RESEARCH NOTE . . .

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Parasites of Grey Squirrels in Cheshire, England

One hundred and fifty grey squirrels (*Sciurus carolinensis* Gmelin), including 28 juveniles, were examined for ectoparasites during April–July 1978 from Delamere Forest, Cheshire. Thin blood films prepared from 133 of the animals were examined for hemoparasites; feces and/or intestinal contents of 12 were concentrated by saturated NaCl flotation to detect intestinal parasites.

Ectoparasites found included two species of fleas and lice and at least three species of mites. The characteristic grey squirrel flea *Orchopeas howardi* (Baker) was present on 142/150 (95%) with a mean of 31 fleas per host in the 91 from which counts were made. Many of the fleas were carrying, phoretically, hypopial nymphs of a mite of the genus *Acarus*, species unknown. Four specimens of *Dasypsyllus gallinulae* (Dale), a common bird flea parasitizing many species, especially Passeriformes (Smit, 1957, Handbook for the Identification of Insects: Siphonaptera. R Entomol Soc, London), were recovered from one juvenile squirrel, together with 13 *O. howardi*.

The lice *Neohaematopinus sciuri* Jancke and/or *Enderleinellus longiceps* Kellogg and Ferris were found in smaller numbers on 55/150 (37%) including only 2/28 juveniles. Louse eggs were found attached to long hairs at the base of the tail and hind limbs in nearly all adults, 112/122 (92%), but on only 1/28 juveniles. Dermanyssid mites, *Androlaelaps fahrenholzi* (Berlese) and/or *Hyperlaelaps microti* (Ewing) were present on 26/122 adults (21%) and 1/28 juveniles. Mean number of these mites per host was less than three. A single nymph of the tick, *Ixodes ricinus* (Linn.) was found on one adult male. Adult female squirrels were infested with ectoparasites less commonly than adult males but frequently harbored larger numbers, especially of mites.

An *Hepatozoon* was the only blood parasite found. This was present in 46/63 adult males (73%); 19/43 adult females (44%) and 1/27 juveniles (<4%). Up to 100 gametocytes per 100 leukocytes (includes some parasites free in the plasma) were seen. Parasitemias were higher in males, mean 18/100 leukocytes, than in females, 14/100 leukocytes. Presumably, the parasite is *Hepatozoon griseisciuri* Clark which undergoes syngamy and sporogony in a mite, Clark (1958, J Parasitol **44:** 52–63) and Redington and Jachowski (1971, J Parasitol **57:** 953–960) but this organism has not been described from squirrels in the U.K. Dasgupta and Meedeniya (1958, Parasitology **48:** 419–422) reported sporogony stages of *Hepatozoon* squirrels." (They had examined fleas from in fleas (*O. howardi*) collected from "English both the indigenous red squirrel, *Sciurus vulgaris* Linn. and the introduced grey squirrel, *S. carolinensis*.) These workers reported that Mrs. M. Vizoso had noted "*Hepatozoon sciuri*" in the leukocytes of both species of squirrels trapped by her in various parts of England. It is possible two separate *Hepatozoon* species are involved—one (*H. sciuri*?) with a red squirrel-flea life cycle, and *H. griseisciuri* with the established grey squirrel-mite life cycle. It is perhaps significant in the present work that while the flea *O. howardi* was found with almost equal regularity on *Hepatozoon* positive and *Hepatozoon* negative squirrels, mites were found on 16/66 *Hepatozoon* positive and only 6/67 *Hepazoon* negative squirrels.

All 12 squirrels (including two juveniles) examined for intestinal parasites revealed oocysts of *Eimeria*, presumably *E. neosciuri* Prasad, ranging in size from 16.5–30.2 × 9.5–16 μm. Helminth ova were found in three of the 12—single operculate ova in the contents of jejunum and appendix of one adult and a similar ovum in the jejunum of a juvenile. Nematode ova (20/g) were found in the feces of another juvenile. Further work is required to elucidate the life cycles of the various parasites encountered in this study in particular the *Hepatozoon*, and to assess its pathogenicity in *S. carolinensis* and *S. vulgaris*.

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D. Britt and D. H. Molyneux, Department of Biology, University of Salford, Salford M5 4WT, Greater Manchester, U.K. Reprint requests should be addressed to Professor D. H. Molyneux.