

## First report of cavity-nesting in Elfin-woods Warbler *Dendroica angelae* at Maricao State Forest, Puerto Rico

Rafael Rodríguez-Mojica

Cotinga 22 (2004): 21–23

Se reporta sobre un nido de Reinita de Bosque Enano *Dendroica angelae* hallado dentro de una cavidad natural de árbol Colorado *Cyrilla recemiflora* en 21 de mayo de 2003 en el bosque de Maricao, región oeste-central de Puerto Rico. La Reinita de Bosque Enano es considerada Vulnerable a extinción y solo se han estudiado con detenimiento dos nidos previamente hallados en el 1992 en Maricao. Las implicaciones de un anidaje en una cavidad en la biología reproductiva de esta especie necesita de mas futuras observaciones en sus hábitos de anidaje. No se conocen de otras *Dendroica* que hayan usado este sustrato para anidar, por lo que el hallazgo es significativo.

The Elfin-woods Warbler *Dendroica angelae* is endemic to Puerto Rico, where it inhabits wet forest, rain forest and lower montane zones in the Cordillera Central<sup>4</sup>. Discovered in 1971 at Luquillo Forest in northern Puerto Rico by Cameron & Angela Kepler<sup>8</sup>, a second disjunct population was discovered a year later at Maricao State Forest in the west-central region of the island<sup>7</sup>. The

population was estimated at no more than 300 pairs and is classified as Vulnerable by BirdLife International<sup>3</sup>.

The only published detailed observations on the nesting biology of the Elfins-wood Warbler were made by Arroyo-Vazquez on two nests found in aerial leaf litter at Maricao State Forest in 1992<sup>1</sup>. Raffaele *et al.*<sup>9</sup> describe the nest of the species as 'a



Figures 1–2. Elfin Woods Warbler *Dendroica angelae*, Maricao State Forest, Puerto Rico, 24 May 2003 (Rafael Rodríguez-Mojica)



Figures 3–4. Nest of Elfin Woods Warbler *Dendroica angelae*, Maricao State Forest, Puerto Rico, 24 May 2003 (Rafael Rodríguez-Mojica)

compact cup, usually close to trunk and well-hidden among epiphytes of a small tree.' It lays 2–3 dull white eggs, moderately to heavily spotted reddish brown, concentrated at the broad end, in March–June. There are no other publications on the breeding biology of the species<sup>10</sup>.

### Observations

On 24 May 2003 at 10h00 in an abandoned camping area at Maricao State Forest (18°09'N 66°59'W; 742 m), I observed a pair of Elfin-woods Warblers carrying insects to a vertical rotten stump of a *Cyrilla racemiflora*. The begging calls of the nestlings were heard immediately the warblers entered the cavity, confirming the presence of an active nest. I stayed in the area from 10h00 to 15h00 documenting the new discovery with photographs and video. Both members of the pair brought insects to the nest at intervals of 3–5 minutes and, twice, at intervals of c.10 minutes. In 36 minutes I observed a total of 12 deliveries of prey to the nest, or one item per three minutes. On several occasions, one or both warblers vocalised with contact *chip* notes on arriving in the area, circling the tree stump in the branches of nearby trees, approached furtively and then flew to the rim of the stump before entering the cavity. On departing the nest the warblers remained in the area for c.1 minute, maintaining close proximity to each other and at times singing. On a few occasions one bird waited for the other to deliver food at the rim before entering with prey, which consisted of arthropods gathered in nearby forest or from the immediately adjacent trees. Once, I observed two prey items carried simultaneously by a member of the pair.

To examine the nest interior and document clutch status and size I mounted my video camera to the end of a c.10 m-long dry bamboo stick. With this and the remote control of the camera I managed to record that there were four fledglings in the rotten wood cavity.

I visited the area three days later and found no activity at the nest. Again using the camera I was able to confirm that the fledglings had left the nest. I found neither member of the pair and nor could I detect the begging calls of the young in the immediate area. The rotten tree stump and the nest were collected for further study.

The size of the area where the nest was found is 0.5 ha<sup>2</sup> and is separated from nearby forest by a 2 m-wide trail. The area is reforested, mainly with *Pinus caribaea* on its west side but also with native trees such as *Callophylum brasiliense*, *Cyrilla racemiflora* and *Magnolia portoricensis*. Trees had been planted c.1–2 m and there is no understorey vegetation. The trees provide sparse canopy cover. Mean diameter at breast height averaged 7 cm and the mean height was c.8 m. The nest was 7 m above

ground and 6 cm deep from the lower border of the irregular rim of the stump. The inside diameter of the cavity at the level of the nest was 6.5 cm. The nest structure consisted of a tightly woven cup of fine plant fibres with dry leaves on its outside.

### Discussion

Previously described nests of Elfin-woods Warbler at Maricao State Forest were two cup nests placed in aerial leaf litter within a *Podocarpus*-mixed hardwood association in the subtropical lower montane zone during April and May<sup>1</sup>. Climate at the site is dry and cool in December–May and humid and hot for the rest of the year, with mean annual precipitation of 2,326 mm and temperature of 21.7°C. Aerial leaf litter consists of dead *Cecropia peltata* leaves that fall from canopy trees and become entangled or caught among vegetation or vines. Reasons for the concealed location were hypothesised to be: reduced exposure to predation and reduced exposure to rain and sun, as the *Cecropia* leaves provided cover for the nests. Among well-known avian nest predators at Maricao State Forest include Sharp-shinned Hawk *Accipiter striatus*, Pearly-eyed Thrasher *Margarops fuscatus* and two species of endemic snakes<sup>2,5</sup>. Because of the location of the nests described by Arroyo-Vazquez<sup>1</sup> it was impossible to gather data on clutch size and the number of fledglings.

The nesting event described here differs from previous data in several important aspects. First, the nest was placed inside a rotten tree stump, quite different from the others. No other *Dendroica* species are known to nest in cavities, either in the tropics or in North America<sup>6,9</sup>. Second, the tree was in man-modified habitat with no ground cover and a sparse canopy, therefore making the nest highly visible and exposed to the elements. Third, the brood size of four nestlings was unexpected as usually other West Indian *Dendroica* have clutch sizes of 2–3<sup>9</sup>.

Factors that may have played in the selection of nest location are speculative, given the extreme paucity of previous data, but one factor may have been avoidance of forest predators. Additional factors may have been the result of intraspecific territorial competition for nesting sites in nearby forest or a previously unknown tendency for cavity-nesting when appropriate opportunities are available.

### Conclusions

Further observations of the species' breeding ecology are required in order to determine the significance of the present report. The perceived plasticity in respect to nest-site selection may be indicative of the Elfin-woods Warbler's adaptability to different habitat conditions within its range, where nest concealment is of paramount

importance. In this respect cavity-nesting may be considered a strategy for avoiding predation. It is also noteworthy that four fledglings were found within such a closely confined space. The discovery of a *Dendroica* nest in a tree cavity is significant as no congeners have been reported using such a site.

#### Acknowledgements

I want to thank my sister Maricarmen for accompanying me in the field. I am also grateful to Jim Wiley for revising the manuscript and Dr Delannoy for his comments on my report.

#### References

1. Arroyo-Vazquez, B. (1992) Observations of the breeding biology of the Elfin Woods Warbler. *Wilson Bull.* 104: 362–365.
2. Biaggi, V. (1997) *Las aves de Puerto Rico*. Ed. Univ. Puerto Rico: Río Piedras.
3. BirdLife International (2000) *Threatened birds of the world*. Cambridge, UK: BirdLife International & Barcelona: Lynx Edicions.
4. Cruz, A. & Delannoy, C. A. (1984) Ecology of the Elfin Woods Warbler (*Dendroica angelae*). I. Distribution, habitat usage, and population densities. *Carib. J. Sci.* 20: 89–96.
5. Delannoy, C. A. & Cruz, A. (1988) Breeding biology of the Puerto Rican Sharp-shinned Hawk. *Auk* 105: 649–662.
6. Dunn, J. & Garrett, K. (1997) *A field guide to the warblers of North America*. Boston: Houghton Mifflin.
7. Gochfeld, M., Hill, D. O. & Tudor, G. (1973) A second population of the recently described Elfin Woods Warbler and other bird records from the West Indies. *Carib. J. Sci.* 13: 231–235.
8. Kepler, C. B. & Parkes, K. C. (1972) A new species of warbler (Parulidae) from Puerto Rico. *Auk* 89: 1–18.
9. Raffaele, H., Wiley, J., Garrido, O., Keith, A. & Raffaele, J. (1998) *A guide to the birds of the West Indies*. Princeton, NJ: Princeton University Press.
10. Wiley, J. (2000) A bibliography of ornithology in the West Indies. *Proc. Western Found. Vert. Zool.* 7: 1–817.

#### Rafael Rodríguez-Mojica

Del Río # 21 North, Mayaguez, Puerto Rico 00680. E-mail: raromo@caribe.net.