

Proctotrupidae and Heloridae (Hymenoptera; Proctotrupoidea) in Lancashire and Cheshire

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Proctotrupoidea is a little-worked group, but Proctotrupidae and Heloridae, being mostly relatively large insects, are perhaps better known than the remaining families. Proctotrupids are larval parasitoids, principally of Coleoptera and especially Carabidae and Staphylinidae, but also of Diptera. Thirty-six species, including four which are queried, are listed as British by Fitton *et al.* (1978); twenty-six species are reported here from Lancashire and Cheshire. British helorids are larval parasitoids of green lacewings (Chrysopidae), emerging as adults from their hosts' cocoons. Only one of the three listed British species of *Helorus* has been discovered in the counties, but it is suspected that two species may exist under this one name.

Records are mostly from specimens and record cards in the Manchester Museum, records published in Nixon (1938), and from a Malaise trap survey by the author in 1986 at Abbots Moss, Cheshire. Results from this survey are given in full as a contribution to our knowledge of the relative frequencies and phenologies of the species. Identifications are based primarily on the keys in Nixon (1938) and Pschorn-Walcher (1971), and nomenclature follows Fitton *et al.* (1978) unless indicated to the contrary. The old (i.e. pre-1972) county boundaries of Lancashire and Cheshire are recognised. Much of the data in the Manchester Museum results from the energetic collecting of Harry Britten, and his records are indicated by his initials in the list which follows.

HELORIDAE

Helorus ruficornis Förster.

Five males were captured in the Malaise traps at Abbots Moss in 1986.

Helorus coruscus Haliday

This species is synonymised under *H. ruficornis* in Fitton *et al.* (1978) but regarded as distinct by Pschorn - Walcher (1971). I am inclined to accept the latter view and two males from Abbots Moss (10/8/1941, HB) have the short, broad forewing stigma which is characteristic of *H. coruscus*.

PROCTOTRUPIDAE

Disogmus areolator (Haliday)

Seven males are recorded in the 1986 Abbots Moss survey.

D. basalis (Thomson)

Represented in the museum by a single female, determined by G. Nixon 1945, reared from a willow stump (20/5/1931, H.W. Miles) from Mawdesley, Lancs. Hosts of *Disogmus* are unknown, but Nixon (1938) suggests that they may be parasitic on fungus gnats (Mycetophilidae).

Proctotrupes gladiator Haliday

One of each sex, both taken in Lancs. by W.D. Hincks, are the only records. The female was collected in a house at Heaton Norris (10/9/1954) and the male at Chat Moss (26/8/1950).

P. gravidator (L.)

Rather more numerous than *P. gladiator*, this species was represented (although only by a single specimen) in the Abbots Moss survey, and there are Lancs. records of single females from Stretford

(10/8/1945, B.G. Hartham), Chat Moss (26/8/1950, W.D. Hincks) and Grange over Sands (5/10/1947, A.E. Wright). It has been recorded as a solitary parasitoid of *Amara apricaria* (Paykull) (Carabidae) in Germany.

Codrus brevicornis (Haliday)

A female from Reddish, Lancs. (5/6/1927, HB) is mentioned by Nixon (1938) and a possible male in the museum was captured at Cotterill Clough, Ches. (18/9/1945, HB). A few females and a possible male were represented in the Abbots Moss survey. Male *Codrus* pose difficult identification problems and specimens attributed here to *brevicornis*, *formicarius* and *ater* are done so tentatively. More reared material is needed before males can be satisfactorily categorised.

C. longicornis Nees

Taken at Grange over Sands (A.E. Wright), Darwen (A. Brindle), Victoria Park in Manchester (L.W. Grensted), Didsbury and Freshfield (HB) in Lancs., and at North Rode, Goyt Valley, Cotterill Clough and Higher Poynton (HB) in Ches.

C. formicarius (Kieffer) (= *microcerus* Kieffer)

A common species, well-represented in the Abbots Moss survey and with specimens and/or records in the Manchester Museum from Heaton Norris (W.D. Hincks), Downham (HB), Stetford (B.G. Hartham), Plymouth Grove and Levenshulme in Manchester (HB), Cadishead Moss (HB), Haughton Dale (HB) and Grange over Sands (A.E. Wright) in Lancs., and Cotterill Clough, Wilmslow, Rostherne, Sinderland, Marple, Dunham Massey, Arnfield, Wincle (all HB) and Beeston (R.R. Askew) in Ches. There do not appear to be any host records from Britain but in Sweden *C. formicarius* has been reared as a solitary parasitoid of Staphylinidae.

C. ligatus Nees

Allied to the foregoing species but distinctly larger, *C. ligatus* was the less common of the two in the Abbots Moss survey in which females only were recognised. Nixon (1938) mentions two females reared by Harry Britten as solitary parasitoids of *Quedius* (Staphylinidae) larvae found in a mole's nest in Ches. One of these specimens is in the Manchester Museum. It is mounted with the host remains, which have been identified as *Q. othiniensis* (Johansen), and is labelled Marple, 1928. Other Ches. localities are Cotterill Clough, Rostherne, North Rode, Heswall, Delamere, Hazel Grove (all HB), Lymm, Wybunbury (both W.D. Hincks) and Beeston (R.R. Askew). In Lancs. the species has been taken at Grange over Sands (A.E. Wright), Chatburn (HB), Broughton in Furness (HB) and Chat Moss (W.D. Hincks).

C. niger Panzer

This species has been reared as a gregarious parasitoid of an unnamed carabid larva in Britain (Nixon 1938), and of *Staphylinus ater* Gravenhorst in Germany (Weidemann 1962). It is not uncommon, with Lancs records from Rampside (A. Dixon), Grange over Sands (A.E. Wright), Haughton Dale and Freshfield (HB), and Ches. records from Abbots Moss (R.R. Askew), Dunham Massey, Ringway, Cotterill Clough and Higher Poynton (all HB).

C. wasmanni (Kieffer)

A single female was taken in the Abbots Moss survey, and there are two females of this species in the Manchester Museum from Cotterill Clough (19/10/1943) and North Rode (27/10/1940), Ches. (both HB), the latter determined by Nixon, 1953. This species, and the next, appear to be associated with myrmecophilous Staphylinidae, although there are no host records for *C. wasmanni*.

C. donisthorpei (Kieffer)

This species was first described from Cheshire. Donisthorpe (1927) in *The Guests of British Ants* (p. 106) lists '*Exallonyx fumipennis* var. *donisthorpei* Kief., with *M. scabrinodis*. Wallasey (Arnold).' Nixon (1938) located Kieffer's type specimen in Donisthorpe's collection in the Natural History Museum (BMNH) and records its data as 'Lancs (sic) (Wallasey), Oct. 1907, 1♂ in nest of *Myrmica scabrinodis* Nyl.'

C. ater Nees

Rare in the Abbots Moss survey but evidently widespread in the counties, there are museum records and/or specimens of this species from Grange over Sands (A.E. Wright) and Chat Moss (HB) in Lancs., and from Cotterill Clough, Sinderland, Rostherne, Dunham Park and Goyt Valley (all HB) in Ches. Nixon (1938) does not give any host records, but Pschorn-Walcher (1971) following British authors cites (unverified) *Creophilus maxillosus* L. and *Staphylinus olens* Müller (Staphylinidae).

C. gracilis (Nixon)

This is another uncommon insect in the Abbots Moss survey, but there are specimens in the Manchsterr Museum from Cotterill Clough, Sinderland (det. Nixon) and Goyt Valley (all HB) in Ches., and from Grange over Sands (A.E. Wright), Lancs. Nixon (1938) lists the Sinderland (as Sunderland) specimen amongst the material from which he described *gracilis*. The museum records list additionally Pulford, Ches. and Chat Moss, Lancs. as localities. No host is known for this species.

C. confusus (Nixon)

Nixon (1938), in describing this species, refers to smaller and larger forms, and suggests the possibility that two species are involved. Both forms were found in the Abbots Moss survey, and the small form, represented almost entirely by females, was the second most numerous proctotrupid and especially abundant in late autumn. *C. confusus* is widespread in Ches. (Cotterill Clough, Rostherne, Sinderland, Dunham Park, Alderley Edge, Hazel Grove, Poynton, Goyt Valley, Longendale, Heswall, North Rode (all HB) and Staley Brushes (W.D. Hincks), but the only Lancs. records are from Whalley (A. Brindle) and Droylsden (HB). Even though this is such a common species, no host has been recorded in Britain: Pschorn-Walcher (1971) gives a Swedish record of *Philonthus* sp. (Staphylinidae).

C. curtigena (Nixon)

C. curtigena was not found in the Abbots Moss survey but it is present in both counties. There are several museum specimens from Cotterill Clough and singletons from Dunham Park and Goyt Valley, Ches. (all HB), and also a record for North Rode (HB). There is a single Lancs. specimen (det. Nixon, 1938) from Downham (HB).

Paracodrus apterogynus (Haliday)

Represented by two males in the Abbots Moss survey; females are virtually wingless and unlikely to be caught in a Malaise trap. *P. apterogynus* is a gregarious parasitoid of click beetle (Elateridae) larvae, and a female in the Manchester Museum emerged 24/8/1938 from a larva of *Agriotes obscurus* (L.) collected at Warburton, Ches. (M. Cohen). The museum records refer to one male and four females, which is probably the composition of the whole brood.

Parthenocodrus elongatus (Haliday)

There are three females of *P. elongatus* in the Manchester Museum, all caught 31/8/1948 at Dunham Massey, Ches. (HB). This is another parasitoid of elaterid larvae. It was found by P. Fernando, a research student at Manchester University, attacking larvae of *Athous haemorrhoidalis* (Fabricius) in Ernocroft Wood near Marple Bridge, Ches. A larva collected 25/8/1962 produced several parasitoids which pupated in characteristic posture with their posteriors embedded in the remains of the host *Athous* larva. Nine female *P. elongatus* soon emerged and these were presented with newly-moulted *A. haemorrhoidalis* larvae. Fernando notes in his thesis that these larvae moulted again but without any increase in head size, indicating that parasitization had modified host development. One of the *Athous* larvae was dissected and found to contain parasitoid larvae. No other details are recorded.

Phaenoserphus pallipes (Latreille)

A taxonomic problem surrounds the identity of *P. pallipes* and *P. subcompressus* Hedicke (= *vexator* Nixon). The majority of specimens have most of the characters of *pallipes* but some show features indicative of *subcompressus*. I believe that all of the material from the two counties belongs to a single species, which is identified here as *pallipes*, in spite of the fact that some specimens will run in keys to *subcompressus*. Nixon (1938) also expresses uncertainty about the validity of his *P. vexator*, a synonym of *subcompressus*.

This is the most frequently captured proctotrupid in the Abbots Moss survey, but it is represented in the Manchester Museum by only a few specimens from Rostherne, Delamere, Middlewood (all HB) and Lymm (W.D. Hincks) in Ches., and Grange over Sands (A.E. Wright) in Lancs. There is also a female, which some years ago I identified as *P. vexator*, that was reared 16/2/1964 as a solitary parasitoid of a larva of *Nebria brevicollis* (Fabricius) (Carabidae) from Broadbottom, Ches. (C. Johnson). Pschorn - Walcher (1971) quotes a Japanese record of *pallipes* as a solitary parasitoid of *Nebria*, and *P. subcompressus* (identified as *vexator* by Nixon) is stated by Davies (1959) to be a solitary parasitoid of *Notiophilus biguttatus* (Fabricius) and *N. rufipes* Curtis (Carabidae) in Wytham Wood, Berkshire.

P. viator (Haliday)

In contrast to the previous species, *P. viator* was not found in the Abbots Moss survey, but it is represented in the museum by specimens from several localities in the two counties. Lancashire material comes from Heaton Norris (W.D. Hincks), Downham (HB), Longton (HB), Fallowfield in Manchester (W. Winwood), Freshfield (HB) and Carnforth (C. Johnson). The Fallowfield record is of (at least) one male and eight females reared 20/8/1919 from a *Pterostichus* (Carabidae) larva collected 2/8/1919. This is presumably the material referred to by Nixon (1938) from Cumberland (sic) (Fallowfield). At Carnforth, three females were reared from a larva of *Nebria gyllenhali* (Schoenherr) (= *rufescens* Ström) (Carabidae) collected 26/4/1964. Cheshire localities are Tatton Park and Lymm (HB), and also Wilmslow from where an unidentified carabid larva yielded at least ten females on 15/9/1951 (R. Cottam). Nixon (1938) records *Carabus violaceus* L. as a host (Essex) and Basden (1959) gives details of it attacking *Pterostichus madidus* (F.) in Midlothian. Pschorn - Walcher (1971) names several *Carabus* and *Pterostichus* species as hosts on the continent. An account of the biology of *P. viator* as a parasitoid of *Pterostichus niger* (Schaller) in Britain is provided by Eastham (1929) who records up to 45 individuals emerging from a single host.

Phaneroserphus calcar (Haliday)

A common species throughout Britain and found in our counties at Abbots Moss (R.R. Askew), Cotterill Clough, Dunham Park, Rostherne, Alderley Edge, Tintwistle, Ringway, Heswall (all HB) and Lymm (W.D. Hincks) in Ches., and Downham, Levenshulme (both HB) and Grange over Sands (A.E. Wright) in Lancs. Nixon (1938) does not provide a host record but Beaver (1967) reared *P. calcar* from *Bolitochara obliqua* Erichson (Staphylinidae) and Weidemann (1962) found it attacking *Quedius simplicifrons* Fairmaire (Staphylinidae) in Germany. An old record of the centipede *Lithobius* as a host has not been repeated and requires verification.

Brachyserphus parvulus (Nees)

There are few records of this species. A male was taken at Cotterill Clough, Ches. (19/5/1945, HB) and a female in the Abbots Moss survey. Two females are labelled as emerging from the fungus *Pleurotus ostreatus* on beech, 12/9/1947, at Alderley Edge, Ches. (W.D. Hincks). Host records are of beetles belonging to a number of families; Osborne (1960) reared specimens from *Meligethes aeneus* (F.) and *M. viridescens* (F.) (Nitidulidae) in Britain and Pschorn-Walcher (1971) gives *Triplax* (Erotylidae) as a host in Austria. Nixon (1938) identified material from Windsor Park reared from a bracket fungus on ash which contained *Orchesia micans* (Panzer) (Melandryidae). That *B. parvulus* may not be confined to attacking beetle larvae is indicated by a series of one female and five males in the Manchester museum labelled as having emerged on 14/7/1960 from *Platypeza* (*Orthovena*) *furcata* (Fallén) (Dipera, Platypezidae) collected at Whalley, Lancs. by A. Brindle.

Cryptoserphus laricis (Haliday)

This seems to be the most numerous British species in a genus of rather rarely encountered insects. All are believed to be parasitoids of fungus gnats (Mycetophilidae). *C. laricis* has been taken in Victoria Park (L.W. Grensted) and Levenshulme (HB) in Manchester, Longton (W.H. Heathcote) and Colne (HB) in Lancs., and at Cotterill Clough, Goyt Valley, Hale Barns, Arden Hall and Delamere (all HB) in Ches.

C. aculeator (Haliday)

A single female is represented in the Abbots Moss survey (aberrant, with only 12 antennal

segments). In the museum there are a female (North Rode, Ches., 24/10/1940, a male (Cotterill Clough, Ches., 24/10/1944, HB) and a record of a female (Cotterill Clough, 18/9/1945, HB).

C. cumaeus Nixon

One female from Cotterill Clough, Ches. (15/9/1945, HB), together with three females reared from the Honey Fungus, *Armillaria mellea*, at Robin Hood's Bay, Yorkshire (8/10/1959, W.D. Hincks) stand in the Manchester Museum.

C. foveolatus (Moeller) (= *perkinsi* Nixon)

There is one female in the museum, identified by Nixon as *perkinsi*, from Abbots Moss (3/8/1941, HB).

C. longitarsis (Thomson)

This species also is represented in the museum by just a single female (Dunham Park, Ches., 27/9/1947, HB), its identity confirmed by Nixon.

HELORIDAE AND PROCTOTRUPIDAE IN THE ABBOTS MOSS SURVEY

Two Malaise traps were operated continuously in the belt of mixed woodland at Abbots Moss between the driveway to the hall and the Forestry Commission road, between 2nd April and 29th November, 1986. The traps were emptied periodically and numbers and sexes of all specimens in the two families, in the two traps combined, are shown in tabular form below. None was taken in the first two sample periods of the year 2-24th April and 24th April - 7th May. The remaining 9 sample periods were over the following dates:

Period 3	7-27 May	Period 8	5-25 August
Period 4	27 May-12 June	Period 9	25 August-21 September
Period 5	12-27 June	Period 10	21 September-12 October
Period 6	27 June-23 July	Period 11	12 October-29 November
Period 7	23 July-5 August		

	sample no.	3	4	5	6	7	8	9	10	11	Total
HELORIDAE											
<i>Helorus ruficornis</i>	♂	-	-	-	-	4	1	-	-	-	5
PROCTOTRUPIDAE											
<i>Disogmus areolater</i>	♂	-	3	3	-	1	-	-	-	-	7
<i>Proctrupes gravidator</i>	♀	-	-	-	-	-	-	-	-	1	1
<i>Codrus brevicornis</i>	♂?	-	-	-	-	1	-	-	-	-	1
	♀	-	-	3	4	-	-	-	-	-	7
<i>C. formicarius</i>	♂?	-	-	14	30	-	-	-	-	1	45
	♀	1	2	2	-	6	2	-	1	29	43
<i>C. ligatus</i>	♀	-	-	1	-	2	1	-	2	14	20
<i>C. niger</i>	♂	-	-	-	-	2	1	-	-	2	5
	♀	-	-	1	-	-	-	1	1	1	4
<i>C. wasmanni</i>	♀	-	-	-	-	-	-	-	1	-	1
<i>C. ater</i>	♂?	-	-	-	-	-	2	-	-	-	2
	♀	-	-	-	-	-	-	1	-	1	2
<i>C. gracilis</i>	♀	-	-	-	-	3	-	-	-	-	3
<i>C. confusus</i> (small)	♂	-	-	-	-	-	-	-	1	2	3
	♀	-	1	-	1	1	-	-	27	127	157
<i>C. confusus</i> (large)	♂	-	1	6	-	-	-	-	1	-	8
	♀	-	1	1	-	3	-	-	3	35	43
<i>Paracodrus apterogynus</i>	♂	-	-	-	-	1	1	-	-	-	2

<i>Phaenoserphus pallipes</i>	♂	-	5	52	49	24	8	-	2	1	141
	♀	-	-	9	-	7	-	2	2	1	21
<i>P. calcar</i>	♂	2	-	10	32	5	1	1	1	2	54
	♀	-	-	-	1	1	1	-	-	4	7
<i>Brachyserphus parvulus</i>	♀	-	-	-	-	1	-	-	-	-	1
<i>Cryptoserphus aculeator</i>	♀	-	-	-	-	1	-	-	-	-	1

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