- ¹²*Nematus reticulatus* - swept from *Vaccinium myrtillus*
- ¹³*Pristiphora cincta* - swept from *Salix lapponum*
- ¹⁴*Pristiphora cincta* - dead in a spiders web spun on a shoot of *Salix lapponum*
- ¹⁵*Pristiphora standingeri* - crawling and flying around *Salix herbacea*
- ¹⁶*Trichosoma lucorum* - the males run to *T. lucorum* / *T. tibiale* in key by Benson (1951)

Notes on species

Names of species new to the British Isles are preceded by the symbol †. Taxa names in alphabetical order: see Table 1 for current family placement (only Tenthredinidae placed in a subfamily) following TAEGER et al. (2010).

Aglaostigma fulvipes (SCOPOLI, 1763)

All very dark specimens (especially red on terga of abdomen reduced), compared to more brightly coloured lowland [southern] material.

Amauronematus fasciatus KONOW, 1897

In Scotland recorded previously only from Lanarkshire and Inverness (BENSON 1958).

Amauronematus hedstroemi MALAISE, 1931

The only published records of this species from Scotland, as *A. tillbergi* [misidentification], are BENSON (1959, Sutherland), LISTON (1980a, Selkirks.).

Amauronematus lateralis KONOW, 1895

There are few records of this species in Scotland, from Lanarkshire and Inverness (BENSON 1958).

Amauronematus mcluckieae BENSON, 1935

Meall nan Tarmachan, NN5838, green larvae on *Salix reticulata*, 13.vii.1996 [6245], 1 ♂ reared, leg. Bland, det. Liston (RSME).

BENSON (1935) dedicated the species name *mcluckiei* [sic!] to his wife (Joyce Elinor Benson, née McLuckie). The incorrect original spelling of the species name is here corrected according to Article 31.1.2 (ICZN 1999).

Salix herbacea has generally been considered to be the normal host of *Amauronematus mcluckieae* since BENSON (1935) first suggested this association. We have not however found a published record of a rearing from this host. In the British Isles, *A. mcluckieae* is still only known from Highland sites in Perthshire and Inverness (BENSON 1958; as *A. arctica* [misidentification]), but seems likely to occur at least also in the Northern Highlands. It is most frequently collected on summit vegetation where the only willow species present is *S. herbacea*, so this association seems likely to be correct. Nevertheless, the above record shows that *S. reticulata* may also sometimes be a host. Larvae of no other sawfly species have yet been observed to feed on *S. reticulata* in Scotland, although in Finland this willow supports a small but highly characteristic complement of apparently mostly monophagous sawfly species (V. Vikberg, pers. comm.).

†*Amauronematus mimus* SCHMIDT, 1997

At least two of the specimens were swept from *Salix aurita* L.

Females of the *A. histrio* group (until recently often referred to also as the *A. fallax* group) in RSME, apart from correctly determined specimens of *A. histrio* (SERVILLE, 1823), include two specimens of an unidentified species from Ireland and two further *A. mimus*:

Ireland: Cavan; Drumcarban, 1 ♀, 2.v.[19]42, leg. R. C. Faris; Cauhoo, 1 ♀, 14.v.[19]42, 8 p.m., leg. R. C. Faris.

Identification of *A. mimus* and several other similar W. Palaearctic species remains difficult, because the only modern work on these by SCHMIDT (1997) deals mainly with the Fennoscandian fauna, and does not cover a number of species known from Central Europe (not all of which are even described). Nevertheless, whilst remembering that colour patterns (often of high diagnostic value) may be somewhat different in individuals from regions outside Fennoscandia, specimens can in some cases be reliably identified using the key and illustrations in SCHMIDT (1997). His data on recorded hostplants (mostly *Salix* species, but a few species on *Betula* and *Vaccinium*) allow a further control of plausibility of identification. At present only females can be identified. Whenever possible, the saw should also be examined. The Scottish females (Figs 1, 2) were compared and found to match very closely a German female (SDEI) of *A. mimus* from Brandenburg, det. S. SCHMIDT. Compared with the illustrations in SCHMIDT (1997), the saw of one Scottish specimen examined by Heibo agrees best (and very closely) with the illustration for *A. mimus*.

A. mimus is otherwise known from Germany, Finland and Russia (TAEGER et al. 2006). *Salix aurita* is the only recorded hostplant, but note that at least two other species of this group (*A. histrio* and *A. hartigi* SAARINEN, 1950) use *S. aurita* as a host (SCHMIDT 1997).

Material of this species group from the British Isles requires re-examination (ideally together with fresh specimens collected from identified *Salix* species), to establish how many species occur and obtain an indication of their host ranges. At present, only *A. histrio* and *A. mimus* are known from Britain and Ireland. The few British specimens so-far re-examined, previously identified as *A. fallax* (LEPELETIER, 1823) or *A. stenogaster* (FÖRSTER, 1854), are *A. mimus* and an unidentified species somewhat resembling *A. mimus* that is not *A. stenogaster* s. str. as redescribed by SCHMIDT (1997) (under the name *A. fallax*). *A. stenogaster* is monophagous on *Salix repens* L. according to recent literature (but in Germany also occurs on *S. rosmarinifolia*; Liston unpublished). For the present, pending re-examination of further museum material and special searches of its host, *A. stenogaster* should be deleted from the list of British Isles sawflies.

Athalia cordata SERVILLE, 1823

Old Bridge of Tilt, 1 ♀, 6.vi.2010, leg. Jansen.

Athalia liberta (KLUG, 1815)

Edinburgh, Roseburn, Water of Leith, 1 ♀, 17.vi.2010, leg. Liston.

In Scotland *Alliaria petiolata* is the main [possibly only?] host.

***Athalia rosae* (LINNAEUS, 1758)**

Roseburn, 2 ♀ ♀, 20.vi.2010, leg. Liston (SDEI, RSME).

LISTON (2008) discussed the recent reappearance of *A. rosae* in Scotland. The individuals above (see also Table 1) were found in vegetation in which the known larval hosts (principally cultivated Brassicaceae) are largely absent. Perhaps these three females were part of a dispersal event. During the preceding days, a strong wind blew from the North. Is it chance that the first records of *A. rosae* in Scotland since 1859 (Berwickshire) were to the North of Edinburgh (St. Andrews, Fife, 2007; LISTON 2008)? It seems worth noting that all records of *A. rosae* in Scotland have until now been from the East Coast and that no male has yet been found.

***Caliroa cerasi* (LINNAEUS, 1758)**

Males are very rarely recorded in Britain (BENSON 1952).

***Cephalcia lariciphila* (WACHTL, 1898)**

Midlothian, Edgehead, near Gorebridge, 2 ♂ ♂, 18.vi.2010, leg. Liston.

Cephalcia lariciphila, oligophagous on *Larix* species, was first recorded in S. England in 1953 (STYLES 1959, as *C. alpina*), in S. Scotland in 1977 (LISTON 1980a) and on snow patches in the Cairngorms in 1981 (LISTON 1989; females).

***Cladius compressicornis* (FABRICIUS, 1804)**

Balerno and Claybokie specimens swept from birch. Taxonomy needs clarification: comparison of specimens reared from *Betula* with those from various Rosaceae is needed.

***Cladius ulmi* (LINNAEUS, 1758)**

Malleny Woods, 1 ♀, 12.vi.2010, leg. Liston.

Cladius ulmi has only been recorded once before in Scotland, from Fife (LISTON 1982a).

***Claremontia alchemillae* (CAMERON, 1877)**

Baddoch, 1 ♂, 4.vi.2010, leg. Blank, Liston & Taeger.

***Claremontia uncta* (KLUG, 1816)**

Fealar Gorge, NN9979, Perth. (89), 1 ♀, 15.v- 9.vi.1999 (1), leg. Bland, det. Liston.

Claremontia uncta, together with *C. tenuicornis* and *C. alchemillae*, forms a complex of biologically and morphologically poorly understood species (LISTON et al. 2006). According to recent determinations, all three are present in Scotland.

***Claremontia waldheimii* (GIMMERTHAL, 1847)**

Previously recorded in Scotland only once (LISTON 1982b; Roxburghs.).

***Dolerus bimaculatus* (GEOFFROY, 1785)**

Very local in the British Isles and in Scotland previously only known from Speyside (BENSON 1952).

***Dolerus brevicornis* ZADDACH, 1859**

Baddoch, 1 ♀, 4.vi.2010, leg. Blank, Liston & Taeger.

Dolerus brevicornis was only recently distinguished from *D. asper* ZADDACH, 1859 (HEIDEMAA et al. 2004). Both species occur in the British Isles, but their distribution needs clarification. The above records are the first of *D. brevicornis* from Scotland.

***Dolerus gessneri* ANDRÉ, 1880**

Malleny Woods, 2 ♀ ♀, 2 ♂ ♂, 12.vi.2010, leg. Liston.

Two of the females (Malleny, Bavelaw) have red patches laterally on some abdominal terga. Similarly coloured specimens apparently occur throughout the European range of *D. gessneri* but in the North increasingly dominate. These have often been identified as *Dolerus labiosus* KONOW, 1897 or *D. gessneri labiosus* by earlier workers. A taxonomic distinction is not justified (GOULET 1986), as was already recognized by BENSON (1934). Superficially, apart from its conspicuously larger size, *D. gessneri* may in Britain most easily be confused with *D. yukonensis*.

***Dolerus stygius* FÖRSTER, 1860**

Determined using key by HEIDEMAA (2004). BENSON (1952) recorded this species (as *D. megapterus* CAMERON, 1881) from Scotland in Invernesshire, Moray, Aberdeenshire and Kincardineshire. LISTON (1980a) published records from Wester Ross and Edinburgh.

***Dolerus vestigialis* (Klug, 1818)**

All these Highland specimens have very black legs. At least in S. Scotland, normal red-legged forms also occur. BENSON (1934) was misled by a pair of dark specimens from Killin and misidentified them as *D. genucinctus* ZADDACH, 1859, a species that does not occur in the British Isles, as far as is known.

***Dolerus yukonensis* NORTON, 1872**

The recent Scottish specimens are at present considered to be a very dark North British form [possibly endemic] of *D. yukonensis* that initially was determined by BENSON (1934) as *Dolerus scoticus* CAMERON, 1881. Some minor morphological as well as conspicuous colour differences

exist between the Scots specimens and a long series of *D. yukonensis* collected by C. Kutzscher & A. Taeger in Finland (SDEI), det. Heidema. GOULET (1986) considered that black, coastal forms have been independently evolved throughout the Holarctic range of *D. yukonensis*. A revision of these taxa, including the closely similar *D. cothurnatus*, is being undertaken by M. Heidema (Tartu).

***Empria basalis* LINDQVIST, 1968**

Empria basalis was recorded as new to Britain, based on specimens from Cumbria, by KNIGHT (2009a). The only known hostplant is *Geum rivale* (PROUS et al. 2011).

***Empria fletcheri* (CAMERON, 1878)**

All specimens swept from young *Betula pubescens* EHRH. that were no more than knee-high (Fig. 3). The growth of these low patches of birch may have been affected by browsing by mammals. Numerous older and taller *B. pubescens* and *B. pendula* ROTH of all ages growing at the same site yielded no specimens, although intensively worked by several individuals.

BENSON (1952) summarised British records of *E. fletcheri* as: "Only found very rarely in Scotland, Perthshire: Rannoch (P. Cameron); Aberdeen: Braemar (D. Sharp); and in 1946 Inverness: Aviemore (P. Harwood, who discovered the previously unknown ♂)." The exact positions of these localities cannot be identified. CAMERON (1878) gave the type locality (unknown number of female syntypes described, but external evidence suggests that there were only two) simply as "Rannoch, [and] Braemar". Two specimens in the RSME collections were also examined: 1 ♀, "Aviemore, 28.v.1946, P. Harwood". 1 ♂, "Scotland. EI [East Inverness], Kincaig, 19-26.v.1952. R. B. Benson". Apart from our new records, *E. fletcheri* has not been found in Scotland since 1952.

Females are characteristically coloured: unique in European *Empria* are the extensively red apical terga and sterna of the abdomen (Fig. 4). The comment by BENSON (1952, p. 87, under *E. immersa*) that males of *E. fletcheri* always have entirely black hind legs, does not hold for the recent Claybokie specimens (Fig. 5) or the Kincaig male, in which the tibia is basally predominantly red in all nine specimens. The extensively black metafemur (especially in medial aspect) of male *E. fletcheri* does however readily distinguish it from males of *E. immersa*, that in Scotland always have a completely red metafemur (except at most for the extreme base).

Penisvalves of these two species (Fig. 6) are very similar and have not previously been distinguished from each other in the literature (e.g. BENSON 1952; ZHELOCHOVTSEV & ZINOVJEV 1993). We have studied penisvalves of 5 *E. fletcheri* and 10 *E. immersa* specimens and found that there seem to be small but consistent differences between them (as indicated by the arrows in Fig. 6).

The larval foodplant(s) of *E. fletcheri* are not yet known, but the collection of adults only from *Betula pubescens* at Claybokie suggest that this might be a host.

***Empria longicornis* (THOMSON, 1871)**

In Scotland this species has seldom been recorded (BENSON 1952, Lanarks.; LISTON 1981d, Edinburgh).

***Empria parvula* (KONOW, 1892)**

Although *Empria parvula* is stated by LISTON et al. (2010) to occur in Scotland, we have not been able to locate published original records that support this. BENSON (1952) recorded only a very few British specimens, from Devon, Herts. and Suffolk. According to MACEK (2009) hostplants are species of *Geum*, *Alchemilla* and *Fragaria*.

***Empria pumila* (KONOW, 1896)**

Perhaps widespread in Scotland, but the only published records are for Perthshire, Invernesshire (BENSON 1952) and Selkirkshire (LISTON 1982c). Larva, host and some behavioural details are described by HEIDEMAA & PROUS (2006).

***Empria tridens* (KONOW, 1896)**

Baddoch, 1 ♀, 04.vi.2010, leg. Blank, Liston & Taeger, det. M. Prous.

The Kindrogan individual (SDEI-GISHym14894), with peculiar morphology of the head (Fig. 7; strongly inflated towards the rear, with small eyes), was mentioned by PROUS et al. (2011). Other characters, including the morphology of the saw (<http://www.morphbank.net/?id=588539>), are not distinguishable from *E. tridens* (KONOW, 1896). According to molecular data, the specimen is not remarkable (see PROUS et al. (2011, particularly Fig. 18). Mitochondrial DNA of the specimen is very similar to a group of sequences comprising mainly *E. tridens* and *E. basalis* (see Fig. 20 in PROUS et al., 2011).

This individual is at present most conveniently considered to be a developmental [teratological] abnormality. However, a female *E. tridens* with a head very similar to the Kindrogan specimen has also been collected by Knight in Cumbria. The existence of two such specimens indicates a need to try to exclude other possible causes of the abnormality. Alternative causes are for example pathological (e.g. infection of the pharyngeal glands by a nematode). The habit of mature larvae of *Empria* species (and many other Allantinae) of boring into substrates such as rotten wood, rich in nematode species that are known to infect the postpharyngeal glands of ants (WHEELER 1928), might expose them (or the prepupal and pupal stages) to such infection (by analogy with infection of ants, perhaps in the salivary glands of sawflies?). So it may be worth noting that pupation of *Empria* species is in a cell in the substrate, lacking any clearly identifiable cocoon and thereby increasing the vulnerability of prepupae and / or pupae to nematode infection.

***Endelomyia aethiops* (GMELIN, 1790)**

Inchnadamph NNR, Sutherland, NC2620, 1 ♂, ex larva on *Rosa spinosissima* L., collected 17.ix.2002, emerged 29.v.2003, leg. Bland (RSME).

KNIGHT (2009b) mentioned *Endelomyia aethiops* among records of some rarely found males of British sawfly species. Males have now been recorded on four occasions in the British Isles. Apart from the 3 males from Hutton Roof Crags, Cumbria (KNIGHT 2009b), other records are of single individuals from: Tring, Hertfordshire (BENSON 1952); Leadhills, Lanarkshire (LISTON 1983a) and Sutherland (above). At present there seems to be no reliable indication (which might be gained by rearing) of the sex-ratio of populations in the British Isles.

***Epicenematus montanus* (ZADDACH, 1883)**

Probably widespread in spruce plantations in Scotland, but not previously recorded in Perthshire.

***Eriocampa ovata* (LINNAEUS, 1760)**

Bridge of Tilt, 1 ♀, 6.vi.2010, leg. Jansen.

***Eutomostethus gagathinus* (KLUG, 1816)**

See LISTON (2011).

***Eutomostethus nigrans* (KONOW, 1887)**

Bridge of Tilt, 1 ♀, 4.vi.2010, leg. Lønnve.

***Euura auritae* KOPELKE, 2000**

Glentress, Peebles., NT3443 (83), stem galls on *Salix aurita*, 13.ix.1980 [1333], leg. Bland.

S. of Drum Croy, Perths., NN7263 (88), stem-galls on *Salix aurita*, 7.iv.1994, leg. Bland.

Beinn a'Chuallaich, Perths., NN6860 (88), stem-galls on *Salix aurita*, 31.viii.1996 [6330], leg. Bland.

Meall na Leitreach, Perths., NN6472 (88), stem-galls on *Salix aurita*, 14.ix.1996 [6364], leg. Bland.

Duke's Pass, Stirlings., NN5103, Trossachs (87), stem-galls on *Salix aurita*, 21.iv.1997 [6529] (reared), leg. Bland.

The Scorrie, Angus, NO2775, 2 galls in twigs of *Salix aurita*, collected 15.iv.2002, leg. Bland.

The taxonomy and nomenclature of the *Euura atra* species group was revised by KOPELKE (1996, 2000). Apart from *E. atra* (JURINE, 1807) (on *Salix alba* and *S. fragilis*), at least *E. auritae* and *E. weiffenbachii* (see below) occur in Scotland. Possibly further species are present. Around Lochan na Lairige, on 5.vi.2010 Tommi Nyman found some freshly vacated galls in stems of *S. atrocinerea*. The identity of the species of the *E. atra* group that causes galls on *S. atrocinerea* is not yet clarified (ZINOVJEV 2010).

***Euura weiffenbachii* ERMOLENKO, 1988**

S. of Malaclete, NF7973, N.Uist (110), stem-galls on *Salix repens*, 11.vii.1992 [4846] (reared), leg. Bland, det. Liston.

Kilmory, Isle of Rum, NG3603 (104), stem-gall on *Salix repens*, 27.viii.2000 [7897] (reared), leg. Bland, det. Liston.

Previous mentions in the literature of *Euura atra* (JURINE) galls on *Salix repens* in Scotland are also referable to *E. weiffenbachii*, according to data on host associations in species of the *E. atra* species group (KOPELKE 2003).

***Fenella nigrita* WESTWOOD, 1839**

Longniddry Bents, NT4376, leafmine in *Agrimonia* [8536], 15.vi.2002, 1 ♀ reared, leg. Bland, det. Liston.

Fenella nigrita is already listed as occurring in Scotland by LISTON & SHEPPARD (in prep.), but the only known Scottish record, above, remained unpublished. The status of the two 'foodplant races' mentioned by BENSON (1952) (one on *Agrimonia eupatoria*, the other on *Potentilla reptans*) still requires investigation. BENSON (1952) stated that "Both races are common in S. and S. E. England, but have not been noticed north of Notts."

***Hartigia xanthostoma* (EVERSMANN, 1847)**

In the British Isles not previously recorded outside S. England (BENSON 1951, 1958).

***Heterarthrus aceris* (KALTENBACH, 1856)**

Sensu ALTENHOFER & ZOMBORI (1984).

***Hoplocampa pectoralis* THOMSON, 1871**

Midlothian, Edgehead, near Gorebridge, 1 ♂, 18.vi.2010, leg. Liston.

***Macrophya albipuncta* (FALLÉN, 1808)**

Roseburn, 1 ♀ 2 ♂ ♂, 10.vi.2010, leg. Liston; 1 ♀, 16.vi.2010, leg. Liston; 1 ♀ 1 ♂, 17.vi.2010, leg. Liston. Larvae abundant on leaf-edges of *Geranium pratense* L., causing defoliation of some whole plants, Roseburn, W. of Leith, 20.vi.2010.

Longniddry Bents, 4 ♀ ♀, 11.vi.2010, leg. Liston (SDEI, RSME).

No *Geranium* species other than *G. pratense* was present at Roseburn. Leaves of a double flowered garden variety of *Geranium* (perhaps also *G. pratense*) in Royal Botanic Gardens, Edinburgh, were severely damaged by abundant larvae, 28.vi.2010. At Longniddry adults were swept from *G. sanguineum* L., which may also be a larval host. In southern Germany, Liston has also found adult *M. albipuncta* on *G. sanguineum*.

Only a single specimen of *M. albipuncta* was previously known from the Edinburgh area (LISTON 1981a). Until recently all observations (for example by BENSON 1952, TAEGER et al. 1998 and LACOURT 1999) indicated *M. albipuncta* to be monophagous on *G. sylvaticum* L., but it seems likely that various *Geranium* species are used as hosts. GREARSON (2007) found *M. albipuncta* on *G. pratense* in Wiltshire and COLLINS (2009) suspected that this is the host in some Surrey localities where *M. albipuncta* occurs but the mainly northern and upland *G. sylvaticum* is absent. Grearson knows of three *M. albipuncta* populations in Wiltshire and Gloucestershire where *G. pratense* is definitely the only or main host.

***Macrophya duodecimpunctata* (LINNAEUS, 1758)**

The single previous record of *Macrophya duodecimpunctata* in Scotland (LISTON 2009) is from Glen Tilt, only about 15 km from Bridge of Garry.

***Microdiprion pallipes* (FALLÉN, 1808)**

Beinn Eighe NNR, NH0064, Wester Ross, native pinewood, 1 ♀, 11.v.-13.vi.1988, Malaise trap, leg. I. MacGowan (RSME).

Both the above individuals (see also Table 1) are extremely pale. The lateral parts of the abdominal terga and most of the sterna are bright yellow. In the field, the Claybokie specimen was initially mistaken because of its pale colouration for *Monoctenus juniperi* (LINNAEUS, 1758). However, the female of *M. juniperi* has at most a band of orange-brown along the lateral margins of the terga.

BENSON (1959) referred Scottish populations of *M. pallipes* to ssp. *pallipes*, found also from northern Fennoscandia south to around Berlin in Germany (FORSSLUND 1960). The nominate subspecies was considered to be replaced by *M. pallipes* ssp. *politum* (KLUG, 1812), adults of which are much darker, in Alpine and pre-Alpine Europe. MALLACH (1973) discussed some of the problems attached to the distinction of these putative subspecies. The description by ENSLIN (1917) of variability in colouration in *Lophyrus* (*M.*) *pallipes* still seems very fitting.

***Nematinus caledonicus* (CAMERON, 1882)**

Recorded by BENSON (1958) in Scotland from “Argyll., Inverness and Sutherland”.

***Nematus brevivalvis* THOMSON, 1871**

Rarely recorded in Scotland. BENSON (1958) mentions only Inverness, LISTON (1981a) Peeblesshire.

***Nematus fagi* ZADDACH, 1876**

Edinburgh, Juniper Green, 1 ♀, 19.vi.2010, leg. Liston.

***Nematus frenalis* THOMSON, 1888**

Ben Vraikie (1150ft), near Moulin, 1 ♂, 8.vi.2010, leg. Halstead.

There are only two previous British records (BENSON 1958, Speyside; LISTON 1981b, Lanarkshire).

***Nematus fuscomaculatus* FÖRSTER, 1854**

Nematus fuscomaculatus was previously known from Scotland only from the two female syntypes of *N. strongylogaster* CAMERON from Kilsyth Glen and Cannisburn (both Stirlingshire) mentioned by CAMERON (1878). BENSON (1958) gives *Populus tremula* as the host, based probably on the original observations by CONDE (1934). *P. tremula* was confirmed as a host by STRITT (1952) and KANGAS (1985). According to PSCHORN-WALCHER & ALTENHOFER (2006) *Salix* is also a host, but this is unconfirmed.

***Nematus leionotus* (BENSON, 1933)**

Shieldaig, Wester Ross, NG8252, native pinewood, 1 ♀, v.1991, Malaise trap, I. MacGowan (RSME).

Only one previous published record in Scotland (LISTON 1980a; E. Lothian).

***Nematus leucotrochus* HARTIG, 1837**

Gregarious larvae swept from *Ribes uva-crispa* by Taeger, Bridge of Tilt, 6.vi.2010. Rearing KJG/2010/03, 4 larvae had made cocoons by 30.6.2010. Determination of larvae with LORENZ & KRAUS (1957), confirmed by emergence of adults in 2011.

***Nematus stichi* (ENSLIN, 1913)**

Im Scotland only recorded previously from Lanarkshire (BENSON 1958).

Nematus* sp. cf *leionotus

Some of these specimens were swept from an unidentified *Salix* sp. (or spp.).

Perhaps this taxon is one of the several 'brown' *Nematus* described by LINDQVIST from northern Europe. These taxa are in need of revision. Compared to female *N. leionotus* this unidentified species is: more extensively dark marked, particularly the upper head; lateral lobes of mesonotum more heavily sculptured; provisionally associated with *Salix* rather than *Betula* [*N. leionotus*] and found later. *N. leionotus* is found only at or a few days after flushing of its host, while the birches on and below crags at Meall nan T. were in full leaf when *N. sp. cf leionotus* was taken.

***Nematus ? cadderensis* CAMERON, 1875**

Bridge of Garry, larva swept from *Betula*, 6.vi.2010, leg. Grearson. Emerged ♂ found dead in rearing pot 29.vii.2010. Slide ref. KJG/X151.

Considered most likely to be *Nematus cadderensis* on the basis of the larval foodplant. *N. ferrugineus* FÖRSTER, 1854, which has a similar penis valve, is thought only to use *Salix* as a larval foodplant.

***Pachynematus albipennis* (HARTIG, 1837)**

There are few previous records of this species from Scotland (BENSON 1958, LISTON 1980b).

***Pachynematus clibrichellus* (CAMERON, 1878)**

Dumfriesshire, White Coomb, north of summit, ca 750 m, 1 ♂, 19.vi.2010, leg. Liston.

Recorded by BENSON (1958) from "Perths., Inverness, Angus, Sutherland and Caithness, mostly on mountain tundra, but at sea level at Wick in Caithness[.]", but also found by NELSON (1971) at high altitudes in the northern Pennines of England. It is therefore of little surprise that

Pachynematus clibrichellus has now been found on one of the highest hills in the Southern Uplands of Scotland, where a few other very local occurrences of 'arctic-alpine' sawfly species are already known (LISTON 1983b; 1984, record refers to *Pontania herbaceae*).

***Pachynematus clitellatus* (SERVILLE, 1823)**

Dumfriesshire, White Coomb, 4 ♂♂, 19.vi.2010, leg. Liston.

Treated in the sense of TAEGER & BLANK (1998). Male specimens from Meall nan Tarmachan, White Coomb and Corrie Fee, leg. Heibo and Liston key to *P. kirbyi* (DAHLBOM, 1835) in BENSON (1958) and might well be considered to represent a different species. These were swept from marshy land dominated by *Carex*, whilst *P. clitellatus* s. str. is also found on dry areas and is attached perhaps only to various Poaceae.

***Pachynematus lichtwardti* KONOW, 1903**

Recorded from a number of former Scottish counties (BENSON 1958; LISTON 1982d), but not previously from Angus or Perthshire. In Scotland *P. lichtwardti* is a much later species (LISTON 1982d) than *P. moerens* (FÖRSTER, 1854), the females of which are very similar.

***Pamphilius gyllenbali* (DAHLBOM, 1835)**

Rarely recorded in Scotland (BENSON 1951; "Singly in C. and S. England, but also Mid Perth in Scotland (Rannoch, vi.1931)").

***Pamphilius stramineipes* (HARTIG, 1837)**

In Britain only known from "Mid-Perth and Inverness" (BENSON 1951).

***Parna apicalis* (BRISCHKE, 1888)**

Malleny Woods and Colinton Dell; several leaf-mines on Common Lime (*T. x vulgaris* Heyne), 19.vi.2010, leg. Liston. Most vacated, but 2 still with larvae.

Parna apicalis was first recorded as a British species by EDMUNDS et al. (2007), but perhaps was previously overlooked, rather than being a very recently introduced species. Both Dr M. R. Shaw (pers. comm.) and Liston probably observed the characteristic leaf-mines in the Edinburgh area as early as the 1980's, but at the time attributed these to *Parna tenella* (KLUG, 1816).

***Perineura rubi* (PANZER, 1803)**

BENSON (1952) records *Perineura rubi* from "N. to R. Forth in Scotland".

***Phyllocolpa alienata* (FÖRSTER, 1854)**

We unfortunately kept no record of the *Salix* species from which *P. alienata* was swept. According to KOPELKE (2007b) it is monophagous on *Salix aurita*, one of the more abundant *Salix* species on and below the crags of M. n. T.

As illustrated by BENSON (1958: as *Pontania coriacea*), the saw in its entirety has a very distinctive form, being almost sickle-shaped, with the radix very long. This contrasts strongly with the comparatively short radix and straighter, less strongly tapered form of the saws of all other British species except for *P. leucapsis* sensu KOPELKE. A deficit in the illustrations by KOPELKE (2007a, b) is that only a part of the radix is shown, although the total shape of this and the detailed structure of the base seem to be extremely helpful in identifying many species of Nematinae, including this taxon. KOPELKE (2007b) designated a neotype for *Nematus leucapsis* and placed *Nematus coriaceus* as its junior synonym (see clarification in TÄGER et al. 2010: 11). He considered *P. leucapsis* to be monophagous on *Salix cinerea*. It is obvious that BENSON's (1940, 1958) interpretation of *Nematus leucapsis* refers to a taxon different from that re-described under this name by KOPELKE (2007b). Very confusingly, specimens that key to *P. leucapsis* or *P. alienata* as defined by KOPELKE, run in the keys by BENSON (1958) and ZHELOCHOVTSEV & ZINOVJEV (1993) to *Pontania coriacea* or respectively *Nematus coriaceus*, whereas species treated under the name *leucapsis* by earlier authors, including BENSON (1958) are regarded by KOPELKE as comprising a whole group of strictly monophagous taxa (i.e., each on a single willow species) under several names (see further under *Phyllocolpa plicaphylicifolia*). After using the key and consulting descriptions by KOPELKE (2007b) we had some doubt as to whether the Meall nan Tarmachan '*P. coriacea*' specimens should be identified as *P. leucapsis* or *P. alienata* (FÖRSTER, 1854). As illustrated by KOPELKE, the possible differences in morphology of the ovipositor and penis valve are in any case small. Weak and possibly variable characters of the Meall nan Tarmachan specimens such as distribution of ctenidia on the basal annular sutures, the incurved lower edge of the sawsheath apex and the shape of the base of the penisvalve, seemed initially to support the identification as *leucapsis* rather than *alienata*. However, the long, dark cerci of the Scots specimens, reaching almost as far as the sawsheath apex, agree only with *P. alienata* as characterised by KOPELKE. He described the cerci of *P. leucapsis* as [translated] "pale [and] extending at most half the length of the sheath" whereas those of *P. alienata* are described as "dark brown and long, extending more than half of the sheath length". After examining two female specimens from Meall nan Tarmachan, Dr Kopelke commented that they are probably *P. alienata* rather than *P. leucapsis* and that his own material of *P. alienata* from northern Europe [Scandinavia] was similarly coloured, with a similar sawsheath and cerci (KOPELKE, pers. comm.).

***Phyllocolpa carinifrons* (BENSON, 1940)**

Leaf-folds were abundant on *Salix pentandra*. Identification based on the generally accepted monophagy of *P. carinifrons* on *Salix pentandra* and observations that no other *Phyllocolpa* species uses this willow as a host (KOPELKE 2003; as *P. excavata* (MARLATT)).

This species has already been recorded from the Red Moss at Balerno (LISTON 1981a).

†*Phyllocolpa erythropyga* (FÖRSTER, 1854)

Specimens key to *Pontania leucosticta* (HARTIG, 1837) in BENSON (1958). KOPELKE (2007a) mentions the more extensively pale pronotum of *P. leucosticta* as one of the characters that distin-

guishes it from *P. erythropgya*. Colouration of the pronotum varies widely in the above specimens. In most only the edges of the pronotum are pale. Those from Braemar are the darkest. One of the Balerno specimens has an extensively pale pronotum. The distribution of ctenidial teeth at the base of the lamnium in all these females is very similar and indicates that they all belong to *P. erythropgya* (KOPELKE 2007a). Dr Kopelke examined a female from Claybokie and also determined it (KOPELKE, pers. comm.) as *P. erythropgya*. He remarked that the cerci seem unusually long, but that this character possibly varies. *P. erythropgya* is monophagous on *Salix aurita* and *P. leucosticta* on *S. caprea* according to KOPELKE (2007a).

***Phyllocolpa ischnocera* (THOMSON, 1863)**

Fealar Gorge, Perth., NO0079 (89), leaf-fold galls on *Salix myrsinifolia*, 26.ix.1997, leg. Bland.
Caenlochan Crags, Angus, NO 1776 (90), leaf-fold galls on *Salix myrsinifolia* 8.ix.1997 [6680], leg. Bland.

N.of Srón na Gaoithe, Aberdeens., NO1580 (92), leaf-fold galls on *Salix myrsinifolia*, 26.viii.1992, leg. Bland.

Allt a'Gharbh-choire, Glen Clunie, Aberdeens., NO1580 (92), vacated leaf-fold galls on *Salix myrsinifolia*, 9.x.1994, leg. Bland.

NE of Loch Kander, Callater, Aberdeens., NO 1981 (92), leaf-fold galls on *Salix myrsinifolia*, 26.viii.1992 [5043a], leg. Bland.

Craig Maud, Doll, Angus, N02376 (90), leaf-fold galls on *Salix myrsinifolia*, 5.viii.1992, leg. Bland.

Corrie Fee, Clova N02474 (90), leaf-fold galls on *Salix myrsinifolia*, 2.viii.1992 [4966c] (reared), leg. Bland.

Craig Rennet, Doll, Angus, N02475 (90), leaf-fold galls on *Salix myrsinifolia*, 5.viii.1992, 25.viii.1994 [5554] (reared), leg. Bland.

West Corrie, Clova, Angus, N02578 (90), leaf-fold galls on *Salix myrsinifolia*, 7.viii.1992, leg. Bland.

Craig Mellon, Doll, Angus, N02676 (90), leaf-fold galls on *Salix myrsinifolia*, 19.viii.1996 [629/1] (reared), leg. Bland.

W. of The Strone, Clova, Angus, N02678 (90), leaf-fold galls on *Salix myrsinifolia*, 4.viii.1992, leg. Bland.

The Scorrie, Clova, Angus, N02775 (90), leaf-fold galls on *Salix myrsinifolia*, 3.viii.1992, 21.viii.1996 [6304] (reared), leg. Bland.

According to KOPELKE (2007a) *P. ischnocera* is the only *Phyllocolpa* species attached to *Salix myrsinifolia* in Europe. Care should be taken however to distinguish 'leaf shelters' made by a *Brachycoluma* species (*Amauronematus viduatus* sensu lato), that have also been reared by Bland from this willow species in Scotland. No records of *P. ischnocera* have been made in Scotland since the description of *Nematus leucostigmus* CAMERON, 1876 (synonymy by KOPELKE 2007a) from "Rannoch, in June" (CAMERON, 1876). As remarked on by BLAND (1993) under "*Phyllocolpa* sp. [on *Salix myrsinifolia*]", and supported by the above records, *P. ischnocera* is evidently a widespread and rather abundant species in the southern Highlands. KOPELKE (2007a) lists records from a number of Fennoscandian and Alpine regions.

†*Phyllocolpa plicalapponum* KOPELKE, 2007

Very similar to *P. plicaphylicifolia* collected at the same site (see below). Determination as *P. plicalapponum* is based, following KOPELKE (2007a), on the more extensively pale lower face, more extensively pale upper posterior of pronotum (both sexes) and the straighter upper and lower edges of the female sawsheath in lateral views. Neither lancets nor penisvalves of Scottish specimens of *P. plicalapponum* and *P. plicaphylicifolia* show clear differences. KOPELKE (2007a) records *P. plicalapponum* only from Norway.

†*Phyllocolpa plicaphylicifolia* KOPELKE, 2007

We are unable to state from which species of *Salix* these were collected.

The identification as *Phyllocolpa plicaphylicifolia* is based particularly on the profile of the sawsheath in lateral view and the morphology of the lamnium of the saw (KOPELKE 2007a). Dr Kopelke examined two of the above females and concluded that they are indeed *P. plicaphylicifolia* (KOPELKE pers. comm.). He remarked that they agreed largely with his own reared material, but the colour of the tegulae was different. Both *P. prussica* (ZADDACH, 1883) and *P. polita* (ZADDACH, 1883) are morphologically similar to this species (KOPELKE 2007a), but in the former two species the posterior dorsal angles of the pronotum are clearly pale marked (in *P. prussica* mainly pale), whilst in *Ph. plicaphylicifolia* these are completely black or very finely white margined (less than 0.1 mm). *P. prussica* is considered to be monophagous on *Salix cinerea* and is recorded below for the first time in the British Isles. *P. polita* is monophagous on *Salix purpurea* (KOPELKE 2007a) and was recorded by BRISCHKE (1884) from Scotland, but this requires substantiation. *P. plicaphylicifolia* is stated by KOPELKE (2007a) to be monophagous on *S. phylicifolia* and to occur in Norway and Finland. *Salix phylicifolia* is widespread in Highland Scotland, although in the Ben Lawers area it may not occur in a pure form, but only as a hybrid with *S. myrsinifolia* (MACKENZIE 2000). Other more or less similar species of *Phyllocolpa* treated by KOPELKE (2007a, b), most of which key to *Pontania leucapsis* in BENSON (1958), may await detection in the British Isles.

†*Phyllocolpa prussica* (ZADDACH, 1883)

This taxon was recently raised from synonymy and redescribed by KOPELKE (2007a), who presented records from predominantly low-altitude sites in Austria, Switzerland, Germany, Denmark and Lithuania. On the continent *P. prussica* is monophagous on *Salix cinerea*. It therefore seems possible that the host in the British Isles may be *Salix cinerea* ssp. *oleifolia* (= *S. atrocinnerea*). The Scottish specimen runs without problems to *P. prussica* in the key by KOPELKE (2007a).

Phymatocera aterrima (KLUG, 1816)

Meall nan Tarmachan, beside Lochan na Lairige, 1 ♀, 5.vi.2010, leg. Blank, Liston & Taeger.
 Bridge of Garry, 1 ♀, 6.vi.2010, from *Polygonatum* growing outside garden fence, leg. Grearson.
 Kindrogan (Kindrogan House), 1 ♀ 1 ♂, 7.vi.2010, leg. Halstead.

Phymatocera aterrima is known to many gardeners as the Solomon's Seal Sawfly. The larvae cause conspicuous, unsightly, damage to *Polygonatum* species. BENSON (1952) described northwards range expansion of *P. aterrima* as far as Cheshire and it is generally considered to have since continued to move northwards in the British Isles. *P. aterrima* was first found in Scotland

(Edinburgh) in 1985 (SHAW 1986) and there is a 2006 record from a garden in Aberdeen (YOUNG 2010). However, it should not be forgotten that *Polygonatum verticillatum* All. is a rare native plant of gorge woodlands in Perthshire (ROBINSON 2008). LACOURT (2001) has suggested that *Paris quadrifolia* L. (also a rare native species in Perthshire: LAVERY 2008) may also be a host. The possibility cannot be overlooked that local, semi-natural populations of *P. aterrima* may have existed in Scotland before its widespread recent occurrence in gardens.

Adults of *P. aterrima* make an impression of being weak and reluctant fliers, and are usually found crawling on their hostplants. We were surprised to find a specimen of this species at Meall nan Tarmachan, apparently far (at least 5 km) from its nearest possible places of origin, presumably either a garden or a semi-natural woodland in a low-lying glen.

***Pontania brevicornis* (FÖRSTER, 1854)**

See VIKBERG & ZINOVJEV (2006) on the recognition of this species that keys to *P. pedunculii* (HARTIG, 1837) in BENSON (1958).

***Pontania herbaceae* (CAMERON, 1876)**

Perthshire, Garbh Mheall, 8 ♀♀ 1 ♂, reared from galls on *Salix herbacea*, collected August 2000, leg. Bland.

The type locality of *Nematus herbaceae* given by CAMERON (1876) for the reared adult syntypes on which he based his description is “Ben Lawers and on “Garyvel”, Rannoch”. The name of the latter locality has puzzled later entomologists. VIKBERG (2003) designated a lectotype and thereby restricted the type locality to “Rannoch”. The mountain referred to by CAMERON as “Garyvel” (more usually spelled by his contemporaries Grayvel, but also named for example Garvell or Gharbhavel) is Garbh Mheall (also named Mheall Garbh on some maps) (+56.623783 -4.446745, NN 500507, summit 986 m), situated 6 km south of Bridge of Gaur, at the West end of Loch Rannoch. This has been a popular destination for entomologists since the Victorian era (see for example RYE 1866; FOWLER 1887; [LLOYD] 1895), usually approached from the North: such an ascent is described in fair detail by METCALFE (1918).

Whilst the combination of gall type and host *Salix* species readily identifies most *Pontania* species in Britain, *Pontania herbaceae* and *P. aquilonis* BENSON, 1941 are exceptional in making the same type of gall on the same host. Whilst the adults can be difficult to distinguish, the larvae of *P. herbaceae* (3 dorsal annulets on abdominal segments, body laterally with pattern of groups of black spicules) can easily be distinguished from those of *P. aquilonis* (4 annulets, groups of black spicules absent) (VIKBERG 2003). In recent years Liston has examined larvae extracted from galls on *S. herbacea* from several Highland localities (Perthshire, Angus, Cairngorms) and around White Coomb in the Southern Uplands, as well as adults reared by Bland from various parts of the Highlands. They all belong to *P. herbaceae*. The only record of the apparently much rarer *P. aquilonis* BENSON, 1941 in the British Isles is based on the type series of *P. algida* BENSON, 1941 collected on Meall na Samhne, Perthshire (BENSON 1958, VIKBERG 2003). The types of the latter are adults and nothing is recorded about the appearance of the larvae. Dr Vikberg told Liston in conversation that he still had some doubts, after morphological comparison of the types, that *P. algida* was really distinct from *P. herbaceae*. We should continue to try to establish whether *P. aquilonis* is now present at any British sites. *Pontania herbaceae* is recorded widely from many of the British populations of *Salix herbacea* (Scotland; probably throughout,

wherever *S. herbacea* still occurs: Scotland; Fair Isle (Nick Riddiford, pers. comm.) [but not otherwise known in Shetlands], through Orkney, Western Isles (sometimes near sea-level) and most mountain summits further south and east over 700 m, including the southern uplands. England; highest summits in northern Pennines and Lake District. Wales; Snowdonia. Ireland; only known from summit of Slieve Donard, County Down [but has anybody really looked on the western mountains, e.g. in Donegal?]. The worldwide distribution of the species is discussed by VIKBERG (2003).

***Pontania lapponicola* KOPELKE, 1994**

Burn of Fialzioch, Angus, NO2377, 3 ♀ ♀ 4 ♂ ♂ reared from galls on *Salix lapponum* L. collected 6.viii.1992, leg. Bland.

Allt Féith Làir, Fealar, Perth., NN9979, coll. 24.vi.1997, 1 ♂ emerged 2.iv.1998, leg. Bland.

Corrie Sharroch, NO2574, 1 ♀ 2 ♂ ♂ reared from galls on *Salix lapponum* collected 29.vii.1999, leg. Bland; floor of Corrie Sharroch, 2 pairs of very young galls on *S. lapponum*, 8.vi.2010, leg. Liston.

Few exact localities are recorded for *Pontania lapponicola* in Scotland. It is monophagous on *Salix lapponum*, which in the British Isles is restricted to a handful of sites in upland Scotland, where the small remaining populations have been severely affected by grazing pressure. Neither galls nor adults could be found on *S. lapponum* at Meall nan Tarmachan, although many bushes, most of which had been recently planted, were searched. Possibly however it was just too early (see dates of Angus records, above).

BENSON (1958) treated as a single species, under the name *P. dolichura* (THOMSON, 1871), the three species now recognized in Britain in the *P. dolichura* species group: *P. dolichura* on *Salix phylicifolia*, *P. nigricantis* on *S. myrsinifolia* and *P. lapponicola*. See KOPELKE (1994) on their taxonomy. Possibly further as yet unrecognized sawflies of this species group are present in Scotland on other *Salix* species. According to BENSON “[galls] can be found in v-vi but are vacated before the middle or end of vii and are thus very early for a mountain species”. In fact, phenology of *P. lapponicola* and *P. nigricantis* [see below], seems to be highly dependent on topography (aspect, altitude) and the often great yearly differences in weather conditions, resulting in a wide variation in timing of emergence of adults and development of galls. The comments by BENSON on phenology best fit populations of *P. nigricantis* found in Scotland along river valleys from near sea-level to about 400 m. Adults and mature galls of *P. lapponicola*, but also those of *P. nigricantis* occurring at sites above this altitude, are typically found several weeks later. No exact data on the occurrence or phenology of *P. dolichura* are available from Scotland, where this seems to be a very rare species.

***Pontania myrsiniticola* KOPELKE, 1991**

Meall nan Tarmachan, NN5939, 1 ♂, reared from pea galls on *Salix myrsinites*, 27.viii.1995, leg. Bland, det. Liston. Inchnadamph, Sutherland, NC2521, 4 ♀ ♀ and 3 ♂ ♂ reared from pea galls on *Salix myrsinites*, 17.viii.2002, leg. Bland, det. Liston.

Few localities are recorded for *Pontania myrsiniticola* in Scotland (see LISTON & BLANK 2006) and these are the first known reared specimens.

***Pontania nigricantis* KOPELKE, 1986**

Craig Rennet, Glen Doll, Angus, N02475 (90), red bean-galls on *Salix myrsinifolia*, 5.viii.1992, reared [5017], leg. Bland, det. Liston.

West Corrie, Glen Clova, Angus, N02578 (90), red bean-galls on *Salix myrsinifolia*, 7.viii.1992, leg. Bland.

The Scorrie, Glen Clova, Angus, N02775 (90), vacated bean-galls on *Salix myrsinifolia*, 21.viii.1996, [6303], leg. Bland.

The Lunkard, Angus, 2 ♀♀ reared from galls on *Salix myrsinifolia* collected 12.vii.1995, leg. Bland (RSME).

Caenlochan Cragg NO 1776 (90), Angus, parallel rows of bean-galls on *Salix myrsinifolia* 8.ix.1997 [6679], leg. Bland.

Allt a'Gharbh-choire, Glen Clunie, Aberdeens., NO1580 (92), vacated chains of bean-galls on *Salix myrsinifolia* 9.x.1994, leg. Bland.

Kilichonan, mature galls on *S. myrsinifolia*, 3.vi.2010, leg. Jänicke (SDEI), det. Liston.

See comments on phenology under *Pontania lapponicola*, above.

***Pristiphora breadalbanensis* (CAMERON, 1882)**

Meall Odhar, Perth. (89), N01577, cocoon below *Empetrum*, 26.iii.2003 [8736] (reared) leg. Bland, det. Liston.

Baddoch, 4.vi.2010, 1 ♂, leg. Blank, Liston & Taeger.

Although adult *Pristiphora breadalbanensis* and *P. lativentris* (sometimes placed in subgenus *Lygaeotus*) are frequently abundant in Scotland and more locally in the Alps, few successful rearings are documented. Larval hosts for the entire *coactula* species group [*Lygaeotus*] remain largely unknown or are sometimes indicated by single records that require confirmation, because of the considerable uncertainties attached to species taxonomy and identification. To date, published comments, apparently based solely on field observations on adults, suggested alternatively the hostplant of *P. lativentris* to be *Vaccinium* (BENSON 1955) or *Salix* (LACOURT 1999). Nobody has hazarded more than a guess on the host of *P. breadalbanensis*, although from limited field observations by Liston it seems probably to be *Salix herbacea* or [and] *Vaccinium myrtillus* in Scotland. Of great interest are the observations by BENSON (1935: 36) on successful oviposition of a female, in the field, that he identified as *Lygaeonematus coactulus* var. *boreus* KONOW, into plants as diverse as *Gnaphalium supinum*, *Vaccinium uliginosum* and *Galium saxatile*. Note that he made this observation on “Meall Ghaordie” [now usually spelled Meall Ghaordaidh], but later (BENSON 1958) he recorded *Pristiphora borea* in Britain only from “near the summits of Schiehallion, and Beinn à Chuallaich, vi.1931”, suggesting that he no longer considered the Meall Ghaordaidh specimen to be this species. These three tops are however not far apart (standing almost in a line of about 25 km between Meall Ghaordaidh in the West and Beinn à Chuallaich in the East). Most sawflies are highly selective with regard to choice of plant species for oviposition. In most cases this is known to be only on or in the larval host species. Apart from BENSON’s observation, no similar indications of selection of oviposition sites other than on the larval host(s) have been recorded in other Nematinae. There are however some well documented examples of habitual oviposition into species of plants other than larval hosts by certain *Macrophya* species (Tenthredininae) (CHEVIN 2009). Do some *Pristiphora* (*Lygaeotus*) species also oviposit in plants which are not their [usual] hosts? Or are perhaps some species more widely polyphagous than previously thought?

***Pristiphora decipiens* (ENSLIN, 1916)**

Determined using LISTON (1981c) and BENEŠ & KRÍSTEK (1976). Previously only known in the British Isles from England (Devon) (LISTON 1981c).

***Pristiphora groenblomi* (LINDQVIST, 1952)**

Ben Vraikie (1150ft), near Moulin, 1 ♂, 8.vi.2010, leg. Halstead.

In Britain previously known only from Aviemore (BENSON 1958) and Upper Deeside (LISTON 1985).

***Pristiphora leucopus* (HELLÉN, 1948)**

Malleny Woods, 1 ♀, 12.vi.2010, leg. Liston. Swept from *Tilia x vulgaris*.

See GREARSON (2006) for an account of *Pristiphora leucopus*, added to the British list based on occurrences in southern England (Surrey, Norfolk and Wiltshire).

***Pristiphora mollis* (HARTIG, 1837)**

Baddoch, 4.vi.2010, 1 ♀ 2 ♂ ♂, leg. Blank, Liston & Taeger.

***Pristiphora testacea* (JURINE, 1807)**

Not previously recorded in Scotland. BENSON (1958) gives Hertfordshire as the most northern occurrence in England.

†*Pristiphora thalictri* (KRIECHBAUMER, 1884)

Species of this group of *Pristiphora*, as far as is known, use Ranunculaceae as larval hosts. Several Palaearctic species are attached to *Thalictrum*, with one species on *Aquilegia* (*P. rufipes* SERVILLE, 1823). *Pristiphora thalictri* is distinguished from other West Palaearctic *Pristiphora* (subgenus *Pristiphora*) species by the combination of shiny and nearly unsculptured mesopleura, entirely (or predominantly) black hind legs, darkened costa and stigma, and more or less infuscate wings (Figs 8, 9). The dark wing colour is evident in all specimens, but varies. Wings of specimens from hot and dry sites seem to be darker, based on material in the SDEI. A specimen with very dark wings was described from Croatia by KONOW (1902) as *P. henschi* (currently treated as a synonym of *P. thalictri*). Wings of the Perthshire specimens are rather pale, like the syntypes from near Munich (ZSM). The hind legs of all Central European specimens examined are entirely black, as are those of the Scottish male. According to CONDE (1934) some Latvian females identified as *P. thalictri* reared from *T. aquilegifolium* have [translated] “the metafemora [...] yellow-white with a black apex”. ZHELOCHOVTSEV & ZINOVJEV (1993) describe leg colouration of *P. thalictri* thus: “Femora darkened. Hind legs black, tibiae with light colored bases, occasionally femora light colored with dark apex.” Presumably this characterization is based on specimens from European Russia. Some specimens from the Waldviertel of Austria, reared from *Thalictrum aquilegifolium*, leg. E. Altenhofer (SDEI) have an almost entirely white metatibia, with only the apex black.

These were previously identified (PSCHORN-WALCHER & ALTENHOFER 2006) as *P. thalictri*, but the lancet differs considerably from that species. Possibly this taxon is undescribed. The Scottish female (HMUG) has pale marked base of metatibia but the metafemur is entirely black. The serrulae of the lancet possess numerous denticles in the Scots female (Fig. 10), as in the illustration given by ZHELOCHOVTSOV & ZINOVJEV (1993) for *P. thalictri*. Also noteworthy, is the entirely black labrum of the Meall nan Tarmachan male (SDEI), as in 1 ♂, Trübsee, Unterwalden, Switzerland (RSME). All Central European specimens of *P. thalictri* (both sexes) so far examined have at least the apical half pale brown. It is apparent that further work on the taxonomy, host associations and distribution of the *Pristiphora* species associated with *Thalictrum* is required.

BENSON (1958) has already mentioned *P. thalictri* as a British species, as a re-identification of the taxon first recorded as *P. fuscata* BENSON, 1943 (a replacement name for *P. fumipennis* (THOMSON, 1871)). BENSON knew only one taxon of this group in the British Isles (in England and Ireland; attached to *Thalictrum flavum*), described as having entirely pale red hind tibia and tarsus [also completely pale femora; implicitly through comparison with *N. fumipennis* THOMSON], which he latterly referred to (BENSON 1958) as *P. thalictri* ssp. *fuscata*, noting that it is “replaced by dark-legged forms of *P. thalictri* KRIECHBAUMER in other parts of Eurasia to Japan”. LINDQVIST (1962), supporting his argumentation particularly with characters in the morphology of the lancet, synonymised *P. fuscata* with *P. brevis* (HARTIG, 1837) and restricted use of the name *thalictri* to specimens with very dark legs, whose distribution stretches from the Ukraine, Balkans and Italy through East and Central Europe, reaching Belgium and Thuringia (Germany) in the North (TAEGER et al. 2006). See above on specimens with differently coloured legs recorded in Austria, Latvia and European Russia.

Nematus thalictri was described partly on the basis of syntype specimens reared from larvae collected on *Thalictrum aquilegifolium* near Munich (KRIECHBAUMER 1884). TAKEUCHI (1922) described a *Diphadnus thalictri* based on specimens reared from *Thalictrum minus* in Japan. OKUTANI (1967) recorded also *Thalictrum thunbergii* as a host of *P. thalictri* in Japan. According to TAKEUCHI (1952) *D. thalictri* is a synonym of *P. thalictri* (KRIECHB.). This synonymy has generally been accepted (e.g. TAEGER et al. 2010), not least because TAKEUCHI described the legs of *D. thalictri* as predominantly black. The placement of *D. thalictri* nevertheless requires confirmation. Whilst *T. aquilegifolium* is an introduced garden plant in the British Isles, recorded only very rarely as naturalized in Scotland, *T. minus* is widespread in upland Scotland. However, the only *Thalictrum* species recorded at Meall nan Tarmachan is *T. alpinum* (long known from there as a typical member of the rock-ledge flora), which therefore seems to be the most likely host at this site. Note that Bland has observed sawfly larvae feeding on *Thalictrum alpinum* near the summit of the Cairnwell (Aberdeens.). These were observed during a search for larvae of Lepidoptera and were not collected. Efforts should be made to obtain further material of *Pristiphora* from *Thalictrum* in Scotland and data on hosts.

Pristiphora (Lygaeotus) sp.

1 ♀, Baddoch, 04.vi.2010, leg. Blank, Liston & Taeger.

Sawsheath in dorsal view rounded-triangular rather like *P. carinata* but more similar to illustration of *P. trochanterica* in ZHELOCHOVTSOV & ZINOVJEV (1993). This specimen is darker than *P. carinata* (i.e. legs very black, with completely dark femur, pronotum nearly completely piceous) and has shorter, thicker antennae and cerci noticeably projecting beyond sawsheath tip and setae on valvula 3 present almost to base. This combination of characters does not fit existing descriptions of *Pristiphora (Lygaeotus)* species.

***Pseudodineura enslini* (HERING, 1923)**

The Lunkard, Craig Maud, Angus, NO2377 (90) leafmines in *Trollius* 12.vii.1995 [5831] (reared) leg. Bland.

Inchnadamph NNR, Suth., NC2619 (108) leafmines in *Trollius* 17.viii.2002 leg. Bland.

Strathy Graveyard, Suth., NC8365 (108), vacated leafmines in *Trollius* 13.viii.1994 leg. Bland.

Loch Iubhair, Perth., NN4226.(88) leafmines in *Trollius* 12.viii.2001, 25.vi.2004, 6.x.2005 leg. Bland.

Glen Fender Meadows NN8967 (89) leafmines in *Trollius* 7.xi.1998, 3.viii.1999 leg. Bland.

Fendoch Marsh, Perth., NN9027 (88) leafmines in *Trollius* 3.ix.2005 leg. Bland.

Brerachan Meadow, Perth., NO0163.(89), leafmines in *Trollius* 3.vii.2004, 13.vii.2004 (reared) K.P. Bland.

Allt Féith Làir, Perth., NO0180 (89), leafmines in *Trollius* 27.ix.1997 [6758] leg. Bland.

Caenlochan Crags, Angus, NO1776, ex blotch mine in *Trollius europaeus*, collected 27.vii.2001, 1 ♀ 1 ♂ emerged 29.iv.-2.v.2002: mines also 8.viii.2002, 14.vii.2003, 6.viii.2005, 8.viii.2008 leg. Bland.

Meall nan Tarmachan, below crags above Lochan na Lairige, 2 leaf-mines with larvae on *Trollius europaeus*, 22.vi.2010, leg. Liston.

BENSON (1958) noted occurrences of *Pseudodineura enslini* in Scotland at one locality each in Moray and Sutherland and LISTON (1985) recorded it from a locality in Aberdeenshire. However, as exemplified by the records above, Bland has observed that *P. enslini* occurs on nearly every of the many Highland populations of *Trollius* that he has visited. The very long period of occurrence of leaf mines in Scotland (above: from late June to late September) raises the question of whether *P. enslini* may be bivoltine in Scotland. Dates of occurrence in Central Europe were discussed, somewhat inconclusively, by ALTENHOFER & PSCHORN-WALCHER (2006). In the colline zone of Lower Bavaria, Germany, *P. enslini* is univoltine (Liston, pers. obs.).

***Pseudodineura fuscula* (KLUG, 1816)**

According to BENSON (1958) found in Scotland in Lanark, Dumfries, Moray, and Caithness.

***Rhogogaster chambersi* BENSON, 1947**

Since the few Scottish records, scattered throughout the country, published by BENSON (1947), this species does not seem to have been mentioned. Its only known host, *Linum catharticum*, is widespread in Scotland (BSBI 2010).

***Rhogogaster genistae* BENSON, 1947**

Midlothian, Gorebridge, 2 ♀ ♀, swept from *Sarothamnus scoparius*, 18.vi.2010, leg. Liston.

***Sciapteryx soror* KONOW, 1890**

Orkney, Hoy, Nowt Bield, HY2301 (111), 21.vi.2009 (2), leg. Bland, det. Liston.

Orkney, Hoy, Quooyberstane, HY4612 (111), 22.vi.2009 (2), leg. Bland, det. Liston.

An addition to the list of Orkney sawflies (LISTON 1983c, SHEPPARD 1986). Note that BLANK & TAEGER (1998) treated *S. soror* provisionally as an Atlantic subspecies of the more continental *S. costalis* (FABRICIUS, 1775), but mentioned that they may be found to be synonyms when a greater amount of material from throughout Europe becomes available for comparison. *Sciapteryx* species are typically active in the early spring. BENSON (1952) gives April to May as the flight period of *S. soror*, that he recorded "N. to Aberdeen and Inverness". The records above are surprisingly late, even though they represent the most northerly known occurrences in the entire range of *S. soror* (TAEGER et al. 2006).

***Tenthredo atra* LINNAEUS, 1758**

The females are all referable to the form treated under the name var. *scopolii* Lepeletier in the key by ENSLIN (1920). They all have a white spot on the metepisternum, but only about half of them have the pronotum narrowly edged with white (in the rest this is completely black). Colour of clypeus varies from nearly completely white to nearly completely black. The orbits are completely black. The males vary not only in the presence or absence of white on the pronotum, but also in the size or presence of a white spot on the metepisternum and the lateral edge of tergum 1.

†*Tenthredo ignobilis* KLUG, 1817

At Meall nan Tarmachan, 5.vi.2010, two adults were swept from birch, one specimen feeding at catkins of *Salix* sp. and one visiting inflorescence of *Sedum rosea*. On 22.vi.2010, most of the adults collected were feeding at inflorescences of *Sedum rosea*, including one pair in copula.

Variability: the Scottish specimens show little variability in colouration, except that the malar space in the male may be entirely black or marked with white (in females always entirely black).

The following notes outline our provisional conclusions on this newly discovered Scottish member of the *Tenthredo atra* species group that at present is identified as *T. ignobilis*. A more thorough study of the taxonomy of the whole species group is evidently needed, but this should ideally be based on material from the entire northern Hemisphere and attempt to clarify not only morphological and genetic taxonomy, but also biological characters (e.g. hostplants). Such a revision falls outside the scope of the present work.

Males of the *T. atra* group are more uniform in morphology than the females, difficult to distinguish from each other and difficult to associate with females. With few exceptions, described taxa are based exclusively or mainly on female specimens. Before the paper by LACOURT (1992), it had been thought possible that males do not occur at all in some species of the *T. atra* group (thelytokous parthenogenesis; see particularly comments by LACOURT 1980). In fact, unlike most other genera of Tenthredinidae, no definite case of parthenogenesis has yet been recorded in *Tenthredo*, currently regarded as by far the largest genus of Symphyta, with over 900 species (TAEGER et al. 2010). SUOMALAINEN (1962) suggested that exclusively parthenogenetic insect species tend to be of relatively recent origin and run a higher risk of extinction than sexually reproducing congeners. Has in the long term this apparent lack of recourse to parthenogenetic reproduction in *Tenthredo* helped to promote the comparatively high diversity of extant species?

The collections at the RSME, the Hunterian Museum (Glasgow) and Kelvingrove Museum and Art Gallery have been checked, but no specimen of *T. ignobilis* was found. The species possesses a combination of colour characters that prevent it from running in the key by BENSON (1952). It therefore seems that BENSON had not seen British specimens.

T. ignobilis, until CHEVIN (1974) raised it from synonymy, was long treated as a colour polymorphism of *T. atra* L. CAMERON (1882) misinterpreted the description of *T. ignobilis* and applied the name to a *Tenthredopsis* species occurring in Britain.

The two existing female syntypes of *T. ignobilis* (ZMHUB; examined) are regarded as conspecific with the Scottish specimens. The taxonomic significance of apparent slight differences between the Scots specimens and Central European, as compared below, requires further investigation during the course of an in-depth revision of the *T. atra* group:

- 4 basal serrulae of lancet shorter and lower (Fig. 12). Tegula entirely black. Slightly larger: body length of ♀ ca 13 mm. ... *T. ignobilis* (Scotland).

- 4 basal serrulae of lancet (Fig. 13) longer and higher. Tegula edged with red-brown, or entirely red-brown. Slightly smaller: body length of ♀ ca 11-12 mm. ... *T. ignobilis* (Poland (Silesia; syntypes, ZMHUB); lowland-colline zones of Germany, Austria (SDEI); France (Alpes Maritimes, 2000 m., leg. C. Schmid-Egger, SDEI)) [Antennal flagellomeres of reared specimens [3 ♀♀ 1 ♂, Austria, Waldviertel, ex *Sedum telephium*, leg. E. Altenhofer, SDEI] short, but in adults taken in the field, including the types, longer and not different from Scots specimens. The short antennae of the Austrian specimens could be the result of adverse rearing conditions. Alpine specimens exhibit variability in the colour of the rear femora (may be completely red, lacking the usual black dorso-apical streak)].

T. ignobilis is recorded in Central Europe from N. Italy through to the Netherlands and Poland, but also in Norway and Finland (TAEGER et al. 2006). In eastern Central Europe (e.g. East Germany, northern Austria) it has been recorded mainly at lowland sites, including gardens, attached to *Sedum telephium* as the larval host (PSCHORN-WALCHER & ALTENHOFER 2006), mainly in regions of low precipitation and high summer temperatures. TAEGER (1989) observed that it is "not particularly rare" [translated] in [lowland] south-east Germany. However CHEVIN (1974) describes *T. ignobilis* as in France apparently restricted to the Alps.

Only *Sedum telephium* has so far been recorded as a larval host of *T. ignobilis* (FORSIUS 1918 in Finland, PSCHORN-WALCHER & ALTENHOFER 2006 in Austria). According to FORSIUS (1918), typical *T. atra* was also reared from *S. telephium*. *S. telephium* is a mainly lowland species in Highland Scotland, local except in parts of the west, and is not recorded from Meall nan Tarmachan or Ben Lawers, but is widespread in England (BSBI 2010). By analogy and the circumstances of capture at Meall nan Tarmachan, it seems possible that the host there is *Sedum rosea* L. (Roseroot), which is abundant on the many crags of this hill. *S. album* was the only other *Sedum* species observed to be present in the area, but only on disturbed ground around the dam. The re-visit to the locality on 22.06.2010 by Liston involved lengthy searching of *S. rosea* for larvae. None was found, nor were any egg pustules detected, that in *T. ignobilis* are rather conspicuous [obs. Liston; Germany, Brandenburg, Trebnitz [garden] v. 2011]. *S. rosea* nevertheless seems to be a possible host at Meall nan Tarmachan. Future searches for larvae should be made later in the year, perhaps in mid-July. No association with any plant species was recorded for the specimens from Bridge of Garry and we have not been able to ascertain which *Sedum* spp. are recorded there (despite particularly the help of M. Robinson).

Our present concept of the British taxa identified hitherto as *Tenthredo atra* and *T. moniliata* is summarised in the following key. The key should not be used for continental specimens, where

the situation is complicated by apparently greater variability in colour in all taxa [or perhaps additional taxa not yet recognised]. In passing we note as examples just two conspicuous European nominal taxa [several more exist, particularly in the Caucasus] not yet recorded in Britain that will not run cleanly in the key: a female form, at present synonymised with *T. atra*, with a red-banded abdomen, described by KLUG (1817) from Silesia as *T. plebeja*, and the form or forms with darkened stigma and apex of costa, such as *T. nobilis* KONOW, 1904 (type locality St. Petersburg) sometimes, possibly wrongly, synonymised with *T. ignobilis* but in several respects more similar to *T. moniliata*; see comments by ENSLIN (1920), who had however, like us, not seen the holotype.

Key to adults of British *Tenthredo* similar to *T. atra*: replaces couplet 3(2) in BENSON (1952).

1- Stigma and apex of costa of forewing black. ♀: abdomen without red markings; middle serrulae of lancet with rounded teeth. ♂: mesepisternum ventrally completely black; abdomen black with terga 3-5 entirely and more than half of the surface of 2 and 6 red. *T. atra* LINNAEUS, 1758 [polyphagous, but possibly a species group containing several sibling species, some of which occur in Britain]

- Stigma and apex of costa of forewing black or brown. ♀: abdomen with red markings on at least abdominal terga (3, 4 and 5 entirely, but occasionally also the extreme apical margins of 2 and base of 6); middle serrulae of lancet entirely flat or with tooth (but if latter then usually smaller and more angular). ♂: mesepisternum ventrally completely black or partly red; either abdomen black with terga 3-5 entirely and less than half of the surface of 2 and 6 red, or terga 2-6 also completely red ... 2

2- ♀ (Fig. 11): Stigma and apex of costa of forewing black; pronotum completely black; tegula black. ♂: Mesepisternum ventrally completely black. ... *T. ignobilis* KLUG, 1817 [*Sedum telephium*, ? *S. rosea*. In Britain only one species, but in the West Palaearctic possibly others]

- ♀ (Fig. 13): Stigma and apex of costa of forewing brown; upper edge of pronotum lined with white; tegula red. ♂: Mesepisternum ventrally largely red. ... *T. moniliata* KLUG, 1817 [in the British Isles so far only one species, monophagous on *Menyanthes trifoliata*, which may or may not be the taxon described by KLUG. Throughout the Palaearctic possibly a number of sibling species occurs, perhaps attached to other hostplants]

***Tenthredo maculata* GEOFFROY, 1785**

BENSON (1952) records *Tenthredo maculata* as "Widespread and sporadic in woods throughout Britain N. to Firth of Forth [..]". Some recent plantings of young trees have been made around Lochan na Lairige, but the locality can in no way yet be regarded as possessing woodland. In places, the presence of several typically woodland herbs seems however to indicate that more tree or scrub cover once existed. The above records are perhaps so far the most northerly for *T. maculata* in the British Isles, although LISTON (1980a) had already recorded a specimen further south in Perthshire.

***Tenthredo mandibularis* FABRICIUS, 1804**

Edinburgh; Roseburn: 3 ♂♂, 16.vi.2010, leg. Liston; 1 ♀, 17.vi.2010, leg. Liston. Midlothian, Gorebridge, Gore Glen, 1 ♂, 18.vi.2010. Edinburgh, Juniper Green, W. of Leith, 1 ♀, 19.vi.2010, leg. Liston. Angus, 3 miles North of Kirriemuir, 2 ♂♂ (many more individuals seen, but only these two taken as vouchers), 23.vi.2010, leg. Liston (SDEI, RSME).

These Scottish adults were collected exclusively from stands of *Petasites hybridus*, which seems likely to be the larval host. According to BENSON (1952) *Tenthredo mandibularis* is “Recorded from Dorset, Hants., Essex, Kent, Beds., Oxon., Yorks., and Cheshire. Probably occurs wherever the *Petasites* is abundant in England.” No previous records from Scotland of this conspicuous and distinctive species are known. Published hostplant records refer only to *Petasites*, usually without naming a species (LORENZ & KRAUS 1957), or identify only *P. albus* as a host (PSCHORN-WALCHER & ALTENHOFER 2000). According to observations apparently made only by BRISCHKE (1883), but often repeated in subsequent publications without citation of the source, *Petasites officinalis* (a synonym of *P. hybridus*) and *Tussilago farfara* are hosts. *Tussilago farfara* is the main or only host of *T. mandibularis* in Norway according to HEIBO & LÖNNVE (2005).

***Tenthredo moniliata* KLUG, 1817**

Orkney, Hoy, Quoyberstane, HY4612 (111), 1 ♀, 22.vi.2009, leg. Bland, det. Liston.

Malleny Woods, (artificial?) pond, 1 ♀, 12.vi.2010, leg. Liston.

As noted by BENSON (1952), *Tenthredo moniliata* is in the British Isles exclusively associated with *Menyanthes trifoliata* L. [see also above under *T. ignobilis*]. In the Highlands *T. moniliata* is widespread, although not previously recorded in Orkney. Around Edinburgh and in other areas of the British mainland south of the Highlands it has become restricted to a very few sites (except in Wales, where it is local but widespread, as in Ireland). Its sole host has suffered numerous local extinctions, as for example is well documented in the Edinburgh area: compare MARTIN (1934) with BSBI (2010). The colour form with mainly black femora described by CAMERON (1878) as *T. lachlaniana* falls within our present concept of variability in *T. moniliata*. The status of *T. moniliata* as regionally endangered in lowland Britain is similar to its status in the lowlands of Central Europe, but in Austria and Germany the situation is complicated by the existence of populations (or perhaps as yet undistinguished sibling species) on *Origanum* and *Pulsatilla*.

***Tenthredopsis friesei* (KONOW, 1884)**

Tenthredopsis friesei has previously only been recorded in Scotland from the Orkney Islands (LISTON 1983c).

***Tenthredopsis litterata* (GEOFFROY, 1785)**

Dumfriesshire, Annandale Water, 1 ♂, 8.vi.2010, leg. Grearson.

***Tenthredopsis nassata* (LINNAEUS, 1767)**

Old Bridge of Tilt, 1 ♀, 1 ♂, 6.vi.2010, leg. Lønnve.

1 ♀, Longniddry Bents, 11.vi.2010, leg. Liston.

The female Scottish specimens are darker and smaller in average body length than Central European *T. nassata* females as characterized by BLANK & RITZAU (1998). However, colouration of the Scots specimens of both sexes is highly variable, particularly the amount of black on the dorsum of abdomen and mesopleura. CAMERON (1882) referred to such dark British specimens under a number of names that are at present generally regarded as synonyms of *T. nassata*. The

male of *T. nassata* is not at present reliably distinguished from *T. scutellaris* (FABRICIUS, 1804). Only a single female *T. scutellaris* possessing the same highly characteristic colour pattern as Central European *T. scutellaris* (see BLANK & RITZAU 1998) was found during the workshop excursions.

Tenthredopsis ornata (SERVILLE, 1823)

BENSON (1952) records the British distribution of *Tenthredopsis ornata* [as *T. excisa* (THOMSON, 1870)] as “Local in damp grassy places in S. England to Yorks.”

Discussion and Conclusions

Records of over 220 sawfly species are presented here, about 190 of which were recorded in 2010 in the southern Highlands, chiefly in Perthshire. This is slightly less than half the total number of species recorded in Scotland (total 419; based on LISTON et al. (2010) and additions in this work) and speaks for high species richness of the regional sawfly fauna. In comparison, the Workshop in the Lower Tatra of Slovakia (ROLLER et al. 2006), with a similar number of participants and fieldwork days but consistently better weather, also yielded records of about 200 species, but the total number of species known in Slovakia is about 630; ROLLER & HARIS (2008).

The value of Malaise traps as a method that augments the spectrum of taxa and sexes of Symphyta collected by hand, was illustrated once again by the results of Grearson’s Malaise trapping, particularly by the first record of *Hartigia xanthostoma* in Scotland and records of eight other species from Kindrogan that were not collected there using hand nets during the same period.

The negative effect of heavy grazing on the abundance of sawflies struck several of us very forcibly during the excursion on Meall nan Tarmachan and neighbouring areas. Many more individuals and species were found when we entered from below the areas which had been recently fenced to exclude deer and sheep. On 5.vi.2010 Heibo and Prous visited the unfenced areas above the fenced crags, as did Liston on 22.vi.2010, but we all found the higher crags to be markedly lacking in sawflies.

The crags on Meall nan Tarmachan have long been known as a refuge offering some protection from grazing for rare upland plants (ROGER 1965, SMITH 1968). The eastern flank of Meall nan Tarmachan is probably the type locality of the sawfly species *Empria alpina* BENSON, 1938 and *Pontania arbusculae* BENSON, 1941, although it is not absolutely certain whether Benson collected on Meall nan Tarmachan, or less likely, on the opposing, but very much less craggy, lower flank of Ben Lawers. BENSON (1938) stated only that the holotype and two paratypes of *E. alpina* were from “Crags above Lochan à Lairige on the catkins of *Salix reticulata* L. vi.1932 (R. B. Benson)”. Note that *S. reticulata* is probably not a larval host of *E. alpina*: see PROUS et al. 2011; according to V. Vikberg it is *Dryas octopetala*. The same place is the type locality of *P. arbusculae*, but no additional information is given by BENSON (1941) that helps to identify its exact location.

Records of three species (*Phyllocolpa plicaphylicifolia*, *Pristiphora thalictri* and *Tenthredo ignobilis*) not previously known in the British Isles, on the crags above Lochan na Lairige on Meall nan Tarmachan, demonstrate the importance of rock ledges as refugia for specialist insect herbivores. The sawflies belonging to this category have generally been discussed only in the context of the subalpine willow scrub that in Scotland is largely confined to rock ledges at higher altitudes. Without doubt, some of the highly specialized gall-makers attached to *Salix* are amongst the rarest and most highly endangered of Scottish sawflies. Examples are *Pontania samolad* (on

S. lapponum), *P. crassipes* s. str. (= *lapponica* Malaise; see VIKBERG 2003) (on *S. lapponum*) (both known in Britain only from records based on late 19th Century herbarium samples with galls, presented by BENSON 1954) and *P. arbusculae* (see above: in Britain only known from the type series). Any of these species may already have suffered extinction in the British Isles, because extensive searches of their increasingly rare hosts, particularly by Bland, have in recent decades failed to reveal their distinctive galls. On the other hand, our records of *Pristiphora thalictri* and *Tenthredo ignobilis* indicate that some overlooked sawfly species occur on the rock ledges, associated with hostplants other than willows (see also comments on *Pristicampus arcticus* (LINDQVIST, 1959) in LISTON 1982e [as *Pachynematus arcticus*]). Some of these sawfly species may of course yet be found to occur at other types of site, insofar as their hostplants are not entirely restricted to rock ledges.

Pristiphora thalictri is a surprising addition to the British fauna, because its distribution in the W. Palaearctic has hitherto been considered to be largely restricted to C. and S. Europe (TAEGER et al. 2006; see also notes on *P. thalictri*). It has not previously been found in the British Isles or Scandinavia. Possibly the scarcity of reliable data on Nematinae in large parts of Norway and Sweden may be obscuring the true distributions of this and probably some other species, that apparently do not occur sufficiently far north as to have been recorded in the relatively better studied fauna of Finland.

The area near Balerno comprising Red Moss, Bavelaw Marsh, and parts of their fringes, is already recognised as being of regional significance as a conservation area (SCOTTISH NATURAL HERITAGE 2010). Its importance is further underlined by the rich assemblage of sawfly species found there, including several species that are rare elsewhere in lowland Scotland, such as *Abia candens*, *Dolerus cothurnatus*, *Dolerus yukonensis*, *Eutomostethus gagathinus* and *Tenthredo moniliata*. The 116 species recorded around Kindrogan surpasses previous total species numbers recorded for any other single Scottish locality, whilst 82 species from Meall nan Tarmachan is outstanding for a high-altitude site.

The phenology of [sub-] arctic-alpine sawfly species in the Scottish mountains is evidently highly influenced by local variations in topography and microclimate (see notes above on *Pontania lapponicola*). Further examples are found in the timing of emergence of sawflies that are monophagous on *Salix herbacea*. These, with their host, are frequently abundant at the edges of snow beds and their phenology necessarily depends on how quickly these melt. The total period of activity for a local population, both as adults and larvae, may therefore be surprisingly long in some years. Perhaps the large span of dates on which mines of *Pseudodineura enslini* have found (in different years) is a result of similar effects. Little published information on the phenology of subalpine-alpine Nematinae in Scotland is available, apart from that to be found in Benson's works. Note however that the label data given by QUINLAN (1974) for types of several species described from Scotland by Benson, is often more detailed than in the original descriptions, and reveals through the various dates the considerable sampling effort by Benson in various parts of Scotland, particularly in the early 1930's, based often at Killin in Perthshire.

A deficit in our field recording is a lack of documentation of the potential hosts from which imagines of the gall-making Euurina (*Pontania*, *Phyllocolpa*, *Euura*) were collected. Photography suggests itself as the most appropriate method of documentation. Destructive sampling of the host is entirely inappropriate, when the rarer willow species are involved (as also is the removal of large numbers of galls from small areas or small numbers of plants). Whilst bearing in mind that adults of Euurina sometimes feed at catkins of willow species other than those that are their larval hosts (see for example LISTON & SPÄTH 2004; under *Pontania purpureae*), future investigations should nevertheless try to relate each captured individual to some form of archived

botanical data. Especially in quantity, such records provide useful clues to possible hostplant associations. The exact hostplant ranges of several taxa remain unclear, particularly some *Phyllocolpa* and *Euura*, and have been interpreted controversially by different authors in some recent works. Still largely untested (but see REDFERN 2009) is the potential of sequencing of genetic material in answering such questions. This approach might eventually reduce the need to rear adults from larvae: for example in *Phyllocolpa*, that are difficult to rear compared to *Eupontania* and *Pontania* species that make closed galls. On a different level, we can at present only regret the lack of joint studies involving British botanists and entomologists on the complex of unresolved taxonomic and biological factors that surround their respective 'model' organisms. Such co-operation would not only help entomologists. In our opinion, a working knowledge of *Pontania* taxonomy, host associations and gall types applied to presence (and obviously much more cautiously to absence) of galls, can be of great help in the distinction of some *Salix* species. A practical example of this was the identification of the only known extant, pure population of *Salix phylicifolia* in the British Isles outside the Highlands (near Leadhills, Lanarkshire; LISTON 1981a) by occurrence of galls and adults of *Pontania pustulator* [and simultaneously *P. arcticornis*, though this record was never published]. These two gall makers, along with *Pontania dolichura* [s. str.] are strictly monophagous on *S. phylicifolia* (KOPELKE 1999, 2003) and do not occur as stated by BENSON (1958) on *S. nigricans* [= *myrsinifolia*]. Sawflies monophagous on *S. phylicifolia* may be endangered in Scotland by widespread introgression of their host with *S. nigricans*.

A detailed study of the gall-making sawflies attached to *Salix atrocinerea* BROTERO is long overdue. In some recent botanical works, this willow is treated as *S. cinerea* subspecies *oleifolia* (SM.) MACREIGHT. KOPELKE (2003) stated that 6-7 gall making Nematinae are attached to *S. cinerea* in C. and N. Europe. It has so far generally been assumed, without any hard evidence, that the British gall-makers on *S. atrocinerea* (at least five species) are conspecific with their more continental counterparts on *S. cinerea*. Two of these sawfly species are mentioned in the present work, under the names *Euura* sp. of *atra* species group and *Pontania brevicornis*. *Pontania bridgmanii* and *Euura* sp. near *mucronata* often also occur on British *S. atrocinerea*, but at least in the case of the former also on several other rough-leaved *Salix* species (KOPELKE 2005). *Phyllocolpa leucapsis* (= *Nematus coriaceus* BENSON according to KOPELKE (2007b)) also occurs in Britain (type locality (BENSON 1953) of *N. coriaceus*: England, Bucks., Whaddon Chase). According to KOPELKE (2007b) its host on the continent is *S. cinerea*, so perhaps in Britain it is attached to *S. atrocinerea*?

BENSON (1935) commented on the frequent occurrence of adults of normally lowland sawfly species on the tops of Scottish mountains. Most of the sawflies found on high-altitude snow patches in Scotland have also evidently originated at lower altitudes. In recent decades, conifer feeding species have often dominated such material, although their nearest hosts are several miles away. As well as various conifer Nematinae, *Cephalcia lariciphila* (Pamphiliidae) and *Xyela julii* (Xyelidae) are frequently present. Of snow patch sawflies collected by Keith Bland on Glas Maol, Perthshire, roughly about a third each of individuals were conifer-feeding Nematinae (mostly *Sharliphora amphibola* and *Anoplonyx destructor*), *Dolerus* species (mostly *D. haematodes*) and boreal Nematinae (mostly *Pristiphora lativentris* and *P. breadalbanensis*, with a single *Nematus reticulatus*). Of these, only the boreal Nematinae seem likely to be of local origin. On other mountains, Bland has found individuals of many other lowland Symphyta. The occurrence only of female specimens in the samples of some species with a presumed lowland origin (in for example *D. haematodes* (12), and *Xyela julii* (7)), supports the idea that sawfly dispersal often involves a behavioural element (LISTON 1989), as opposed to resulting purely passively from transport by air currents or the activities of humans. However this may be, it is safe to conclude that adult Symphyta frequently travel distances of many miles, at least within landmasses. Evidence for natural dispersal over longer distances across water is however still very limited.

Several species have been mentioned in this contribution from areas further north than previously. In recent years it has become fashionable to assume that new records of insect species in European regions outside (particularly to the North) of their previously known ranges, are the result of climatic warming leading to shifts in distribution. By analogy with some better recorded groups of herbivorous insects such as butterflies (HILL et al. 2002), it seems highly likely that the ranges of many sawflies are at present undergoing considerable changes. That nearly all sawfly females are capable of natural dispersal over long distances, should not be doubted (see above). It is regrettable that data on the distribution of British sawflies is usually too inadequate (both past and present) to allow even a rough, qualitative assessment of such possible range shifts. Species for which a plausible recorded sequence of northwards spread in the British Isles exists are few. Their range extensions in these cases are clearly attributable to human activity, particularly the planting of non-native trees (e.g. *Larix*, *Picea*) in afforestation areas and use of 'exotic' plants in horticulture, the latter often still involving international trade in living material together with potentially contaminated root substrates. Yet in many cases it is not possible to exclude the possibility that a local population may have already inhabited an area which might be considered to have been freshly colonized: *Phymatocera aterrima* is an example.

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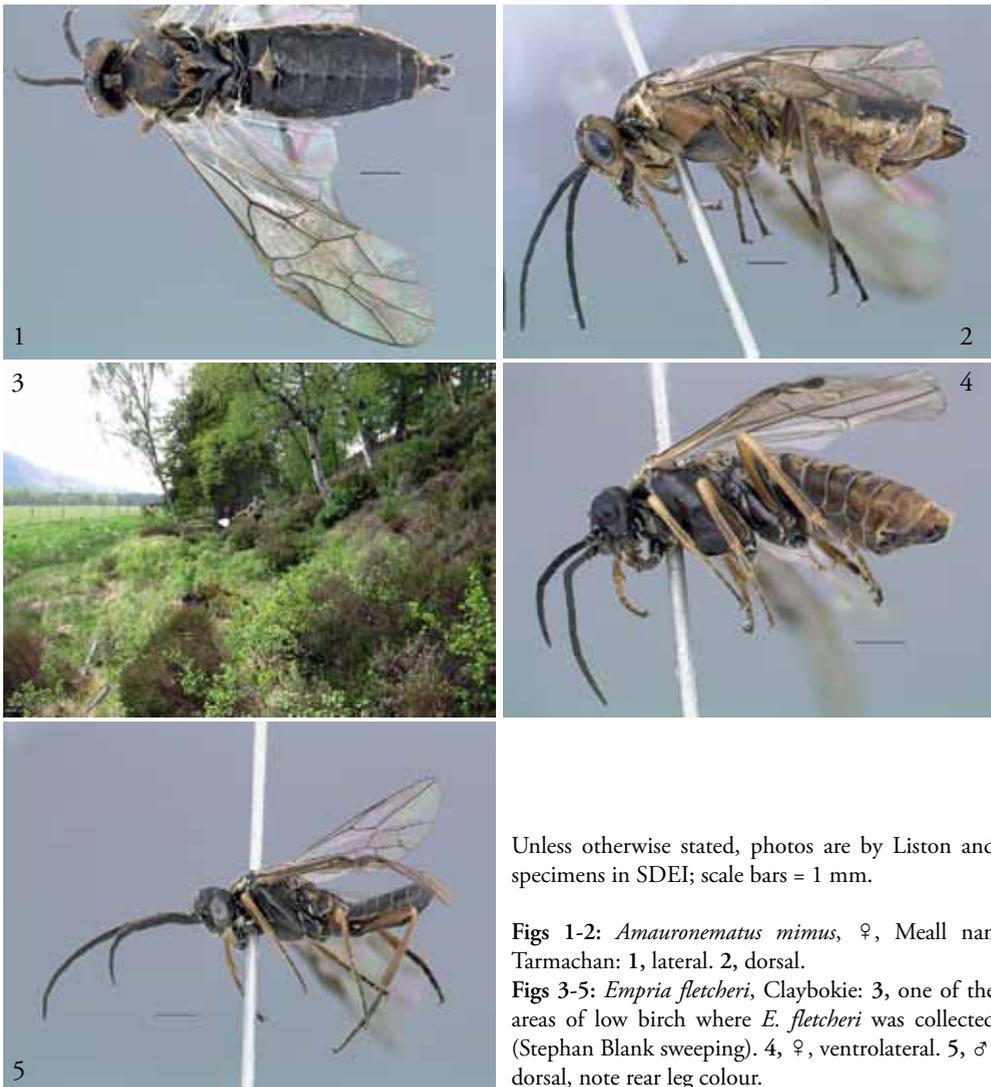
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Unless otherwise stated, photos are by Liston and specimens in SDEI; scale bars = 1 mm.

Figs 1-2: *Amauronematus mimus*, ♀, Meall nan Tarmachan: 1, lateral. 2, dorsal.

Figs 3-5: *Empria fletcheri*, Claybokie: 3, one of the areas of low birch where *E. fletcheri* was collected (Stephan Blank sweeping). 4, ♀, ventrolateral. 5, ♂, dorsal, note rear leg colour.

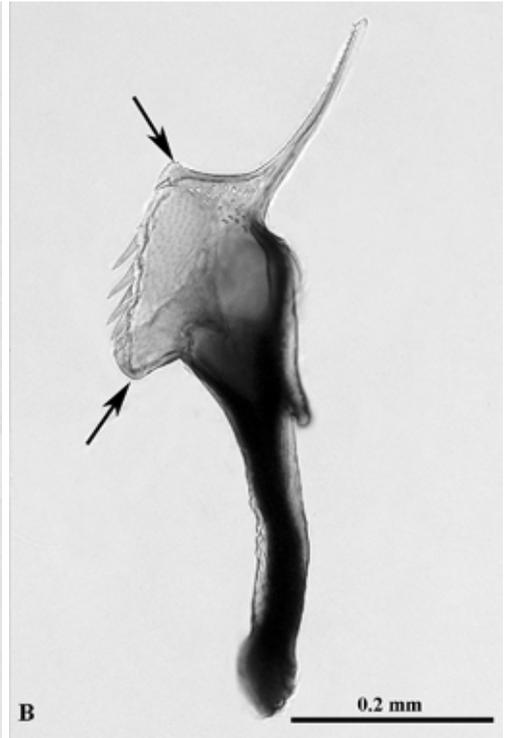


Fig. 6 (photos by M. Prous), penis valves of *Empria fletcheri* (A, Claybokie) and *E. immersa* (B, Denmark, ZMUC). Arrows indicate the parts of the penis valves which show consistent differences between the species. More images are available in Morphbank (<http://www.morphbank.net/?id=591958>).

Fig. 7: *Empria tridens*, Kindrogan: abnormal head (see text).

Figs 8-9: *Pristiphora thalictri*, Meall nan Tarmachan: 8, ♂, lateral. 9, ♀, dorsal.

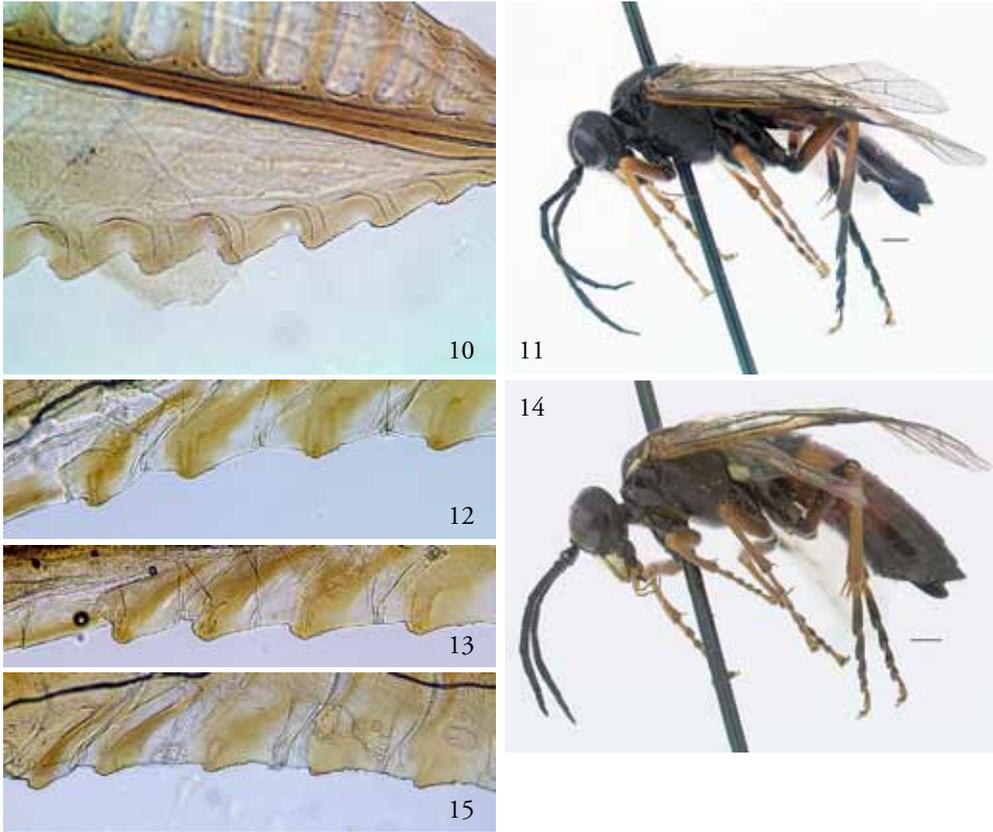


Fig. 10: *Pristiphora thalictri*, Meall nan Tarmachan: 10, apex of lancet. **Figs 11-13:** *Tentredo ignobilis*, Meall nan Tarmachan: 11, ♀, lateral. 12, basal serrulae of lancet. 13, Austria: basal serrulae of lancet. **Figs 14-15:** *Tentredo moniliata*, Bavelaw: 14, ♀, lateral. 15, lancet.