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# A new record of eggs and a domed nest of the Long-tailed Wood-Partridge (*Dendrortyx macroura*).

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## Abstract

A domed nest with four eggs of the Long-tailed Wood-Partridge (*Dendrortyx macroura*) was found on 29 April 1998 at 1900 m in Barranca del Cupatitzio National Park, Michoacán, Mexico. I describe the vegetation at the site and the structure of the nest and a clutch of four eggs found on 11 June 1998 in the nearby communal forest of Nuevo San Juan Parangaricutiro.

**Key words:** nesting, Trans Mexican Volcanic Belt, Odontophoridae.

## Un nuevo registro de huevos y de un nido abovedado de *Dendrortyx macroura*.

### Resumen

El 29 de abril de 1998 encontré un nido abovedado con cuatro huevos de *Dendrortyx macroura*, a una altitud de 1900 m, en el Parque Nacional Barranca del Cupatitzio, Uruapan, Michoacán, México. Aquí describo la vegetación del sitio y la estructura del nido, al igual que una nidada de cuatro huevos encontrada el 11 de junio de 1998 en el vecino bosque comunal de Nuevo San Juan Parangaricutiro.

**Palabras clave:** anidación, Eje Volcánico Trans Mexicano, Odontophoridae.

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## Introduction

Nests of New World quails (Odontophoridae) are usually open scrapes on the ground surrounded by grass or brush, but some Neotropical quails (*Cyrtonyx*, *Odontophorus*, and *Dendrortyx*) construct well-hidden, domed or roofed structures with a tunnel entrance (Leopold and McCabe 1957, Johnsgard 1973, 1988, Carroll 1994). Little is known about the nests of wood-partridges (*Dendrortyx*). The nest of the Buffy-crowned Wood-Partridge (*D. leucophrys*) was recently described as a chamber in the form of an oven (Komar *et al.* 2005). The nest of the Bearded Wood-Partridge (*D. barbatus*) has not been described in the wild, but captive birds construct open nests (Johnsgard 1988) or domed structures (Cornejo 2007) lined with dry leaves.

Only three nests of the Long-tailed Wood-Partridge (*D. macroura*), a mountain forest-dwelling Mexican endemic, have been described: one from Morelos and two from Oaxaca. The nest near Huitzilac, Morelos, was on a steep slope amid rocks in semi-open fir-pine-oak forest; it contained six eggs in a well-enclosed chamber, roofed with a matting of twigs, pine needles and leaves accumulated on the prostrated branches of a brush (Warner 1959). Two nests with four eggs each were found in Sierra de Miahuatlán, Oaxaca;

the nests were in somewhat open habitats at the edge of a maize field bordering the thick understory vegetation of a steep slope in an area of cloud forest (Rowley 1966). One of the nests was associated with a rocky outcrop in a cleared section of the cornfield with no concealment and was lined with a few leaves and litter from the forest floor, and several wood-partridge feathers. The other nest consisted of a few dead leaves and pine needles in a depression at the base of a small shrub. Here I report on a domed nest found in Barranca del Cupatitzio National Park, Uruapan, Michoacán, Mexico, as well as eggs collected at nearby Nuevo San Juan Parangaricutiro, during a study to determine abundance and habitat relationships of the Long-tailed Wood-Partridge (Chávez-León and Velázquez 2004, Chávez-León *et al.* 2004).

## Observations

On 29 April 1998 at 08:55 (CST) I located a nest with a clutch of four eggs with the help of a trained dog (2 years old female German Shorthaired Pointer). While walking along a dirt road I heard a noise made by an animal walking over dry leaves. I released the dog to investigate and a Long-tailed Wood-Partridge immediately flew away emitting its distinctive loud alarm call; the dog then

pointed to the ground. I called the dog and searched the area, finding the eggs in front of the tunnel entrance to a cavity nest made with dry pine needles. I returned two days latter to inspect the still intact nest, but the entire clutch and the parent were missing. There were no eggshell remains in or around the nest, nor were any feathers from the parents scattered on the ground. I concluded that the eggs were predated, probably by a snake, although there were fresh faeces of a gray fox (*Urocyon cinereoargenteus*) on the nearby dirt road.

The nest was located at 19°26'05"N, 102°06'26"W at 1900 m asl on a steep slope (56%) in a lava front facing southwest (234°), 17 m north of a dirt road. Much rock was exposed, but the soil cover was deep (8-24 cm) consisting of pine and oak litter. The vegetation was open pine-oak forest dominated by *Pinus douglasiana* with a mean height of 24 m and 40% canopy cover above the nest. There were few oaks (*Quercus obtusata*) scattered among the pines ( $\leq 8$  m high, 12 cm diameter). The closest tree to the nest was an oak 5.3 m to the southwest (252°), 7.5 m high and 10.7 cm in diameter. The closest pine tree (24 m high, 56.8 cm diameter) was 8.8 m east (88°) of the nest. The bark of all trees around the nest showed fire damage from ground level up to 1.5 m; the most recent forest fire in the area occurred on April 1991. A dense shrub layer 0.7-3.5 m high was dominated by *Rumfordia floribunda*. A large *Agave cupreata* was located 3 m to the north (10°) upslope from the nest. The herbaceous layer was sparse with 30% ground cover. The nest was found at the peak of the dry season (January-May), as recorded by the national park's weather station located 1.6 km to the southeast. Data from this station indicates that there was no rainfall during April 1998 with temperature ranging 6.5-28.2° C.

The eggs were in a flat circular area 21 cm wide at the entrance to an empty chamber lined with dry pine needles; branches of *R. floribunda* brush were over the nest, 14 cm above the level area. This flat structure was not found in the domed nest described by Warner (1959). Behind the platform was an 11 cm wide opening at a right angle (284° W) outward from the cavity. The interior of the chamber measured 19 cm from front to back, 20 cm from floor to ceiling, with a depression 9 cm below the level of the platform. The walls were formed by well-placed dry pine needles, except for the rear wall, which was a large rock (1 m high, 0.8 m wide) similar to the nest found by Warner (1959).

Although the eggs from this domed nest were lost, I obtained a four-egg clutch from firewood gatherers. They found a nest with eggs in the nearby Nuevo San Juan Parangaricutiro communal forest on 11 June 1998 (19°26'38"N, 102°12'12"W, 2635 m asl) and placed the eggs in an automatic domestic quail (*Coturnix* sp) incubator. The eggs did not hatch after 4 weeks and

were donated to me for preservation. The colour of the shell is pale white-cream, sparingly marked with small round spots (varying 0.5-1.5 mm in diameter) that match Russet colour no. 34 of Smithe (1975). These spots are undistinguishable from a distance  $>1.5$  m, and the eggs stand out because of their whitish colour. The eggs were uniquely numbered, and their length and breadth measured with a vernier calliper ( $\pm 0.1$  mm) so that egg volume could be calculated using Hoyt's (1979) equation. Mean dimensions ( $\pm$  SD) were  $44.8 \pm 0.94 \times 31.3 \pm 0.46$  mm, and  $22.42 \pm 0.75$  ml volume (Table 1). Mass was not measured because the eggs started to root at the time they were in the hands of the author.

**Table 1.** Dimensions of four eggs of the Long-tailed Wood-Partridge (*Dendrortyx macroura*) from Nuevo San Juan Parangaricutiro, Michoacán, Mexico.

Length (mm)	Breadth (mm)	Volume (ml)
46.2	31.1	22.8
44.4	31.8	22.9
44.1	30.8	21.3
44.6	31.6	22.7

## Discussion

This domed nest is similar to that described by Warner (1959), found in fir-pine-oak forest interior with little herbaceous cover, but different from the open nests found by Rowley (1966) in a treeless situation with a dense understory in an area of cloud forest. The genus *Dendrortyx* is a good example of an apparently generalized New World quail that is similar to the presumed ancestral Odontophorines (Holman 1961, Johnsgard 1988, Gutiérrez *et al.* 1983). Most members of a genus or larger taxonomic groups commonly share the same nest-type (Snow 1978). However, there is extensive diversity in nest-building behaviour of Neotropical birds, even among close relatives (Welty 1975). In nearly every case, the need for concealment has been the primary factor influencing nest structure. Birds with precocial young that lay their clutch on the ground and construct chamber nests protect eggs not only from predators, but also from harsh weather (Snow 1978). The construction of domed nests in *Dendrortyx* may be an adaptation to closed canopy forests, where there is little herbaceous cover. Alternatively, it may be the result of geographic variation in a life history trait at the subspecific level. The nests of the Long-tailed Wood-Partridge reported so far, were found within the range of three subspecies: *D. m. striatus* Nelson, 1897 from Michoacán (domed nest, reported here), *D. m. griseipectus* Nelson, 1897 from Morelos (domed nest, Warner 1959) and *D. m. inesperatus* Phillips, 1966 from Sierra de Miahuatlán, Oaxaca (open nests, Rowley 1966).

Although the colour of egg markings and spots are from pigments produced by glands in the female's oviduct (Welty 1975), the presence of dark spots on mostly whitish quail eggs has also been attributed to colour leached onto the shell from wet vegetation or soil in the nest staining the eggs during the rainy season (Carroll 1994). There was an increase in staining of eggs of captive Bearded Wood-Partridge in the course of incubation attributed to wet nest materials (Cornejo 2007). However, the eggs reported here were found at the peak of the dry season and still showed spots. Unmarked white eggs are found mostly among some cavity-nesting species where there is no need for the eggs to be camouflaged. Other cavity nesters have spotted eggs, presumably an indication that they once used open nests. Finally, the dimension of these eggs shows little intra-clutch variability (Table 1), but intraspecific variability may be higher.

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