Field notes on the breeding biology and diet of Ferruginous Pygmy-owl (Glaucidium brasilianum) in the dry Chaco of Argentina

Article *in* ORNITOLOGIA NEOTROPICAL · June 2008

CITATIONS
8

READS
190

5 authors, including:

Fernando J. Fernández
National University of La Plata
72 PUBLICATIONS **414** CITATIONS
SEE PROFILE

Federico Pablo Kacoliris
National University of La Plata
54 PUBLICATIONS **231** CITATIONS
SEE PROFILE

Igor Berkunsky
National University of the Center of the Buenos Aires Province
80 PUBLICATIONS **331** CITATIONS
SEE PROFILE

ORNITOLOGIA NEOTROPICAL 19: 315–319, 2008

FIELD NOTES ON THE BREEDING BIOLOGY AND DIET OF FERRUGINOUS PYGMY-OWL (*GLAUCIDIUM BRASILIANUM*) IN THE DRY CHACO OF ARGENTINA

Joaquín D. Carrera[1], Fernando J. Fernández[1], Federico P. Kacoliris[2], Luis Pagano[2], & Igor Berkunsky[3]

[1]Cátedra de Anatomía Comparada, Fac. de Ciencias Naturales y Museo, Universidad de La Plata, Calle 64, No 3, 1900 La Plata, Argentina. *E-mail: j*oaquincarrera@hotmail.com.

[2]Museo de Ciencias Naturales, Universidad Nacional de La Plata, Paseo del Bosque s/n, 1900 La Plata, Argentina.

[3]Ecología, Genética y Evolución, Fac. de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Pab. II, Ciudad Universitaria (C1428EHA), Buenos Aires, Argentina.

Notas de campo sobre la biología reproductiva y la dieta del Caburé chico (*Glaucidium brasilianum*) en el Chaco Seco de Argentina.

Key words: *Glaucidium brasilianum*, Ferruginous Pygmy-Owl, diet, breeding biology, Chaco.

Owls of the genus *Glaucidium* (pygmy-owls and owlets) are small, crepuscular and diurnal, cavity-nesters. Although 10 pygmy-owl species occur in South America (König & Weick 2005), only one species, the Austral Pygmy-Owl (*Glaucidium nanum*) had a detailed dietary study (Jiménez & Jaksic 1989), and only anecdotal reports exist for the diet of some of the other species (Poulin *et al.* 1994, Robbins & Stiles 1999). The Ferruginous Pygmy-Owl (*Glaucidium brasilianum*) is geographically widespread, with 3 of 12 subspecies occurring in Central and North America (Holt *et al.* 1999). In Argentina, it occurs in a wide array of subtropical ecosistems that range from semiarid desert to rain forest (Mazar Barnett & Pearman 2001). In this paper, we present our observations on the breeding success and diet of of Ferruginous Pygmy-Owls nesting in northern Argentina.

The study site was a subtropical dry-forest (El Impenetrable, 160 m a.s.l.) of the "Gran Chaco" ecoregion in northern Argentina, with seasonal precipitation mostly occurring between October and February. Mean annual precipitation and temperature were 60 cm and 23°C, respectively. The dominant tree species include white quebracho (*Aspidosperma quebracho-blanco*) and the red quebracho (*Schinopsis lorentzii*; Burkart 1999).

Between 2004 and 2006, we found two Ferruginous Pygmy-Owl nests in cavities in white quebracho trees, 5.4 m and 6.0 m above ground level, and 40 cm and 93 cm depth, respectively. Coordinates of nests were for nest 1, 25°30'05"S, 61°54'49"W, and for nest

TABLE 1. Number of individuals (N), relative frequency (%), and relative biomass (%Bio) of prey of Ferruginous Pygmy-Owls.

Prey categories	N	%	%Bio
Mammals			
Gray leaf-eared mouse (*Graomys griseoflavus*)	4	5.8	11
Common yellow-toothed cavy (*Galea musteloides*)	3	4.3	29
Velvety free-tailed bat (*Molossus molossus*)	1	1.4	1
Fat tailed mouse opossums (*Thylamys pusillus*)	1	1.4	1
Birds			
Spot-backed Puffbird (*Nystalus maculatus*)	1	1.4	2
Dark-billed Cuckoo (*Coccyzus melacoryphus*)	2	2.9	4
Guira Cuckoo (*Guira guira*)	1	1.4	6
Picui Ground-Dove (*Columbina picui*)	2	2.9	4
Little Nightjar (*Caprimulgus parvulus*)	1	1.4	2
Red-eyed Vireo (*Vireo olivaceus*)	1	1.4	1
Red-crested Finch (*Coryphospingus cucullatus*)	1	1.4	1
Golden-billed Saltator (*Saltator aurantiirostris*)	1	1.4	2
Rufous-collared Sparrow (*Zonotrichia capensis*)	1	1.4	1
Creamy-bellied Thrush (*Turdus amaurochalinus*)	8	11.6	21
Furnariidae indet	3	4.3	3
Suboscinae indet.	6	8.7	4
Oscinae indet.	2	2.9	2
Reptiles			
Spiny lava lizard (*Tropidurus spinulosus*)	7	10.1	5
Four-toed tegu (*Teius teyou*)	1	1.4	1
Brazilian bush anole (*Polychrus acutirostris*)	2	2.9	2
Sauria indet.	1	1.4	1
Insecta			
Odonata	1	1.4	
Giant cicada (*Quesada gigas*)	12	17.4	
Scarab beetle (*Epichalcoplethis sanctijacobi*)	1	1.4	
Rutelinae (*Homonyx elongata*)	1	1.4	
Scarabaeinae (*Megathopa* sp.)	1	1.4	
Scarabaeidae (*Coelosis bicornis*)	1	1.4	
Coleoptera-Cerambycidae-Lamiinae	1	1.4	
Lepidoptera	2	2.9	

2, 25°28'57"S, 61°54'48"W. Theses cavities were natural holes and they were used by Blue-fronted Parrots (*Amazona aestiva*) in previous years. We monitored the nests from egg-laying (mid-October) until fledging (mid-December). Nests were visited, on average, every 5 days (9 to 14 visits per nest). We removed pellets and prey remains (i.e., feathers, bones, wings of insects, etc.) during 2005 and 2006. We identified prey items using reference collections from the Museo de Ciencias Naturales de La Plata (Buenos Aires, Argentina).

We estimated consumed biomass by multiplying mean body mass of each prey species by the number of individuals found. We obtained prey body mass data from Redford & Eisenberg (1992) and Di Giacomo (2005). We did not consider the body mass of insects, because insect body mass estimation is difficult and the contribution to total biomass is relatively little.

We monitored three breeding events, two at nest 1 in 2004 and 2005, and one at nest 2 in 2006. Owls started laying during the second half of October; modal clutch size was 5 eggs (range 4-5 eggs). Hatching success was 80% (4 chicks hatch from 5 incubated eggs) in two of the nests and 50% in the other nest (2 chicks hatch from 4 incubated eggs). There were no predation cases during either, the incubation and chick periods. All nests were successful and all chicks survived, resulting in 3.3 fledglings per nest. The total nesting period was between 52 and 58 days (28-30 days for incubation and 24-28 days for brood-rearing). Fledging occurred between 10 and 20 December. During 90% of nest visits, adults were at the nest tree or neighboring areas, and sometimes they attacked us by flying over and touching our heads.

We collected 70 prey items and identified 21 prey species. Birds were the most common prey item (43%), followed by insects (29%), reptiles (16%) and mammals (13%). Cream-bellied Thrush (*Turdus amaurochalinus*) was the most common bird prey and represented 11% of the total prey collected, and 27% of the birds collected (Table 1). Lava lizard (*Tropidurus spinulosus*) was the most common reptile prey and represented 10% of the total prey collected, and 64% of the reptiles collected (Table 1). Interestingly, we catalogued the same number of brazilian bush anole (*Polychrus acutirostris*), a threatened and rare species (Lavilla *et al.* 2000), as were found during a long-term study of this species conducted in the same area (Kacoliris *et al.* 2006).

Prey body mass ranged from 12.5 to 225.0 g (mean = 43.7 g, SD = 10.8 g). Birds represented 50% of total biomass, followed by mammals (41%) and reptiles (8%). Similar to previous study (Proudfoot & Beasom 1997) and similar to studies in others pygmy-owls species (Jiménez & Jaksic 1989, Holt & Leroux 1996), Ferruginous Pygmy-Owls took prey larger than themselves, i.e., Guira Cuckoos (*Guira guira*), Spot-backed Puffbirds (*Nystalus maculatus*), some prey being four times larger, including adult individuals of common yellow-toothed cavy (*Galea musteloides*). Although cooperative hunting was never reported in pygmy-owls, the park ranger of Loro Hablador Provincial Park observed a pair hunting an adult individual of common yellow-toothed cavy (R. Rojas pers. com.). Further studies to understand the presence of this unusually large prey in their diet should be conducted.

Pygmy-owls seem to be generalized predators that utilize different prey according to region, season, and time of day. Pygmy-owls show a great variability where main prey item could be represented by: birds (this study 50%, see also Boiko & Shutova 2005), mammals (60.8% , Holt & Leroux 1996), lizards (48% , Duncan *et al.* 2003), and even insects (50% Jiménez & Jaksic 1989). The importance of insects in the diet has been either underestimated because prey remains at nests may not

adequately represent insects in a raptor's diet (Barrows 1989), or overestimated if insects were in the stomachs of insectivorous birds and reptiles eaten by the owls. In addition, because the diet was described using a single method (prey remains), it is possible that large prey were over-represented and small prey and highly digestible prey under-represented, making our results difficult to compare with data from observation studies (Bull *et al.* 1989). Our data suggests that the Ferruginous Pygmy-Owls we studied were generalist predators that fed primarily on birds and arboreal lizards.

ACKNOWLEDGMENTS

We are grateful to R. Rojas, R. Ruggera, S. Faegre, K. Jones and L.J.M. De Santis for partnership and collaboration during field and laboratory work. We are especially grateful to M. Lucía for determination of insect prey items. We thank J. I. Areta, G.A. Proudfoot, D. W. Holt, and R. McNeil for useful comments on the manuscript. IB and FPK were supported by fellowships from Comisión de Investigaciones Científicas de la Provincia de Buenos Aires (CIC), and Consejo Nacional de Investigaciones Científicas y Técnicas de Argentina (CONICET).

REFERENCES

Barrows, C. W. 1989. Diets of five species of desert owls. Western Birds 20: 1-10.

Boiko, N. S., & E. V. Shutova. 2005. Diets of the Pygmy Owl *Glaucidium passerinum* and Tengmalm's Owl *Aegolius funereus* in the Gulf of Kandalaksha area, White Sea. Pp. 23-29 *in* Proceedings of the workshop on the status of raptor population in eastern Fennoscandia, Kostomuksha, Karelia, Russia.

Bull, E. L., M. G. Henium, & R. S. Rohweder. 1989. Diet and optimal foraging of Great Gray Owls. Wildl. Manage. 53: 47-50.

Burkart, R. 1999. Conservación de la biodiversidad en bosques naturales productivos del subtrópico argentino. Pp. 131-174 *in* Mateucci, S. D., O. T. Solbrig, J. Morello, J., & G. Halffter (eds.). Biodiversidad y uso de la tierra. Conceptos y ejemplos de Latinoamérica. Eudeba, Buenos Aires, Argentina.

Di Giacomo, A. G. 2005. Aves de la Reserva El Bagual. Pp. 201-465 *in* Di Giacomo, A. G., & S. F. Krapovickas (eds.). Historia natural y paisaje de la Reserva El Bagual, Formosa, Argentina. Inventario de la fauna de vertebrados y de la flora vascular de un rea del Chaco Húmedo. Temas de Naturaleza y Conservación, N° 4. Aves Argentinas, Buenos Aires, Argentina.

Duncan, W. W., F. R. Gehlbach, & Middendorf III, G. A. 2003. Nocturnal activity by diurnal lizards (*Sceloporus jarrovi*, *S. virgatus*) eaten by small owls (*Glaucidium gnoma*, *Otus trichopsis*). Southwest. Nat. 48: 205-218.

Holt, D. W., & L. A. Leroux. 1996. Diets of Northern Pygmy-Owls and Northern Saw-Wet Owls in west-central Montana. Willson Bull. 108: 123-128.

Holt, D. W., R. Berkley, C. Deppe, P. L. Enríquez-Rocha, P. D. Olsen, J. L. Petersen, J. L. Rangel-Salazar, K. P. Segars, & K. L. Wood. 1999. Family Strigidae. Species account of Strigidae. Pp. 76-243 *in* del Hoyo, J., A. Elliott, & J. Sargatal (eds.). Handbook of the birds of the world. Volume 5: Barn-owls to hummingbirds. Lynx Edicions, Barcelona, Spain.

Jiménez, J. E., & F. M. Jaksic. 1989. Biology of the Austral Pygmy-Owl. Wilson Bull. 101: 377-389.

Kacoliris, F. P., I. Berkunsky, & J. Williams. 2006. Herpetofauna of Impenetrable, Argentinean Great Chaco. Phyllomedusa 5: 149-157.

König, C., & F. Weick. 2005. A new Least Pygmy Owl (Aves: Strigidae) from southeastern Brazil. Stuttgarter Beitr. Naturk. Ser. A 688: 1–12.

Lavilla E. O., E. Richard, & G. Scrocchi. 2000. Categorización de los anfibios y reptiles de la República Argentina. Asociación Herpetológica Argentina, Miguel Lillo, Tucumán, Argentina.

Mazar Barnett, J., & M. Pearman. 2001. Lista comentada de las aves Argentinas. Lynx Edicions, Barcelona, España.

Poulin, B., G. Lefebvre, & R. McNeil. 1994. Diets of land birds from northeastern Venezuela.

Condor 96: 354-367.

Proudfoot, G. A., & S. L. Beasom. 1997. Food habits of nesting Ferruginous Pygmy-Owls in southern Texas. Wilson Bull. 109: 741-748.

Redford, K. H., & J. F. Eisenberg. 1992. Mammals of the Neotropics, Volume 2. The southern cone. Univ. of Chicago Press, Chicago, Illimois.

Robbins, M. B., & F. G. Stiles. 1999. A news species of Pygmy-Owl (Strigidae: *Glaucidium*) from the Pacific slope of the northern Andes. Auk 116: 305-315.

Accepted 24 February 2008.