

APHID PREDATION BY HARVESTMEN IN POTATO FIELDS IN SCOTLAND

Several species of aphids damage potatoes in Scotland. Dixon (1986) has studied the natural enemies of potato aphids, paying particular attention to polyphagous predators like harvestmen, spiders and ground beetles. The harvestmen, *Leiobunum rotundum* (Latreille) (Todd 1950) and *Phalangium opilio* Linné (Bristowe 1949) are known to prey on aphids, but little information exists on harvestmen as predators of aphids on potatoes. This paper reports on the predation of aphids by harvestmen in potato fields in Scotland.

Harvestmen were caught in pitfall traps during the summers of 1983-85 inclusive in fields of potatoes (cv. Maris Piper) near Edinburgh, Scotland. Pitfall traps were clear polystyrene containers (perimeter: 25 cm) placed in the potato furrows with their rims at soil level. Traps were emptied weekly. Forty-five ml of 10% formalin and a drop of liquid detergent were added to each trap at each

Table 1.—Total numbers of harvestmen caught in pitfall traps in Scottish potato fields during 1983 and 1984.

Species	1983	1984
<i>Phalangium opilio</i> Linné	65	61
<i>Opilio saxatilis</i> C. L. Koch	47	3
<i>Mitopus morio</i> (Fabricius)	16	7
<i>Paroligolophus agrestis</i> (Meade)	11	0
Immature harvestmen	1	19
<i>Leiobunum rotundum</i> (Latreille)	1	1
<i>Oligolophus tridens</i> (C. L. Koch)	1	0
<i>Opilio parietinus</i> (DeGeer)	1	0

sampling occasion. One hundred and twenty traps were spaced over 1.3 ha in 1983, but this trapping intensity was too time consuming and in each of 1984 and 1985, 56 traps were used in 2.0 ha.

Harvestmen were dissected under a binocular microscope and stomachs with attached gastric caecae were removed, placed on slides in 40% glycerine (after Loughridge and Luff 1983), and examined at 100X bright-field. Aphid remains were counted and identified to species (*Macrosiphum euphorbiae* (Thomas), *Myzus persicae* (Sulzer) (Homoptera: Aphididae)) where possible. All harvestmen were dissected except during late summer when aphids were not present in the field.

Seven species of harvestmen were trapped during 1983 and 1984, but none in 1985 (Table 1). Of a total of 233 individuals, 54% were *Phalangium opilio*, a long-legged, highly active species which usually inhabits woodland and bushes (Sankey and Savory 1974). Dempster (1967) suggested that *P. opilio* was an important predator of *Pieris rapae* (L.) (Lepidoptera: Pieridae) in Brussel sprout crops. This harvestmen has been recorded from potato fields in England (Foster 1972). The data for other species trapped are combined over time because the numbers trapped were low. *Phalangium opilio* was present over most of the summer, but *Opilio saxatilis*, the next most frequently trapped species, occurred almost entirely in September. Although populations were probably underestimated by pitfall trapping, the method will have indicated which species were present. The usual methods of sampling harvestmen include beating and sweeping foliage or using funnels (Berlese, Tullgren) to assess soil and litter samples (Sankey and Savory 1974).

Of the species trapped in potato fields, all contained aphid remains except the single *Oligolophus tridens*. Fifty-four percent of 113 *P. opilio* examined, had eaten aphids. The maximum number of aphids found in a harvestman was in a *P. opilio* which contained at least five (30 legs, 4 siphunculi, and 3 rostra).

Opilionids have been neglected and probably undervalued as predators of crop pests. The present study has shown that several species prey on aphids in potato crops. Harvestmen may have great potential in natural pest control and warrant further research.

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