



<http://dx.doi.org/10.11646/zootaxa.3666.2.7>

<http://zoobank.org/urn:lsid:zoobank.org:pub:4951C68A-93C4-4777-B7D4-D7D657AE1DBC>

## Identification, distribution, and adult phenology of the carrion beetles (Coleoptera: Silphidae) of Texas

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### Abstract

The carrion beetles (Coleoptera: Silphidae) of Texas are surveyed. Thirteen of the 14 species, and five of the six genera, of this ecologically and forensically important group of scavengers that have previously been reported from Texas are confirmed here based on a study of 3,732 adult specimens. The one reported, but unconfirmed, species, *Oxelytrum discicolle*, was probably based on erroneous label data and is excluded from the Texas fauna. Two additional species, *Nicrophorus sayi* and *N. investigator* are discussed as possible, but unconfirmed, components of the fauna. Taxonomic diagnoses, Texas distribution range maps, seasonality profiles, and biological notes are presented for each confirmed species. The confirmed Texas silphid fauna of 13 species comprises 43% of the 30 species of this family that are known from America north of Mexico. The highest richness (11 species) is found in the combined Austroriparian and Texan biotic provinces of eastern Texas. Phenologically, three species (*Necrophila americana*, *O. rugulosum* and *Nicrophorus tomentosus*) exhibit bimodal adult temporal occurrence patterns with peaks in the spring and late summer or fall; four species (*Oiceoptoma noveboracense*, *Necrodes surinamensis*, *Nicrophorus carolinus*, and *N. orbicollis*) exhibit unimodal occurrence patterns with a single peak in late spring or early summer; one species (*Oiceoptoma inaequale*) exhibits a unimodal occurrence pattern with a single peak in early spring; and five species (*Thanatophilus truncatus*, *Nicrophorus americanus*, *N. marginatus*, *N. mexicanus* and *N. pustulatus*) display unimodal occurrence patterns with peaks in late summer or early fall.

**Key words:** Coleoptera, Silphidae, *Necrodes*, *Necrophila*, *Nicrophorus*, *Oiceoptoma*, *Oxelytrum*, *Thanatophilus*, American Burying Beetle, Texas

### Introduction

Species belonging to the family Silphidae are known as carrion beetles because they are among the most conspicuous insects that scavenge on vertebrate carcasses. They are ecologically beneficial as decomposers and are important for maintaining ecosystem health and productivity (Anderson & Peck 1985). Both larvae and adults feed on carrion, but a few species may be phytophagous or feed on fungi or fly larvae (Ratcliffe 1996, Peck 2001). Members of the two subfamilies, Silphinae and Nicrophorinae, are attracted to carcasses at different stages of decay. Silphinae readily feed upon carcasses in a more advanced stage of decay, while Nicrophorinae require mostly fresh carcasses for reproduction (Katovich *et al.* 2005). *Nicrophorus* species bury small vertebrate carcasses that they use as food for their young (Scott 1998). Typically, both male and female beetles provision developing larvae after burial of a carcass. Species of Silphinae lay eggs just beneath the surface of the soil near a carcass without burial of the carcass (Ratcliffe 1996). Many silphid species also have potential importance for forensic investigations, though post-mortem estimations are problematic due to the unresolved natural histories of most Silphinae species (Watson & Carlton 2005). The group includes one federally protected species, the American burying beetle, *Nicrophorus americanus* (Lamson 1989). This species was once widespread across eastern North America but is now known to exist at only one eastern location and several scattered sites on the western margin of its original range (Backlund *et al.* 2008). Although 14 species of this taxonomically well-known family have