

N O T E

OCCURRENCE OF A SOIL-INHABITING PEST OF ROW CROPS, *MELANOTUS SIMILIS* (KIRBY) (COLEOPTERA: ELATERIDAE), IN FOREST HABITATS

Key Words: *Melanotus*, wireworm, Elateridae, habitat selection

J. Entomol. Sci. 23(1): 75-76 (January 1988)

Larvae of the genus *Melanotus* exploit a wide variety of habitats, including soil in cultivated fields and fallen trees. The soil-dwelling *Melanotus* species are thought to have evolved from species that inhabited an original environment of dead timber (Gur'yeva, Y. L. 1969. Entomol. Rev. 48: 154-59). A limited range of larval habitat requirements has been viewed as a characteristic of each elaterid species, and different larval habitats, such as soil and decaying wood, have been used to separate larvae of different species (Hyslop, J. A. 1917, Ann. Entomol. Soc. Am. 10: 241-63; Glen, R. et al. 1943, Can. J. Res. 21, Sec. D: 358-87). In collections of wireworms from decaying wood in forest habitats, we have encountered larvae of a major soil-inhabiting agronomic pest, *Melanotus similis* (Kirby).

Melanotus similis larvae were collected from trunks of fallen trees and from the adjacent forest soil. Larvae were obtained from the outer soft layer under the bark of decaying logs and from the adjacent soil by crumbling the decaying wood and soil by hand and removing larvae from their tunnels. Each larva was identified to species using the most recent descriptions and key to *Melanotus* larvae (Riley, T. J. and A. J. Keaster 1979, Ann. Entomol. Soc. Am. 72: 408-14). The identifications were verified by the senior author of that key. Forty-one *M. similis* larvae were collected from decaying oak logs (*Quercus* sp.) and adjacent soil in a forest in Clayton Co., GA. Two larvae were obtained from decaying logs (unknown tree species) and three larvae were obtained from rotten walnut husks (*Juglans* sp.) in collections from four forests in Missouri (Cedar Co., Clark Co., and Randolph Co.). *Melanotus similis* [= *M. fissilis* (Say)] is a major pest of row crops in Canada (Glen et al. 1943) and the midwestern U. S. (Forbes. S. A. 1892, Rep. State Entomol. Ill. 18: 24-45). This species also occurs on row crops in Georgia (Fattig, P. W. 1951, Emory Univ. Mus. Bull. 10. 25 pp.).

Melanotus similis larvae were collected on seven sampling occasions (January-October 1985) in Clayton Co., GA. Two sample pairs, each consisting of a sample of a log (40 × 40 × 10 cm deep) and a sample of soil below the log (40 × 40 × 20 cm deep), were obtained on each sampling date. Numbers of larvae obtained from wood and soil were 4 and 6 on 12 January, 4 and 4 on 29 March, 0 and 11 on 4 May, 0 and 4 on 22 June, 0 and 0 on 20 July and 17 August, and 2 and 6 on 16 October. The majority of the larvae (76%; n = 41) were collected from soil adjacent to decaying timber, indicating that, like the larval habitat in agroecosystems, soil is an important component of the larval habitat of *M. similis* in forest ecosystems.

On the final sampling date in Clayton Co., GA, our samples contained overwintering adults in pupal cells in decaying wood (n = 1) and in soil (n = 3). Forbes (1892) reported the occurrence of *M. similis* adults in decaying logs during winter

months. The observations reported here suggest that Forbes may have encountered overwintering beetles in their larval habitat.

Ten of the *M. similis* larvae obtained from decaying wood were each retained in a sealed 500-ml jar containing soil from the collection site. All larvae were fed at monthly intervals with living white-fringed beetle (WFB) larvae (*Graphognathus* sp.) and corn seeds (*Zea mays* L.) on alternating feeding occasions. All *M. similis* larvae consumed WFB larvae. In the presence of corn seedlings, each wireworm exhibited a feeding behavior identical to that of corn-infesting *Melanotus* larvae (Bryson, H. R. 1930, J. Econ. Entomol. 23: 303-15). Four individuals survived and emerged as adults by December 1986, and each of these beetles was identified as *M. similis* (Quate, L. W. and S. E. Thompson 1967, Proc. U. S. Nat. Mus. 12(3568): 1-84). Voucher specimens (1 male and 3 larvae) have been deposited in the Entomological Collection, Museum of Natural History, University of Georgia, Athens, GA.

Investigation of the number of *Melanotus* species whose larvae inhabit both forests and cultivated fields is warranted. Evidence of the occurrence of *Melanotus communis* (Gyllenhal) in both habitats was obtained in a field that was cleared from forested land in Pike Co., GA. Corn planted 10 months after removal of the forest was severely damaged by late-instar *M. communis* larvae. The larval stage of this species lasts at least 3 years (Forbes 1892), suggesting that the population of *M. communis* larvae was present in the forest before the land was cleared. Fattig (1951) recorded collections of adults of *Melanotus depressus* (Melsheimer), *M. communis* and *M. similis* from forested areas in Georgia.

Exploitation of both forest and agricultural habitats appears to be possible because *Melanotus* larvae, although known mostly for their destructive phytophagous behavior, are primarily predators (Gur'yeva 1969; Zacharuk, R. Y. 1963, Bull. Entomol. Res. 54: 161-65). Fauna inhabiting dead timber possibly provide food for larvae in forest habitats, while plants and possibly other soil organisms provide food for larvae in agricultural soils. Our observations suggest that the current theory of the evolution of soil dwelling elaterid larvae from species that inhabited dead timber should be revised to include the case of *M. similis*, a species that can inhabit dead timber, forest soil, and soil in cultivated fields. The importance of forest habitats as sources of *Melanotus* infestations in field crops warrants investigation. J. M. Cheshire, Jr., Department of Entomology, University of Georgia, Georgia Experiment Station, Experiment, GA 30212-5099 and T. J. Riley, Department of Entomology, Louisiana State University, Baton Rouge, LA 70803-1710. (Accepted for publication July 30, 1987).