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Rates of Hematophagous Ectoparasite Consumption during Grooming by an Endemic Madagascar Fruit Bat

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Abstract : Few details are available on the consumption of ectoparasites, specifically bat flies (Diptera: Nycteribiidae and Streblidae), by their chiropteran hosts while grooming. Such details could provide information on the dynamics of host-parasite interactions. This study presents data on ectoparasite ingestion rates for an endemic Malagasy fruit bat (Pteropodidae: Rousettus madagascariensis) occupying a cave day roost colony in northern Madagascar. Using quantified behavioral analyses, grooming and associated ingestion rates were measured from infrared videos taken in close proximity to day-roosting bats. The recorded individual bats could be visually identified to age (adult, juvenile) and sex (male, female), allowing analyses of the proportion of time these different classes allocated to consuming ectoparasites via auto-grooming (self) or allo-grooming (intraspecific) per 10 min video recording session. These figures could then be extrapolated to estimates of individual daily consumption rates. Based on video recordings, adults spent significantly more time auto-grooming and allo-grooming than juveniles. The latter group was not observed consuming ectoparasites. Grooming rates and the average number of ectoparasites consumed per day did not differ between adult males and females. The mean extrapolated number consumed on a daily basis for individual adults was 37 ectoparasites. When these figures are overlaid on the estimated number of adult Rousettus occurring at the roost site during the dry season, the projected daily consumption rate was 57,905 ectoparasites. To the best knowledge of the authors of this study, the details presented here represent the first quantified data on bat consumption rates of their ectoparasites, specifically dipterans. These results provide new insights into host-parasite predation dynamics. More research is needed to explore the mechanism zoonotic diseases isolated from bat flies might be transmitted to their bat hosts, specifically those pathogens that can be communicated via an oral route.

Keywords : diptera, host-parasite interactions, Madagascar, nycteribiidae, pteropodidae, Rousettus madagascariensis
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