

MONITO DEL MONTE - A FOOD ITEM PREVIOUSLY UNKNOWN IN THE DIET OF THE CHIMANGO CARACARA IN SOUTHERN CHILE

Monito del monte – un ítem trófico hasta ahora desconocido en la dieta del tiuque en el sur de Chile

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RESUMEN.- El tiuque (*Milvago chimango*) es un ave rapaz diurna que ocupa típicamente hábitats abiertos. Esta especie es principalmente insectívora, consumiendo alternativamente carroña y animales vertebrados. Aun cuando una variedad de animales vertebrados conforman parte de la dieta del tiuque, hasta ahora el consumo de marsupiales de bosque no ha sido documentado. El 9 de enero de 2015, a las 20:05 h, registramos en el Parque Nacional Nahuelbuta a un tiuque macho posado sobre la rama de un árbol con un monito del monte (*Dromiciops* spp.) sosteniéndolo con su pico. Después de casi 30 segundos de ser observado, el tiuque voló y desapareció de nuestra vista entre los árboles. Ya que nuestra observación es incompleta, no podemos afirmar que el monito del monte fue realmente capturado por el tiuque. Es posible que el marsupial haya sido encontrado muerto, robado a algún otro depredador o efectivamente cazado. Independiente de esto, nuestra observación revela por primera vez el consumo potencial de un marsupial nocturno especialista de bosque por parte del tiuque, una ave rapaz de dieta generalista y cazador oportunista, y con este registro contribuir a comprender cómo este último se beneficia de los ecosistemas boscosos.

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The Chimango Caracara (*Milvago chimango*) is a South American raptor ranging from southern Brazil and Bolivia to southernmost Patagonia (Humphrey *et al.* 1970, Fjeldsa & Krabbe 1995, GRIN 2016). In most of Chile, it is the most common, ubiquitous and widespread raptor species inhabiting a variety of habitats (Araya & Millie 1986, Egli & Aguirre 2000, Martínez & González 2005). Available information on its food habits suggest that the Chimango Caracara has a generalist diet and an opportunistic hunting behavior, preying mainly on invertebrates and secondarily feeding on carrion, not being an active predator of vertebrates (Barros 1960, Núñez *et al.* 1982, Cabezas & Schlatter 1987, Biondi *et al.* 2005). Vertebrates consumed by Chimango Caracaras in Chile include small rodents, small birds, lizards, toads, and fish (Housse 1934, Barros 1960, Núñez & Yáñez 1981, Yáñez *et al.* 1982, Sazima & Olmos 2009, Figueroa & Corales 2015, Tobar *et al.* 2015). Most vertebrate taxa reported as food of this raptor are common species inhabiting open habitats. To our knowledge, forest-specialist small

mammals have never been reported as food of the Chimango Caracara. Here, we describe an event that suggests that the monito del monte (*Dromiciops* spp.), a forest-specialist marsupial, potentially constitutes a food item of the Chimango Caracara in southern Chile.

On 9 January 2015, at 20:05, at the crossroads to Pehuenco, Piedra del Águila and Coimallín (37°48'21"S, 73°00'59"W), on the southeastern slope of Nahuelbuta National Park, we observed a Chimango Caracara perched on a branch of a Lenga tree (*Nothofagus pumilio*) carrying a small mammal in its bill. Judging by the yellow color of its legs, the Chimango Caracara was an adult male (see Sarasola *et al.* 2011). After about 30 sec of observation, the bird flew away into the trees with its "food item" and was lost from sight. We presumed that the mammal was later consumed by the Chimango Caracara or transported to its nest to feed the young. After analyzing a photograph that one of us (CRB) took while the Chimango Caracara was perched, we could determine that the "food item" in its bill was a monito del monte (Fig. 1). Fur color and



Figure 1. A male Chimango Caracara (*Milvago chimango*) sustaining a Monito del Monte (*Dromiciops* spp.) in the Nahuelbuta National Park, southern Chile. Photographed by Constanza Riquelme (January 9th 2015).

body shape were typical of this marsupial (Iriarte 2008). Based on the distribution, it is likely that it was a specimen of *Dromiciops bozinovici* (D'Elia *et al.* 2016).

Given that our observation is incomplete, we cannot confirm that the Chimango Caracara actually captured the monito del monte in Nahuelbuta. Chimango Caracaras can be agile hunters of vertebrate prey including small rodents, birds, lizards, and fishes (Housse 1934, Sazima & Olmos 2009, R.A. Figueroa, comunicación personal) and they could potentially subdue and kill a Monito del Monte. However, both species strongly differ in their daily activity pattern and habitat use, which decreases the chances of an encounter. Whereas Chimango Caracaras concentrate their activity during the daytime mainly in open habitats (Housse 1945, Barros 1960, Cabezas & Schlatter 1987), the Monito del Monte is a strictly nocturnal and forest-specialist species (Osgood 1943, Kelt & Martínez 1989, Hershkovitz 1999, Fortúnbel *et al.* 2009). In addition, Chimango Caracaras are known to be carrion consumers (Barros 1960, Cabezas & Schlatter 1987, Biondi *et al.* 2005) and can steal food from other predators by using kleptoparasitic tactics (Barros 1960, García & Biondi 2011). It is possible that the Chimango found the monito del monte already dead on the ground, lost or discarded by another forest predator. On occasions, owls and hawks lose their prey while manipulating them on elevated platforms and after falling to the ground, it becomes difficult to recover. Baladrón *et al.* (2009) observed that other aerial predators such as the Variable

Hawk (*Geranoaetus polyosoma*) could indirectly supply food to Chimango Caracaras. It is also possible that the Chimango Caracara had stolen the monito del monte from the interior of a nesting cavity or from a platform where some other forest aerial predator stored its food. Often Chimango Caracaras explore natural and built cavities when searching for food (R.A. Figueroa, com. pers.).

Alternatively, there is also a possibility that the Chimango Caracara had in fact captured the monito del monte. Chimangos are facultative forest users and may eventually search for prey or food in the forest (Figueroa 2015a, Figueroa & Corales 2015). It is possible that while the Chimango was searching for prey in the forest, it had casually detected some active nest of monito del monte and took it while it was still dormant. Slow reaction of this marsupial upon awakening from its daytime drowsiness (Muñoz-Pedrerros & Palma 2000) could have facilitated its capture and handling by the Chimango Caracara. The fact that the observed Chimango was a male, may not be accidental. In southern Chile, Chimango Caracaras reproduce in spring and summer, and males tend to intensively search for prey to feed the female during courtship and incubation, and their chicks during the breeding season (Housse 1945, Barros 1960, Figueroa 2015b). Thus, potential predation upon a monito del monte by a Chimango Caracara may represent a rare occurrence by a male securing food.

Assuming the Chimango Caracara effectively killed and ate the monito del monte, this species would

constitute part of a subset of forest predators that typically prey on this marsupial. These include the Rufous-legged Owl (*Strix rufipes*; Martínez 1993, Martínez & Jaksic 1996, 1997, Figueroa et al. 2006), Austral Pygmy Owl (*Glaucidium nana*; Ibarra et al. 2014), chilla fox (*Lycalopex griseus*; Martínez et al. 1993, Rau et al. 1995, Zúñiga et al. 2008), darwin's Fox (*Lycalopex fulvipes*; Jaksic et al. 1990, Elgueta et al. 2007, Jiménez 2007), puma (*Puma concolor*; Rau et al. 2002), and the Chilean long-tailed snake (*Philodryas chamissonis*; Muñoz-Leal et al. 2013).

Regardless of whether the monito del monte was either captured, taken as carrion or stolen from another predator, our record reveals for the first time the potential consumption of this forest-specialist marsupial by a Chimango Caracara. More research is necessary to determine to what extent monitos del monte are consumed and how these are actually obtained by this raptor. How Chimangos use and benefit from forests is still an open question (Figueroa 2015a) and we hope that our finding may contribute to the response.

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CITED LITERATURE

- ARAYA, M.B. & G. MILLIE. 1986. *Guía de Campo de las Aves de Chile*. Editorial Universitaria. Santiago, Chile. 406 pp.
- BALADRÓN, A.V., L.M. BIONDI, M.S. BÓ, A.I. MALIZIA & M.J. BECHARD. 2009. Red-backed Hawks supply food to scavenging Chimango Caracaras. *Emu* 109: 260–264.
- BARROS, R. 1960. El tiuque *Milvago chimango chimango* (Vieillot). *Revista Universitaria* 44–45: 31–37.
- BIONDI, L.M., M.S. BÓ & M. FAVERO. 2005. Dieta del chimango (*Milvago chimango*) durante el período reproductivo en el sudeste de la provincia de Buenos Aires, Argentina. *Ornitología Neotropical* 16: 31–42.
- CABEZAS, V.M. & R.P. SCHLATTER. 1987. Hábitos y comportamiento alimentario de *Milvago chimango* Vieillot, 1816 (Aves, Falconidae). *Anales del Museo de Historia Natural de Valparaíso* 18: 131–141.
- D'ELÍA, G., N. HURTADO & A. D'ANATRO. 2016. Alpha taxonomy of *Dromiciops* (Microbiotheriidae) with the description of 2 new species of monito del monte. *Journal of Mammalogy* 97: 1136–1152.
- EGLI, M. & G. AGUIRRE. 2000. *Aves de Santiago*. Unión de Ornitólogos de Chile. Santiago, Chile. 165 pp.
- ELGUETA, E.I., J. VALENZUELA & J.R. RAU. 2007. New insights into the prey spectrum of Darwin's fox (*Pseudalopex fulvipes* Martin, 1837) on Chiloé Island, Chile. *Mammalian Biology* 72: 179–185.
- FIGUEROA, R.A. 2015a. El rapaz olvidado – ¿Por qué hay tan pocos estudios sobre la historia natural y ecología básica del tiuque (*Milvago chimango*) en Chile? *Boletín Chileno de Ornitología* 21: 103–118.
- FIGUEROA, R.A. 2015b. For the Chimango' legs! *Boletín Chileno de Ornitología* 21: 155–159.
- FIGUEROA, R.A. & E.S. CORALES. 2015. Registros ocasionales de presas consumidas por aves rapaces en áreas boscosas del sur de Chile. *Boletín Chileno de Ornitología* 21: 150–154.
- FIGUEROA, R.A., S.E. CORALES, D.R. MARTÍNEZ, R.M. FIGUEROA & D. GONZÁLEZ-ACUÑA. 2006. Diet of the Rufous-legged Owl (*Strix rufipes*, Strigiformes) in an Andean *Nothofagus-Araucaria* forest, southern Chile. *Studies on Neotropical Fauna and Environment* 41: 179–182.
- FJELDSA, J. & N. KRABBE. 1990. *Birds of the high Andes*. Zoological museum, University of Copenhagen and Apollo Books. Copenhagen, Denmark. 876 pp.
- FORTÚRBEL, F.E., E.A. SILVA-RODRÍGUEZ, N.H. CÁRDENAS & J.E. JIMÉNEZ. 2019. Spatial ecology of monito del monte (*Dromiciops gliroides*) in a fragmented landscape of southern Chile. *Mammalian Biology* 75: 1–9.
- GARCÍA, G.O. & L.M. BIONDI. 2011. Kleptoparasitism by the caracara chimango (*Milvago chimango*) on the American Oystercatcher (*Haematopus palliatus*) at Mar Chiquita Lagoon, Argentina. *Ornitología Neotropical* 22: 453–457.
- GLOBAL RAPTOR INFORMATION NETWORK (GRIN). 2016. Species account: Chimango Caracara *Milvago chimango*. www.globalraptors.org. Accessed 1 septiembre 2016
- HERSHKOVITZ, P. 1999. *Dromiciops gliroides* Thomas, 1894, last of the Microbiotheria (Marsupialia), with a review of the family Microbiotheriidae. *Fieldiana Zoology* 93: 1–60.
- HOUSSE, R. 1934. Monografía del tiuque. *Milvago* (Milano vago) *chimango* (Azara). *Polyborus* (muy glotón), *chimango* (Vieillot). *Revista Chilena de Historia Natural* 38: 49–53.
- HUMPHREY, P.S., D. BRIDGE, P.W. REYNOLDS & R.T. PETERSON. 1970. *Birds of Isla Grande (Tierra del Fuego)*. Smithsonian Institution, Washington DC., EE.UU. 411 pp.
- IBARRA, J.T., T.A. ALTAMIRANO, K. MARTIN, F.H. VARGAS & C. BONACIC. 2014. Tree-cavity nesting of Austral Pygmy-Owls (*Glaucidium nana*) in Andean temperate forests of southern Chile. *Journal of Raptor Research* 48: 82–85.
- IRIARTE, A. 2008. *Mamíferos de Chile*. Lynx Edicions, Barcelona. Chile. 420 pp.
- JAKSIC, F.M., J.E. JIMÉNEZ, R. MEDEL & P.A. MARQUET. 1990. Habitat and diet of Darwin's fox (*Pseudalopex fulvipes*) on

- the Chilean mainland. *Journal of Mammalogy* 71: 246–248.
- KELT, D.A. & D.R. MARTÍNEZ. 1989. Notes on distribution and ecology of two marsupials endemic to the Valdivian forests of southern South America. *Journal of Mammalogy* 70: 220–224.
- MARTÍNEZ, D. & G. GONZÁLEZ. 2004. *Las Aves de Chile, Nueva Guía de Campo*. Ediciones del Naturalista, Santiago, Chile. 620 pp.
- MARTÍNEZ, D.R. 1993. Food habits of the rufous-legged owl (*Strix rufipes*) in temperate rainforests of southern Chile. *Journal of Raptor Research* 27: 214–216.
- MARTÍNEZ, D.R. & F.M. JAKSIC. 1996. Habitat, relative abundance, and diet of rufous-legged owls (*Strix rufipes* King) in temperate forest remnants of southern Chile. *Ecoscience* 3: 259–263.
- MARTÍNEZ, D.R. & F.M. JAKSIC. 1997. Selective predation on scansorial and arboreal mammals by rufous-legged owls (*Strix rufipes*) in southern Chilean rainforest. *Journal of Raptor Research* 31: 370–375.
- MUÑOZ-LEAL, S., K. ARDILES, R.A. FIGUEROA & D. GONZÁLEZ-ACUÑA. 2013. *Philodryas chamissonis* (Reptilia: Squamata: Colubridae) preys on the arboreal marsupial *Dromiciops gliroides* (Mammalia: Microbiotheria: Microbiotheriidae). *Brazilian Journal of Biology* 73: 15–17.
- MUÑOZ-PEDREROS, A. & E. PALMA. 2000. Marsupiales de Chile. Pp. 43–52, in Muñoz-Pedrerros, A. & J. Yáñez (eds). *Mamíferos de Chile*. CEA Ediciones, Valdivia, Chile.
- NÚÑEZ, H. & J.V. YÁÑEZ. 1981. Alimentación del Tiuque *Milvago chimango chimango* (Vieillot) (Aves: Falconiformes). *Noticiario Mensual Museo Nacional de Historia Natural de Chile* 25: 5–9.
- NÚÑEZ, H., M. SALLABERRY, R. VERGARA & J. YÁÑEZ. 1982. Alimentación anual de *Milvago chimango* (Vieillot, 1816) (Aves: Falconiformes). *Boletín del Museo Nacional de Historia Natural de Chile* 39: 125–130.
- OSGOOD, W.H. 1943. The mammals of Chile. Field Museum of Natural History, *Zoological Series* 30: 1–268.
- RAU, J. R., D. R. MARTÍNEZ, J. R. LOW, & M. S. TILLERÍA. 1995. Depredación por zorros chillas (*Pseudalopex griseus*) sobre micromamíferos cursoriales, escansoriales y arborícolas en un área silvestre protegida del sur de Chile. *Revista Chilena de Historia Natural* 68: 333–340.
- ZÚÑIGA, A., A. MUÑOZ-PEDREROS & A. FIERRO. 2008. Dieta de *Lycalopex griseus* (Gray, 1837) (Mammalia: Canidae) en la depresión intermedia del sur de Chile. *Gayana Zoología* 72: 113–116.
- SARASOLA, J.H., J.J. NEGRO, M.J., BECHARD & A. LANUSSE. 2011. Not as similar as thought: sexual dichromatism in Chimango Caracaras is expressed in the exposed skin but not in the plumage. *Journal of Ornithology* 152: 473–479.
- SAZIMA, I. & OLMOS, F. 2009. The Chimango Caracara (*Milvago chimango*), an additional fisher among Caracarini falcons. *Biota Neotropica* 9: 403–405.
- TOBAR, C., J. RAU, A. SANTIBÁÑEZ, A. ARRIAGADA, S. SADE, R. ARANEDA & F. TELLO. 2015. Dieta el tiuque (*Milvago chimango*) en agroecosistemas de la ciudad de Osorno, sur de Chile. *Boletín Chileno de Ornitología* 20: 13–16.
- YÁÑEZ, J.L. & H. NÚÑEZ. 1980. Análisis de información y similitud para dos formas de determinación del espectro trófico en *Milvago chimango* (Vieillot, 1816). *Boletín del Museo Nacional de Historia Natural de Chile* 37: 113–116.
- YÁÑEZ, J.L., H. NÚÑEZ & F.M. JAKSIC. 1982. Food habits and weight of Chimango Caracara in central Chile. *Auk* 99: 170–171.