Observations on a secondary cavity nest of Yellow-crowned Euphonia *Euphonia luteicapilla*

Taylor Crisologo, Reid Rumelt, Eric Sibbald and Benjamin G. Freeman

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Describimos la observación de una pareja de *Euphonia luteicapilla* anidando en una cavidad secundaria en la estación biológica La Selva, en las tierras bajas de Costa Rica. En abril de 2015 observamos una pareja armando su nido en una cavidad originalmente construída por un pájaro carpintero en un poste telefónico. Creemos que esta es la primer observación de una pareja de *E. luteicapilla* (o de una pareja de una de las 34 especies del género *Euphonia* en general) anidando en una cavidad secundaria. Las especies del género *Euphonia* suelen armar sus nidos en forma de domo en pequeñas grietas al costado de los caminos, sobre masas de plantas epifitas y entre las raíces de plantas colgantes. Finalmente, describimos una serie de observaciones adicionales que sugieren que las species del género *Euphonia* ocasionalmente utilizan cavidades secundarias para anidar.

The genus *Euphonia* (Fringillidae) is a group of 34 species of small-bodied, frugivorous, nine-primaried oscines endemic to the Neotropics[7]. While most nine-primaried oscines construct open-cup nests[2], euphonias generally build enclosed nests. Typical euphonia nests have side entrances and roofs, and are often nestled in nooks and crannies in epiphytes, road banks and other substrates[13,14]. Perhaps related to this distinct nest-building strategy, euphonias are reported to lay larger clutches than co-occurring open-cup builders[15,17].

Yellow-crowned Euphonia *Euphonia luteicapilla* inhabits Central American lowlands from southern Nicaragua to Panama, preferring secondary forest and forest edge[7]. The species' breeding biology is reasonably well known. Pairs often build spherical nests at the sides of roads or in shady clearings[15,16]; in Costa Rica, nest construction typically begins in March. Nests require external structural support, using, e.g., stumps, fence posts, epiphytic plants, thick tree branches and old wasps' nests[15,18]. Skutch[14] described nest height as ranging

Figure 1. Male Yellow-crowned Euphonia *Euphonia luteicapilla* perching at the entrance hole of the nest (left); female Yellow-crowned Euphonia in the hole with the male perched outside (right) (E. Sibbald)

from near the ground to >30 m high, with the vast majority of nests sited 2–3 m above ground. During construction, pairs arrive together at the nest area carrying materials, but the male almost always enters the nest first[15], a behaviour hypothesised to be a by-product of stereotyped nestling-provisioning in this species (when pairs arrive together to feed chicks, males typically regurgitate food before the female[15]). Females incubate clutches of 2–4 white eggs with brown mottles[14].

New observations

In March 2015, we observed a pair of Yellow-crowned Euphonias nest-building in an abandoned woodpecker cavity at La Selva Biological Station, prov. Heredia, Costa Rica (10°25'53.4858"N 84°00'9.7482"W). The cavity was c.8 m above ground in a 9 m-tall wooden powerline pole near the entrance station at La Selva (Fig. 1); surrounding habitat was secondary forest with a c.25 m canopy. The hole was clearly created by a primary excavating species, probably the locally common Black-cheeked Woodpecker *Melanerpes pucherani*.

We first observed the pair of euphonias near the nest site on the afternoon of 30 March 2015, when we noticed the male and female uttering scolding vocalisations by the pole. We confirmed the euphonias were nest-building in the cavity on the afternoon of 31 March, and observed the nest for 75 minutes that afternoon and for 60 minutes next morning. During our first observation period (31 March), the pair arrived together at the nest 15 times (during 75 minutes). The male brought nest material only once in this period, compared to seven times by the female; material consisted mostly of rootlets, moss and other plant fibres, with individual pieces ranging in length from c.4 to 8 cm. On each visit, the male entered the cavity first. After the male exited the nest hole, the female would enter and deposit material. Following her departure, the male would re-enter the nest and appeared to inspect it before the pair flew away together. During our second observation period (1 April), the male visited the nest cavity alone on three occasions, twice bringing material. We did not observe the female during this time.

We observed the male engage in aggressive behaviour on three occasions when a heterospecific landed near the nest. In all three cases, the male euphonia dive-bombed the intruder (a Black-cheeked Woodpecker, Long-tailed Tyrant *Colonia colonus* and Great Kiskadee *Pitangus sulphuratus*, respectively), causing it to depart the vicinity. In addition, both members of the pair would scold and give a twittering vocalisation when people walked past the pole; the pair would not enter the nest until people were c.15 m from the base of the pole.

Discussion

Our observations of a Yellow-crowned Euphonia pair nest-building within an abandoned cavity in a telephone pole represent the first unequivocal record of a secondary cavity nesting attempt by this species, and perhaps the first documented record of a *Euphonia* sp. attempting to nest in a secondary cavity. A fundamental divide in nest architecture exists between species that nest in cavities and those that do not[3]. Relative to species that construct open-cup or domed nests, cavity-nesting species typically have larger clutches[17], suffer lower rates of nest predation[10,11] and experience more stable nest microclimates[4,9]. Unpublished records suggest that other euphonia species may occasionally nest in cavities. For example, White-vented Euphonia *E. minuta* has been observed investigating cavities in dead trees in Venezuela (J. Kvarnback pers. comm.), Chestnut-bellied Euphonia *E. pectoralis* has been observed entering a cavity in a dead tree in Paraguay (A. Bodrati pers. comm.) and Thick-billed Euphonia *E. laniirostris* kept in aviaries has been noted to nest in modified nestboxes even when other nesting substrates were available (J. Ingels pers. comm.). However, we emphasise that euphonias and closely related chlorophonias typically construct domed or enclosed nests nestled in nooks or within epiphytes[6,14], and that nestbox studies in the Neotropics have yet to identify instances of *Euphonia* occupying them (K. Cockle pers. comm.). Indeed, with the exception of a few species of predominantly Old World distributions (in the genera *Acanthis*, *Alario*, *Carduelis*, *Pseudochloroptila* and *Serinus*), cavity nesting is rare or absent among Fringillidae[2], although present in some lineages of nine-primaried oscines, including *Sicalis* and *Tangara* (e.g., a report of Blue-necked Tanagers *Tangara cyanicollis* nesting in a hollow tree in captivity[12]). While most nine-primaried oscines construct cup nests, our observations demonstrate that Yellow-crowned Euphonias—and possibly other euphonias—can be viewed as facultative secondary cavity nesters.

Neotropical species that typically build domed nests, e.g. Great Kiskadee *Pitangus sulphuratus* and other tyrannids, occasionally nest in cavities[8], suggesting a link between domed nests and opportunistic use of cavity sites. In Neotropical tyrannids, cavity nesting is hypothesised to be the ancestral state; in this view, derived domed nests represent 'cavity substitutes' that provide protection from predators and the elements without requiring a physical cavity[8]. The absence of cavity-nesting species in Fringillidae suggests this scenario is unlikely to apply to *Euphonia*, where the reverse may be true—domed nests may predispose *Euphonia* to occasionally use novel nest-supporting structures, such as cavities. More detailed descriptions of nesting behaviour

in the Fringillidae are necessary to evaluate this hypothesis.

That we observed the probable first record of cavity nesting in a species at La Selva Biological Station, a well-studied site that has hosted generations of ornithologists[1,17], also suggests that much remains to be learned concerning the breeding ecology of euphonias and other Neotropical birds[5]. Further natural history information will facilitate future comparative analyses of the links between nest architecture, clutch size and parental care in the Neotropical nine-primaried oscines and other tropical radiations.

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Taylor Crisologo, Reid Rumelt, Eric Sibbald and Benjamin G. Freeman

Department of Ecology and Evolutionary Biology, Cornell University, Ithaca, NY 14853 USA. E-mails: tlc95@cornell.edu, rbr73@cornell.edu, ets48@cornell.edu, bgf27@cornell.edu.