WING CULLING OF INSECT PREY BY THE GRAY BAT (MYOTIS GRISESCENS)

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Many species of insectivorous bats increase feeding efficiency by various prey manipulations, including the culling of wings or other appendages. Coutts, Fenton, and Glen (J. Mamm., 54:985-999, 1973) found that captive Eptesicus fuscus culled various part dependent upon the degree of chitinization of the parts, the size of the insect, and the number of insects eaten. To our knowledge, no one has described this culling technique, and several bat biologists who were questioned did not know how it was accomplished. We report here a method used by female Myotis grisescens to remove wings from coleopteran prey before ingestion.

In early June 1979, during studies of M. grisescens in southern Missouri, a female, although apparently uninjured, refused to fly upon release after capture. It was decided to keep and feed her until she would again fly. She was fed a variety of insects captured with a fluorescent black light and a funnel trap. She was offered live insects while she was held in one hand with the wings folded next to the body. The bat ate well when fed in this manner, although the position was not entirely natural. However, the wings would normally be engaged in flight and unavailable for most prey manipulations. A variety of insects, including Coleoptera, Lepidoptera,
Trichoptera, Diptera, and Ephemeroptera, were offered. Although the insects eaten were not quantified, it became apparent that beetles, particularly click beetles (Elateridae), and to a lesser extent snout beetles (Circulionidae), were more readily accepted than other types of insects. Lepidoptera were frequently rejected. Undesirable insects were rejected by flipping them away with a jerk of the head. Insects up to 2 cm in length were accepted and eaten without apparent difficulty.

Since the bat was hand held, all prey manipulation was by mouth. Prey was nearly always eaten head first, and if the insect presented posterior end first, it would be accepted and quickly rotated 180° before consumption. The prey was consumed by a continuous and rapid mastication, which slowly engulfed the entire insect. Mastication of anterior portions of the thorax resulted in an opening of the elytra at an angle of 30° to 60° from the plane of the insect's body. This was probably due to contraction of the mashed elytra muscles. Consumption of the prey continued posteriorly, severing the elevated elytra. This wing clipping procedure was quite effective (wings were clipped an estimated 85% of the time), and yet took no special effort or energy expenditure on the part of the bat, except the initial positioning of the prey so that it was eaten head first. Leg-clipping was much less frequent than was wing-clipping but was achieved by the same passive mechanism.

These observations indicate that manipulations of relatively small prey for appendage removal may frequently entail simply positioning of the prey with the mouth, so that it may be eaten head first. Thereafter, the benefits of elytra and leg removal are derived passively without further expenditure of time or energy.

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