

Frugivory by the hummingbird *Chlorostilbon notatus* (Apodiformes: Trochilidae) in the Brazilian Amazon

Piero Angeli Ruschi^{1, 2,*}

RESUMO: Frugivoria pelo beija-flor *Chlorostilbon notatus* (Apodiformes: Trochilidae) na Amazônia brasileira - Beija-flores dependem de néctar como sua principal fonte de energia para suprir sua alta demanda fisiológica. Exceções à dieta nectarívora são raras. O presente trabalho descreve pela primeira vez o consumo de frutos de calabura (*Muntingia calabura*) pelo beija-flor *Chlorostilbon notatus*, o qual foi registrado em Porto Velho, Rondônia, Brasil.

Palavras-chave: dieta, beija-flor-verde-de-garganta-azul, Muntingiaceae, *Muntingia calabura*, calabura.

ABSTRACT: Hummingbirds rely solely on nectar as the main source of energy to supply their high physiological demands. Exceptions to their nectarivorous diet are few. The present work describes for the first time the consumption of Jamaica Cherry fruit (*Muntingia calabura*) by the hummingbird *Chlorostilbon notatus*, recorded in Porto Velho, Rondônia, Brazil.

Key words: diet, Blue-chinned Sapphire, Muntingiaceae, *Muntingia calabura*, Jamaica Cherry.

Hummingbirds are well known to be the most specialized nectar eaters among vertebrates (Schuchmann, 1999). It is therefore not unexpected that hummingbirds rarely exploit alternative energy sources. These exceptions correspond to other six energy sources recorded so far: 1) small arthropods (Ruschi 1982; Schuchmann, 1999); 2) sap wells excavated by sapsucker woodpeckers (Freer, 1935; Miller & Nero, 1983); 3) honeydew excreted by coccid larvae (Reicholf & Reicholf, 1973; R. Ridgley, pers. com in Miller & Nero, 1983); 4) pollen (Bent, 1940; Schuchmann, 1999); 5) small seeds

¹ Setor de Ornitologia, Departamento de Vertebrados, Museu Nacional/UF RJ, 20940-040 Quinta da Boa Vista, Rio de Janeiro, Brazil.

² Setor de Ornitologia, Departamento de Zoologia, Museu de Biologia Prof. Mello Leitão/MBML, 29.650-000 Santa Teresa, Espírito Santo, Brazil.

*Autor para correspondência: ruschip@gmail.com

Recebido: 9 set 2013 – Aceito: 16 mar 2014

(Poulin *et al.*, 1994); 6) fruit (Lack, 1976; Wendelken & Martin 1988; Poulin *et al.*, 1994).

Five hummingbird species have been reported to feed from open fruits (exposed flesh) in natural conditions: The Jamaican Mango (*Anthracothorax mango*) upon cactus (*Stenocereus hystrix*) on Jamaica (Lack 1976); the Cinnamon hummingbird (*Amazilia rutila*) and the Plain-capped Starthroat (*Helimaster constantii*) upon cactus (*Stenocereus eichlamii* and *Pilosocereus maxonii*) in Guatemala (Wedelken & Martin 1988); the Copper-rumped hummingbird (*Amazilia tobaci*) and the Buffy hummingbird (*Leucippus fallax*) in Venezuela (Poulin *et al.* 1994), although the opened fruit plant species consumed were not given by the author.

Herein, I report observations of the Blue-chinned Sapphire - *Chlorostilbon notatus* (Reich, 1793) foraging upon fruits of Jamaica Cherry (*Muntingia calabura*). Field work was conducted for 10 days in February 2013 in the Brazilian Amazon, Porto Velho, Rondônia, along the right margin of Madeira River (8°40' S 63°54' W). Observations started at 05:00 and ended at 17:00, totalizing 120h.

Neither the Blue-chinned Sapphire nor the Jamaica Cherry had ever been documented in previous records of hummingbird fruit feeding. Their interaction differs from those previously described by the fact that these hummingbirds were feeding on closed fruits. In contrast to the previous records of hummingbird frugivory, the Jamaica Cherry is not found open with exposed flesh. This task requires the birds to puncture the fruit with their bills thereupon giving the birds access to the pulp.

Muntingia calabura (Muntingiaceae) is a Tropical American native plant (Bayer *et al.*, 1998) known as Jamaica Cherry. It was introduced to Brazil where it has been given the name of “Calabura” (Souza & Lorenzi, 2005). This species is a pioneer invasive plant (Figueiredo *et al.*, 2008) cultivated in urban areas (Silva Filho & Bortoleto, 2005) and can grow to 13 m high (Lorenzi *et al.*, 2003). In Porto Velho, however, it is mostly found along the margins of Madeira River (Fig. 1A), as well as along streams feeding into the river. The flower of Jamaica Cherry is white with a shallow corolla (Fig. 1B), which, during my observations, was only visited by bees, wasps, and butterflies, and not hummingbirds. The fruit is spherical, measuring 1.4 cm in diameter, possessing a thin reddish peel and a transparent carpo of thin lamellar walls and fragile sweet juicy plumps (Fig. 1C). Hummingbirds were recorded drinking from the fruit throughout the day (from sunrise to sunset) for the duration of the field work. I also observed two species of passerine birds (*Ramphocelus carbo* and *Tangara mexicana*), bees, and wasps consuming this fruit.

In order to drink from Jamaica Cherry fruits, a hummingbird must

first puncture the peel with its bill closed. Then the bird pushes its bill inside the fruit and moves it in many directions to burst the vesicles. Once the juice is released from the vesicles, the bird drinks using its tongue (Fig. 1D), in a fashion similar to nectar feeding from flowers. The birds drank while they were perched, grabbing a leaf or branch, or hovering. After the bird finishes drinking, the hole on the fruit peel is closed by seeds. This same hole is often used again by the hummingbird for feeding, as well as by arthropods (i.e., bees and wasps).

Interestingly, only the Blue-chinned Sapphire was recorded feeding on Jamaica Cherry fruits, whereas at least 14 other hummingbird species (*Phaethornis hispidus*, *Threnetes leucurus*, *Glaucis hirsutus*, *Florisuga mellivora*, *Thalurania furcata*, *Campylopterus largipennis*, *Amazilia fimbriata*, *Amazilia rondonie*, *Lophornis chalybeus*, *Hylocharis cyannus*, *Polytmus*

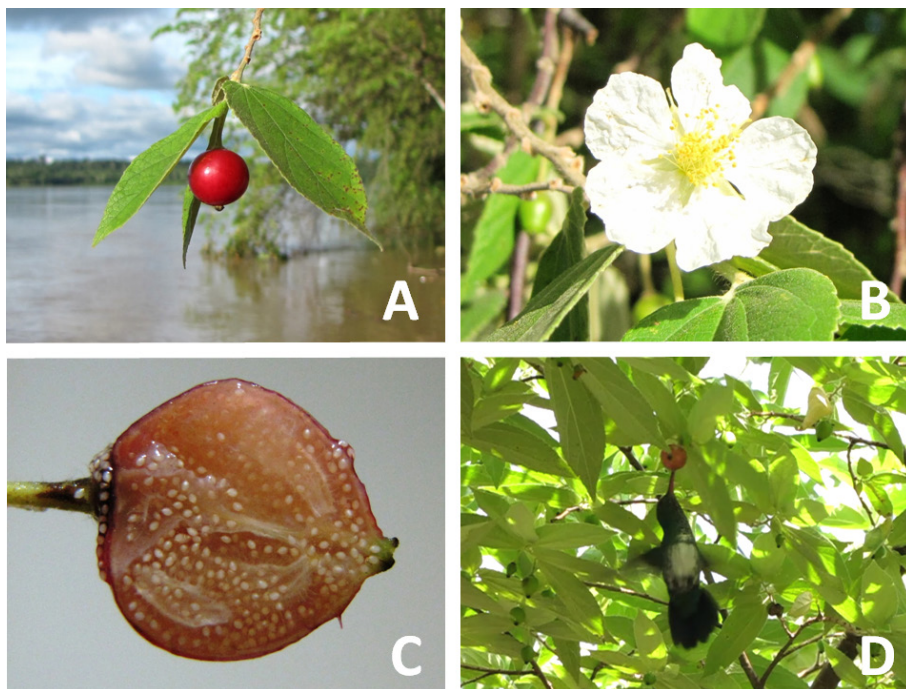


Figure 1. A) Jamaica Cherry fruit and plant at the right margin of Madeira River; B) Jamaica Cherry flower; C) Perpendicular cut view of the Jamaica Cherry fruit; D) Female Blue-chinned Sapphire (*Chlorostilbon notatus*) drinking from the Jamaica Cherry fruit. These pictures were extracted from a video footage, which is available at “youtube” and “vimeo” under the same title of the present paper – a file also related to its key-words and reference.

theresie, *Heliomaster longirostris*, *Anthracothorax nigricollis* and *Heliodytes aurita*) apparently ignored it despite feeding on nectar from neighboring plants, particularly *Inga* species. The Jamaica Cherry plants were aggressively defended by Blue-chinned Sapphire males against conspecific intruders. This species, which has a wide distribution in South America (Ruschi, 1982; Schuchmann 1999), is also the most common species of hummingbird that I have found in Porto Velho during my visits to this locality in the last three years. Considering that the Jamaica Cherry is an exotic pioneer species already widespread in South America (Figueiredo *et al.*, 2008), it will be interesting to see if other populations of Blue-chinned Sapphire or other hummingbird species also exploit this food resource.

Acknowledgments

I am grateful to Monique Britto de Goes for identifying and providing information on the Jamaica Cherry fruit plant; to anonymous reviewer for giving the reference to important bibliography; and to Professor William Bryan Jennings for reviewing the English writing. I thank CNPq for my doctoral fellowship (Process number 140458/2012-3).

Literature Cited

- Bayer, C.; Chase, M. W. & Fay, M. F. 1998. Muntingiaceae, a new family of dicotyledons with malvacean affinities. *Taxon*, 47: 37-42.
- Bent, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies. *Bulletin of the United States Natural Museum*, 176, 506 p.
- Figueiredo, R. A.; Oliveira, A. A.; Zacharias, M. A.; Barbosa, S. M.; Pereira, F. F.; Cazela, G. N.; Viana, J. P. & Camargo, R. A. 2008. Reproductive ecology of the exotic tree *Muntingia calabura* L. (Muntingiaceae) in southeastern Brazil. *Revista Árvore*, 32 (6): 993-999.
- Freer, R. S. 1935. The yellow-bellied sapsucker and the ruby-throated hummingbird—commensals? *Auk*, 52: 187-188.
- Lack, D. 1976. *Island Biology, illustrated by the land birds of Jamaica*. Univ. California Press., Berkeley, 445 p.
- Lorenzi, H.; Souza, H. M. de; Torres, M. A. V. & Bacher, . B. 2003. *Árvores exóticas no Brasil: madeireiras, ornamentais e aromáticas*. Nova Odessa, Plantarum, 368 p.

- Miller, R. & Nero, R. 1983. Hummingbird-sapsucker associations in northern climates. *Canadian Journal of Zoology*, 61: 1540-1546.
- Poulin, B.; Lefebvre, G. & McNeil, R. 1994. Diet of land birds from northeastern Venezuela. *Condor* (96): 354-367.
- Reichoff, H. & Reichoff, J. 1973. "Honingtonau" der Bracaatinga Schildlaus als Winternahrung von Kolibris (Trochulidae) in Siid-Brasilien. *Bonner zoologische Beiträge*, 24: 7-14.
- Ruschi, A. 1982. Beija-flores do Estado do Espírito Santo – Hummingbirds of state of Espírito Santo. São Paulo: Ed. Rios, 263p.
- Schuchmann, K. L. 1999. Family Trochilidae (Hummingbirds). In Del Hoyo, J., Elliott, A. & Sargatal, J. (eds). *Handbook of the Birds of the World. Barn-owls to Hummingbirds*. Barcelona: Lynx Edicions, v. 5, p. 468-680.
- Silva Filho, D. F. & Bortoleto, S. 2005. Uso de indicadores de diversidade na definição de plano de manejo de arborização viária de águas de São Pedro – SP. *Revista Árvore*, 29 (6): 973-981.
- Souza, V. C. & Lorenzi, H. 2005. *Botânica sistemática. Guia ilustrado para identificação das famílias de Angiospermas da flora brasileira, baseado em APG II*. Nova Odessa, Plantarum, 640 p.
- Wendelken, P. W. & Martin, R. F. 1988. Avian consumption of the Fruit of the Cacti *Stenocereus eichlamii* and *Pilosocereus maxonii* in Guatemala. *American Midland Naturalist*, 19 (2): 235-243.