

gration and wintering location for American Kestrels, particularly for female and juvenile birds (del Hoyo et al. 1994). The sizes of the two winter territories I observed (3 and 6–8 ha) were small compared to those observed in the northern U.S. (Craighead & Craighead 1969, Enderson 1960, Mills 1975). In California, Cade (1955) observed similarly small winter territories (e.g., a vacant lot 100 × 130 m in size). It may be that Mediterranean-type and tropical winter habitats with their mild or warm climates offer higher densities of prey biomass for wintering kestrels than do habitats in temperate and boreal climates.

RESUMEN.—Y observe lo mínimo de 14 diferente *Falco sparverius* en la isla de Socorro en el pacífico de México en 1992. Los *Falco sparverius* parecieron ocupar y defender territorios de presa en áreas herbosas en la isla donde primeramente cazaban grillos, saltamontes y langostas. Estos territorios de cazar varían en tamaño de 3–8 ha y estaban notablemente más pequeños que los antes descubiertos para *Falco sparverius*.

[Traducción de Raúl De La Garza, Jr.]

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## DIET OF THE SPECTACLED OWL (*PULSATRIX PERSPICILLATA*) DURING THE RAINY SEASON IN NORTHERN OAXACA, MEXICO

HÉCTOR GÓMEZ DE SILVA

*Instituto de Ecología, UNAM, Apartado Postal 70-275, Ciudad Universitaria, UNAM, C.P. 04510, México, D.F., Mexico*

MÓNICA PÉREZ-VILLAFÁÑA

*Calle 1537-3, Col. San Juan de Aragón, Sección 6, C.P. 07918, México, D.F., Mexico*

JOSÉ ANTONIO SANTOS-MORENO

*Departamento de Zoología, Instituto de Biología, Apartado Postal 70-153, UNAM, C.P. 04510 México, D.F., Mexico*

KEY WORDS: *Spectacled Owl*; *Pulsatrix perspicillata*; *naked-tailed climbing-rat*; *Tylomys nudicaudus*; *diet*; *Oaxaca, Mexico*; *niche segregation*.

The Spectacled Owl (*Pulsatrix perspicillata*) is the largest owl in humid tropical forests of the New World, averaging

750 g in mass (Stiles and Skutch 1989). Based on its size, it is likely that it preys on the largest potential prey species in tropical forests (Emerson et al. 1994) and it is known to take mammals up to the size of agoutis (*Dasyprocta* spp.), skunks (Mephitinae) and opossums (Didelphidae). It also preys on birds as large as oropendolas (*Psar-*

Table 1. Prey remains identified in 19 pellets of the Spectacled Owl (*Pulsatrix perspicillata*) in northern Oaxaca, Mexico. Numbers represent conservative estimates of the number of individuals contained in the sample.

TAXON	NO. OF INDIVIDUALS IN SAMPLE
<b>Mammals:</b>	
<i>Tylomys nudicaudus</i>	20
<i>Marmosa</i> sp.	4
Small rodent	2
Unidentified	4
Chiroptera	1
<b>Birds:</b>	
<i>Momotus momota</i>	1
<i>Leptotila</i> sp.	1
Unidentified	2
<b>Arthropods:</b>	
<i>Melanototus globosus</i> (Tettigonidae, Pseudophyllinae)	3
<i>Erichus spiniger</i> (Tettigonidae, Copiphorinae)	1
<i>Golofa</i> sp. (Scarabaeidae, Melolonthidae)	1
<i>Cetinis subviolaceus</i> (Scarabaeidae, Cetiniinae)	1
Unidentified, scarabaeid	1
Tenebrionidae	2
Small crustacean	2

*ocolius* spp.) and jays (Corvidae), and large insects, lizards and freshwater crustaceans (Álvarez del Toro 1980, Stiles and Skutch 1989, Sick 1993).

While conducting fieldwork during the rainy season in 1994 near Cerro de Oro, Oaxaca (18°02'N, 96°15'W), we found an owl roost where we observed an adult Spectacled Owl for several days. We collected 19 fresh pellets from beneath the roost site from 19 July–24 September. Here, we report the contents of these pellets (Table 1), because few quantitative data have been published on the diet of this species. Cerro de Oro is very close to the northern limit of the Spectacled Owl's range (Howell and Webb 1995) and this region has fewer potential prey species than at other sites where the diet has been studied.

Our sample was somewhat biased since it was likely that not all prey consumed by the owl was regurgitated, and not every item that was regurgitated was identified. Also, some types of prey were more likely to be found in pellets than others. For example, numerous mandibles and other parts of rodents and opossums were found in pellets but the only evidence of a bat was a phalanx and a single tooth in separate pellets found on the same day. Similarly,

the only evidence of birds was feathers in one pellet and isolated bone fragments in others. Arthropods were represented by varied, usually small fragments of mandibles, elyter fragments, cephalic ornaments and valves of female tettigonids. No arthropod remains were found in the last seven pellets we collected but they were found in the 12 previously collected pellets. Because of this, we feel certain that prey other than rodents and opossums were underrepresented in our sample.

Our most noteworthy finding was that at least 20 and maybe as many as 24 prey items (75–80% of the individuals) belonged to one species of rodent, the naked-tailed climbing rat (*Tylomys nudicaudus*). Nine rodent and two opossum species were found during preliminary surveys of the area (Chávez Tapia et al. 1993). They ranged in mass from 17–4000 g but 63.6% of them weighed <200 g. The naked-tailed climbing rat is semiarboreal and is the largest nocturnal rodent in the area. Its mean adult mass ranges from 156–326 g (Emmons 1990).

Owls usually swallow their prey whole and therefore rarely consume prey larger than themselves (Bowles 1916; Marti 1974). The naked-tailed climbing rat was the largest nocturnal mammal found in the area that is smaller than the Spectacled Owl itself. Crustacean remains in pellets suggested that the owl wandered at least as far as the nearest permanent stream approximately 700 m away to forage, and bat remains suggested foraging also occurred at the mouth of a cave that was located about 750 m from the roost. Owls preying on bats usually do so at dusk when the bats leave caves in large numbers (Twente 1954, Baker 1962). The owl roost was only 400 m from the edge of a large man-made clearing that was largely abandoned and overgrown with tall grasses and reeds. It is interesting that the pellets did not contain remains of small mammals typical of clearings such as the abundant cotton rat (*Sigmodon hispidus*), which apparently breeds year round in the study area (Chávez Tapia et al. 1993). In Costa Rica, the Spectacled Owl has been found to hunt at forest edges and clearings (Stiles and Skutch 1989). It would be inefficient for a large owl, such as the Spectacled Owl, to capture small prey unless they could be caught very easily and quickly (Marti 1974) since small prey would make food available at a slower rate relative to the time and energy expended capturing them (Brown et al. 1993).

Naked-tailed climbing rats could also be the preferred prey elsewhere in the species' range. Adults of naked-tailed climbing-rats are probably too large for other rainforest owls to capture. If this is true, it suggests that co-existence of Spectacled Owls with several owl species may be facilitated by their concentration on prey species unavailable to other owls (Wilson 1975).

**RESUMEN.**—Se estudia la dieta del Búho Gorjiblanco *Pulsatrix perspicillata* mediante la identificación de los restos de sus presas contenidos en egragópilas que recogimos en Cerro de Oro, Oaxaca, durante la época de lluvias. La

presa más frecuente que se identificó en las egagrópilas es *Tylomys nudicaudus*, una rata grande semiarbórea. Otras presas incluyen insectos de diferentes tamaños, mamíferos medianos y pequeños (incluyendo un murciélago), aves medianas y probablemente crustáceos. La presa principal probablemente es demasiado grande para que se alimenten de ella los otros búhos que se encuentran en la mayor parte del área de distribución del Búho Gorjiblanco.

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NOTES ON A NEST OF THE TAWNY FISH-OWL (*KETUPA FLAVIPES*) AT SAKATANG STREAM, TAIWAN

YUAN-HSUN SUN<sup>1</sup>

*Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843 U.S.A.*

YING WANG

*Department of Biology, National Taiwan Normal University, Taipei, Taiwan 117*

KEITH A. ARNOLD

*Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX 77843 U.S.A.*

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Fish-owls are often regarded as the nocturnal counter-

parts of Ospreys (*Pandion haliaetus*), fish-eagles (*Ichthyophaga* spp.) and sea-eagles (*Haliaeetus* spp.). There are four species in the Asian genus *Ketupa* and three species in the African genus *Scotopelia* (Fogden 1973). Of the Asian species, we know the least about the Tawny Fish-Owl (*Ketupa flavipes*). Kou (1986) reported one instance of mating on Taiwan and Voous (1988) described nest locations and clutch sizes in India. Herein, we document the diet of a pair of Tawny Fish-Owls and attempt to dem-

<sup>1</sup> Present address: Department of Forest Resource Management and Technology, National Pingtung Polytechnic Institute, Pingtung, Taiwan 902.



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