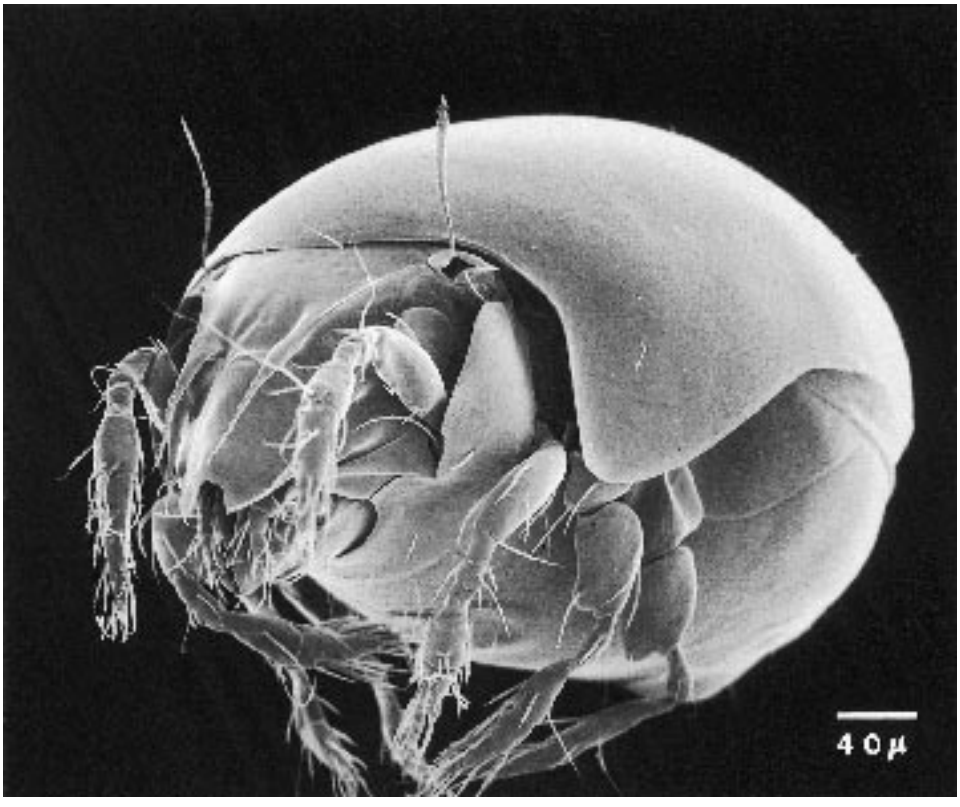

Frontispiece. Scanning electron micrograph of *Ceratozetes borealis* Behan-Pelletier, an East Beringian ceratozetid mite collected only from dry habitats in the Yukon and Alaska.

Oribatid Mites (Acari: Oribatida) of the Yukon

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Abstract. Distribution, ecological and habitat data on the oribatid mite fauna of the northern Yukon are summarized and discussed. Inadequacies in the current data are identified, especially incomplete distributional and zoogeographical data. The known fauna currently comprises 157 species, of which 25 are undescribed, in 87 genera and 50 families. Species in 6 families account for 50 percent of oribatid diversity: Ceratozetidae (28 spp.), Damaeidae (14 spp.), Mycobatidae (10 spp.), Camisiidae (8 spp.), Eremaeidae (7 spp.), Peloppiidae (6 spp.), and Oppiidae (5 spp.). The name *Diapterobates siccatus* Behan-Pelletier (Ceratozetidae) is considered a junior subjective synonym of *D. rotundocuspidatus* Shaldybina.

Of the 132 species whose ranges are known 40 (30%) have a Nearctic distribution, including 22 (17%) with a known range restricted to East Beringia, and 54 (41%) are distributed widely in the Palaearctic and Nearctic regions. Eight species (6%) are East-West Beringian and an additional 11 species (8%) are found throughout the northern Nearctic and in West Beringia, and 6 species (5%) in the Palaearctic and western Nearctic regions. The remaining species have ranges spanning the Nearctic and Neotropical regions (3), or are cosmopolitan (10 species).

Résumé. *Les oribates (Acari: Oribatida) du Yukon*. La répartition, l'écologie et l'habitat de la faune d'oribates du nord du Yukon sont examinés et résumés ici. La mise à jour des données a permis d'identifier les failles dans nos connaissances de la répartition et de la zoogéographie des oribates. La faune actuelle comprend 157 espèces, dont 25 encore inédites, appartenant à 87 genres et 50 familles. Six familles constituent 50 pourcent de toute la faune: les Ceratozetidae (28 espèces), les Damaeidae (14 espèces), les Mycobatidae (10 espèces), les Camisiidae (8 espèces), les Eremaeidae (7 espèces), les Peloppiidae (6 espèces) et les Oppiidae (5 espèces). Le nom *Diapterobates siccatus* Behan-Pelletier (Ceratozetidae) est considéré comme un synonyme subjectif récent de *D. rotundocuspidatus* Shaldybina.

Des 132 espèces dont la répartition est connue, 54 (41%) sont holarctiques et 40 (30%) sont néarctiques, dont 22 (17%) sont restreintes à la Béringie orientale. Huit espèces (6%) ont une répartition panbéringienne, 11 autres (8%) sont répandues dans tout le nord de la région néarctique et en Béringie occidentale et enfin 6 autres (5%) habitent la zone paléarctique et l'ouest de la zone néarctique. Le reste des espèces ont une répartition néarctique et néotropicale (3) ou sont cosmopolites (10).

Introduction

In Yukon habitats, as in nearly all terrestrial ecosystems, Oribatida, the so called "beetle" or "box" mites, are actively involved in decomposition of organic matter, in nutrient cycling and in soil formation. All active instars of these mites feed on a wide variety of material including living and dead plant and fungal material, lichens and carrion; some are predaceous, but none is parasitic. Oribatida influence decomposition and soil structure by comminuting organic matter and producing faecal pellets, which provide a large surface area for decomposition and are in turn an integral component of soil structure. They disperse bacteria and fungi, both externally on their body surfaces, and by feeding on spores that survive passage through their alimentary tracts. Many oribatid species sequester calcium and other minerals in their thickened cuticle. Thus, their bodies may form important "sinks" for nutrients, especially in nutrient-limited environments such as peatlands (Crossley 1977; Norton and Behan-Pelletier 1991). Recent reviews on the role of Oribatida in decomposition and nutrient cycling include those of Wallwork (1983), Seastedt (1984) and Norton (1986).

pp. 115–149 in H.V. Danks and J.A. Downes (Eds.), Insects of the Yukon. Biological Survey of Canada (Terrestrial Arthropods), Ottawa. 1034 pp.

The role of oribatid mites in decomposition, nutrient cycling and soil formation in northern soils is particularly important as large invertebrates such as earthworms, isopods, myriapods and some insects are absent or infrequently present (Behan 1978). In subarctic localities and organically rich low-arctic areas, oribatid mites are the dominant soil microarthropods, in terms of both biodiversity and density. As in temperate areas, however, soils low in available moisture and/or organic matter support a greater diversity and density of actinedid than oribatid mites (Kethley 1990).

Approximately 366 species of oribatid mites in 163 genera and 73 families are known to occur in Canada (Marshall et al. 1987; Behan-Pelletier 1993*a*, *b*, 1994; Colloff 1993), and 157 species (of which 25 are undescribed), representing 87 genera and 50 families are known from the Yukon Territory (Tables 1 and 2). The first data on Yukon oribatid mites were based on specimens collected from northern coastal tussock tundra (Behan 1978). A study by Hammer (1952) on the oribatid fauna of the Canadian arctic and subarctic pre-dated similar information on this large group of mites from other parts of Canada by almost 16 years, but Hammer never collected in the Yukon. She did, however, collect 33 species of Oribatida from tundra in part of the Richardson Mountains (68°24′N 135°37′W) adjacent to the Yukon. Eleven of these species were new to science, and subsequently all 33 of these species have been recorded from the Yukon.

The present study deals primarily with the oribatid fauna of arctic and subarctic habitats in the northern Yukon. In recent years this part of the Yukon has been more thoroughly studied, in particular the habitats in the British, Richardson and Ogilvie Mountains, and North Slope, and those traversed by the Dempster Highway (Behan-Pelletier and Norton 1983, 1985; Behan-Pelletier 1985, 1986, 1988, 1993*b*, 1994). Unfortunately, other than limited collections from Kluane Lake area, Carcross Dunes, and scattered points along the Klondike Highway, the oribatid fauna of the southern Yukon is unknown (Table 4).

I estimate that the 157 species of Oribatida currently recorded represent at most 40 percent of the Yukon oribatid fauna. For example, approximately 70 species occur in the Northwest Territories and/or Alaska (Behan-Pelletier 1993*a*) and are not currently known from the Yukon, though their presence is expected. In contrast, recent estimates suggest that at most 25 percent of the oribatid species in Canada or North America have been described (Behan-Pelletier 1993*a*; OConnor 1990).

Most genera of Oribatida occurring in the Yukon require thorough taxonomic revision and phylogenetic analysis. In few cases have North American specimens of putative Holarctic species been compared with Palaearctic specimens. Recent access to oribatid specimens from Siberia and the Russian Far East have permitted some clarification of the taxonomy, and resulted in the new synonymy (*Diapterobates rotundocuspidatus* Shaldybina, 1970 and *D. siccatus* Behan-Pelletier, 1986) noted in Table 2.

Nature of the Fauna

Habitats. The oribatid faunas of temperate and arctic regions differ. That of temperate regions is found throughout the soil profile, in surface litter, on low-growing herbs and shrubs and on the trunk, branches and foliage of trees. In contrast life-forms at northern latitudes are primarily associated with the soil surface, litter and moss cover; deep soil forms and arboreal species are absent. Intuitively, the more restricted northern fauna appears to be correlated with presence of permafrost and lack of trees. There is a reduced diversity of Oripodoidea, a superfamily which includes many arboreal species. Only one species of the carabodid genus *Carabodes* occurs in the Yukon, though this genus is represented by

9 species in arboreal and litter habitats in eastern Canada, where adults and immatures feed on fungi (Reeves 1988, 1990; Table 1). Similarly, the Phthiracaroidea and Euphthiracaroidea, whose members are primarily associated with decaying wood, are rare in northern habitats (Table 1). However, these indications have not been tested fully; for example, techniques such as deep soil washing and heptane flotation, or twig washing, have not been used in Yukon habitats; similarly, few aquatic habitats have been sampled, and the permafrost/active layer boundary has been overlooked. We need to know considerably more about the biology and ecology of individual species to establish which historical or ecological variables, or combinations thereof, limit the distribution of specific taxa. Other taxa with sparse or no representation in northern habitats are the Hermanniellidae, Cepheidae, Oribatellidae and Galumnatidae, which attain greatest species richness in deciduous forests.

Life History. Oribatid mites have 6 postembryonic instars: an inactive prelarva, and active larva, protonymph, deutonymph, tritonymph and adult. All active instars feed, and feeding habits may differ between immatures and adults of the same species (Siepel 1990). Oribatid mites generally have low metabolic rates, slow development and low fecundity and exemplify "K-selected" organisms (Crossley 1977). Species are iteroparous with adults living a relatively long time (Norton 1993). Estimates of development time from egg to adult vary from several months to 2 years in temperate forest soils (Luxton 1981). In cool climates oribatid mites have longer life cycles. For example, *Tectocepheus velatus* (Michael) from northern Norway lives for 2 or more years (Solhøy 1975). Data from Burn (1986) suggest that the duration of nymphal stages of the Antarctic species *Alaskozetes antarcticus* (Michael) may be more than 3 years.

Oribatid mites in temperate and cold habitats exhibit extensive supercooling ability (Sømme 1981). In all species studied immature instars are at least as cold hardy as adults (Cannon 1983) and immatures and adults can overwinter in mixed populations (Cannon and Block 1988). Oribatida in temperate and cold habitats also have cold-tolerance traits such as accumulation of cryoprotectants and resistance to desiccation, but data suggest that these traits are plesiotypic rather than adaptive in Oribatida (Behan-Pelletier 1997). However, there is some evidence for modifications in metabolism such as lowered enzyme activation temperatures relative to temperate species (Convey 1994*b*). Nevertheless, as Norton (1993) notes, "the evidence for oribatid mite life-history traits specifically adapted to cold environments is weak, especially when one compares known traits of temperate species".

Genetic Systems. Thelytokous parthenogenesis is common in oribatid mites and nearly half of early derivative oribatid families (Families 1 to 20 in Table 1) contain no sexual species (Norton et al. 1993). In more derived oribatid mites (the Brachypylina) thelytoky is rare; however, members of the genera *Tectocepheus*, *Oppiella*, *Quadroppia*, *Suctobelbella*, *Limnozetes*, and *Ceratozetes parvulus* Sellnick are known or suspected parthenogens. In total about 20 percent of the Yukon oribatid fauna are known or suspected parthenogens, a figure which closely approximates the percentage of parthenogens estimated for the total Canadian oribatid fauna (Behan-Pelletier and Bissett 1994), and the estimated 15 percent of suspected parthenogens in the temperate North American oribatid fauna (Behan-Pelletier 1997). There is no evidence for an increase in percentage of parthenogenetic species as an adaptation to arctic conditions, as noted by Downes (1965) and Danks (1990) for certain groups of insects. Although 45 percent of the oribatid fauna of the high arctic is thelytokous (Behan-Pelletier 1997), there is no evidence that this is a response to cold, and there are no supporting altitudinal correlations (Norton et al. 1993) or antarctic correlations (Convey

1994*a*). Rather, this level of thelytoky possibly is a reflection of the disturbed nature of high-arctic soil microhabitats (Behan-Pelletier 1997).

Habitats and Ecology of Oribatid Mites in the Yukon

Oribatid mites recorded from the Yukon have been recovered from a variety of microhabitats in the different ecoregions ranging from black spruce forests, boreal forests, and tamarack bogs to rock-garden type vegetation on dry scree slopes (Tables 3 and 4). To facilitate discussion I have attributed these various microhabitats primarily to one or other of the 6 major habitats defined by Lafontaine and Wood (1988) in their study of the Noctuidae of Beringia (Table 3). I have, however, subdivided their "wet tundra" habitat into its main components "bog tundra" and "shrub tundra", based on my data that show that many oribatid species prefer the drier shrub tundra component. Likewise, the rock desert/fell-field extreme has been separated from the "dry tundra" habitat, as some oribatid species seem to be restricted to this barren habitat.

I have added an additional habitat, marine littoral, which I characterize as a broad to narrow band of soil extending between the low bog/shrub tundra of the coastal plain and the sea. It is an area covered by salt water or ice at various times during the year, as evidenced by extensive accumulations of driftwood. Vegetation varies from absent to sparse, with scattered *Sedum*, *Polygonum* and *Carex* species.

Of the 73 families and 37 superfamilies found in Canada, 50 and 30, respectively, have been recorded from the Yukon (Tables 1, 2; Figs. 1–6). Only superfamilies represented by several species in the Yukon, or those of special interest, are discussed below.

Superfamily Hypochthonioidea

Hypochthonius rufulus (C.L. Koch), a species with an Holarctic distribution, is the only representative of the Hypochthonioidea collected in the Yukon so far. This species feeds primarily on bacteria (Luxton 1972) and is a common inhabitant of peatlands in Canada and the Palaearctic region. The widely distributed *Eniochthonius minutissimus* (Berlese) lives in North American and European peatlands and I anticipate its occurrence in this habitat in the southern Yukon.

Superfamily Brachychthonioidea

These are small mites, generally less than 250 μm in size, found in soil, moss and litter. They are microphytophagous, feeding on fungi and possibly also bacteria (Luxton 1991). In the Yukon they are primarily inhabitants of shrub tundra. Only 5 of 16 species known from the northern Nearctic region occur in the Yukon, 4 of which have an Holarctic distribution. I consider the only explanation for this low diversity to be insufficient collecting.

Superfamily Phthiracaroidea and **Superfamily Euphthiracaroidea**

As already noted these superfamilies are poorly represented in Yukon soils and litter. Species in both superfamilies are primarily macrophytophages (Luxton 1972), feeding on decaying parts of higher plants. Adults and immatures of some species prefer conifer needles, whereas those of other species are xylophages on twigs and rotting branches; others burrow into the woody vascular tissue of leaves (Jacot 1930).

Superfamily Perlohmannioidea

The single, very large (1000 μm as adults) species in this superfamily may be conspecific with *Perlohmannia zachvatkini* Bulanova-Zachvatkin, known from Sakhalin Island

(text continues on p. 142)

TABLE 1. Diversity of Oribatida in Canada and the Yukon.

Family	Number of genera	Number of species		
		Canada	Alaska/Northwest Territories	Yukon
Palaeacaroidea				
1. Palaeacaridae	1	2	2	2
Ctenacaroidea				
2. Aphelacaridae	1	1	-	-
Hypochthonioidea				
3. Hypochthoniidae	1	1	1	1
4. Eniochthoniidae	1	1	1	-
5. Mesoplophoridae	-	-	1	-
Brachychthonioidea				
6. Brachychthoniidae	8	23	16	5
Atopochthonioidea				
7. Pterochthoniidae	1	1	-	-
Parhypochthonioidea				
8. Parhypochthoniidae	1	2	-	-
9. Gehypochthoniidae	1	1	-	1
Phthiracaroidea				
10. Phthiracaridae	5	9	4	2
Euphthiracaroidea				
11. Oribotritiidae	2	2	2	1
12. Euphthiracaridae	3	4	1	1
Eulohmannioidea				
13. Eulohmanniidae	1	1	1	1
Perlohmannioidea				
14. Perlohmanniidae	1	1	1	1
Epilohmannioidea				
15. Epilohmanniidae	1	2	1	1
Crotonioidea				
16. Nothridae	1	5	2	2
17. Camisiidae	3	12	9	8
18. Trhypochthoniidae	3	5	2	2
19. Malaconothridae	2	2	3	1
Nanhermannioidea				
20. Nanhermanniidae	1	4	1	1
Hermannioidea				
21. Hermanniidae	1	3	3	3
Hermannielloidea				
22. Hermanniellidae	1	2	-	-
23. Plasmobatidae	1	1	-	-
Liodoidea				
24. Liodidae	1	1	-	-
Plateremaeoidea				
25. Gymnodamaeidae	5	9	4	4
26. Plateremaeidae	1	1	-	-
27. Licnodamaeidae	1	1	-	-
Damaeoidea				
28. Damaeidae	7	20	15	14
Cephoidea				
29. Cepheidae	4	7	2	1
Polypterozetoidea				
30. Podopterotegaeidae	1	1	-	-
Microzetoidea				
31. Microzetidae	1	1	-	-
Amerobelboidea				
32. Damaeolidae	1	1	-	-
33. Eremobelbidae	1	2	-	-
Eremaeoidea				
34. Eremaeidae	2	24	4	7

TABLE 1. (*continued*)

Family	Number of genera	Number of species		
		Canada	Alaska/Northwest Territories	Yukon
35. Megeremaeidae	1	4	1	1
Gustavioidea				
36. Tenuialidae	2	2	-	1
37. Liacaridae	3	5	3	3
38. Astegistidae	2	4	1	1
39. Peloppiidae	3	8	6	6
40. Gustaviidae	1	2	-	-
Carabodoidea				
41. Carabodidae	1	10	1	1
Tectocepheoidea				
42. Tectocepheidae	2	3	2	2
Oppioidea				
43. Oppiidae	6	14	6	5
44. Quadroppiidae	1	1	1	1
45. Suctobelbidae	3	11	4	4
46. Autognetidae	2	2	1	1
47. Caleremaeidae	1	2	2	1
48. Thyrisomidae	3	5	3	3
Hydrozetoidea				
49. Hydrozetidae	1	1	1	1
50. Limnozetidae	1	9	1	1
Ameronothroidea				
51. Ameronothridae	1	3	2	1
52. Tegeocranellidae	1	1	-	-
Cymbaeremaeoidea				
53. Cymbaeremaeidae	3	9	1	1
Licneremaeoidea				
54. Passalozetidae	1	1	1	1
55. Scutoverticidae	1	1	-	-
Oripodoidea				
56. Scheloribatidae	4	9	4	4
57. Oribatulidae	5	9	3	3
58. Haplozetidae	5	8	2	2
59. Mochlozetidae	2	2	1	-
60. Parakalummidae	2	3	1	1
Ceratozetoidea				
61. Chamobatidae	1	2	1	-
62. Euzetidae	1	1	-	-
63. Zetomimidae	2	2	-	-
64. Ceratozetidae	11	40	29	28
65. Cyrtozetidae	1	1	1	1
66. Humerobatidae	1	2	-	-
67. Mycobatidae	5	23	11	10
Phenopelopoidea				
68. Phenopelopidae	3	8	4	3
69. Unduloribatidae	1	1	-	-
Oribatelloidea				
70. Oribatellidae	1	5	3	3
Achipterioidea				
71. Tegoribatidae	3	5	5	5
72. Achipteriidae	5	8	2	2
Galumnatoidea				
73. Galumnatidae	3	6	1	1
Unplaced genera	2	2	0	0
Total	161	385	181	157

TABLE 2. Distribution of Yukon Oribatida. Abbreviations: AK, Alaska; YT, Yukon Territory; BC, British Columbia; AB, Alberta; SK, Sask atchewan; MB, Manitoba; ON, Ontario; PQ, Quebec; NB, New Brunswick; PE, Prince Edward Island; NS, Nova Scotia; NF, Newfoundland.

Species	AK	YT	NT	BC	AB	SK	MB	ON	PQ	NB	PE	NS	NF	Range
Palaeacaroidea														
Palaeacaridae														
Palaeacarus hystricinus Trägårdh	+	+						+	+				+	Holarctic
Palaeacarus sp.		+												
Hypochthonioidea														
Hypochthoniidae														
Hypochthonius rufulus (C.L. Koch)	+	+	+				+	+	+				+	Holarctic
Brachychthonioidea														
Brachychthoniidae														
Eobrachychthonius borealis Forsslund	+	+	+											Holarctic
E. latior (Berlese)	+	+	+				+	+	+				+	Holarctic
Liochthonius forsslundi (Hammer)	+	+	+											Northern Nearctic
L. sellnicki Thor	+	+	+				+		+				+	Holarctic
Sellnickochthonius suecica (Forsslund)		+	+											Cosmopolitan
Parhypochthonioidea														
Gehypochthoniidae														
Gehypochthonius rhadamanthus Jacot		+							+					Cosmopolitan
Phthiracaroidea														
Phthiracaridae														
Atropacarus striculus (C.L. Koch)		+	+					+	+					Holarctic
Phthiracarus borealis (Trägårdh)	+	+												Holarctic
Euphthiracaroidea														
Oribotritiidae														
Protoribotritia sp.		+												
Euphthiracaridae														
Rhysotritia ardua (C.L. Koch)	+	+	+				+						+	Cosmopolitan
Eulohmannioidea														
Eulohmanniidae														
Eulohmannia ribagai (Berlese)	+	+	+				+	+	+					Holarctic
Perlohmannioidea														
Perlohmanniidae														
Perlohmannia sp. near *coiffaiti* Grandjean	+	+	+											

Epilohmannioidea													
Epilohmanniidae													
Epilohmannia sp.		+											
Crotonioidea													
Nothridae													
Nothrus borussicus Sellnick	+	+	+			+							Holarctic
N. pratensis Sellnick	+	+	+					+				+	Holarctic
Camisiidae													
Camisia biurus (C.L. Koch)	+	+	+		+								Holarctic
C. dictyna Colloff		+	+										Nearctic-West Beringian
C. foveolata Hammer	+	+											Palaearctic-East Beringian
C. horrida (Hermann)	+	+	+		+	+		+	+				Holarctic
C. spinifer (C.L. Koch)	+	+											Holarctic
Heminothrus longisetosus Willmann	+	+						+					Holarctic
Platynothrus peltifer (C.L. Koch)	+	+	+				+	+			+	+	Cosmopolitan
P. punctatus (L. Koch)	+	+	+			+							Holarctic
Trhypochthoniidae													
Trhypochthoniellus setosus canadensis Hammer	+	+	+										Western Nearctic
Trhypochthonius tectorum (Berlese)	+	+	+	+		+		+					Holarctic and Neotropical
Malaconothridae													
Malaconothrus mollisetosus Hammer	+	+	+			+		+				+	Holarctic and Neotropical
Nanhermannioidea													
Nanhermanniidae													
Nanhermannia sp.		+											
Hermannioidea													
Hermanniidae													
Hermannia hokkaidensis Aoki		+											Palaearctic-East Beringian
H. reticulata Thorell	+	+	+					+					Holarctic
H. subglabra Berlese	+	+	+								+		Holarctic
Plateremaeoidea													
Gymnodamaeidae													
Gymnodamaeus ornatus Hammer		+	+										East Beringian

TABLE 2. (*continued*)

Species	AK	YT	NT	BC	AB	SK	MB	ON	PQ	NB	PE	NS	NF	Range
Nortonella gildersleeveae (Hammer)	+	+	+		+		+							Western Nearctic
Pleodamaeus sp. 1		+												
Pleodamaeus sp. 2		+												
Damaeidae														
Belbodamaeus sp.		+												
Caenobelba alleganiensis Norton	+	+		+				+						Nearctic disjunct
Epidamaeus arcticolus (Hammer)	+	+	+											Palaearctic-Western Nearctic
E. bakeri (Hammer)	+	+	+											Palaearctic-Western Nearctic
E. coxalis (Hammer)	+	+	+											Holarctic
E. floccosus Behan-Pelletier and Norton	+	+												East Beringian
E. fortispinosus Hammer	+	+							+					Nearctic-West Beringian
E. koyukon Behan-Pelletier and Norton	+	+	+											East Beringian
E. longitarsalis (Hammer)	+	+	+											Holarctic
E. mackenziensis (Hammer)	+	+	+											East Beringian
E. nasutus Behan-Pelletier and Norton	+	+												East Beringian
E. tritylos Behan-Pelletier and Norton	+	+	+											East-West Beringian
Epidamaeus (Akrodamaeus) sp.		+	+											
Lanibelba sp.		+												
Cepheoidea														
Cepheidae														
Cepheus corae Jacot	+	+	+						+				+	Nearctic
Eremaeoidea														
Eremaeidae														
Eremaeus grandis Hammer	+	+	+											East Beringian
E. translamellatus Hammer	+	+	+	+	+	+								Holarctic
Eueremaeus foveolatus Hammer	+	+	+	+	+	+			+					Holarctic
Eu. marshalli Behan-Pelletier		+	+	+	+	+	+	+	+					Nearctic
Eu. nahani Behan-Pelletier		+												Cordilleran/Western Nearctic
Eu. quadrilamellatus Hammer	+	+	+											East Beringian
Eu. yukonensis Behan-Pelletier		+												East Beringian

Megeremaeidae														
Megeremaeus keewatin Behan-Pelletier		+	+											East Beringian
Gustavioidea														
Tenuialidae														
Tenuiala sp.		+												
Liacaridae														
Dorycranosus parallelus Hammer	+	+												East-West Beringian
Dorycranosus sp.		+	+											
Liacarus bidentatus Ewing	+	+		+										Nearctic
Astegistidae														
Cultroribula dentata Willmann	+	+	+											Holarctic
Peloppiidae														
Ceratoppia bipilis (Hermann)	+	+	+		+		+	+	+	+			+	Holarctic
C. quadridentata arctica Hammer	+	+	+		+				+					Nearctic-West Beringian
C. sexpilosa Willmann	+	+	+											Holarctic
C. sphaerica (L. Koch)	+	+	+											Holarctic
Metrioppia helvetica Grandjean	+	+	+											Holarctic
Pyroppia lanceolata Hammer	+	+												Palaearctic-East Beringian
Carabodoidea														
Carabodidae														
Carabodes labyrinthicus (Michael)	+	+	+						+					Holarctic
Tectocepheoidea														
Tectocepheidae														
Tectocepheus sarekensis Trägårdh	+	+												Cosmopolitan
T. velatus (Michael)	+	+	+	+	+	+	+	+	+	+	+	+	+	Cosmopolitan
Oppioidea														
Oppiidae														
Moritzoppia clavigera (Hammer)	+	+	+				+							Holarctic
Oppiella maritima (Willmann)	+	+	+										+	Holarctic
O. nova (Oudemans)	+	+	+	+	+	+	+	+	+	+	+	+	+	Cosmopolitan
O. translamellata (Willmann)	+	+	+						+				+	Holarctic
Ramusella maculata (Hammer)	+	+	+				+		+					Holarctic
Quadroppiidae														
Quadroppia quadricarinata (Michael)	+	+	+				+		+					Cosmopolitan
Suctobelbidae														
Suctobelbella acutidens (Forsslund)	+	+	+						+				+	Holarctic
S. near *palustris* (Forsslund)		+	+											

TABLE 2. (*continued*)

Species	AK	YT	NT	BC	AB	SK	MB	ON	PQ	NB	PE	NS	NF	Range
S. setosclavata (Hammer)	+	+	+											Nearctic
S. hammerae (Krivoluckij)		+	+				+							Holarctic
Autognetidae														
Autogneta longilamellata (Michael)	+	+	+					+	+	+			+	Holarctic
Caleremaeidae														
Veloppia pulchra Hammer	+	+											+	Northern Nearctic
Thyrisomidae														
Banksinoma lanceolata canadensis Fujikawa		+	+											Nearctic
B. spinifera (Hammer)		+					+							Western Nearctic
Gemmazetes sp.		+												
Hydrozetoidea														
Hydrozetidae														
Hydrozetes sp.		+												
Limnozetidae														
Limnozetes canadensis Hammer	+	+	+											Western Nearctic
Ameronothroidea														
Ameronothridae														
Ameronothrus lineatus (Thorell)	+	+	+											Holarctic
Cymbaeremaeoidea														
Cymbaeremaeidae														
Ametroproctus beringianus Behan-Pelletier		+												East-West Beringian
Licneremaeoidea														
Passalozetidae														
Passalozetes sp.		+		+										
Oripodoidea														
Scheloribatidae														
Liebstadia similis (Michael)	+	+	+		+									Cosmopolitan
Hemileius sp.		+	+											
Scheloribates pallidulus (C.L. Koch)	+	+	+		+		+		+					Holarctic
Scheloribates sp.		+	+											
Oribatulidae														
Oribatula tibialis (Nicolet)	+	+	+						+					Holarctic
Zygoribatula bulanovae Kulijew	+	+	+				+		+					Holarctic
Zygoribatula sp.		+												

Haplozetidae													
Peloribates canadensis Hammer	+	+	+				+		+				Nearctic-West Beringian
P. pilosus Hammer	+	+	+				+						Holarctic
Parakalummidae													
Neoribates aurantiacus (Oudemans)	+	+	+				+	+	+	+		+	Holarctic
Ceratozetoidea													
Ceratozetidae													
Ceratozetes borealis Behan-Pelletier	+	+											East Beringian
C. fjellbergi Behan-Pelletier	+	+											East Beringian
C. gracilis (Michael)	+	+		+	+	+	+	+	+	+		+	+	Cosmopolitan
C. inupiaq Behan-Pelletier		+	+											East Beringian
C. kutchin Behan-Pelletier		+												East Beringian
C. parvulus Sellnick	+	+											+	Holarctic
C. spitsbergensis Thor	+	+	+											Palaearctic-East Beringian
C. thienemanni Willmann	+	+	+		+		+	+	+	+		+	+	Holarctic and Neotropical
Dentizetes rudentiger Hammer		+			+									Cordilleran/Western Nearctic
Diapterobates humeralis (Hermann)	+	+	+										+	Holarctic
D. notatus (Thorell)	+	+	+				+					+		Holarctic
D. rotundocuspidatus Shaldybina (= *D. siccatus* Behan-Pelletier **new synonymy**)	+	+	+											East-West Beringian
D. variabilis Hammer	+	+	+						+				+	Holarctic
Fuscozetes sellnicki Hammer	+	+	+				+		+				+	Holarctic
Ghilarovizetes longisetosus Hammer	+	+	+						+			+		Nearctic-West Beringian
Iugoribates gracilis Sellnick	+	+	+											Northern Nearctic
Laminizetes fortispinosus Behan-Pelletier		+	+											East Beringian
Melanozetes meridianus Sellnick	+	+	+				+		+					Holarctic
M. tanana Behan-Pelletier	+	+												East Beringian
Neogymnobates luteus (Hammer)	+	+	+											Western Nearctic
Sphaerozetes arcticus Hammer	+	+	+									+		Holarctic
S. castaneus Hammer	+	+												East Beringian
S. firthensis Behan-Pelletier		+												East Beringian

TABLE 2. (*continued*)

Species	AK	YT	NT	BC	AB	SK	MB	ON	PQ	NB	PE	NS	NF	Range
Svalbardia paludicola Thor	+	+	+				+							Nearctic-West Beringian
Trichoribates copperminensis Hammer	+	+	+											Northern Nearctic-West Beringian
T. ogilviensis Behan-Pelletier		+												East Beringian
T. polaris Hammer	+	+	+											Northern Nearctic-West Beringian
T. striatus Hammer		+					+							Northern Nearctic
Cyrtozetidae														
Cyrtozetes denaliensis Behan-Pelletier	+	+												East-West Beringian
Mycobatidae														
Mycobates beringianus Behan-Pelletier	+	+	+											East Beringian
M. conitus Hammer	+	+	+						+				+	Nearctic-West Beringian
M. consimilis Hammer	+	+	+		+								+	Holarctic
M. hammerae Behan-Pelletier	+	+												East Beringian
M. incurvatus Hammer	+	+	+		+				+			+		Northern Nearctic
M. sarekensis (Trägårdh)	+	+	+											Holarctic
M. punctatus Hammer	+	+							+					Northern Nearctic
M. yukonensis Behan-Pelletier		+												East Beringian
Punctoribates near *quadrivertex* (Halbert)	+	+	+											
Zachvatkinibates maritimus Shaldybina		+												East-West Beringian
Phenopelopoidea														
Phenopelopidae														
Propelops canadensis (Hammer)	+	+	+		+									Holarctic
P. groenlandicus (Sellnick)	+	+	+				+							Holarctic
Propelops sp.		+												
Oribatelloidea														
Oribatellidae														
Oribatella arctica Thor	+	+	+				+							Holarctic
O. reticuloides Hammer	+	+												East-West Beringian
Oribatella sp.		+												
Achipterioidea														
Tegoribatidae														
Lepidozetes latipilosus Hammer	+	+	+											East-West Beringian

L. singularis Berlese	+	+	+					+			Holarctic
Scutozetes lanceolatus Hammer	+	+	+			+			+	+	Nearctic-West Beringian
Scutozetes sp.		+									
Tegoribates americanus Hammer	+	+	+		+						Nearctic-West Beringian
Achipteriidae											
Achipteria sp.		+									
Parachipteria nivalis (Hammer)	+	+	+	+							Holarctic
Galumnatoidea											
Galumnatidae											
Pergalumna near *formicaria* Berlese		+									

TABLE 3. Habitats of oribatid mites in the Yukon. For notes on habitat types, see text.

Species	Habitat								
	Bog tundra	Shrub tundra	Dry tundra	Rock desert	Dune	Southern steppe	Boreal forest	Boreomontane	Littoral
Palaeacaridae									
Palaeacarus hystricinus Trägårdh		+					+	+	
Palaeacarus sp.							+		
Hypochthoniidae									
Hypochthonius rufulus (C.L. Koch)							+		
Brachychthoniidae									
Eobrachychthonius borealis Forsslund		+					+		
E. latior (Berlese)		+	+				+		
Liochthonius forsslundi (Hammer)	+						+		
L. sellnicki Thor		+	+				+		
Sellnickochthonius suecica (Forsslund)							+		
Gehypochthoniidae									
Gehypochthonius rhadamanthus Jacot							+		
Phthiracaridae									
Atropacarus striculus (C.L. Koch)							+		
Phthiracarus borealis (Trägårdh)		+					+		
Oribotritiidae									
Protoribotritia sp.							+		
Euphthiracaridae									
Rhysotritia ardua (C.L. Koch)	+						+		
Eulohmanniidae									
Eulohmannia ribagai (Berlese)		+	+				+		+
Perlohmanniidae									
Perlohmannia sp. near *coiffaiti* Grandjean	+		+				+		
Epilohmanniidae									
Epilohmannia sp.							+		
Nothridae									
Nothrus borussicus Sellnick							+		
N. pratensis Sellnick	+		+				+		
Camisiidae									
Camisia biurus (C.L. Koch)		+	+				+		
C. dictyna Colloff		+						+	
C. foveolata Hammer	+								
C. horrida (Hermann)		+	+	+		+	+		+

C. spinifer (C.L. Koch)		+							
Heminothrus longisetosus Willmann							+		
Platynothrus peltifer (C.L . Koch)	+								
P. punctatus (L. Koch)	+		+				+		
Trhypochthoniidae									
Trhypochthoniellus setosus canadensis Hammer	+								
Trhypochthonius tectorum (Berlese)			+				+		
Malaconothridae									
Malaconothrus mollisetosus Hammer	+								
Nanhermanniidae									
Nanhermannia sp.							+		
Hermanniidae									
Hermannia hokkaidensis Aoki									+
H. reticulata Thorell		+							+
H. subglabra Berlese									+
Gymnodamaeidae									
Gymnodamaeus ornatus Hammer			+		+	+			
Nortonella gildersleeveae (Hammer)			+			+			
Pleodamaeus sp. 1						+			
Pleodamaeus sp. 2						+			
Damaeidae									
Belbodamaeus sp.		+					+		
Caenobelba alleganiensis Norton							+		
Epidamaeus arcticolus (Hammer)		+	+				+		
E. bakeri (Hammer)		+	+				+		
E. coxalis (Hammer)		+	+				+		
E. floccosus Behan-Pelletier and Norton							+		
E. fortispinosus Hammer							+		
E. koyukon Behan-Pelletier and Norton		+					+		
E. longitarsalis (Hammer)			+	+			+		
E. mackenziensis (Hammer)			+				+		
E. nasutus Behan-Pelletier and Norton							+		
E. tritylos Behan-Pelletier and Norton		+	+			+	+		
Epidamaeus (Akrodamaeus) sp.			+			+			
Lanibelba sp.			+			+			
Cepheidae									
Cepheus corae Jacot							+		
Eremaeidae									
Eremaeus grandis Hammer			+						

TABLE 3. (*continued*)

Species	Habitat								
	Bog tundra	Shrub tundra	Dry tundra	Rock desert	Dune	Southern steppe	Boreal forest	Boreomontane	Littoral
E. translamellatus Hammer		+	+						
Eueremaeus foveolatus Hammer		+	+	+		+			
Eu. marshalli Behan-Pelletier		+	+			+	+		
Eu. nahani Behan-Pelletier			+					+	
Eu. quadrilamellatus Hammer			+						
Eu. yukonensis Behan-Pelletier			+						
Megeremaeidae									
Megeremaeus keewatin Behan-Pelletier			+						
Tenuialidae									
Tenuiala sp.					+				
Liacaridae									
Dorycranosus parallelus Hammer	+								+
Dorycranosus sp.			+						
Liacarus bidentatus Ewing							+		
Astegistidae									
Cultroribula dentata Willmann			+				+		
Peloppiidae									
Ceratoppia bipilis (Hermann)		+	+				+		
C. quadridentata arctica Hammer			+				+		
C. sexpilosa Willmann	+		+				+		
C. sphaerica (L. Koch)		+	+						
Metrioppia helvetica Grandjean		+	+				+		+
Pyroppia lanceolata Hammer			+						
Carabodidae									
Carabodes labyrinthicus (Michael)							+		
Tectocepheidae									
Tectocepheus sarekensis Trägårdh	+								
T. velatus (Michael)		+	+			+			
Oppiidae									
Moritzoppia clavigera (Hammer)			+						
Oppiella maritima (Willmann)	+	+					+		
O. nova (Oudemans)	+	+	+		+	+	+		
O. translamellata (Willmann)	+	+	+				+		
Ramusella maculata (Hammer)							+		

Quadroppiidae									
Quadroppia quadricarinata (Michael)		+	+				+		
Suctobelbidae									
Suctobelbella acutidens (Forsslund)			+						
S. hammerae (Krivoluckij)	+	+							
S. near *palustris* (Forsslund)	+								
S. setosclavata (Hammer)		+	+	+			+		
Autognetidae									
Autogneta longilamellata (Michael)							+		
Caleremaeidae									
Veloppia pulchra Hammer	+								
Thyrisomidae									
Banksinoma lanceolata canadensis Fujikawa		+					+		
B. spinifera (Hammer)		+							
Gemmazetes sp.	+	+							
Hydrozetidae									
Hydrozetes sp.	+								
Limnozetidae									
Limnozetes canadensis Hammer	+								
Ameronothridae									
Ameronothrus lineatus (Thorell)									+
Cymbaeremaeidae									
Ametroproctus beringianus Behan-Pelletier			+						
Passalozetidae									
Passalozetes sp.						+			
Scheloribatidae									
Liebstadia similis (Michael)	+	+	+				+		
Hemileius sp.							+		
Scheloribates pallidulus (C.L. Koch)							+		
Scheloribates sp.	+	+							
Oribatulidae									
Oribatula tibialis (Nicolet)		+	+				+		
Zygoribatula bulanovae Kulijew			+						
Zygoribatula sp.						+			
Haplozetidae									
Peloribates canadensis Hammer	+	+							
P. pilosus Hammer			+				+		

TABLE 3. (*continued*)

Species	Habitat								
	Bog tundra	Shrub tundra	Dry tundra	Rock desert	Dune	Southern steppe	Boreal forest	Boreomontane	Littoral
Parakalummidae									
Neoribates aurantiacus (Oudemans)	+		+				+		
Ceratozetidae									
Ceratozetes borealis Behan-Pelletier			+			+	+		
C. fjellbergi Behan-Pelletier				+					
C. gracilis (Michael)			+				+		
C. inupiaq Behan-Pelletier				+					
C. kutchin Behan-Pelletier				+					
C. parvulus Sellnick	+								
C. spitsbergensis Thor		+	+						
C. thienemanni Willmann							+		
Dentizetes rudentiger Hammer			+		+			+	
Diapterobates humeralis (Hermann)		+	+				+		
D. notatus (Thorell)	+	+	+						+
D. rotundocuspidatus Shaldybina (= *D. siccatus* Behan-Pelletier **new synonymy**)				+					
D. variabilis Hammer			+						
Fuscozetes sellnicki Hammer		+							
Ghilarovizetes longisetosus Hammer	+						+		
Iugoribates gracilis Sellnick			+	+					+
Laminizetes fortispinosus Behan-Pelletier				+					
Melanozetes meridianus Sellnick			+						
M. tanana Behan-Pelletier	+	+							
Neogymnobates luteus (Hammer)	+								
Sphaerozetes arcticus Hammer		+					+		
S. castaneus Hammer			+						
S. firthensis Behan-Pelletier			+				+		
Svalbardia paludicola Thor	+		+						
Trichoribates copperminensis Hammer	+								
T. ogilviensis Behan-Pelletier			+						
T. polaris Hammer	+						+		
T. striatus Hammer						+			

Cyrtozetidae												
Cyrtozetes denaliensis Behan-Pelletier			+					+				
Mycobatidae												
Mycobates beringianus Behan-Pelletier			+									
M. conitus Hammer			+					+				
M. consimilis Hammer			+	+				+				
M. hammerae Behan-Pelletier			+									
M. incurvatus Hammer	+		+					+		+		
M. sarekensis (Trägårdh)			+	+								
M. punctatus Hammer								+				
M. yukonensis Behan-Pelletier								+				
Punctoribates near *quadrivertex* (Halbert)								+				
Zachvatkinibates maritimus Shaldybina											+	
Phenopelopidae												
Propelops canadensis (Hammer)			+		+	+						
P. groenlandicus (Sellnick)		+	+					+				
Propelops sp.				+								
Oribatellidae												
Oribatella arctica Thor		+	+								+	
O. reticuloides Hammer		+										
Oribatella sp.		+										
Tegoribatidae												
Lepidozetes latipilosus Hammer			+									
L. singularis Berlese		+	+					+				
Scutozetes lanceolatus Hammer			+					+				
Scutozetes sp.						+						
Tegoribates americanus Hammer			+									
Achipteriidae												
Achipteria sp.			+									
Parachipteria nivalis (Hammer)		+	+					+				
Galumnatidae												
Pergalumna near *formicaria* Berlese								+				

TABLE 4. Distribution of oribatid mites in the Yukon. Yukon ecogeographic regions are those of Scudder (1997).

Species	Yukon ecogeographic region										
	Coastal Plain (1)	British Mts. (2)	Porcupine Plain (4)	Richardson Mts. (5)	Eagle Plain (6)	Ogilvie Mts. (8)	Yukon Tintina (10)	Eastern Plateau (11)	Western Ranges (13)	Coast Mts. (16)	Southern Lakes (17)
Palaeacaridae											
Palaeacarus hystricinus										+	
Palaeacarus sp.		+									
Hypochthoniidae											
Hypochthonius rufulus	+										
Brachychthoniidae											
Eobrachychthonius borealis				+							
E. latior	+			+		+					
Liochthonius forsslundi						+					
L. sellnicki	+		+	+		+					
Sellnickochthonius suecica			+								
Gehypochthoniidae											
Gehypochthonius rhadamanthus		+									
Phthiracaridae											
Atropacarus striculus			+								
Phthiracarus borealis			+								
Oribotritiidae											
Protoribotritia sp.						+					
Euphthiracaridae											
Rhysotritia ardua										+	
Eulohmanniidae											
Eulohmannia ribagai	+		+			+					
Perlohmanniidae											
Perlohmannia near *coiffaiti*			+	+		+					
Epilohmanniidae											
Epilohmannia sp.		+									
Nothridae											
Nothrus borussicus			+	+		+					
N. pratensis										+	
Camisiidae											
Camisia biurus			+	+		+					

C. dictyna		+									
C. foveolata				+							
C. horrida	+		+	+	+	+	+				+
C. spinifer				+							
Heminothrus longisetosus						+					
Platynothrus peltifer			+	+		+	+				
P. punctatus			+	+		+					
Trhypochthoniidae											
Trhypochthoniellus setosus canadensis						+					
Trhypochthonius tectorum			+	+		+					
Malaconothridae											
Malaconothrus mollisetosus			+			+					
Nanhermanniidae											
Nanhermannia sp.	+										
Hermanniidae											
Hermannia hokkaidensis	+										
H. reticulata	+										
H. subglabra	+										
Gymnodamaeidae											
Gymnodamaeus ornatus			+	+		+	+				+
Nortonella gildersleeveae						+	+				
Pleodamaeus sp. 1						+					
Pleodamaeus sp. 2						+					
Damaeidae											
Belbodamaeus sp.				+			+				
Caenobelba alleganiensis								+			
Epidamaeus arcticolus	+	+	+	+		+	+				
E. bakeri	+		+	+	+	+					
E. coxalis			+	+		+		+			
E. floccosus			+								+
E. fortispinosus	+		+								
E. koyukon			+	+		+	+	+			
E. longitarsalis	+		+	+		+					
E. mackenziensis			+	+		+					
E. nasutus						+					
E. tritylos	+		+	+	+	+					
E. (Akrodamaeus) sp.			+	+							
Lanibelba sp.			+	+							

TABLE 4. (*continued*)

Species	Yukon ecogeographic region										
	Coastal Plain (1)	British Mts. (2)	Porcupine Plain (4)	Richardson Mts. (5)	Eagle Plain (6)	Ogilvie Mts. (8)	Yukon Tintina (10)	Eastern Plateau (11)	Western Ranges (13)	Coast Mts. (16)	Southern Lakes (17)
Cepheidae											
Cepheus corae				+		+	+				
Eremaeidae											
Eremaeus grandis	+			+		+					
E. translamellatus	+	+	+	+		+					
Eueremaeus foveolatus	+	+	+	+	+	+	+				
Eu. marshalli	+	+			+						+
Eu. nahani						+					+
Eu. quadrilamellatus	+										
Eu. yukonensis				+							
Megeremaeidae											
Megeremaeus keewatin		+		+		+					
Tenuialidae											
Tenuiala sp.											+
Liacaridae											
Dorycranosus parallelus	+			+							
Dorycranosus sp.				+		+					
Liacarus bidentatus										+	
Astegistidae											
Cultroribula dentata	+		+	+		+					
Peloppiidae											
Ceratoppia bipilis	+	+	+	+		+	+				+
C. quadridentata var. *arctica*				+		+					
C. sexpilosa	+	+	+	+		+					
C. sphaerica	+			+	+	+					
Metrioppia helvetica	+	+	+	+		+					
Pyroppia lanceolata	+										
Carabodidae											
Carabodes labyrinthicus										+	
Tectocepheidae											
Tectocepheus sarekensis				+			+				
T. velatus	+			+		+					+

Oppiidae											
Moritzoppia clavigera				+							
Oppiella maritima	+	+	+	+		+					
O. nova	+		+	+				+			+
O. translamellata	+	+	+	+		+					
Ramusella maculata			+			+					+
Quadroppiidae											
Quadroppia quadricarinata	+		+	+		+					
Suctobelbidae											
Suctobelbella acutidens				+							
S. hammerae	+										
S. near *palustris*				+							
S. setosclavata	+		+	+	+	+					
Autognetidae											
Autogneta longilamellata	+										
Caleremaeidae											
Veloppia pulchra			+	+		+					
Thyrisomidae											
Banksinoma spinifera										+	
B. lanceolata canadensis						+					
Gemmazetes sp.				+		+					
Hydrozetidae											
Hydrozetes sp.				+							
Limnozetidae											
Limnozetes canadensis	+										
Ameronothridae											
Ameronothrus lineatus	+										
Cymbaeremaeidae											
Ametroproctus beringianus				+		+					
Passalozetidae											
Passalozetes sp.											+
Scheloribatidae											
Hemileius sp.										+	
Liebstadia similis	+	+	+	+		+					
Scheloribates pallidulus	+										
Scheloribates sp.				+							+
Oribatulidae											
Oribatula tibialis	+	+	+	+		+					+
Zygoribatula bulanovae	+										+
Zygoribatula sp.											+

TABLE 4. (*continued*)

Species	Yukon ecogeographic region										
	Coastal Plain (1)	British Mts. (2)	Porcupine Plain (4)	Richardson Mts. (5)	Eagle Plain (6)	Ogilvie Mts. (8)	Yukon Tintina (10)	Eastern Plateau (11)	Western Ranges (13)	Coast Mts. (16)	Southern Lakes (17)
Haplozetidae											
Peloribates canadensis			+	+		+					
P. pilosus	+			+							+
Parakalummidae											
Neoribates auranticus						+					
Ceratozetidae											
Ceratozetes borealis			+	+		+					
C. fjellbergi		+		+		+					
C. gracilis		+				+					+
C. inupiaq		+		+		+					
C. kutchin		+				+					
C. parvulus		+									
C. spitsbergensis				+							
C. thienemanni	+										
Dentizetes rudentiger		+									+
Diapterobates humeralis	+	+	+	+							+
D. notatus	+	+	+	+		+	+				+
D. rotundocuspidatus	+	+		+		+					
D. variabilis	+										
Fuscozetes sellnicki	+	+		+							
Ghilarovizetes longisetosus	+	+	+	+							
Iugoribates gracilis	+	+		+		+					
Laminizetes fortispinosus		+		+		+					
Melanozetes meridianus		+		+							
M. tanana	+	+		+		+					
Nyogymnobates luteus			+								
Sphaerozetes arcticus	+	+		+	+			+			
S. castaneus											+
S. firthensis	+	+	+	+		+					
Svalbardia paludicola	+	+		+		+	+				
Trichoribates copperminensis		+		+		+			+		
T. ogilviensis						+					
T. polaris				+		+					

T. striatus			+								
Cyrtozetidae											
Cyrtozetes denaliensis		+	+	+	+	+					
Mycobatidae											
Mycobates beringianus	+	+		+							
M. conitus	+			+		+					
M. consimilis	+	+		+		+					
M. hammerae			+			+					
M. incurvatus			+	+		+		+			
M. sarekensis		+			+	+					
M. punctatus				+		+					
M. yukonensis				+		+					
Punctoribates near *quadrivertex*							+				
Zachvatkinibates maritimus	+										
Phenopelopidae											
Propelops canadensis			+								+
P. groenlandicus			+	+		+	+				
Propelops sp.				+							
Oribatellidae											
Oribatella arctica	+		+	+		+					+
O. reticuloides	+										
Oribatella sp.	+										
Tegoribatidae											
Lepidozetes latipilosus			+	+		+					
L. singularis	+		+	+		+					
Scutozetes lanceolatus			+	+		+					+
Scutozetes sp.			+								+
Tegoribates americanus				+		+					+
Achipteriidae											
Achipteria sp.											+
Parachipteria nivalis	+		+	+		+					+
Galumnatidae											
Pergalumna near *formicaria*			+								

(Golosova et al. 1983), but specimens have not been compared with Russian material. Individuals of this species can occur in large numbers in the humus layer of boreal-forest soils, and occasionally are found in wet-tundra and dry-tundra habitats. *Perlohmannia* species are presumed macrophytophages; one species is known to damage the root system of crop plants (Evans et al. 1961).

Superfamily Crotonioidea

Species in this large superfamily of mites are inhabitants of moist soil and litter habitats, where they are panphytophages (feeding on a wide variety of decaying plant material), or in some genera, e.g. *Platynothrus*, primarily fungivorous (Siepel 1990) (Fig. 1). Among species found in the Yukon, only *Camisia horrida* is eurytopic, i.e. found in a wide range of habitats. In this superfamily, as in Brachychthoniidae and Nanhermanniidae, thelytokous parthenogenesis is the general method of reproduction (Norton and Palmer 1991). Eleven of the 13 Yukon crotonioid species are Holarctic in distribution. *Camisia dictyna* Colloff was described recently on the basis of specimens from the Canadian arctic, Magadanskaya Oblast in the Russian Far East, and California. Many species in these families prefer biotopes with high humidity; thus I expect that collecting in peatland and aquatic habitats in the southern Yukon will yield many more species.

Superfamily Hermannioidea

Two of the 3 *Hermannia* species recorded from the Yukon have a broadly Holarctic distribution; *H. hokkaidensis*, in contrast, is known only from Hokkaido, Japan and the Yukon. All 3 species are inhabitants of the marine littoral, a common habitat for species in this family, where they are thought to feed on microorganisms (Krantz 1978).

Superfamily Plateremaeoidea

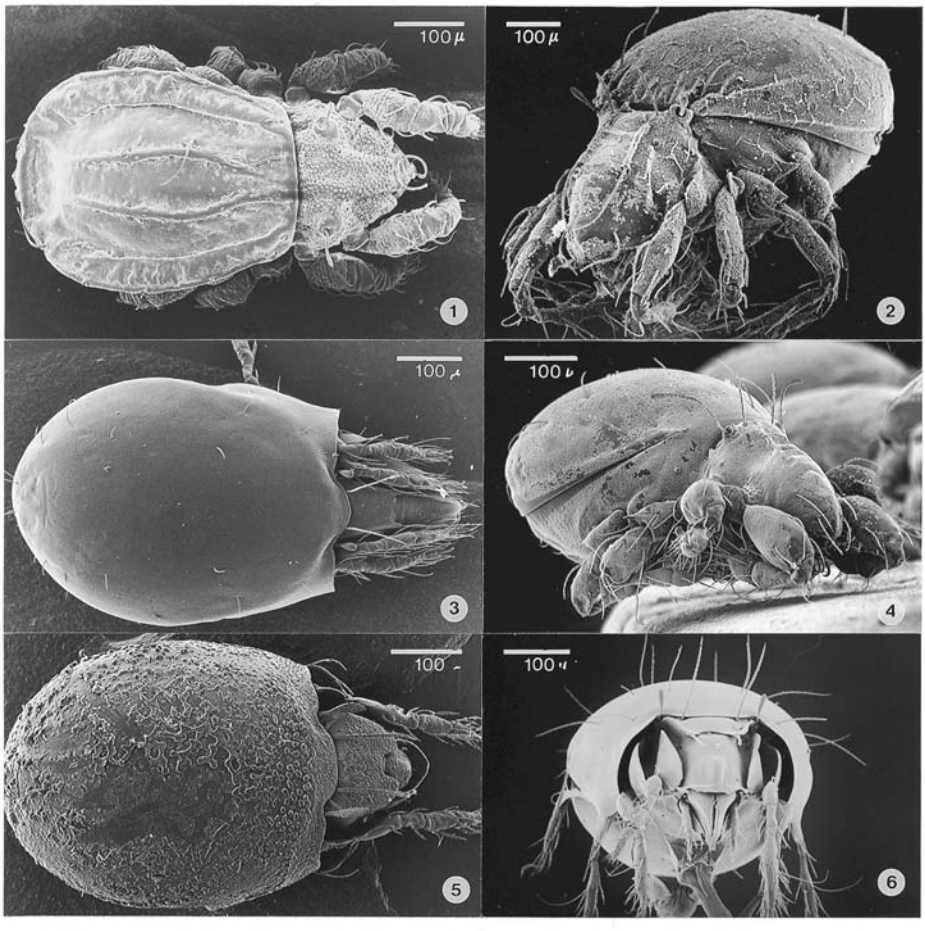
The 4 species of Gymnodamaeidae in the Yukon are inhabitants of southern steppe, with 2 species extending into dry-tundra/dune habitats. The range of all 4 species is Yukon or northwestern North America. This northern Nearctic distribution is similar to that recorded by Lafontaine and Wood (1988) for Noctuidae of southern-steppe habitat. Gymnodamaeid species whose feeding habits are known are microphytophages (Luxton 1972).

Superfamily Damaeoidea

This superfamily is diverse in north temperate areas. As a result of recent revisions of *Epidamaeus* (Behan-Pelletier and Norton 1983, 1985) the family is now known to be well represented in the northern Nearctic region and the Yukon. Of 15 species of Damaeidae known from the northern Nearctic, 14 are found in the Yukon. Five species of *Epidamaeus* are restricted to Siberia and the Russian Far East, Alaska and the Yukon, and 3 of these are found west of the Lena River in Russia (Golosova et al. 1983; Karppinen and Krivolutsky 1982).

Superfamily Eremaeoidea

Species in this superfamily primarily inhabit periodically dry habitats, and in the Yukon they are found in dry and shrub tundra, where they live in the organic litter. Norton and Alberti (1997) suggest a correlation between this living habit and the presence of the apodemato-acetabular tracheal system in immatures as well as adults in this superfamily. Species are microvores, feeding on fungal hyphae and spores, though occasionally pollen is observed in their guts (Behan-Pelletier 1993*b*). The Eremaeidae are species rich in Canada and represented by 7 species in the Yukon, 2 of which are found in tundra habitats in eastern



FIGS. 1–6. Species of Oribatida known from the Yukon. 1, *Platynothrus peltifer* (C.L. Koch) (Camisiidae), cosmopolitan; 2, *Megeremaeus keewatin* Behan-Pelletier (Megeremaeidae), East Beringian; 3, *Svalbardia paludicola* Thor (Ceratozetidae), Nearctic-West Beringian; 4, *Eremaeus translamellatus* Hammer (Eremaeidae), Holarctic; 5, *Propelops canadensis* (Hammer) (Phenopelopidae), Holarctic; 6, *Diapterobates rotundocuspidatus* Shaldybina (Ceratozetidae), East-West Beringian.

Russia. One species, *Eueremaeus nahani*, is known only from the southern Yukon and Colorado, suggesting that this species could be restricted to habitats in the Cordillera of North America (Behan-Pelletier 1993*b*).

Marshall (1978) estimated the occurrence of one megeremaeid species for Canada. Four species are now recorded (Behan-Pelletier 1990) and specimens of one species, *Megeremaeus keewatin* Behan-Pelletier (Fig. 2), are known only from northern Yukon, Northwest Territories, and as a fossil record from Meighen Island. Interestingly, the eremaeid genus *Proteremaeus* which is well represented in eastern and Far Eastern Russia is known from North America only on the basis of fossil records from Pliocene deposits on Ellesmere Island (Behan-Pelletier and Ryabinin 1991).

Superfamily Gustavioidea

Members of this superfamily are common in the northern Yukon and mainland Northwest Territories. However, none extends into the Canadian arctic archipelago (Behan 1978;

Danks 1981). Individuals live mainly in dry and/or shrub tundra or boreal forest, and are mostly generalized feeders on dead plant material (Luxton 1972). Of the 5 families represented in Canada, only Peloppiidae is comparatively species-rich in the northern Nearctic region.

Superfamily Oppioidea

Oppiidae and Suctobelbidae are fairly well represented in the northern Nearctic region and the Yukon, primarily by widely distributed Holarctic species. The Oppioidea are small (180–250 μm as adults) and inhabit litter and soil. Oppiidae are fungal feeders and Suctobelbidae are probably liquid feeders. Luxton (1991) noted few immature Oppiidae with food boluses and suggested that they may be liquid feeders. *Oppiella nova* (Oudemans) is one of the most widely distributed terrestrial arthropods and is found in both disclimax systems and complex stable associations (Norton and Palmer 1991), and is one of the most abundant mites in peatlands (Behan-Pelletier and Bissett 1994).

Superfamily Licneremaeoidea

Until recently (Behan-Pelletier 1987*c*) there were no published records of Passalozetidae from Canada. Specimens of *Passalozetes* are now known from Waterton Lakes National Park, Alberta and the Yukon, as well as southern British Columbia. In the Yukon, individuals have been collected from southern-steppe habitats along the Klondike highway.

Superfamily Oripodoidea

As noted above, this superfamily is poorly represented in the northern Nearctic region. However, the species of *Peloribates* are among the most common mites in shrub and dry-tundra habitats. *P. pilosus* Hammer is considered an Holarctic species based on records from Siberia and the Russian Far East. There is a possibility, however, that Nearctic and Palaearctic populations are not conspecific (pers. obs.), and certainly the genus needs revision. Mochlozetidae are represented in northern Canada by *Podoribates longipes* (Berlese), known from the Northwest Territories (Hammer 1952). This species is readily collected from litter of shrub tundra at Reindeer Station, east of the Mackenzie Delta, but so far has not been recorded from apparently similar habitats west of the Delta, or in the Yukon.

Superfamily Ceratozetoidea

This is the most diverse superfamily in northern Nearctic habitats, the fauna being dominated by members of the Ceratozetidae and Mycobatidae. Both families are also found in a variety of habitats in the Canadian Arctic Archipelago. Species are macrophytophages, microphytophages, fungivores; some feed on carrion. Specimens of many species found in the Yukon inhabit dry tundra and rock desert, or, in the case of *Trichoribates ogilviensis* Behan-Pelletier, wet microhabitats in dry tundra terrain. Others, such as *Melanozetes tanana* Behan-Pelletier and *Ghilarovizetes longisetosus* (Hammer), are almost ubiquitous in wet tundra, as also is *Sphaerozetes arcticus* Hammer in shrub tundra. *G. longisetosus* and *S. arcticus* probably are broadly distributed in these habitats across northern Canada, as they have been found in cold habitats by swiftly flowing streams in Cape Breton Highlands National Park (Behan-Pelletier 1987*b*). Half of the 28 species of Ceratozetidae in the Yukon are restricted to the Nearctic region (Table 2). I expect that the range of many of these Nearctic species will be extended, especially when dry habitats in the Russian Far East have been sampled. The mycobatid *Zachvatkinibates maritimus* Shaldybina has an interesting distribution, being restricted to the marine littoral of Russian Far East, Alaska, British

Columbia and the Yukon. This is a habitat subject to periodic desiccation and this species can be very numerous and often the only mite in samples from this habitat. Adults of this species exhibit sexual dimorphism in notogastral porose areas, males having very large porose areas in comparison with those of females (Behan-Pelletier 1988). Norton and Alberti (1997) suggest that this dimorphism is linked to the glandular nature of these porose areas, which may be producing semiochemicals important to the reproductive biology of this species.

Superfamily Achipterioidea

This superfamily is well represented in the north, and all 5 Canadian representatives of Tegoribatidae have been recorded from the Yukon. Species with known feeding habits are panphytophagous (Luxton 1972). Members of this superfamily are primarily found in dry-tundra habitats, where some species, e.g. *Scutozetes lanceolatus* Hammer and *Parachipteria nivalis* (Hammer), can be very numerous. Described species are all Holarctic in distribution, and are known from a wide variety of localities in Siberia and the Russian Far East (Golosova et al. 1983). *S. lanceolatus* is also common in the rocky barrens of Cape Breton Highlands National Park, the most southern record of this species for Canada (Behan-Pelletier 1987*b*).

Zoogeography of Yukon Oribatida

Comments on distribution patterns of oribatid mites, especially those apparently restricted to the Yukon, are tentative for the following reasons. Many species known from the Yukon and adjacent areas have been described only in recent years (Behan-Pelletier 1985, 1986, 1990, 1993*b*, 1994; Behan-Pelletier and Norton 1983, 1985), and 25 undescribed species are listed in Table 2. The oribatid fauna of the Yukon and also the entire boreal forest stretching across northern North America, as well as the diverse regions of the Cordillera, is poorly known. Finally, though information on the distribution of certain species in the northern Palaearctic region is well documented in the publications of Golosova et al. (1983), Karppinen and Krivolutsky (1982) and Karppinen et al. (1986, 1987), there has been little collecting of Oribatida in the Russian Far East.

Of the 132 described oribatid species so far recorded from the Yukon, 92 (70 percent) have been recorded from both the Nearctic and Palaearctic regions (Table 2). Of these 92 species, 8 (6 percent) are known only from northwestern North America and habitats in Russia east of the Lena River. Much of this area was unglaciated during the Pleistocene glaciations, and the range of these species can most easily be explained by their survival during these glaciations in various parts of an ice-free Beringia. Many of these 8 species in the Yukon inhabit dry tundra in montane areas. The remaining 40 species (30 percent) are known only from the Nearctic region. Twenty-two of these species (17 percent) have an East Beringian distribution, restricted to areas of northwest North America, much of which was unglaciated during the Pleistocene. Undoubtedly, however, more collecting in dry-tundra and rock-desert habitats, especially in northeastern Russia, will extend the range of some of these species.

This East Beringian element of 22 species coupled with the 8 East-West Beringian species suggests a potentially rich Beringian oribatid fauna (23 percent of described species). However, unglaciated localities have been the focus of collecting in the Yukon, and have been studied much more intensively than subarctic and boreal habitats across northern North America.

Of Yukon oribatids whose broad habitat preferences are known (Table 3), approximately 75 (50 percent) are inhabitants of wet and/or shrub tundra; the distribution of many of these further extends into boreal forest, and presumably into moist microhabitats in dry tundra. The range of all but 6 of the remaining 67 species is circumpolar, a distribution that might be expected because, as Lafontaine and Wood (1988) indicate, the wet-tundra habitat today is widely distributed in an almost unbroken band across the northern Palaearctic and Nearctic regions.

Of the 18 species found in the steppe habitat, 6 have an Holarctic distribution, 4 are restricted to the Nearctic region, and 8 species, or almost 50 percent of this fauna, are undescribed. Whether these latter are most closely related to species in similar habitats in Russia, or to species of North American grasslands farther south, awaits further study.

Dentizetes rudentiger Hammer and possibly *Eueremaeus nahani* Behan-Pelletier can be considered as true members of the boreomontane fauna, sensu Lafontaine and Wood (1988). The former species is common in the subalpine forests of the Cordillera, and the genus appears to be restricted to western North American montane habitats. As already noted, the latter species is known only from the Yukon and Colorado.

All 4 species restricted to the marine littoral, *Hermannia hokkaidensis* Aoki, *H. subglabra* Berlese, *Ameronothrus lineatus* (Thorell) and *Zachvatkinibates maritimus* Shaldybina are known from Nearctic and Palaearctic regions.

Ranges. Although the cautionary comment of Danks (1981, p. 208), that mites are in general inadequately known, is very appropriate, the distribution of some species will be used as examples of the types of ranges exhibited by Yukon Oribatida.

1. ***Cosmopolitan***. Thirteen species are cosmopolitan or have a Nearctic and Neotropical distribution: *Gehypochthonius rhadamanthus* Jacot, *Sellnickochthonius suecica* (Forsslund), *Rhysotritia ardua* (C.L. Koch), *Platynothrus peltifer* (C.L. Koch), *Trhypochthonius tectorum* (Berlese), *Malaconothrus mollisetosus* Hammer, *Tectocepheus velatus* (Michael), *T. sarekensis* Trägårdh, *Oppiella nova* (Oudemans), *Quadroppia quadricarinata* (Michael), *Liebstadia similis* (Michael), *Ceratozetes gracilis* (Michael) and *C. thienemanni* Willmann (Table 2). These species range across several major zoogeographical regions in the northern and southern hemispheres (Marshall et al. 1987). Data suggest that all but *L. similis*, *C. gracilis* and *C. thienemanni* reproduce parthenogenetically. Further, though all North American populations of *C. gracilis* are sexual (Norton et al. 1993), Ryabinin and Pankov (1987) report female-biased sex ratios in Russian populations. The cosmopolitan distribution of *R. ardua* and *P. peltifer* would appear to reflect the age of these species, which probably pre-dates the breakup of Pangaea (Hammer and Wallwork 1979). Distributions of *T. tectorum* and *M. mollisetosus* may be relictual, or may represent natural dispersal from the Nearctic to the Neotropical regions.
2. ***Circumpolar.*** Of the remaining 54 species with an Holarctic distribution, the ranges of 32, of which at least 11 are parthenogens, extend broadly across the Palaearctic and Nearctic regions. Some of these species are common in arctic and high-arctic localities, e.g. *Liochthonius sellnicki* Thor, *Camisia horrida* (Hermann), *Hermannia subglabra* Berlese and *Oppiella translamellata* (Willmann) (Danks 1981).
3. ***Other Holarctic.*** Many species have an Holarctic distribution involving substantial gaps. Often the range in Eurasia is more extensive than in North America (Danks 1981). Eight species are found in both eastern and western Palaearctic, but in the Nearctic region are confined to the west, or in the case of *Sphaerozetes arcticus* Hammer and *Epidamaeus*

fortispinosus Hammer primarily to the west with a substantial gap in distribution across North America. These gaps in North America probably represent inadequate collecting in boreal forest and shrub tundra stretching across the continent. In contrast, species such as *Ghilarovizetes longisetosus* Hammer and *Trichoribates polaris* Hammer are widely distributed in the northern Nearctic region, but known only from a few localities in the Palaearctic.

4. ***East-West Beringian.*** As already indicated, 8 species occur only in northwestern North America and eastern Asia. These are found in the families Damaeidae (*Epidamaeus bakeri* (Hammer), *E. tritylos* Behan-Pelletier and Norton), Liacaridae (*Dorycranosus parallelus* Hammer), Peloppiidae (*Ceratoppia quadridentata* var. *arctica* Hammer), Cymbaeremaeidae (*Ametroproctus beringianus* Behan-Pelletier), Ceratozetidae *(Diapterobates rotundocuspidatus* Shaldybina), Cyrtozetidae (*Cyrtozetes denaliensis* Behan-Pelletier), and Mycobatidae (*Zachvatkinibates maritimus* Shaldybina). Many of these species are inhabitants of dry-tundra and/or shrub-tundra habitats.
5. ***Nearctic Disjunctions***. It is tempting to consider the distribution patterns of certain species, e.g. *Caenobelba alleganiensis* Norton and *Epidamaeus fortispinosus* Hammer, as showing a disjunction in their range. Both species are found only in northwestern and eastern North America. However, this suggestion must be rejected as both species are boreal-forest inhabitants and it is probable that with further collecting their known ranges will be expanded.
6. ***Northwestern Nearctic/East Beringian.*** Twenty-two species are known only from northwestern North America, primarily from areas unglaciated during the Pleistocene. These are: *Liochthonius forsslundi* (Hammer), *Trhypochthoniellus setosus canadensis* Hammer, *Gymnodamaeus ornatus* Hammer, *Epidamaeus floccosus* Behan-Pelletier and Norton, *E. koyukon* Behan-Pelletier and Norton, *E. nasutus* Behan-Pelletier and Norton, *Eremaeus grandis* Hammer, *Eueremaeus quadrilamellatus* Hammer, *Eu. yukonensis* Behan-Pelletier, *Megeremaeus keewatin* Behan-Pelletier, *Ceratozetes borealis* Behan-Pelletier, *C. fjellbergi* Behan-Pelletier, *C. inupiaq* Behan-Pelletier, *C. kutchin* Behan-Pelletier, *Laminizetes fortispinosus* Behan-Pelletier, *Melanozetes tanana* Behan-Pelletier, *Sphaerozetes castaneus* Hammer, *S. firthensis* Behan-Pelletier, *Trichoribates ogilviensis* Behan-Pelletier, *Mycobates beringianus* Behan-Pelletier, *M. hammerae* Behan-Pelletier, and *M. yukonensis* Behan-Pelletier.

Conclusion

The oribatid fauna of the northern Yukon is comparatively species-rich, and has strong affinities with that of the Palaearctic region and especially that of the eastern Palaearctic. The fauna potentially restricted in distribution to Beringia is substantial (30 species, 23 percent of known species), with 8 species found in East-West Beringia and 22 species in East Beringia. I stress throughout that the data presented here are preliminary; they highlight two major research needs. A thorough survey of the oribatid species of the Yukon is required, in particular those of southern habitats. This survey should emphasize collecting in all habitat types already noted but especially these same habitats in more southern localities, as well as aquatic and semi-aquatic ecosystems generally. Concurrently, comprehensive systematic revisions are needed for most genera represented in the Yukon, but especially those that constitute a major component of the fauna, e.g. genera in the Brachychthoniidae, Damaeidae and Oppiidae.

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