

Opportunistic predation by Crested Owl *Lophotrix cristata* upon Seba's Short-tailed Bat *Carollia perspicillata*

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ABSTRACT: This note reports two opportunistic events of predation on Seba's Short-tailed Bats *Carollia perspicillata* (Chiroptera: Phyllostomidae) by an immature Crested Owl *Lophotrix cristata* (Strigiformes: Strigidae), in Central Amazonia, Brazil. Both predation events took place while bats were mist-netted. Given the abundance of *C. perspicillata* in the study area we argue that this bat species likely constitutes a natural prey for *L. cristata*.

KEY-WORDS: central Amazon; diet; Phyllostomidae; Strigidae; trophic interaction.

The Crested Owl *Lophotrix cristata* is a monotypic medium-sized owl (mass between 400-600 g; total length 36-43 cm), widely distributed across tropical and subtropical forest habitats of Central America and central Amazon Basin (Marks *et al.* 1999). Compared to diurnal birds, the knowledge on the ecology and natural history of tropical nocturnal birds is notoriously scarce (Sekercioglu 2010) and *L. cristata* is no exception to this trend (Barros & Cintra 2009). In the Amazon, the species has been found to occur in both secondary and old-growth forest sites (Sberze *et al.* 2010) and its abundance has been suggested to be positively associated with the density of snags (Barros & Cintra 2009). However, information regarding the species' diet is limited to the description of large insects and small vertebrates as prey (Marks *et al.* 1999) and currently no studies on the individual species preyed upon by *L. cristata* are available.

Seba's Short-tailed Bat *Carollia perspicillata* is a small to medium sized bat (mass about 18.5 g; total length 66-95 mm) found in moist evergreen and dry deciduous forests, from Mexico to southern Brazil. It commonly occurs up to 1,000 m and is one of the most frequently captured bats, being especially abundant in secondary growth forests (Cloutier & Thomas 1992; Williams & Genoways 2007). *Carollia perspicillata* feeds predominantly on

understory fruits of *Piper*, *Solanum*, and *Cecropia* species, and supplements its diet with nectar, pollen, and insects (Cloutier & Thomas 1992; Williams & Genoways 2007).

Trophic interactions between owls and bats have been reported in numerous locations across the Neotropics (e.g., Motta-Jr. *et al.* 2004; Escarlante-Tavares & Pessoa 2005; Motta-Jr. 2006; Carvalho *et al.* 2011) and Seba's Short-tailed Bats have been suggested to constitute a potential prey of several owl species such as Barn *Tyto alba*, Mottled *Strix virgata*, and Spectacled *Pulsatrix perspicillata* Owls (Cloutier & Thomas 1992; Motta-Jr. & Taddei 1992). Here we report two opportunistic predation events on *Carollia perspicillata* by the *Lophotrix cristata*, in central Amazon, Brazil.

Both predation events took place two days apart and were observed during bat surveys in the Porto Alegre reserve, Biological Dynamics of Forest Fragments Project (for site description, see Gascon & Bierregaard 2001). Bats were captured using 14 mist nets (12 x 3 m) open from 18:00 to 00:00 h and stretched along 2 perpendicular transects of roughly 100 m.

The first event took place on 5 June 2012 in a terra firme forest fragment (2°24'17.20"S, 59°52'16.07"W). Shortly after dusk (18:15 h), a juvenile *Lophotrix cristata* was netted adjacent to an inanimate bat. When

approached, the owl managed to escape leaving behind a dead bat that presented claw perforations on the thorax and wing membranes. The bat was an adult male *Carollia perspicillata* (forearm 39.5 mm; tibia 19.3 mm; weight 12 g).

The second predation event took place 1.4 km away from the first one, on 7 June 2012 in mature

Cecropia-dominated secondary forest (2°21'58.76"S, 59°58'4.14"W). As in the previous case, the predation event took place just after dusk (18:10 h) and involved a juvenile *Lophotrix cristata* (Figure 1) preying upon an adult male *Carollia perspicillata* (forearm 41.5 mm; tibia 19.7; weight 13 g; Figure 2). Both individuals were entangled and the owl was captured.

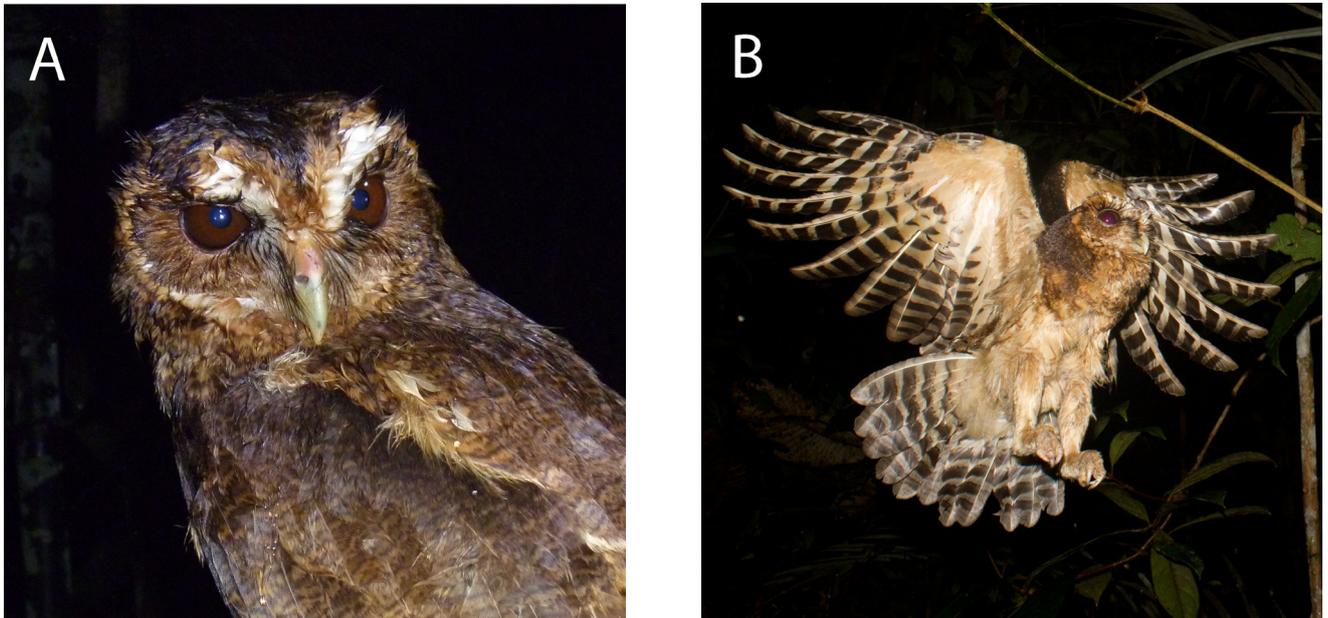


FIGURE 1. Juvenile *Lophotrix cristata* captured during bat sampling in mature *Cecropia*-dominated secondary regrowth, Porto Alegre reserve, central Amazon. A) Head detail; B) owl flying upon release.

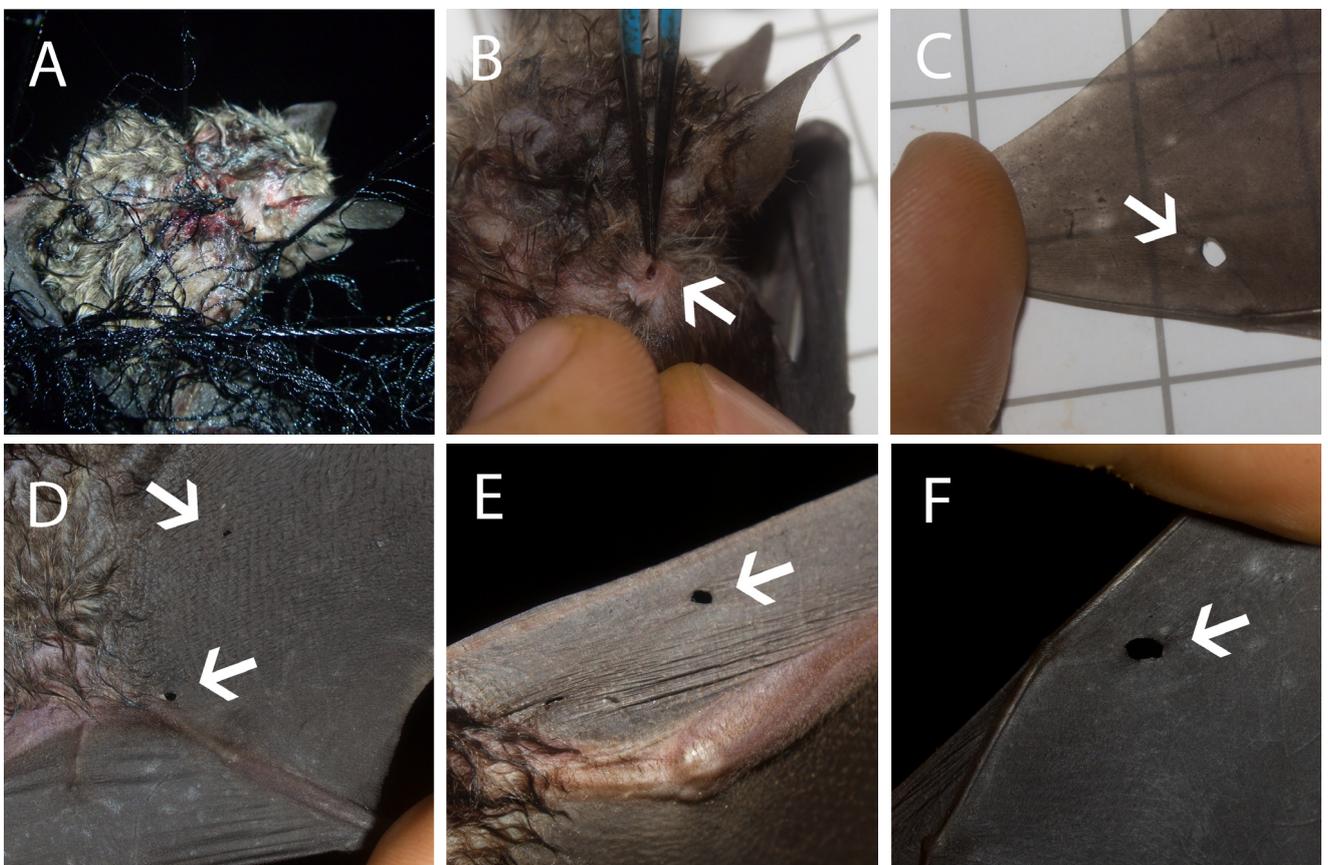


FIGURE 2. Adult *Carollia perspicillata* preyed upon by *Lophotrix cristata*. A) bat entangled in the mist-net; B) detail of claw perforation on the bat's dorsum; C)–F) details of claw perforations on the bat's wing membranes.

The owl from the first predation event presented similar size, plumage pattern, and striking bold white eyebrows like those of the *L. cristata* individual captured on the second event. Based on the spatial and temporal proximity of these predation events it is possible that the same owl individual had been responsible for both bat fatalities.

Bat predation by owls is relatively rare. The frequency of bats in the diet of Neotropical owls usually constitutes less than 5% of their vertebrate prey (Escarlate-Tavares & Pessôa 2005; Motta-Jr. 2006), likely because bats are more difficult to capture than amphibians or small terrestrial mammals. Owls are opportunistic predators and their diet is related to the local abundance of prey in their hunting grounds (Bernard *et al.* 2010). The reported predation events may have occurred due to the fact that the bats were entangled in the net. However, *Carollia perspicillata* is the most common bat species in the Biological Dynamics of Forest Fragments landscape (Bobrowiec & Gribel 2010) and could constitute a natural prey of *Lophotrix cristata*. The nocturnal lifestyle of *Lophotrix cristata* and *Carollia perspicillata* contributes to the scarce literature on the natural history and ecology of both species. Thus, similar predation events should be properly reported whenever witnessed to allow a better understanding of the trophic interactions between bats and their avian predators.

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REFERENCES

- Barros, O. G. & Cintra, R. 2009.** The effect of forest structure on occurrence and abundance of three owl species (Aves: Strigidae) in the Central Amazon forest. *Zoologia*, 26: 85-96.
- Bernard, N.; Michelat, D.; Raoul, F.; Quéré, J. P.; Delattre, P.; & Giraudoux, P. 2010.** Dietary response of Barn Owls (*Tyto alba*) to large variations in populations of common voles (*Microtus arvalis*) and European water voles (*Arvicola terrestris*). *Canadian Journal of Zoology*, 88: 416-426.
- Bobrowiec, P. E. D. & Gribel, R. 2010.** Effects of different secondary vegetation types on bat community composition in Central Amazonia, Brazil. *Animal Conservation*, 13: 204-216.
- Carvalho, L. F. A. C.; Cunha, N. L.; Fischer, E.; & Santos, C. F. 2011.** Predation on Broad-eared bat *Nyctinomops laticaudatus* by the Spectacled Owl *Pulsatrix perspicillata* in southwestern Brazil. *Revista Brasileira de Ornitologia*, 19: 417-418.
- Cloutier, D. & Thomas, D. W. 1992.** *Carollia perspicillata*. *Mammalian Species*, 417: 1-9.
- Escarlate-Tavares, F. & Pessôa, L. M. 2005.** Bats (Chiroptera, Mammalia) in Barn Owl (*Tyto alba*) pellets in northern Pantanal, Mato Grosso, Brazil. *Mastozoologia Neotropical*, 12: 61-67.
- Gascon, C. & Bierregaard, R. O. 2001.** The biological dynamics of Forest Fragments Project: the study site, experimental design, and research activity, p. 31-42. In: Bierregaard, R. O.; Gascon, C.; Lovejoy, T. E.; & Mesquita, R. (eds.). *Lessons from Amazonia: the ecology and conservation of a fragmented forest*. New Haven: Yale University Press.
- Marks, J. S.; Canning, R. J.; & Mikkola, H. 1999.** Family Strigidae (Typical Owls), p. 152-238. In: del Hoyo, J.; Elliott, A.; & Sargatal, J. (eds.). *Handbook of the birds of the world*, v. 5. *Barn-Owls to Hummingbirds*. Barcelona: Lynx Edicions.
- Motta-Jr, J. C. & Taddei, V. A. 1992.** Bats as prey of stygian owls in southeastern Brazil. *Journal of Raptor Research* 26: 259-260.
- Motta-Jr., J. C.; Alho, C. J. R.; & Belentani, S. C. S. 2004.** Food habits of the Striped Owl *Asio clamator* in southeast Brazil, p. 777-784. In: Chancellor, R & Meyburg, B. U. (eds.). *6th World Conference on Birds of Prey and Owls*. Budapest: World Working Group on Birds of Prey and Owls and MME/BirdLife.
- Motta-Jr., J. C. 2006.** Relações tróficas entre cinco Strigiformes simpátricas na região central do Estado de São Paulo, Brasil. *Revista Brasileira de Ornitologia*, 14: 359-377.
- Sberze, M.; Cohn-Haft, M.; & Ferraz, G. 2010.** Old growth and secondary forest site occupancy by nocturnal birds in a neotropical landscape. *Animal Conservation*, 13: 3-11.
- Sekercioglu, C. H. 2010.** The mystery of nocturnal birds in tropical secondary forests. *Animal Conservation*, 13: 12-13.
- Williams S. L. & Genoways H. H. 2007.** Subfamily Phyllostominae, p. 255-299. In: Gardner A. L. (ed.). *Mammals of South America*. Chicago: The University of Chicago Press.

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