ORIBATID MITES (ACARI: ORIBATIDA) OF HAYNES LEASE ECOLOGICAL RESERVE

BY

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Oribatida are a quantitatively important component of most soils. They affect litter decomposition by feeding on and dispersing fungi, and by stimulating senescent fungal colonies through grazing. Many spores pass undigested through their guts giving rise to new fungal colonies. In addition, they carry fungal spores, most of which are viable, on their setae and over their body surface. They indirectly affect soil formation and ultimately, growth of roots and seed germination, by vertical movement of organic matter to deeper soils, humus formation and comminution of plant residues. Many species concentrate nutrients, in particular calcium, in their heavily sclerotized exoskeleton, which can be important in slowing the leaching of these nutrients from the soil. Some species are associated with plants, feeding on various living parts of higher plants, including pollen. A few species are predators on other small soil arthropods and nematodes and may be important in controlling populations of soil nematodes.

There have been very few studies on the oribatid fauna of semiarid grasslands (reviewed in Walter, in press) and desert ecosystems (Franco et al. 1979, Kamill et al. 1985, Steinberger and Whitford 1984, 1985, Wallwork 1972, Wallwork et al. 1984) in the United States, and none in Canada. All these

studies have demonstrated that in these ecosystems the diversity of all mites, including Oribatida, is low. In addition, whereas in forested habitats or areas with a thick humus layer, where Oribatida are more species rich than Actinedida (prostigmatid mites) and quantitatively very important, the reverse is generally true in arid grassland and desert ecosystems. There is some evidence that this is related to a combination of availability of soil moisture and organic matter, such that in microhabitats where organic matter has accumulated oribatid mites are more numerous, and oribatid densities peak during periods of maximum rainfall.

SAMPLING

Thirteen soil and litter samples were collected from the Haynes Lease Ecological Reserve in early July 1986. Samples were collected from a diversity of habitats in the antelope brush and bunchgrass community at the base of the 'throne' and from under Balsamorhiza, Penstamon, Eriogonum and Huechera on the 'throne'. Mites were extracted from eight of these samples in a Berlese-Tullgren extractor which uses a behavioural response to heat to drive the fauna from the soil. Five samples have been retained for future extraction using a wash method. All specimens were deposited in the Canadian National Collection at Biosystematics Research Centre.

RESULTS AND DISCUSSION

Twenty species, including 2 species previously collected by Rob Cannings, are now known from the Haynes Lease area. These species represent 19 genera in 17 families (Table 1). In most habitats, in particular the strictly arid grassland habitats at the base of the 'throne', an undescribed species of Exechocepheus is both the dominent oribatid mite and often the dominent arthropod. Of the oribatid species recorded only adults were found in the July samples, whereas many immatures were found in samples collected from the same habitats in May by Syd Cannings.

As expected, the oribatid species richness in this arid grassland site is low in comparison with that of forest habitats where more than 50 species may be found in a single sample. However, it compares favourably with results from desert and semi-desert habitats in New Mexico where 12 species were recorded (Kamill et al. 1985, Steinberger and Whitford 1985). Taxa that are not usually found in arid grassland localities were recorded from the samples collected on the 'throne', i.e., Propelops, Lepidozetes and Oribatella. Species in these taxa are more common in moist to dry forested to alpine soils, for example, the same species of Propelops is ubiquitous in subalpine soils in Cathedral and Manning Provincial Parks. Their presence on the 'throne' probably reflects a slightly less arid microclimate. It is interesting that similar taxa, at the generic or family level, to those found in the Haynes Lease area have been recorded from desert and arid grassland localities in the U.S. As a result we can hypothesise that all arid

grassland to desert habitats in North America include representatives of the following families: Camisiidae, Trhypochthoniidae, Cosmochthoniidae, Gymnodamaeidae, Damaeidae, Tectocepheidae, Scutoverticidae, Passalozetidae, Scheloribatidae and Oribatulidae.

Passalozetes californicus Wallwork and Ametroproctus canningsi m.s. were not recorded from the samples collected in July, although they were collected in the Haynes Lease Reserve in spring of other years by Rob Cannings. This is the first record of the genus Passalozetes in Canada and A. canningsi is only known from the Haynes Lease area, Kobau Mountain, Manning Prov. Pk. and Waterton Lakes N.P.

Although the oribatid fauna of the Haynes Lease Ecological Reserve is not rich, it is interesting, harbouring the genera Exechocepheus and Passalozetes, which were previously unrecorded from Canada. It is the type locality for Ametroproctus canningsi, and will be the type locality for a species of Exechocepheus when it is described.

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Table 1. Oribatid mites known from the Haynes Lease Ecological Reserve.

COSMOCHTHONIIDAE	*Cosmochthonius* sp. 1
CAMISIIDAE	*Camisia horrida* (Hermann)
TRHYPOCHTHONIIDAE	*Trhypochthonius tectorum* (Berlese)
GYMNODAMAEIDAE	*Odontodamaeus* sp. 1
PLATEREMAEIDAE	*Pedrocortesia* sp. 1
DAMAEIDAE	*Dyobelba* sp. 1
	Dyobelba sp. 2
	Epidamaeus sp. 1
EREMAEIDAE	*Eremaeus* sp. 1
TECTOCEPHEIDAE	*Tectocepheus velatus* (Michael)
OPPIIDAE	*Oppia* sp. 1
CYMBAEREMAEIDAE	*Ametroproctus canningsi* m.s.
PASSALOZETIDAE	*Passalozetes californicus* Wallwork
SCUTOVERTICIDAE	*Exechocepheus* n.sp.
ORIBATULIDAE	*Oribatula* sp. 1
	Zygoribatula fusca (Ewing)
SCHELORIBATIDAE	*Scheloribates* sp. 1
PHENOPELOPIDAE	*Propelops* sp. 1
ORIBATELLIDAE	*Oribatella* sp. 1
TEGORIBATIDAE	*Lepidozetes* sp. 1