ACTA
AMAZONICA

http://dx.doi.org/10.1590/1809-4392201700502

Nestling development of the tropical screech-owl (*Megascops choliba*): a successful case report from the southwestern Amazon

Edson GUILHERME*, Izabele Rodrigues de SOUZA

[1] Universidade Federal do Acre, Centro de Ciências Biológicas e da Natureza, Laboratório de Ornitologia. Campus Universitário, BR 364, Km 04, Distrito industrial, CEP 69920-900, Rio Branco, Acre, Brasil

* Corresponding author: guilherme@ufac.br

ABSTRACT

This study reports a successful reproductive event in *Megascops choliba* in eastern Acre, northern Brazil. An active *M. choliba* nest was monitored from the hatching of the eggs to the departure of the nestlings. Once hatched, the nestlings were weighed every two days to verify their weight gain over time. The nestlings remained in the nest for 30 days. The pattern of weight gain was similar to that found in other birds, presenting a rapid increase over the first 15 days, followed by a drastic reduction in the mean growth rate during the second half of the development period. Our observations indicate that the breeding season of *M. choliba* in southwestern Amazonia is similar as that reported for the species in the northern hemisphere. These are the first data on this species from this region, and contribute to the understanding of its reproductive biology within its geographic range.

KEYWORDS: birds, Strigidae, growth rate, nest, state of Acre, Brazil

Desenvolvimento do ninhego em corujinha-do-mato (*Megascops choliba*): um relato de caso bem sucedido na Amazônia sul-ocidental

RESUMO

Este estudo refere-se a um caso bem sucedido de reprodução de *Megascops choliba* no leste do estado do Acre. Um ninho ativo de *M. choliba* foi acompanhado desde a eclosão até o abandono dos filhotes. A partir da eclosão, os filhotes foram pesados a cada dois dias. O tempo de permanência dos filhotes no ninho foi de 30 dias. O ganho de peso dos filhotes seguiu o padrão encontrado em outros estudos com aves, ou seja, um rápido aumento de peso nos primeiros 15 dias e uma redução drástica da taxa média de crescimento na segunda metade do período de desenvolvimento. Nossas observações indicam que o período reprodutivo de *M. choliba* no sudoeste amazônico deve ser o mesmo relatado para a espécie no hemisfério norte. Os dados apresentados aqui são inéditos para a região e contribuem para o entendimento da biologia reprodutiva desta espécie ao longo de sua distribuição geográfica.

PALAVRAS-CHAVE: aves, Strigidae, taxa de crescimento, ninho, Estado do Acre, Brasil

The tropical screech-owl (*Megascops choliba*) is widely distributed in the Neotropical region, between Costa Rica and Argentina (Holt *et al*. 1999). This owl is nocturnal, becomes active at nightfall, and is found in a variety of habitats, ranging from open areas, such as the Brazilian Cerrado (savanna), to semi-arid regions, and even rainforest, in the Amazon basin and eastern Brazil (Marini *et al*. 2007; Borges *et al*. 2004; Lima and Lima Neto 2009; Motta-Junior *et al*. 2010; Barros and Motta-Junior 2014; Dias and Lima 2015). The breeding season of *M. choliba* in the northern hemisphere extends from January to July, with a peak in May, while in the southern hemisphere there is a peak in September and October (Motta-Junior & Braga 2015). Megascops choliba is the most common owl in areas impacted by humans, such as forest fragments, edges of riparian forests, silvicultural plantations, and urban environments (Motta-Junior 2002; Borges *et al*. 2004; Anjos *et al*. 2007; Simon *et al*. 2007; Vasconcelos *et al*. 2007; Sberze *et al*. 2010; Cardona 2012; Barros and Motta-Junior 2014). Despite being both common and widely distributed, few data are available on the breeding patterns for *M. choliba*, and there are none from the Amazon basin (Thomas 1977; Lima and Lima Neto 2009; Motta-Junior *et al*. 2010; Dias and Lima 2015). The present study reports on a breeding event of an active *M. choliba* nest found in the southwestern Amazon, Acre, Brazil.

The nest was monitored every two days from its discovery onwards. The eggs were measured with a universal analogical caliper (scale: 1/128 – 0.05 mm) and the nestlings were weighed on a precision balance. The nestlings were marked with numbered aluminum bands on the 18th day after hatching. The bands were supplied by CEMAVE (Brazilian National Center for Wild Bird Research and Conservation).

The nest, containing three eggs, was discovered on July 6th 2011 in a broken trunk of a dead tucumã palm, *Astrocaryum aculeatum* (Figure 1A), near the margin of the reservoir of the nursery of the Zoobotanical Park of the Federal University of Acre (UFAC) in Rio Branco, Acre, Brazil (09°57'10.13" S, 67°52'32.83" W). The nest entrance was 1.57 m above the ground, where the trunk had a diameter of 53 cm. The incubation chamber was 43 cm below this opening, and contained only a few pieces of tree bark on which the eggs were laid. The three eggs were white and measured 33 mm x 30 mm, with a mean weight of 15±1 g.

The first nestling hatched on July 8th, with the other two hatching on the following two days. The newly hatched nestlings had their eyes closed, and were covered completely in white plumage, with pink legs and a gray beak with a white egg tooth (Figure 1B). On July 13th, the eyes of the first nestling were beginning to open. From the 13th day of life onwards, the white feathers were substituted by a darker (mesoptile) plumage, with some stalks of the remiges appearing (Figure 1C). By July 27th, the nestlings were already covered by a dark, barred plumage, with well-developed flight feathers (remiges) and completely open eyes, showing a large yellow iris (Figure 1D). During the first 15 days of monitoring, the female owl was observed leaving the nest when the researchers approached to collect the measurements (Figure 1A), and it seems possible that it was in the nest protecting the nestlings during their first few days of life. The only evidence of the provisioning of the nestlings was the leg of an insect found in the nest on July 25th. From July 11th onwards, once the last egg had hatched, the nestlings were weighed every two days until the departure of the first fledgling on August 6th. On the first day, the oldest nestling weighed 32 g, the second to hatch weighed 22 g, and the third, 14 g (Figure 2). This ranking persisted over subsequent measurements, although the differences among the individuals decreased over time, and by the final weighing, on August 5th, all three individuals had the same weight, 110 g (Figure 2). Over the first 14 days (up until July 21st), the weight gain of all three nestlings was rapid, with the two oldest gaining an average of 6.6±2.3 g per day, and the youngest, 4.9±3.2 g per day. From the 18th day (25th July onwards, Figure 2), the mean growth rate decreased drastically in the two oldest nestlings, to 1.0±4.5 g per day in the oldest and 1.8±3.1 g per day in the second oldest, while

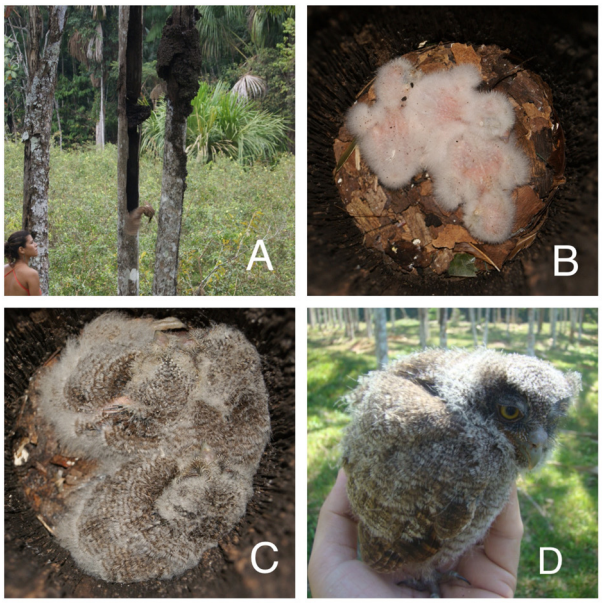

Figure 1. Active *Megaschops choliba* in the Zoobotanical Park of the Federal University of Acre. 1A – Dead tucumã (*Astrocaryum aculeatum*) palm in which the nest was found. It is possible to observe the female emerging from the nest in response to the approach of the researcher; 2B – The three recently hatched nestlings in the incubation chamber on July 11th 2011; 2C – Nestlings at 11–13 days of life (20th July 2011); 3D – Nestlings at 18–20 days of life (27th July 2011), note the development of the remiges. This figure is in color in the electronic version.

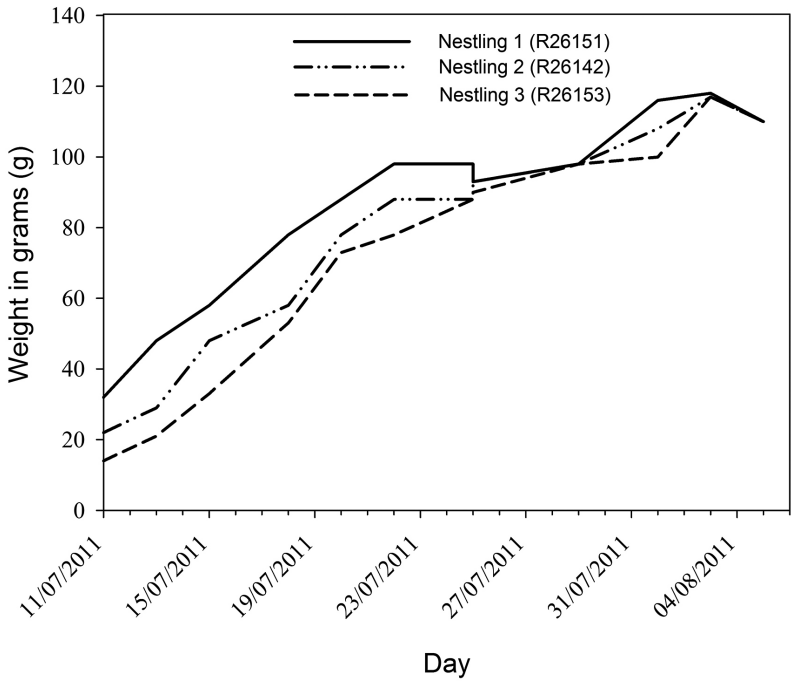

Figure 2. Weight gain of the *Megascops choliba* nestlings in Acre (Brazil) over the development period (measurements taken every two days).

the reduction in the growth rate was less marked in the case of the youngest, decreasing to 2.65±4.1 g per day. On 25th July, the oldest nestling was marked with an aluminum band (code R-26151), followed by the intermediate individual, on 27th July (code R-26142), and the youngest, on 29th July (R-26153). The nestlings remained in the nest for 30 days.

Despite being found throughout the Amazon basin, these are the first data on the nesting of *M. choliba* in this region. The characteristics of the nest, eggs, and nestlings were all similar to those reported from other regions, such as Venezuela (Thomas 1977) and Bahia, Brazil (Lima and Lima Neto 2009). The breeding season, from July to April, was not consistent with that expected for the species in the southern hemisphere -September/October (Holt *et al*. 1999). As a nest with fully feathered *M. choliba* nestlings was observed at the same site on May 25th 2010 (one year prior to the present study), the breeding season of the species in southwestern Amazonia may be the same as that reported for the species in the northern hemisphere, i.e., January–July (Motta-Junior and Braga 2015). The high growth rate recorded over the first 15 days of development and the subsequent decrease of this rate was also observed in *M. choliba* by Thomas (1977) in Venezuela and Lima and Lima Neto (2009) on the coast of Bahia, Brazil, and appears to be a standard development pattern in bird nestlings (Gotie and Kroll 1973; Ricklefs 1979; Winterstein and Raitt 1983). The reduction in the growth rate during the second half of nestling development appears to be related to the consolidation of body mass (flight muscles) and the regulation of body temperature, i.e., thermoregulation (Gotie and Kroll 1973; Ricklefs 1979). In the UFAC Zoobotanical Park, *M. choliba* shares its nesting sites with its congener, *Megascops usta* (Souza and Guilherme 2013).

ACKNOWLEDGMENTS

We are grateful to Francisca Cristina Moura de Lima Boaventura, director of the UFAC Zoobotanical Park for permission to conduct research in the study area, and to all the members of the research at the UFAC Ornithology Laboratory for their logistical support during fieldwork. We are grateful to the Brazilian National Center for Wild Bird Research and Conservation (CEMAVE/ICMBIO), for providing the bands used in project 1099. We are also grateful to two anonymous reviewers for their comments and suggestions.

REFERENCES

Anjos, L.; Volpato, G.H.; Lopes, E.V.; Serafini, P.P.; Poletto, F.; Aleixo, A. 2007. The importance of riparian forest for the maintenance of bird species richness in an Atlantic Forest remnant, southern Brazil. *Revista Brasileira de Zoologia*, 24: 1078–1086.

Barros, F. M. and Motta-Junior, J.C . 2014. Home range and habitat selection by the Tropical Screech-Owl in a Brazilian savanna. *Journal of Raptor Research*, 48: 142–150.

Borges, S.H.; Henriques, L.M.; Carvalhaes, A. 2004. Density and habitat use by owls in two Amazonian forest types. *Journal of Field Ornithology*, 75: 176-182.

Cardona, M.Á.Q. 2012. *Efeitos do manejo florestal na estrutura da avifauna na floresta Amazônica de Paragominas (Pará)*. PhD Thesis, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo. 107p.

Dias, R.I. and Lima, M.R. 2015. Breeding biology and nest survival in Tropical Screech-Owls (*Megascops choliba*) in the Brazilian Cerrado. *The Wilson Journal of Ornithology*, 127: 432–440.

Gotie, R. and Kroll, J. 1973. Growth rate and ontogeny of thermoregulation in nestling Great-tailed Grackles, Cassidix mexicanus prosopidicola (Icteridae). *The Condor*, 75:190–199.

Holt, D.W.; Berkley, R.; Deppe, C.; Rocha, P.L.E.; Olsen, P.D.; Petersen, J.L.; Salazar, J.L. R; Segars, K.P.; Wood, K.L. 1999. Strigidae species accounts. In: del Hoyo, J.; Elliott, A.; Sargatal, J. (Ed.). *Handbook of the birds of the world*. Volume 5: Barn Owls to hummingbirds. Lynx Edicions, Barcelona, p.152–242.

Lima, P.C.; Lima Neto, T.N.C. 2009. O comportamento reprodutivo da corujinha-do-mato *Otus choliba choliba* (Strigiformes: Strigidae) no litoral norte da Bahia: um ensaio fotográfico. *Atualidades Ornitológicas*, 152: 41–65.

Marini, M.Â.; Aguilar, T.M.; Andrade, R.D.; Leite, L.O.; Anciães, M.; Carvalho, C.E.A *et al*. 2007. Biologia da nidificação de aves do sudeste de Minas Gerais, Brasil. *Revista Brasileira de Ornitologia*, 15: 367–376.

Motta-Junior, J.C.; Braga, A.C.R. 2015. Tropical Screech Owl - *Megascops choliba*. *The Owl Pages*. (http://www.owlpages.com/owls/species.php?s=920). Accessed on 11/01/2017.

Motta-Junior, J.C. 2002. Diet of breeding Tropical Screech-Owls (*Otus choliba*) in Southeastern Brazil. *Journal of Raptor Research*, 36: 332–334.

Motta-Junior, J.C.; Granzinolli, M.A.M.; Monteiro, A.R. 2010. Miscellaneous ecological notes on Brazilian birds of prey and owls. *Biota Neotropica*, 10: 355–359.

Ricklefs, R.E. 1979. Patterns of Growth in Birds. V. A Comparative study of Development in the Starling, Common Tern, and Japanese Quail. *The Auk*, 96: 10–30.

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.

Simon, J.E.; Lima, S.R.; Cardinali, T. 2007. Comunidade de aves no Parque Estadual da Fonte Grande, Vitória, Espírito Santo, Brasil. *Revista Brasileira de Zoologia*, 24: 121–132.

Souza, I.R.; Guilherme, E. 2013. First record of nesting behavior in the Austral Screech-Owl (*Megascops usta*) in an urban forest fragment in eastern Acre, Brazil. *Atualidades Ornitológicas*, 173: 22.

Thomas, B.T. 1977. Tropical Screech Owl nest defense behavior and nestling growth rate. *The Wilson Bulletin*, 89: 609–612.

Vasconcelos, M.F.; Pacheco, J.F.; Parrini, R. 2007. Levantamento e conservação da avifauna na zona urbana de Marabá, Pará, Brasil. *Cotinga*, 28: 45–52.

Winterstein, S.R.; Raitt, R.J. 1983. Nestling growth and development and the breeding ecology of the Beechy Jay. *The Wilson Bulletin*, 95: 256–268.

Received: 03/03/2017
Accepted: 22/06/2017