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NOTES ON THE ECOLOGY OF XYLORYCTES JAMAICENSIS (COLEOPTERA: SCARABAEIDAE) IN SOUTHERN ONTARIO

(see cover photo)

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The comprehensive survey of literature on the biology of the Scarabaeidae by Ritcher (1958) indicates that the ecology of many large groups is known from a study of very few species. Such is the case with the rhinoceros beetles in the subfamily Dynastinae. From 1960 to 1965 I had many opportunities to observe the rhinoceros beetle *Xyloryctes jamaicensis* (Drury) in a woodlot near Wheatley, Ontario, on the north shore of Lake Erie. My notes, although fragmentary, suggest areas of further research.

The Wheatley woodlot, now part of a provincial park, has a bluish clayey soil, interspersed with many elevated areas and ridges of fine sand. Low spots oten hold surface water in spring and early summer, causing the well-drained sandy areas to stand out like islands. Low-growing plants are scarce in the deciduous forest; white ash (*Fraxinus americana* L.) is common in the lower areas and is frequently found in sandy soil close to the clay.

While digging at the base of one of these latter trees in late July, 1960 I found an adult *X. jamaicensis*. The next day, digging around the living but partially decayed ash, I exposed 12 males, 5 females and several larvae in an early instar. All the specimens were taken at a depth of 6''-10'' in a hard-packed mixture of sand and clay. Scars were evident on the main roots near the base of the tree, and signs of recent feeding were found.

Early instar larvae were collected in close proximity to other trees, always white ash. Yet later, when sifting leaf litter some distance from any growth of ash, many large, late instar larvae were found. These were at the level where the loose litter met older matted leaves. The larvae had fed extensively on various leaves, and frass was found in quantity. Similar larvae were observed in most heavy accumulations of leaves in the area, always on sandy ground and elevated above the water table.

I attempted to rear 25 larvae by placing them in a 10-gallon aquarium containing 2''-3'' of sand covered with 3'' of leaf litter, which was replaced as consumed. The sand and leaf litter were both obtained at the collection site. The aquarium was placed in a partially heated garage, where the temperature in winter seldom drops below freezing.

Pupation began in late October, at which time no more larvae could be found in the field. After four larvae had constructed egg-shaped unlined cavities in the soil, it was noticed that the remaining larvae were developing dark, scabrous patches, and had started to shrink as if dehydrated. Close examination showed that the larvae were infested

with large numbers of small, pale brown mites; unfortunately these were not identified. All these larvae died and only those already below ground escaped.

Adult emergence took place in May, probably due to the warm temperature of the garage; in the field adults are not seen until late July or early August. Data could not be obtained on length of adult life in the field, but I suspect that death occurs shortly after mating and deposition of ova, as I have never found live adults after late August.

Digging in 1961 and subsequent years confirmed the impression that sandy soil is a preferred habitat; also, young larvae were never found except near the roots of white ash. In other woodlots near Tilbury where both white ash and leaf litter were plentiful but the soil was not sandy, adults or larvae were not found. A large woodlot in Maidstone Township, Essex County, Ontario, yielded a few specimens but these were only found in a few sandy spots in the otherwise clayey soil.

I have not collected *X. jamaicensis* at light in Ontario, but was able to take a series by this method near Portal, Arizona in 1964 and 1966. [The species has been collected at light in Grand Traverse Co., Mich.-Ed.] The specimens were considerably larger than my Ontario captures. Vincent Roth, director of the Southwestern Research Station, Portal, has informed me that, to his knowledge, larvae have not been collected in the vicinity, but adults have been taken at light in the relatively treeless desert as well as at higher altitudes where various species of trees are found.

X. jamaicensis would seem to be fairly common in southwestern Ontario under the conditions described. Small larvae migrate from their original habitat at the roots of white ash, to complete their growth in leaf litter on well drained, sandy soil. The larvae are within easy reach of predators, yet appear to produce no protective liquids or offensive odors; perhaps a complete absence of odor protects them. Ritcher (1958) points out that length of life cycles among the Scarabaeidae varies with the climate, being longest in more temperate regions. In this area a two year cycle is most likely for *X. jamaicensis*, but definite proof is not yet available.

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LITERATURE CITED

Ritcher, Paul O. 1958. Biology of Scarabaeidae. Ann. Rev. Entomol. 3: 311-334.