RESEARCH NOTES

LOW TEMPERATURE ACTIVITY OF PSEUDOSCORPIONS AND PHALANGIDS IN SOUTHERN MANITOBA

Horizontal activity of pseudoscorpions and phalangids on the soil surface was determined by means of modified pitfall traps (Aitchison 1974), from October 1973, until May 1975, covering two winter periods with snow cover. In those periods they were collected occasionally. The snow cover acts as a blanket for the soil surface, maintaining the temperature there at close to or just below 0°C while the ambient air temperatures vary between -15° and -35°C. Temperatures under the snow were monitored by thermistor probes in 1973-1974 and by a simple radiotelemetric device in 1974-1975 (Atichison 1974). The three habitat sites were a ridge between two ponds, an aspen-bur oak wood and a damp meadow; collection and description of the study area are described by Aitchison (1974, 1978).

Two species of pseudoscorpions were collected: *Microbisium brunneum* (Hagen) and *M. confusum* Hoff. Both species are parthenogenetic (Hoff 1949). Five adult females and tritonymphs of *M. brunneum* were collected from the ridge and the meadow: one on 31 October 1973, another on 21 November 1973, when the subnivean (under the snow) temperature was -1.5°C. In the winter of 1974-1975 the three remaining specimens were trapped in November and December at subnivean temperatures ranging between -1° and -4°C. One tritonymph of *M. confusum* was taken at a subnivean temperature of -6°C on 28 March 1974.

Weygoldt (1969) reported that in some parts of Europe *Neobisium muscorum* (Leach) was active throughout the cold season, while some other species of pseudoscorpions were active whenever temperatures exceeded 0°C. Höregott (1963) using pitfall traps found that adult activity in *N. muscorum* occurred from October until March, peaking in December and January. This corroborates the data from southern Manitoba where activity occurred mainly between October and December in a somewhat lower temperature range.

Three species of phalangids were collected: *Odiellus pictus* Wood, *Odiellus* sp. nr. *pictus* Wood and an immature *Leiobunum* sp. A total of five specimens were taken in autumn and spring only, one of which was an adult male *O.* sp. nr. *pictus* collected in mid-October 1973. In 1974-1975 four immatures were trapped in an aspen-bur oak wood on 31 October, 7 November and in May. At the end of October, the soil surface temperature was recorded as -0.6°C; in the first week of November it varied between 0° and 4°C; and in May it was 2°C. No specimens were taken during periods of snow cover. It seems as though harvestmen were limited to activity usually at times when the soil surface temperatures exceeded 10°C.

Todd (1949) explained that the species with which she experimented were able to survive -4° to -4.5°C for one hour and furthermore that -9°C was the critical minimum for *Phalangium opilio* L. In Germany activity in winter months was noted in juveniles of *Oligolophus tridens* Koch and *Platybunus triangularis* Herbst (Höregott 1963). *O. pictus* appeared in this study to be active in the temperature range of -0.6° to 4°C in autumn and spring.

Determinations of pseudoscorpions were kindly done by W. B. Muchmore, University of Rochester, New York, and those of phalangids by C. D. Dondale, Biosystematics Research Institute, Agriculture Canada, Ottawa.

C. W. Aitchison, Department of Entomology, University of Manitoba, Winnipeg, Manitoba R3T - 2N2, Canada.

LITERATURE CITED

Aitchison, C. W. 1974. A technique of sampling for subnivean invertebrates in southern Maintoba. Manitoba Entom. 8:32-36.

Aitchison, C. W. 1978. Spiders active under snow in southern Canada. Symp. Zool. Soc. London, 42:139-148.

Hoff, C. C. 1949. The pseudoscorpions of Illinois. Bull. Illinois Nat. Hist. Survey 24(4):412-498.

Höregott, H. 1963. Zur Ökologie und Phänologie einiger Chelonethi und Opiliones (Arach.) des Gonsenheimer Waldes und Sandes bei Mainz. Senck. Biol. (Frankfurt) 44:545-551.

Todd, V. 1949 The habits and ecology of the British harvestmen (Arachnida, Opiliones) with special reference to those of the Oxford district. J. Anim. Ecol. 18:209-229.

Weygoldt, P. 1969. The biology of pseudoscorpions. Harvard University Press, Cambridge, Massachusetts. 145 pp.