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FOREIGN CHAFERS I. Melolontha melolontha (L.)[1] (COLOEPTERA: SCARABAEIDAE)

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INTRODUCTION: Because of the greater speed and frequency of travel, live foreign insects are more easily introduced into the United States. In an effort to provide assistance for an increased detection effort, a series of circulars is planned on the foreign chafers of greatest economic importance. The key to any suppressive action is the prompt and accurate identification of the pest.

Melolontha melolontha (L.) is variously called the "cockchafer, common cockchafer, May beetle, hanneton, chestnut chafer", etc. The larvae are usually referred to as "white grubs", a nonspecific name used for nearly any larva of the family Scarabaeidae. This species is often intercepted at U. S. ports of entry and could easily become established if it entered undetected.

DESCRIPTION (fig. 1-3) Adult: Length about 1 inch (25mm), width ½ inch (12-13mm). Although this species superficially resembles several native May or June beetles (Phyllophaga), it is easily distinguished from them by the costate ridges on the elytra (fig. 1a) and the projection of the pygidium (fig. 2a) in both sexes. When specimens are freshly emerged, they are coated with whitish scales, but these are easily rubbed off. The general appearance is then a dull brown with only a scattering of white scales. The males have an enlarged antennal club with 7 lamellae (fig. 1b). In this character it is most like our species of Polyphylla. The female club is small and composed of 6 segments.

The larva is a typical C-shaped white grub about 1.5 inches (37.5mm) long. Characters of the epipharynx and raster are used to distinguish the larvae, but these are relatively difficult to use except by trained taxonomists having comparative specimens available.

BIOLOGY: The life cycle of this beetle is extremely variable, particularly in various parts of its geographic range. From egg to adult usually takes at least 3 years and sometimes 5 years. There are also exceptional individuals which vary from the norm in any given region. In most areas, "flight years" occur during the year coinciding with the average life cycle length, although usually a few emerge every year. This variability of life cycle has been the subject of many studies [Dai (1965), Decoppet (1920), Dominik (1962), Gyorfi (1957), Hurpin (1962)].

A generalized life history finds most adults emerging in May and flying until early July only at dusk. They feed on leaves of trees and mate on the foliage. The female burrows into the soil up to 15 inches (375mm) for oviposition of about 24 eggs. A second batch of eggs may be laid about 2 weeks later after additional feeding. Eggs hatch in 6 to 7 weeks, the newly emerged larvae feeding on fine roots. In September they move down in the soil to as low as 30 inches and remain inactive until the next spring when they ascend to the upper levels and resume feeding. Pupation usually occurs in the third year in Great Britain (USDA 1957), but the adults do not emerge until spring of the fourth year. Dai (1965) found that in China the life cycle required 6 years: egg development 45-56 days; larval stage at least 58 months; pupal stage 2 months; adults emerge between late July and September but do not leave the soil until May of the following year.

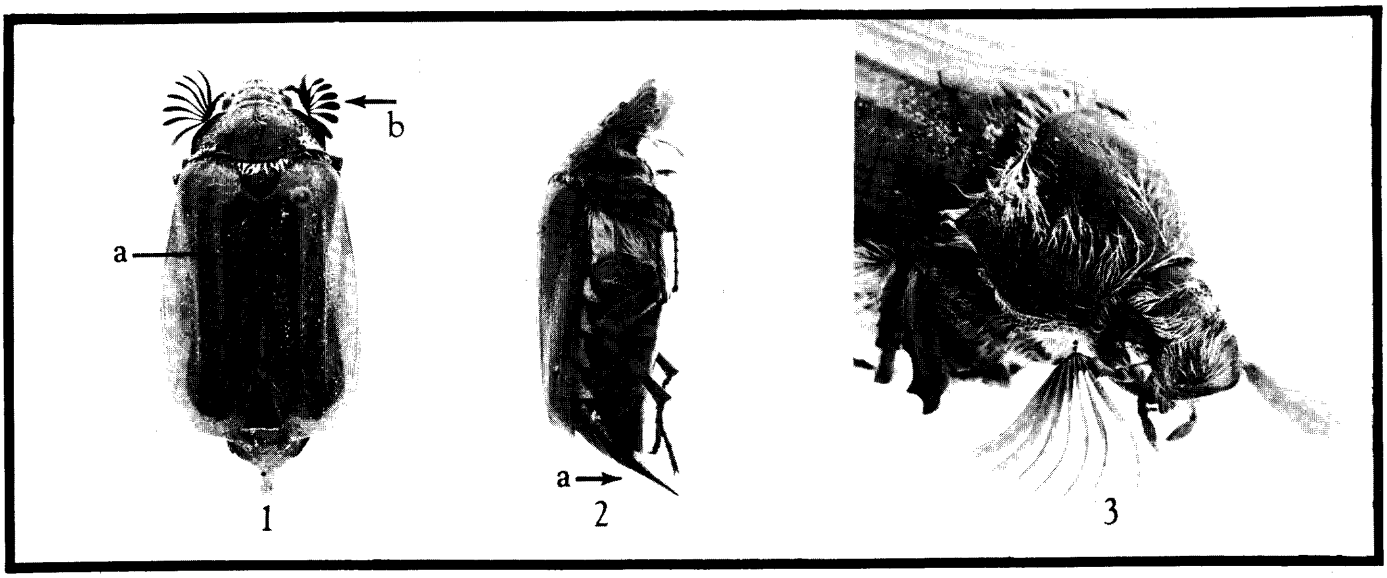

Fig. 1-3. Melolontha melolontha (L.), male: 1) dorsal view; 2) lateral view, 3) oblique view, showing lamellae of antennal club.

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HOSTS: More than 60 plants have been recorded as hosts. These include fruit, ornamental, and forest trees; specific examples of economic plants are: strawberry, grape, apple, pear, plumcherry, pea, bean, onion, lettuce, potato, crucifers, oats, barley, corn, soybean, tobacco, alfalfa, and clover. Many other commercial crops are potential hosts in this country.

ECONOMIC IMPORTANCE: Larvae are one of the major pests in Europe on hosts previously mentioned. Serious economic losses have been reported throughout most of its distribution in peak years of emergence. Adults often defoliate individual trees, but they do not cause as much concern as do the white grubs.

CONTROL: Since most chemicals that have been reported as successful (Gyorfi 1957; Jorgensen 1962; Dai 1965; Hurpin 1962) are either banned or unavailable, much work has been done on biological control. Bacillus popilliae Dutky has been tried without success (Blonska-Pawlak & Szcyepanska 1963). Organisms found useful in control include a fungus [Beauveria tenella (Delaer.)Siem.], a virus (Entomopoxvirus melolonthae), and a rickettsia [Rickettsiella melolonthae (Krieg) Philip] (Ferron 1965; Ferron & Hurpin 1974; Hurpin & Ferron 1965; Niklas 1960, 1963). Recommendations (Niklas 1960) involve plowing and disking to clear the grass and prevent oviposition, leaving some reservoir of diseases and parasites; under certain soil conditions the rickettsiosis seemed best for direct biological control, with fungus diseases unrelaible, and the virus disease requiring too long an incubation period.

Specimens are attracted to ultraviolet light (Couturier 1967), and this could offer some degree of adult control as well as a detection and survey tool.

DISTRIBUTION: Throughout most of Europe, including Austria, the British Isles, Czechoslovakia, Denmark, France, Germany, Holland, Hungary, Italy, Poland, Rumania, Sweden, and Switzerland (USDA 1957).

REFERENCES: This species has the distinction of having several hundred citations including a book (Decoppet) and a play (Widmann), and yet no thorough bibliography is available. The references listed here are only those relevant to this circular.

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