

The Fauna of a Hibernation Nest of a Meadow Jumping Mouse, *Zapus hudsonius*

On 22 January 1974 a nest containing a hibernating meadow jumping mouse (*Zapus hudsonius* (Zimmermann, 1780) was found in the burrow of a woodchuck (*Marmota monax*) in a dike along the Wabash River, 6 mi (10 km) NW of Terre Haute, Vigo County, Indiana. The burrow had collapsed because of heavy rains and floods, thus exposing the nest. The burrow had been abandoned by the woodchuck but was utilized by raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*) during the winter of 1973–74 (L. L. Schmeltz, personal communication). The nest was about 14 cm in diameter and constructed entirely of the leaves of *Festuca* sp., the principal plant on the dike.

The jumping mouse was an adult female; the skull and skeleton are preserved in the collection of G. S. Jones (#2284). The specimen contained 3 g subcutaneous fat and 1 g fat in the peritoneal cavity. The stomach was empty. The small intestine was empty except for a small amount of nondescript material near the posterior end. The caecum contained finely ground material in the distal fifth. The large intestine contained nine pellets composed of highly digested parts of grass seeds, vegetation, and fungal spores which appeared to have been in place for a long time. No endoparasites were found and there were no placental scars or embryos.

The only ectoparasites found on the jumping mouse were eight mites, *Androlaelaps fahrenheitsi* (Berlese). After the nest was placed in a Berlese funnel, the following invertebrates were recovered: Collembola—*Hymenaphorura sibirica* (Tullberg) 25, *Folsomia ?diplophthalma* (Axelson) 1, Coleoptera larva 2; Hymenoptera—Pteromalidae, *Dorcatomophaga* sp. 6; Bethylidae 1; Pauropoda—*Allopauropus gracilis* var. *sabaudianus* (Remy) 2; Nematoda 11.

Acarina: Glycyphagidae—*Dermacarus* probably *newyorkensis* Fain 1♂, 1♀, 1 larva; Acaridea—*Tyrophagus* probably *putrescentiae* (Schränk) 2♂♂, 2♀♀, 6 nymphs; Stigmaeidae 1 nymph; Oribatei 1 nymph; Pyemotidae 2; Chortoglyphidae—*Chortoglyphus arcuatus* (Troupeau) 2; Anoetidae 1; Tarsonemidae—*Tarsonemus* sp. 1♂, 11♀♀; Tydeidae—*Tydeus* sp. 4 nymphs; Parasitidae—*Pergamasus* near *nasellus* Karg 1♂; Laelapidae—*Hypoaspis angustus* Karg 1♀; *Ascidaecgasellodes* sp. in *bicolor* complex 3♀♀.

The specimens of *Hymenaphorura sibirica* are the first taken in Indiana and only the third record in North America (Hart, *in press* and personal com-

munication). The specimens of *Dorcatomophaga* sp. represent the first record of this genus from the Western Hemisphere and apparently represent a new species (Yoshimoto, personal communication). The two adults of *Dermacarus* probably *newyorkensis* were the first adults of this species known; Dr. Alex Fain, Edwin J. Spicka, and the authors are studying the life cycle of this species since the discovery of the adults in this nest.

Discussion

Only two of the invertebrates from the nest are known to be regular associates of the meadow jumping mouse: these are *Dermacarus newyorkensis* and *Androlaelaps fahrenheitsi*. Whitaker (1963) and Whitaker and Mumford (1971) found that these two species are among the most abundant mites found on the meadow jumping mouse in New York and Indiana. A third common species on *Zapus* is *Radfordia ewingi* (Fox) (Whitaker and Mumford 1971); there was no evidence of this species in the nest.

Representatives of *Tydeus* have been found in bird nests (Krantz 1970), *Dermacarus hypudaei* (Koch) adults have been reported from rodents' nests in Europe (Rupes 1967), and pyemotids and acarids were found in rodent nests in Egypt by Yunker and Guirgis (1969).

Vysotskaja (1967) discussed the relationships of invertebrates in rodent nests, suggesting that some species move into the nests during cold periods in order to make use of the host as a "hot water bottle" hibernaculum. He further emphasized that the inhabitants within rodents, nests form a community, termed acarocoenosis by Lundqvist (1974) and acarinium by Rosicky and Mrciak (1967). The coleopterous larvae, collembolans, pauropods, nematodes, oribatids, tarsonemids, and anoetids all live in the soil or humus and feed on detritus. Some pyemotids and stigmaeids are known to be predators as are some *Tydeus*. Both hymenopterans are parasitoids and Bethylidae, at least, is known to prey on coleopterous larvae (Borror and Delong 1971).

Although several *Zapus* hibernation nests have been found, this is the first that had its arthropod inhabitants collected and studied. The distribution records, possible new species, and discovery of an adult of a form previously known only from hypopi, illustrate the value of such a study.

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