

## **The use of carrion beetles in forensic entomology: life cycle of two species of Silphids**

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Carrion beetles (Coleoptera, Silphidae) are a small group of Coleoptera counting less than 200 species that are worldwide spread. Silphidae are mainly carrion feeder (necrophagous species) but can also prey on other carrion inhabitants such as fly eggs or maggots and other small carrion beetles (necrophilous species). These beetles have been referred to as being part of the entomofaunal colonization of a dead body but very few studies have looked at them in forensic context. However, the use of beetles could be relevant in forensic entomology. Silphids could provide information on postmortem colonization on remains and time since death. Typically, beetles life cycles are typically longer than that of flies and may improve the postmortem interval estimation. Among their ecological preference for large vertebrate carcasses, Silphinae may have a more important value as forensic indicators than Nicrophorinae. This study focuses on two Palearctic silphine species of forensic interest: *Necrodes littoralis* LINNAEUS and *Thanatophilus sinuatus* FABRICIUS. The beetles' life cycles were studied at two constant temperatures (18°C & 23°C) during their complete development. Each individual has been measured (4 measures of length per individual) twice a day with a geometrical micrometer during its active growth. Developmental milestones were also recorded. Three instars were identified for both species and their rate of development were also calculated for both temperatures. In addition to previous observations on Diptera conducted to calculate the minimum PMI (temperatures models), this study of the rates of development of the immature stages of Silphinae may extend the minimum PMI.