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Silphidae or Carrion Beetles (Insecta: Coleoptera) of Plummers Island, Maryland

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Abstract.—Based on an examination of the collection of the National Museum of Natural History, Smithsonian Institution, Washington, D.C., seven species of Silphidae (Coleoptera) were collected on Plummers Island, Maryland, from 1905 to 2004. This is 38.8% of the known silphid fauna of Maryland. The most commonly collected species is the habitat- and carrion-generalist *Nicrophorus tomentosus* Weber.

Key words.—Inventory, historical records, scavengers, *Nicrophorus.*

Silphidae or carrion beetles are primarily scavengers and carrion feeders, often having preferences for certain carrion, marked diel periodicity (Shubeck 1971, 1976; Shubeck & Blank 1972), and soil types (Bishop et al. 2002). A few species are phytophagous. Adult Silphidae can be collected at blacklights, in flight intercept traps, in Malaise traps, and at carrion (either natural or in pitfall or hanging traps).

Members of the subfamily Silphinae feed on exposed carrion or other decaying material. They tend to arrive during the early to mid-stages of carcass decomposition. Adults feed on carcasses of any size but will lay eggs only on or near carcasses of about 1 kg or larger (Ratcliffe 1996). Once a dead animal is located, adults mate and females lay their eggs in the soil around the carcass. Larvae move to the carcass and begin to feed. There is no parental care of larvae. Pupation occurs in the soil. Species in this subfamily avoid competition with fly larvae by attacking the carcass after the flies have pupated. *Necrodes surinamensis* (Fabricius) is primarily a predator on fly larvae but also consumes carrion. Adults are nocturnal and often are taken at lights (Ratcliffe 1972). *Aclypea opaca* (L.) is an introduced species from Europe that feeds on the roots of *Beta* sp. (Chenopodaceae) (Martin 1945).

Nicrophorus spp. (subfamily Nicrophorinae) bury small mammal or bird carcasses, guard and feed the developing larvae, and exhibit complex subsocial behaviors (Anderson & Peck 1985, Trumbo 1992; Scott 1996, 1997). The buried carcass is less accessible to flies and scavengers, thus minimizing competition from these groups. *Nicrophorus americanus* Olivier, the largest United States species in the genus (25–35 mm), has vanished from most of its former range. Consequently, it has been listed as an endangered species by the U.S. Fish and Wildlife Service (Lomolino et al. 1995, Backlund & Marrone 1997). Adults are nocturnal, and most historic specimens were taken at lights (Anderson & Peck 1985).

The family contains 30 species in eight genera in North America (Peck 2001). Staines (1987, 1989) reported 18 species in five genera from Maryland.

The insect collection at the National Museum of Natural History, Smithsonian Institution (USNM), was examined for specimens collected on Plummers Island, Maryland, now a part of the Chesapeake & Ohio Canal National Historical Park. The USNM is the major repository for specimens from Plummers Island since most of the entomologists who worked on the Island were affiliated with the institution. Species identifications were confirmed, and label data were recorded from all specimens. In addition, published literature on various silphid genera was examined for records from Plummers Island.

The USNM insect collection contains 31 carrion beetles from Plummers Island representing seven species or 38.8% of the Maryland fauna. Most of these specimens were collected prior to 1916 (80%) with one specimen from 1932, three from the 1960s, and two from 2004. Specimens were collected between April and October with the highest number collected in July.

Species Accounts

Necrodes surinamensis (Fabricius) adults are primarily predators on fly larvae on carrion (Ratcliffe 1972). Four specimens were collected between 28 August and 12 September 1907.

Necrophila americana (Linnaeus) adults may be found on carrion or fungi; adults are active during the day, are habitat generalists (Cole 1942, Shubeck 1971), and are found most often in riparian areas

(Bishop et al. 2002). One specimen was collected on 1 June 1905.

Nicrophorus orbicollis Say is found more commonly on cold-blooded carrion (Shubeck 1976). It prefers forested areas (Anderson 1982), is a nocturnal species, is attracted to lights (Shubeck 1971), and is found mostly in riparian areas (Bishop et al. 2002). Five specimens were collected from 28 April 1905 to 20 July 1968. The 1968 specimens were collected in a Malaise trap.

Nicrophorus pustulatus Herschel adults have been collected on fetal pigs (Shubeck & Blank 1982). This species appears to be a brood parasite, prefers forested areas, is seldom taken in pitfall traps, is attracted to lights (Anderson 1982, Anderson & Peck 1985, Trumbo 1992), and is usually collected on alluvial soils (Bishop et al. 2002). Five specimens were collected from 12 September 1907 to 7 June 1962. One specimen was collected at light.

Nicrophorus tomentosus Weber is a summer-active habitat- and carrion-generalist (Anderson 1982). It is diurnal (Shubeck 1971) and is found in various soil types (Bishop et al. 2002). It differs from all other North American *Nicrophorus* in that it does not bury the carcass of its host. Instead, it makes a shallow pit and covers it with leaves and other debris (Anderson & Peck 1985). This was the most commonly collected species with eight specimens taken from 1 July 1905 to 25 August 2004. One was noted on a dead squirrel, *Sciurus carolinensis* (Gmelin) (Rodentia: Sciuridae).

Oiceoptoma inaequalis (Fabricius) adults are found year round on carrion; they prefer exposed locations (Cole 1942). Four specimens were collected in 1908 [23 April, 31 May, 7 June (2)].

Oiceoptoma novaboracense (Forster) adults usually are found on carrion but occasionally are taken on fungi. This species is a habitat generalist and is bivoltine in New Jersey (Cole 1942, Shubeck 1971). Two specimens were found in the USNM collection: 1 July 1905 and 7 June 1908.

Discussion

Three of the seven Plummers Island species are habitat- and carrion-generalists. Of these, only *Nicrophorus tomentosus* has been collected recently. Both of the forest specialists, *N. orbicollis* and *N. pustulatus,* were collected in the 1960s and should still be found on the Island. This family is an excellent candidate for future inventory work on Plummers Island. Adults are easily identified, and their biology is relatively well known.

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