Predation of *Craugastor podiciferus* (Anura: Craugastoridae) by *Catharus frantzii* (Passeriformes: Turdidae) in a neotropical cloud forest

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Resumen: Presentamos el primer reporte de depredación de *Craugastor podiciferus* por parte de un ave, *Catharus frantzii*, en un bosque montano bajo de Costa Rica. Además, es el primer vertebrado conocido dentro de la dieta del pájaro, aparentemente un depredador oportunista de pequeños anfibios.

During May 24th (2013), at 10:50 h, we observed a *Catharus frantzii* (Turdidae) that killed and ate an individual of *Craugastor podiciferus* (Craugastoridae) in Santa Elena Cloud Forest Reserve (Monteverde, Guanacaste Province of Costa Rica; 10°20´36"N/ 84°47´45"W [WGS84]; 1.650 masl). The identification of the anuran was confirmed by Adrián García (Zoology Museum at Universidad de Costa Rica). This species is endemic from highlands of Costa Rica and Western Panama, fairly common in leaflitter of montane forests (Savage, 2002).

The predator took the amphibian by the leg and hit it against the forest ground (Figure 1), repeating this movement around three minutes. The bird showed a similar predatory behavior than an individual belonging to the genus *Turdus* (Sandoval *et al.*, 2008). Once the anuran died, the bird flew with the prey in the beak to finally ingest it.

C. frantzii occurs from Southern Mexico to Western Panama, and it is considered an omnivorous bird that inhabits and foraging on the forest floor (Stiles & Skutch, 1989). However, we present the first reported predation event carried on a vertebrate by this species. Also, this is the first official predation report on *C. podiciferus* by an avian predator. Predation interactions involving birds and herpetofauna are still considered rare and poorly understood (Sandoval *et al.*, 2008).

Several songbirds, as the genus *Catharus*, are opportunistic predators of small vertebra-

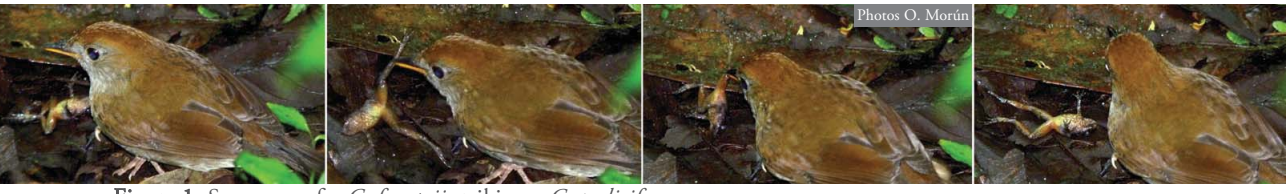

Figure 1. Sequence of a *C. frantzii* striking a *C. podiciferus*.
Figura 1. Secuencia de un individuo de *C. frantzii* golpeando a un ejemplar de *C. podiciferus*.

tes because they need a great effort to kill this type of prey (Toledo *et al.*, 2007; Sandoval *et al.*, 2008). Additionally, robber frogs (e.g., genus *Craugastor*) can be difficult to find for a predator that depends on sight and movement due to a high cryptic polymorphism, as well as the type of escape response (Cooper *et al.*, 2008; Toledo *et al.*, 2007). We note the relevance of this observation because the herpetofauna represents less than 1% of diet for passerine birds in Neotropical forests (Poulin *et al.*, 2001; Lopes *et al.*, 2005), and even for well structured diet studies, detect bird predation upon some amphibian species would be complex.

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References

Cooper, W.E., Caldwell, J.P. & Vitt, L.J. 2008. Escape responses of cryptic frogs (Anura: Brachycephalidae: *Craugastor*) to simulated terrestrial and aerial predators. *Behaviour*, 145: 25-38.

Lopes, L., Fernandes, A. & Marini, M. 2005. Predation on vertebrates by Neotropical passerine birds. *Lundiana*, 6:57-66.

Poulin, B., Lefevbre, G., Ibáñez, R., Jaramillo, C., Hernández, C. & Rand, S. 2001. Avian predation upon lizards and frogs in a neotropical forest understory. *Journal of Tropical Ecology*, 17:21-40.

Sandoval, L., Biamonte, E. & Solano-Ulate, A. 2008. Previously unknown food items in the diet of six neotropical bird species. *Wilson Journal of Ornithology*, 120: 214-217.

Savage, J.M. 2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas*. The University of Chicago Press. Chicago.

Stiles, G. & Skutch, A. 1989. *A Guide to the Birds of Costa Rica*. Cornell University Press. Ithaca.

Toledo, L.F., Ribeiro, R.S. & Haddad, C.F. 2007. Anurans as prey: an exploratory analysis and size relationships between predators and their prey. *Journal of Zoology*, 271:170-177.

El tamaño importa: tractos digestivos y nematodos Pharyngodonidae parásitos de reptiles

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Los nematodos Pharyngodonidae son parásitos de vertebrados ectotermos relacionados filogenéticamente con la familia Thelastomatidae cuyos representantes infectan a invertebrados. Su origen es posiblemente polifilético a partir de oxiúridos de insectos (Petter & Quentin, 1976). Los géneros de Pharyngodonidae parásitos de reptiles parecen haberse separado en dos líneas filogenéticas diferentes que han evolucionado en reptiles herbívoros y en reptiles carnívoros respectivamente (Petter, 1966; Petter & Quentin, 1976; Roca, 1999).

Forstner (1960) y Petter (1966) señalan la presencia de miles e incluso de cientos de miles de nematodos Pharyngodonidae en la porción final del tubo digestivo (colon) de lagartos herbívoros (principalmente iguánidos) y de tortugas terrestres (principalmente pertenecientes al género *Testudo*). Estos nematodos se encuadran en la línea filogenética de los Pharyngodonidae de reptiles her-