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Life on a High Isolated Mountain: the Arthropod Fauna of Mt. Taylor, Cibola County, New Mexico

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David B. Richman and William O'Keefe (2011) Life on a high isolated mountain: the arthropod fauna of Mt. Taylor, Cibola County, New Mexico. *Zoological Studies* **51**(6): 793-803. The arthropod fauna of Mt. Taylor, New Mexico at 2874-3445 m (9424-11,300 ft) was examined by pitfall trapping, and to a lesser extent by pan trapping and hand collection between 1997 and 2008, with continuous pitfall trapping in 1997-2000. This fauna was characteristically Canadian in nature (as might be expected as the area covers Canadian and Hudsonian life zones with a tiny area of Arctic-Alpine at the top of the peak's north face; see Price 1997), but also contained unique elements such as a then-undescribed species of trapdoor spider (Araneae: Cyrtaucheniidae) from the pitfall traps (described as *Neoapachella rothi* Bond and Opell in 2002) and a still-undescribed jumping spider of the genus *Habronattus* (Araneae: Salticidae). At least 237 species in a minimum of 75 families were collected over the course of the study. As our methods were somewhat limited, we expect many more species to be found in the area covered. Pitfall traps were maintained near the summit until 2000. Dominant arthropods included *Carabus* (*Oreocarabus*) *taedatus agassii* LeConte (Coleoptera: Carabidae), *Anystis* sp. (Acari: Anystidae), and *Pardosa concinna* (Thorell) (Araneae: Lycosidae), among others. The Canadian and Rocky Mountain tiger beetle *Cicindela longilabris* Say (Coleoptera: Carabidae), the alpine dragonfly *Oplonaeschna armata* (Hagen) (Odonata: Aeshnidae), and the short-winged grasshoppers *Chorthippus curtipennis* (Harris) and *Melanoplus magdalenae* Hebard were examples of less-common hand-collected or pan-trapped high-elevation species. http://zoolstud.sinica.edu.tw/Journals/51.6/793.pdf

Key words: Larval fish, Alpine fauna, Faunal survey.

Mt. Taylor is a relatively isolated volcanic mountain in Cibola County, New Mexico, at latitude 35.2°N and longitude 107.6°W (Fig. 1). The peak elevation, on the rim of an old volcanic caldera, is at 3445 m, making it one of the highest peaks in the state that is not associated with the Sangre de Cristo complex. The peak itself is partly forested and partly alpine tundra, with cinquefoil, various grasses, and scrubby conifers. Because of its elevation, relative ease of ascent and access, and its relative isolation from other mountain ranges, we thought that it would provide insights into the alpine arthropod fauna and also possible immigration from other high peaks in Arizona to the west. One jumping spider species, *Habronattus orgonensis* (Peckham and Peckham); for example, is primarily known from the Pacific coast, but occurs in high-elevation areas through much of southeastern Arizona, such as in the Santa Catalina, Chiricahua, and Pinaleño Mts., usually above 2500 m (Griswold 1987, Wayne Maddison, pers. comm.). Antor (1994) noted that lowland insects and spiders were often found on snowfields in the Pyrenees in Spain, and we believe that such could also happen (and indeed must have happened) to allow for the strange distribution patterns of such arthropods as *H. oregonensis*. As Price (1997) noted, such movements can be a result of fallout from aerial

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plankton. Relatively little has been published about arthropod faunas of mountains and comparable habitats, and most of the publications centered on the Old World (Mani 1962 1968, Ashmole et al. 1983, Khruleva and Vinkurov 2007).

MATERIALS AND METHODS

Three pitfall traps were initially installed on the peak just below the summit in 1997. Propylene glycol was placed in the bottom of a cup (250 ml in volume usually filled to 150-200 ml during trapping; with an inside top diameter of 7 cm and a depth of 8 cm with the bottom tapering to 5 cm). Specimens were collected from the traps as often as possible. During the winter, this was often prevented by snow (traps were protected by placing them under rocks), but later droughts during the summer also interfered with collection because of 2 fire closures (in the 1st case, no fires occurred at the sites of the pitfall traps and 1 closure was preventative). Pitfall traps were later added at a saddle just below the peak. On 2 occasions, pan traps were set up at the Run/Ski parking lot at 2900 m and once at the First Meadow and Saddle sites. Specimens were also collected by hand, turning over rocks, sweeping vegetation with a sweep net, and using aerial nets along the trail from Run/Ski to the summit. Pitfall sampling continued through the year 2000 for an accumulative time of 4 yr. During this time, at least 1 trip was made by the senior author every year to pick up traps and collect new material. Otherwise, the junior author collected the traps as weather and time allowed. Over 15,000 arthropod individuals were collected by all

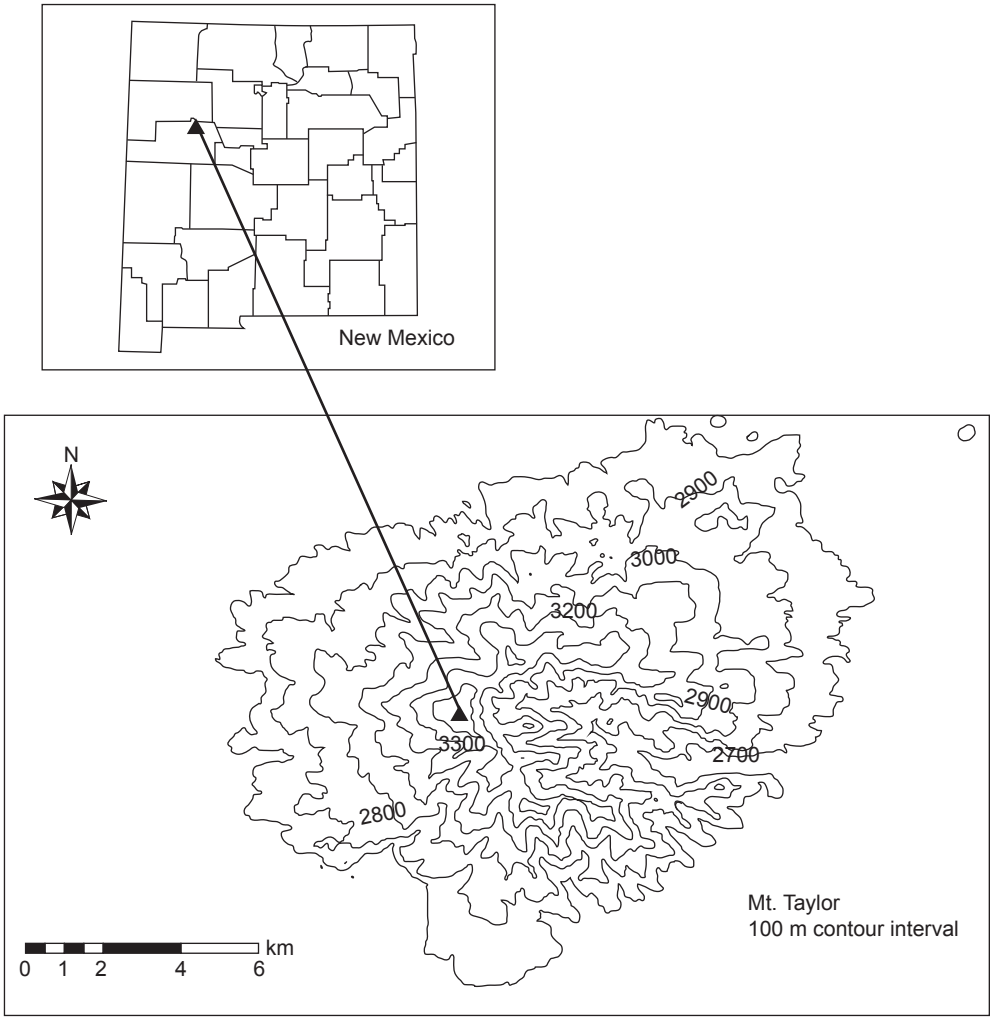

Fig. 1. Map of Mt. Taylor, Cibola County, NM, USA, showing its location in New Mexico and the elevation contours. The peak (triangle on contour map) is at 3425 m.

methods, with pitfall trapping accounting for the largest proportion by far.

In 1997, all traps were in the vicinity of the Mt. Taylor summit (3425 m) where the plant material was a mixture of Engelmann spruce (*Picea engelmannii*) and Douglas-fir (*Pseudotsuga menziesii*), with moss covering the forest floor on the northern face. Perennial bunch grasses including fescues, bromes, and *Poa* dominated the southern face. Between the north and south faces was an area of forbs and shrubs running east to west that included lupines, yarrow, *Ribes*, cinquefoil, and *procumbens* junipers. Within this environment, arthropods were collected in 1997 over these 4 dates: 3 May- 14 June (43 d), 14 June- 6 July (22 d), 6 July- 9 Aug. (34 d), and 9 Aug.- 15 Oct. (67 d). The spring that year was very wet on Mt. Taylor, and this continued into the winter.

In 1998, 3 pitfall traps each were placed near the summit of Mt. Taylor, at the saddle at 3180 m between the summits of La Mosca and Mt. Taylor, and at the First Meadow at 3030 m, for a total of 9 traps. Trap samples were collected in the following time periods: 7-27 June (20 d), 27 June- 18 July (21 d), 18 July- 7 Aug. (20 d), 7 Aug.- 6 Sept. (30 d), and 6 Sept.- 30 Oct. (54 d). Plant material around the saddle was much the same as at the summit of Mt. Taylor, with areas of perennial bunch grasses blended with forested areas of spruce and fir trees. First Meadow also had a perennial bunch grass area surrounded by a mixed forest including spruce, fir, and aspen (*Populus tremuloides*) trees. The snow on Mt. Taylor was so deep in May that we could not get above First Meadow (about 3030 m) during a field trip.

The 1999 sampling sites were at the summit, saddle, and around the Run/Ski parking lot, the latter at 2874 m in elevation (this was the lowest elevation level sampled). The 1999 season had 3 traps per site, for a total of 9 traps per date, and 3 dates of trap sampling: 13 June- 16 July (33 d), 16 July- 14 Aug. (29 d), 14 Aug.- 15 Sept. for which the data were lost, and 15 Sept.- 7 Nov. (53 d). Plant material around the Run/Ski parking lot was a mixed forest predominantly of ponderosa pine (*Pinus ponderosa*) and also including fir, spruce and aspen trees. This was a very dry year, and we were unable to visit the mountain during the spring because of a forest fire.

The year 2000 included 4 dates of trap collection: 24 June- 28 July (34 d), 28 July- 1 Sept. (34 d), 1-29 Sept. (29 d), and 29 Sept.- 2 Nov. (34 d) at the same sample sites as the previous year, i.e., the summit, saddle, and around the Run/Ski parking lot; however, there were 2 traps per site that year, 1 less than in 1999. In June, the forest was closed because of fire danger, but we were allowed entry by special permit. While the snow was poor during the winter of 1999-2000, by the time we visited the peak (Run/Ski, saddle, and trail from saddle to summit), enough rain had fallen to the forest to be opened up shortly after we visited.

In addition, several trips were made to Mt. Taylor during which specimens were collected from the Run/Ski parking lot to the summit of the peak. During one of these (24 June 2000), a count was made of butterflies found at the saddle area at around 3200 m. The most recent of these trips was in late July 2008. During this trip, a camp was set up at the saddle, and pan traps and a Malaise trap were used to collect flying insects. Sweep netting and aerial netting were also used to collect specimens from the saddle to the summit. Two black lights (UV) were set up for 1 night, and specimens were collected by hand from white sheets suspended below them.

Carabid and tenebrionid beetles, and Hemiptera were identified by specialists in these families, while all other taxa were identified to the lowest level possible by the senior author, using the resources (library and research specimen collection) in the Arthropod Museum, Department of Entomology, Plant Pathology and Weed Science, New Mexico State Univ. (NMSU), Las Cruces, NM. Ants were identified using MacKay and MacKay (2002). All voucher specimens were deposited in the Arthropod Museum at NMSU.

Unfortunately, there is no weather station on Mt. Taylor, and data from Grants at the base would be almost meaningless because it is at a much lower elevation.

RESULTS

Over 15,000 specimens were collected from nearly 4 yr of mostly pitfall sampling, plus 5 collecting trips in which other methods of collecting, as described above, were employed. The results are presented in table 1 and figures 2-6. The table shows the species collected, as far as we could determine them. The figures summarize abundances of the most common higher taxa.

One of the most notable findings was a trapdoor spider (Mygalomorpha: Cyrtaucheniidae) that was not described beyond family. Only males were captured in pitfall traps, and despite our

Table 1. Species of arthropods collected on Mt. Taylor in 1997-2008 at 2900-3445 m (9500-11,300 ft). Because of the disparate collecting methodology, it was impossible to assign meaningful exact numbers to each species, but the samples were dominated by ants, wolf spiders (especially *Pardosa concinna*), opilionids, mites, and carabid beetles. Most other species were represented by at most 1 to a few dozen specimens

ARACHNIDA	
Araneae	
Agelenidae	*Calilena* sp.
Anyphaenidae	*Anyphaena hespar* Platnick
	Anyphaena marginalis (Banks)
Araneidae	*Araneus* sp. (immature)
	Araniella displicata (Hentz)
	Neoscona oaxacensis (Keyserling)
Clubionidae	*Clubiona oteroana* Gertsch
Corinnidae	*Scotinella* sp.
Cyrtaucheniidae	*Neoapachella rothi* Bond and Opell
Dictynidae	*Circurina robusta* Simon
	Cicurina sp.
Gnaphosidae	*Drassodes neglectus* (Keyserling)
	Gnaphosa muscorum (L. Koch)
	Haplodrassus signifer (C.L. Koch)
	Micaria pulicaria (Sundevall)
	Orodrassus sp.
	Zelotes fratris Chamberlin
	Zelotes lasalanus Chamberlin
	Zelotes puritanus Chamberlin
Hahaniidae	*Neoantistea gosiuta* Gertsch
Linyphiidae	*Helophora* sp.
	Pityohyphantes minidoka Chamberlin and Ivie
	Wubana drassoides (Emerton)
	2 Unknown Erigonines
Lycosidae	*Alopecosa kochii* (Keyserling)
	Pardosa concinna (Thorell)
	Pardosa sp. (*nigra* group)
	Pardosa sp. (*modica* group)
	Trochosa terricola Thorell
Philodromidae	*Thanatus coloradensis* Keyserling
Pholcidae	*Psilochorus* sp.
Salticidae	*Dendryphantes nigromaculatus* (Keyserling)
	Habronattus cockerelli (Banks)
	Habronattus n. sp. (*coecatus* group)
	Pelegrina arizonensis (Peckham and Peckham)
	Phanias sp.
	Unknown (immature)
Theridiidae	*Steatoda* sp. (immature)
	Theridion neomexicanum Banks
Thomisidae	*Coriarachne* sp. (immature)
	Xysticus emertoni Keyserling
	Xysticus luctuosus (Blackwall)
Titanoecidae	*Titanoeca nigrella* (Chamberlin)
Pseudoscorpiones	
Neobisiidae	*Cryptocreagris laudabilis* (Hoff)
Opiliones	
Triaenonychidae	*Sclerobunus robustus* (Packard)
Sclerosomatidae	*Togwoteeus biceps* (Thorell)
Acari	
Anystidae	*Anystis* sp.
Ixodidae	*Dermacentor andersoni* Stiles
CHILOPODA	
Geophilomorpha	
Geophilidae?	Undetermined genus
DIPLOPODA	

Table 1. (Continued)

ARACHNIDA	
Spirobolida	
Spirobolidae?	Undetermined genus
ENTOGNATHA (Non-Insect Hexapoda)	
Collembola	
Entomobryidae	Undetermined genus
Neanuridae	*Neanura* sp.
INSECTA	
Odonata	
Aeshnidae	*Oplonaeschna armata* (Hagen)
Orthoptera	
Acrididae	*Aeropedellus clavatus* (Thomas)
	Chorthippus curtipennis (Harris)
	Circotettix rabula Rehn and Hebard
	Melanoplus magdalenae Hebard
Tettigoniidae	*Anabrus simplex* Haldeman
Hemiptera	
Corixidae	Undetermined genus
Pentatomidae	*Thyanta* sp.
	Trichopepla sp.
Thyreocoridae	*Corimelaena nigra* Dallas
Alydidae	*Alydus* sp.
Miridae	12 + species
Lygaeidae	*Lygeus kalmii* Stal
	Nysius sp.
Rhyparochromidae	Undetermined genus (1 + species)
Cicadellidae	5 undetermined species in 5 genera
Cercopidae	1 undetermined species in 1 undetermined genus
Coleoptera	
Carabidae	*Agonum* (*Agonum*) *placidum* (Say)
	Amara (*Amarocelia*) *ellipsis* (Casey)
	Amara (*Percosia*) *obesa* (Say)
	Calathus (*Procalathus*) *advena* (LeConte)
	Calathus (*Neocalathus*) *ingratus* Dejean
	Carabus (*Oreocarabus*) *taedatus agassii* LeConte
	Cicindela longilabris (Say)
	Cymindis (*Cymindis*) *cribricollis* Dejean
	Harpalus animosus Casey
	Harpalus ellipsis LeConte
	Pterostichus (*Bothriopterus*) *adstrictus* Eschscholtz
	Pterostichus (*Hypherpes*) *protractus* LeConte
	Rhadine nivalis group, probably *umbra* Casey
	Scaphinotus (*Scaphinotus*) *snowi snowi* (LeConte)
	Synuchus dubius (LeConte)
Staphylinidae	Aleocharinae sp. 1 (genera difficult to separate)
	At least 10 species in several genera undetermined
Scarabaeidae	*Diplotaxis* sp.
	Macrodactylus sp.
	Phyllophaga sp.
Elateridae	*Ctenicera triundulata* (Randall)
Cantharidae	*Cantharis* sp.
Coccinelidae	*Hippodamia convergens* Guérin-Méneville
Tenebrionidae	*Eleodes extricates* (Say)
	Eleodes hoppingi Blaisdell
	Stenomorpha sp.
Melyridae	*Collops bipunctatus* Say
Oedemeridae	Undetermined genus
Chrysomelidae	Undetermined genus
Cerambycidae	*Leptura propinqua* Bland
Undetermined family	Undetermined genus
Lepidoptera	(Note: butterflies and skippers were not collected, but were identified in the field)
Papilionidae	*Papilio bairdii* W.H. Edwards

Table 1. (Continued)

ARACHNIDA	
	Papilio rutulus Lucas
	Papilio zelicaon Lucas
Pieridae	*Colias eurytheme* Boisduval
Lycaenidae	*Hemiargus isola* (Reakirt)
	Plebejus acmon (Westwood and Hewitson)
	Plebejus icarioides (Boisduval)
	Agriades franklinii (Curtis)
	Lycaeides melissa (W.H. Edwards)
Nymphalidae	*Euptoieta claudia* (Cramer)
	Nymphalis antiopa (Linnaeus)
	Poladryas arachne (W.H. Edwards)
	Polygonia zephyrus (W.H. Edwards)
	Speyeria atlantis (W.H. Edwards)
	Vanessa cardui (Linnaeus)
	Vanessa virginiensis (Dury)
Hesperiidae	*Erynnis persius* (Scudder)
	Hesperia sp.
	Oarisma garita (Reakirt)
	Polites themistocles (Latreille)
	Thorybes mexicanus (Herrich-Schaeffer)
	Thorybes pylades (Scudder)
Trichoptera	
Undetermined family	Undetermined genus
Diptera	
Tipulidae	*Tipula* sp.
Bombyliidae	*Anthrax* sp.
	Undetermined genera (at least 2 species)
Asilidae	Undetermined genus
Dolichopodidae	Undetermined genus
Syrphidae	*Chryostoxum* sp.
	Eristalis tenax (Linnaeus)
	Volucella mexicana Macquart
Sarcophagidae	Undetermined genus
Calliphoridae	Undetermined genus
Tachinidae	*Gymnosoma* sp.
	Undetermined genera (3 species in 3 genera)
Fanniidae	Undetermined genus
Undetermined families (including "midges")	Undetermined genera (at least 23 species)
Hymenoptera	
Argidae	Undetermined genus
Tenthredinidae	Undetermined genus
Braconidae	Undetermined genera 5+ species
Ichneumonidae	*Ophion* sp.
	Itoplectis sp. 1
	Itoplectis sp. (2 species)
	Undetermined genera (15 + species)
Torymidae	Undetermined genus
Dryinidae	Undetermined genus
Chrysididae	Undetermined genera (2 species in 2 genera)
Sphecidae	*Ammophila* sp.
	Podalonia sp.
	Undetermined genera (8 undetermined species)
Vespidae	*Vespula vulgarus* (Linneaus)
	Ancistrocerus sp
	3 undetermined genera and species
Pompilidae	*Anoplius* sp.
Formicidae	*Camponotus modoc* Wheeler
	Formica sp. *rufa* group
	Formica sp. (different group)
	Lasius sp.
	Myrmica sp.

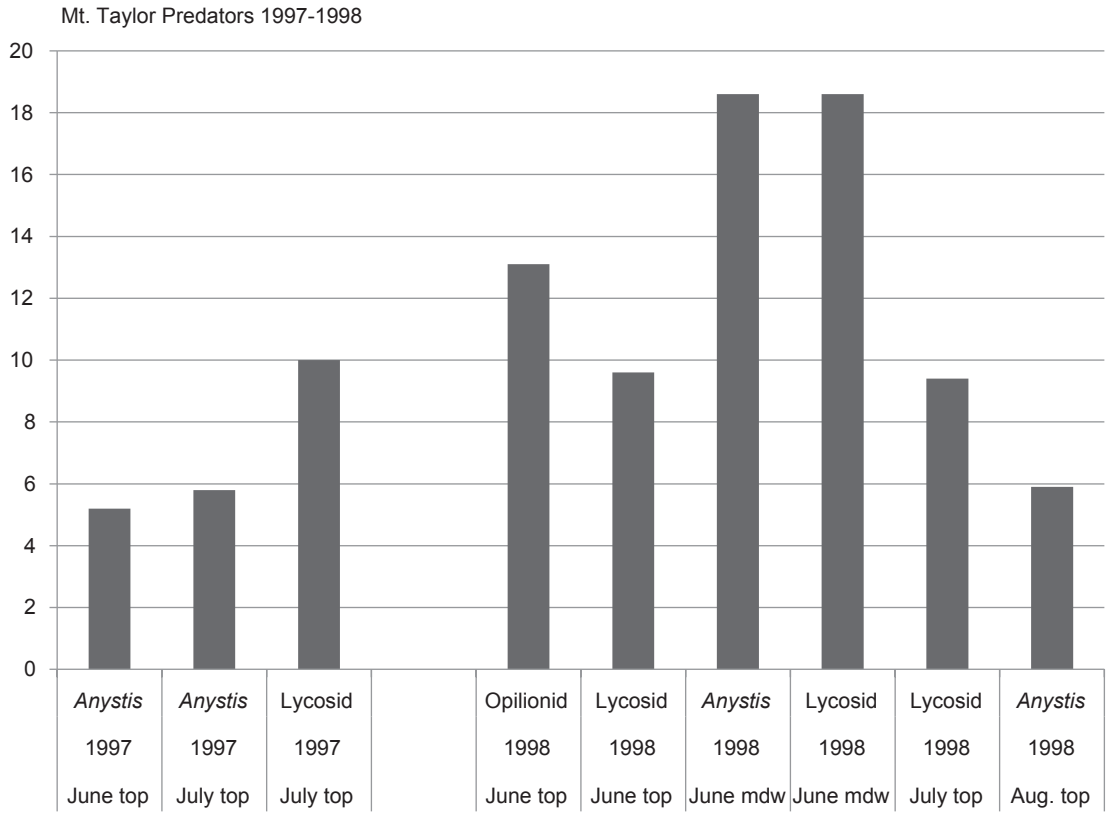

Fig. 2. Predatory arthropod specimens per pitfall trap in 1997-1998 (3 traps at the summit of Mt. Taylor). Summit of peak near 3445 m (top) and First Meadow at 3030 m (mdw).

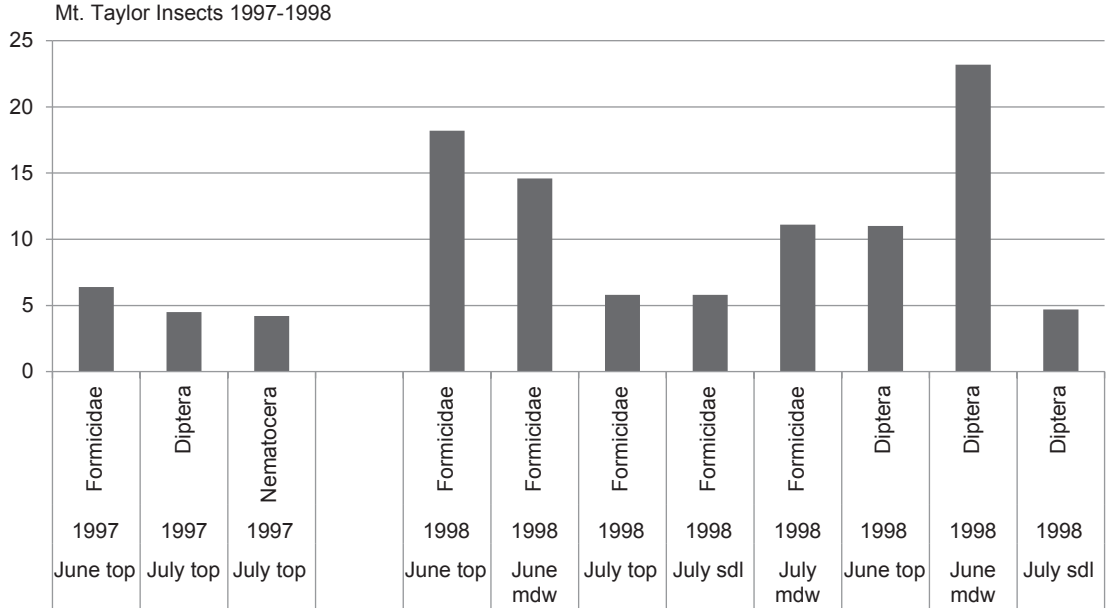

Fig. 3. Insect specimens per pitfall trap in 1997-1998 (3 traps at the summit of Mt. Taylor). Summit of peak near 3445 m (top), First meadow at 3030 m (mdw), and Saddle at 3180 m (sdl).

best efforts, no female was found. The greatest number of males was found in 1997, with 4 males collected in July and 1 in Aug. The genus and species were finally described as *Neoapachella rothi* in 2002 by Bond and Opell. This is one of the highest-elevation records known for this family. Bond and Opell (2002) did not rule out the possibility that there may actually be more than 1

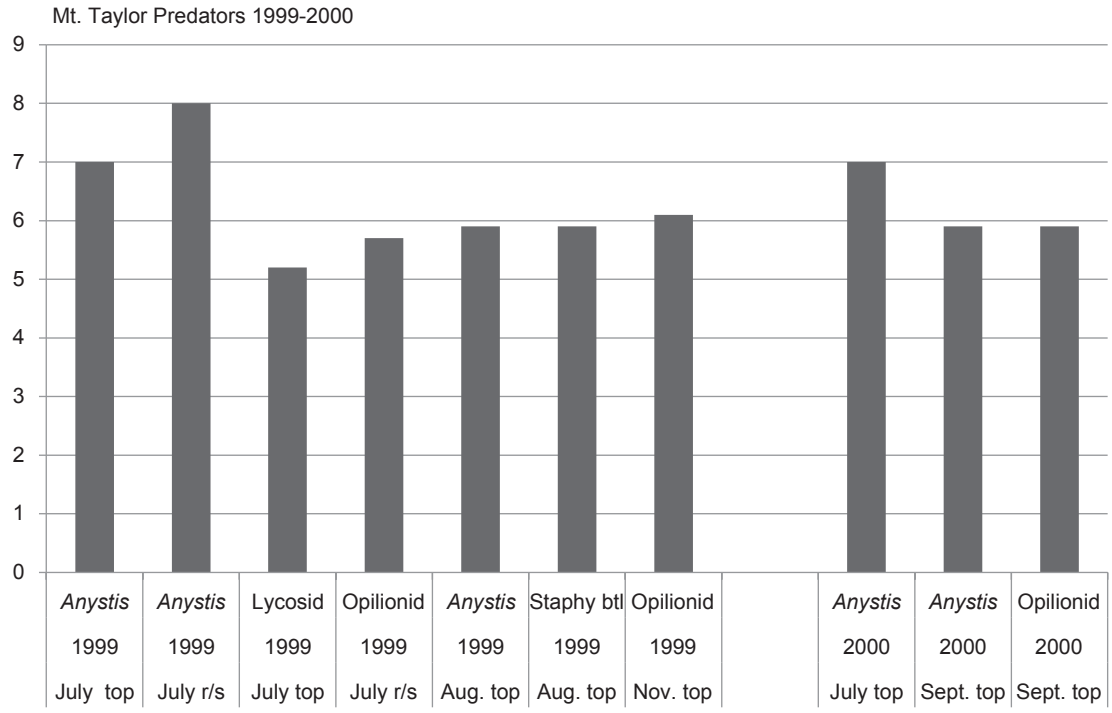

Fig. 4. Predatory arthropods collected per pitfall trap at the summit (top). Lowest pitfall collection site at Run/Ski at 2874 m (r/s). Staphy btl, Staphylinid bettles.

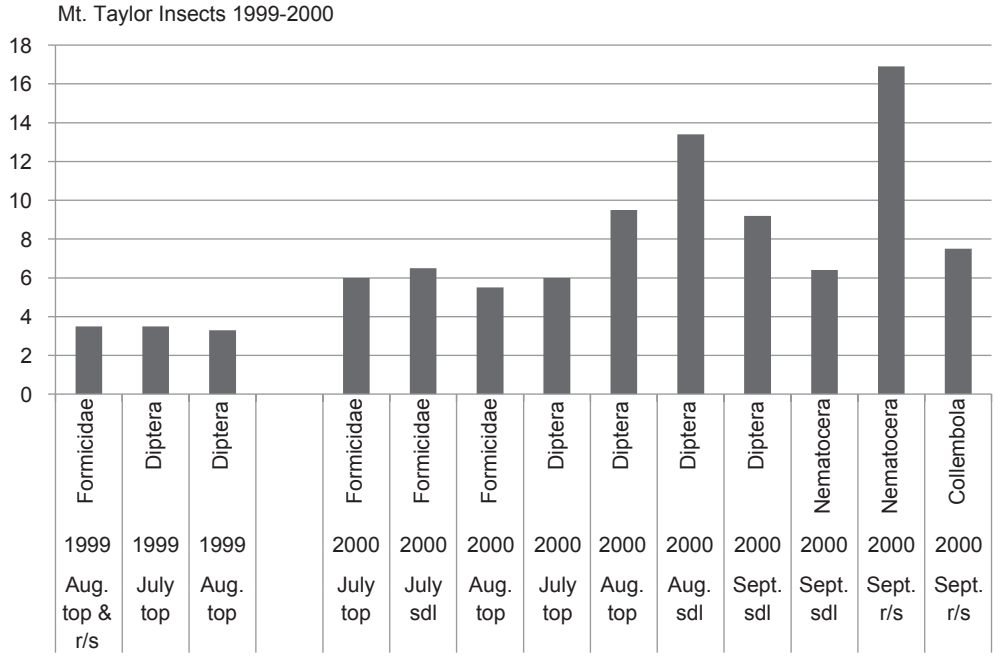

Fig. 5. Insects collected per pitfall trap at Run/Ski at 2874 m (r/s), Summit near 3445 m (top), First Meadow at 3030 m (mdw), and Saddle at 3180 m (sdl) in 1999-2000.

species of *Neoapachella* because of the elevation and apparent isolation of the 4 known populations. However they did not have enough specimens to rule out natural variation. Thus, the specimens from Mt. Taylor may represent a separate species. The tendency for mygalomorph spiders, especially trapdoor spiders, to live in isolated populations promotes localized speciation (Bond et al. 2006, Ferretti et al. 2010).

All traps were at the top of Mt. Taylor during 1997. *Anystis* whirligig mites were collected at densities of 5-6 per trap during June and early July, and lycosid spiders were 10 per trap during early July (Fig. 2). Ants reached densities of over 6 per trap during June. Non-nematoceran flies (Diptera), and associated midges (Nematocera), were each found at over 4 per trap during early July (Fig. 3).

During 1998, both *Anystis* whirligig mites and lycosid spiders peaked at more than 18 per trap at the First Meadow (mdw) site, and Opiliones reached 13 per trap at the top (Fig. 2). Ants (Formicidae) appeared at more than 18 per trap at the top and more than 14 per trap at First Meadow in June (Fig. 3). Flies were found at 11 per trap at the top and 23 per trap at First Meadow during June (Fig. 3). In July, 9 lycosid spiders per trap were recovered at First Meadow (Fig. 2). In Sept., ants peaked at over 50 per trap at First Meadow (not shown in figure because of scale).

The 1999 season began with *Anystis* whirligig mites at all sites: 7 per trap at the top, 8 per trap at the Run/Ski parking lot. There were 5 lycosid spiders at the top (Fig. 4). There were fewer than 4 ants at the top in Aug., while there were fewer than 4 flies per trap at the top in July and Aug. (Fig. 5). Around mid-season, *Anystis* reappeared at nearly 6 per trap at the top. Staphylinid beetles appeared at the top at nearly 6 per trap. In late season at the top, there were 6 Opiliones per trap (Fig. 4).

The final season, 2000, began with 7 *Anystis* mites per trap at the top (Fig. 4). There were 6 ants per trap at both the top and saddle; there were 6 flies per trap at the top (July) and over 9 per trap at the top (Aug.) and over 13 at the saddle (Aug.) (Fig. 5). Nematoceran flies appeared in Sept. with 6.4 per trap at the saddle and 16.9 per trap at the Run/Ski parking lot (Fig. 5). springtails appeared at over 7.5 per trap at the saddle, and flies had over 9 per trap at the saddle (Fig. 5). In the late season, *Anystis* mites and Opilionids both had fewer than 6 specimens per trap (Fig. 4).

Overwintering per-trap densities were over 5 per trap for *Anystis* whirligig mites in 1997-1998. Overwintering traps once again had fewer than 4 per trap of *Anystis* whirligig mites and over 1 Opiliones per trap in 1998-1999, i.e., from 30 Oct. 1998 to 13 June 1999. Over the winter, *Anystis* whirligig mites reappeared at the top at over 4 per trap and over 2 Opiliones per trap for 1999-2000 (Nov. to May) (Fig. 6).

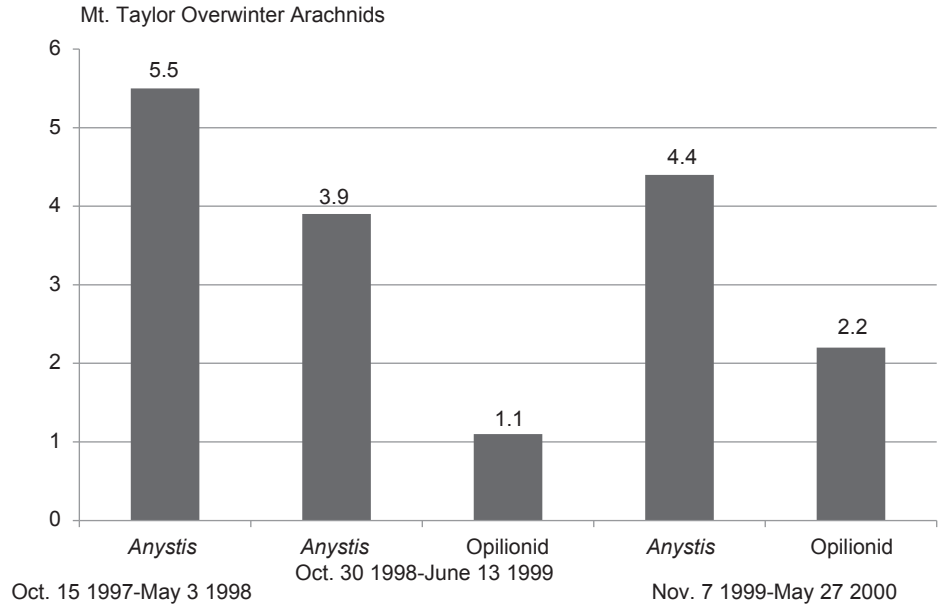

Fig. 6. Overwintering arachnids per pitfall trap based on collection of specimens from traps left on the summit of Mt. Taylor through the winters of 1997-1998, 1998-1999, and 1999-2000.

DISCUSSION

Of the nearly 250 different arthropods collected on Mt. Taylor, we were able to identify 85 to species. The survey is by no means comprehensive, but the numbers of species and individuals indicate that even on a high mountain at 2900-3445 m, the fauna is complex. To our knowledge there are no other comprehensive studies on North American high-mountain Arthropoda as a group, although spiders of the entire Chiricahua Mts. in Arizona were covered in a list by Jung and Roth (1974), but those only reached 2975 m. All other known studies are at lower elevations, at least for the Southwest US. Examples of such studies for only 1 taxon, Araneae, include Lowrie (1985) and Muma (1980), but neither of those exceeded 2200 m. The presence of both widespread Canadian species and local southwestern mountain species, like *Neoapachella rothi*, indicates a quite varied fauna, and a larger number of species are likely to exist on the mountain than have so far been collected. For example, the moths are poorly represented, and there should be a minimum over 200 species of these alone (there are over 700 species of butterflies and 11,000 species of moths described for North America, according to Evans 2008), and the parasitoid wasps and smaller beetles are also underrepresented. While we did not find either *Habronattus oregonensis* or females of the recently described *Neoapachella rothi*, we did document a quite diverse fauna above about 2900 m on a relatively remote volcanic mountain outlier of the Rocky Mts. We know that females of the trapdoor spider must exist on the mountain, and we cannot dismiss the possibility that the jumping spider may be there as well. As in any faunal study, much remains to be done.

Acknowledgments: This study would have been impossible without the cooperation of officials of Cibola National Forest. They allowed us access to Mt. Taylor and encouraged our work. The original idea for the study was proposed by the late D. Haynes, emeritus professor at Michigan State Univ., East Lansing, MI, who accompanied us on the 1st few trips to Mt. Taylor. People who aided in the project in addition to Dr. Haynes included G. Logarzo, A. Morrison, E. Fredrickson, L. Wiener, C.S. Bundy, P. Hyder, and L. Oelke. We would especially like to thank R.L. Davidson of the Section of Invertebrate Zoology, Carnegie Museum of Natural History, Pittsburg, PA, for identifying the non-*Cicindella* Carabidae; S. Bundy of the Department of Entomology, Plant Pathology and Weed Science, New Mexico State University, Las Cruces, for identifying the Hemiptera; C. Triplehorn of Ohio State Univ., Columbus, OH, for identifying the Tenebrionidae; J. Cokendolpher of Texas Tech Univ., Lubbock, TX, for identifying the Opiliones; D. Lightfoot of the Museum of Southwestern Biology at the Univ. of New Mexico, Albuquerque, NM for identifying several of the Acrididae; and L. Wiener of Santa Fe, New Mexico, for providing us with her list of butterflies and skippers that she observed in 2000, mostly from the 3000-m level. Dr. M.S. Harvey of the Western Australian Museum, Welshpool, Western Australia offered accurate suggestions on the identification of 1 species of Pseudoscorpiones. W. Maddison of the Univ. of British Columbia, Vancouver, BC, Canada offered unpublished data on the distribution of *Habronattus oregonensis*. The contour map of Mt. Taylor was originally constructed by B.A. Nolen of the Department of Biology, New Mexico State Univ. but was redrawn and revised by B. Griggs under the direction of M.P. Bleiweiss, at the Department of Entomology, Plant Pathology and Weed Science, New Mexico State Univ. The reviewers of this manuscript helped to improve the organization and content. This research was supported in part by funds provided by the Agricultural Research Station, New Mexico State Univ.

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