

## Letter to the editor

# Arthropodophagy vs “insectivory” in bats

Bats are a highly diverse group at various levels (taxonomic, morphological, genetic, etc). It is also diverse from the trophic standpoint, and includes six food guilds recorded in their species: frugivorous, nectarivorous, sanguivorous, piscivorous, carnivorous, omnivorous and arthropodivorous. The latter has traditionally been referred to in the literature as insectivorous (e. g., [McNab 1971](#); [Bonaccorso 1979](#); [Fenton 1990](#); [Schnitzler and Kalko 2001](#)). However, it has been widely documented that bats consume other classes of arthropods in addition to insects, such as Arachnida, Chilopoda and Diplopoda ([Segura-Trujillo et al. 2016](#)). The name insectivorous not only is vague as regards the taxa bats prey, but it is also inaccurate for understanding the ecology and foraging habits of the different bat species.

Some 1,200 species of bats are recognized worldwide ([Simmons 2005](#)), of which an estimated 75 % feed on arthropods ([Wilson 1973](#); [Hutson and Mickleburgh 2001](#)). The partitioning of trophic resources in bats is explained basically by the hunting stratum and type of foraging habitat ([Schnitzler and Kalko 2001](#); [Denzinger et al. 2016](#)). The hunting stratum includes three categories: aerial (capture of prey during flight), gleaning (capture of prey on a substrate), and trawling (capture of prey on a water reservoir; [Schnitzler and Kalko 2001](#)). For the type of habitat, reference is made to the complexity of the area where foraging is performed, including three categories: uncluttered space (open areas), cluttered space (at the edge of the vegetation) and highly cluttered space (between the vegetation or next to a substrate; [Schnitzler and Kalko 2001](#); [Denzinger et al. 2016](#)). In this way, these categories are used to describe and understand bats are segregated according to the use of the “insect” (arthropod) resource. However, under this scheme, what is the relevance of naming bats as insectivorous or arthropodophagous?

The first argument is the accuracy about the taxa that prey upon, and the second is that the term arthropodophagous denotes a greater conceptual coherence with the theory of guilds for bats, relative to the common term insectivorous. For example, the name insectivorous clearly implies that bats are able to catch flying prey during flight, for example, adult organisms of the orders Lepidoptera and Coleoptera. In the same way, the habit of catching prey with the legs by trawling on water bodies can be related to feeding on insects with a life cycle associated with water bodies, such as the families Chironomidae, Culicidae and Psychodidae (e. g., [Biscardi et al. 2007](#)). However, as regards the gleaning habit, the insectivorous concept limits us to associate the hunting habit with the consumption of resting insects or larvae. In this regards, it should be noted that this habit is not uncommon and has been reported in very low percentages in bats excreta (i. e., *M. lucifugus* in [Whitaker 1977](#)). In contrast, the arthropodophagous denomination widens the trophic niche just mentioned, allowing to describe and better understand the gleaning hunting habit. This can be defined as the capture of non-flying organisms from surfaces, which may correspond to the Orders Arachnida, Chilopoda and Diplopoda. This habit has been reported in the emblematic gleaning species *Myotis myotis* and *Antrozous pallidus*, for which the arthropod orders Arachnida, Chilopoda and Diplopoda comprise up 20 % of the volume in excreta (e. g., [Arlettaz 1999](#); [Johnston and Fenton 2001](#)). Hence, it is important to include the orders Arachnida, Chilopoda and Diplopoda to describe the trophic ecology of bats.

According to [Polis and Strong \(1996\)](#), arthropodivory is defined as the habit of consuming arthropods, which includes insects, myriapods and terrestrial crustaceans. In the recent revision work of the diet of predatory arthropod species of North America, [Segura-Trujillo et al. \(2016\)](#) adopted the concept for referring to the most common feeding habit in the Order Chiroptera. However, given the Greek etymological origin of *arthropod* (ἄρθρον or arthron = “articulation” and πούς or pous = “foot”), the use of the greek suffix -phagous (φαγεῖν or phagein = feed) instead of the Latin suffix -vorous (vorus = eater) is hereby proposed. Accordingly, the use of the term arthropodophagus is proposed to name the trophic habit of preying on arthropods, and arthropodophage to refer to organisms that prey on arthropods.

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