ABSTRACT OF THE THESIS

Ecological Studies of Necrophagous Beetles

in Hutcheson Memorial Forest

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Carrion-baited ground cans and air cans were used to collect carrion beetles in Hutcheson Memorial Forest during the summers of 1961 through 1965. Fresh chicken legs were used as bait and they were left in the cans for two-week periods of time. Practically all of the flesh was eaten or decomposed by the end of two weeks. All collected beetles were keyed out to family, all Silphidae were identified to species and all members of Leptodiridae were identified to genus or species. Finger nail polish was used to mark the elytra of the carrion beetles used in the orientation studies. The release-points of the recaptured individuals were thus identifiable.

Families Silphidae, Leptodiridae, Histeridae and Staphylinidae were consistently attracted to carrion and these families actually accounted for the bulk of the beetles that were trapped. Seven species of Silphidae were collected and these species accounted

for almost half of the total beetles collected from the four families mentioned. The dominant family of Coleoptera collected on carrion was Silphidae and the numbers of individuals of this family were maintained at about the same level throughout the seasonal periods of study in 1961 and 1963. There was no apparent succession of Silphidae species on carrion during the two-week period of time required for total decomposition. The carrion seemed to be most attractive to carrion beetles from the fifth to the tenth days when it was in the fresh-bloated, bloated, and decay stages. There was a seasonal pattern of change in dominant populations of Silphidae during the six-week summer periods of study. Silpha noveboracensis, the dominant species of early summer, decreased steadily and virtually disappeared by middle summer. Nicrophorus sp., on the other hand, was present in small numbers in early summer but increased steadily and became the dominant species in middle summer. Silpha noveboracensis was the dominant species in three shrub areas during early summer. It was most abundant in the Maple-leaved Viburnum shrub area. The numbers of Nicrophorus orbicollis, when compared with the numbers of Nicrophorus tomentosus, showed a definite decrease during the five summers of study. The niches

of these two species are not identical because they responded differently to the carrion-baited air cans and carrion-baited ground cans. The rate of return to carrion by Silpha noveboracensis from distances of 5 to 75 meters was apparently due to random wandering and not because of orientation to carrion odors. The periphery of odor perception seems to be about 1 meter from carrion when the movement of air is negligible. Carrion beetles were shown clearly to be attracted to carrion. Our studies, however, seem to indicate quite strongly that the distance of this attraction is much less than anyone has ever believed.