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BREEDING OBSERVATIONS OF CAVE SWALLOWS (*HIRUNDO FULVA*) AT TWO CUBAN SITES

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INTRODUCTION

Following to Ridgely & Tudor (1989), we considered the Cave Swallow (*Hirundo fulva*) as a species distinct from the Chesnut-collared Swallow (*H. rufocollaris*), which has breeding populations in Ecuador and Perú. The Cave swallow breeds in Central America, the Caribbean and in the southern U.S. The species is widely distributed in Cuba and the Juventud Isle (fomerly called Isle of Pines), where it breeds on farm-houses, factories, sea cliffs and in natural caves (Bond 1990), wintering in small flocks in the country (Garrido 1988). In spite of its relative abundance, little is known of its breeding biology in the Caribbean. The aim of this study is to provide information on the breeding biology of two Cave Swallow populations in two different habitats of central Cuba.

STUDY AREA AND METHODS

Observations were made in the caves of Beruvides-Sebastián, located 1.5 km east of the village of Agramonte (22°40'N, 81°08'W), province of Matanzas (central Cuba). The other colony, also located in the Matanzas province, was situated on a high factory building in San Antonio de Los Baños (23°03'N, 81°31'W). Both localities are situated in a mixed urban-agricultural area. The colonies were monospecific, without association with other swallow species, as has been fund elsewhere (Huels 1985).

The caves of Agromonte have numerous escarpments, which the swallows use to attach their nests. The nests of the San Antonio colony are fund on the top of roof beam. In both colonies, a mist-net 9 x 2 m, was set up during the morning at the entrance of the caves and building, from 20 March to 22 December 1993; a total of 215 birds were captured. Most of the birds were weighed, measured, banded with a U.S. Fish & Wildlife Service aluminum ring and released afterwards.

The following measurements were taken

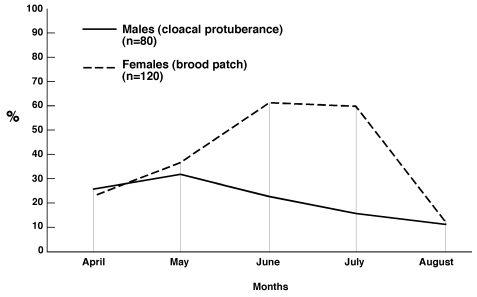

FIG. 1. Percentage of occurrence of cloacal protuberance and brood patch according to seasons, in breeding Cave Swallows from Matanzas (central Cuba).

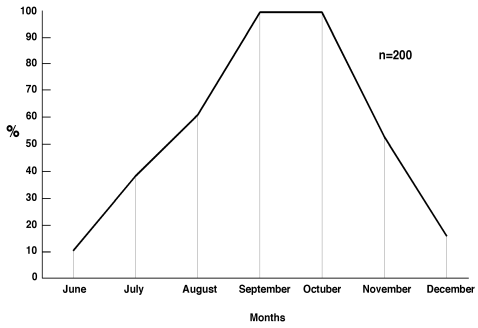

FIG. 2. Percentage of Cave Swallow individuals molting in Matanzas, central Cuba.

following Svensson (1984): wing length (flattened and straightened), tail, tarsus length and bill length (from the nostrils to the tip of the bill). In April, the birds were sexed using as criteria the presence or absence of an incubation patch and the morphology of the cloacal protuberance. Nest measurements included height above the ground, external maximum diameter, internal maximum diameter and depth of the nest´s concavity. Eggs were measured (length and width) with a slide caliper to the nearest 0.1mm. Egg weight was obtained by a Pesola balance to the nearest 0.5 g and only in the first three incubation days. Statistical analysis was carried out with two-tailed *t*-tests (Fowler & Cohen 1987).

RESULTS AND DISCUSSION

Measurements and morphology of the breeding birds. No apparent sexual dimorphism was found in plumage characters. Although males were slightly larger than females, no significant differences (mean ± SD; $P > 0.05$) were found between the sexes in body mass: male 17.6 g ± 1.2, female: 17.6 g ± 1.4; wing lenght: male 102.1 mm ± 0.2, female: 101.3 mm ± 0.1; tail length: male 41.0 mm ± 0.2, female 41.4 mm ± 0.2; tarsus length (12.7 mm ± 0.0) and culmen length (5.5 mm ± 0.0), nor between the birds from the two study localities. Brood patches were present in all the females captured from late April to early August. This patch is not so well developed in males, being a useful character in sexing swallows (Fig. 1). Cloacal protuberance is only slightly marked in females, but it is well developed in males (Fig. 1), being also a good character for sex discrimination during the breeding season (late April to early August).

The eggs size were measured only in one locality (Agromonte) : mean length = 20.5 mm ± 0.1 (CV = 5.0), width : 14.5 mm ± 0.1 (CV = 3.2), and fresh weight = 2.1 g ± 0.2 (CV = 1.9). Molting of the inner primaries began in both sexes from early-middle June to middle December, reaching its maximum during September and October, when all the captured birds were moulting (Fig. 2).

Comparison between nests in natural caves and factory buildings. Median height of the nests above the ground in natural caves was very similar to those measured in buildings (Table 1). Nests from the human settlements in San Antonio have significantly larger diameters and width than these situated in the caves (Table 1). Depth and height of the nests were similar in both localities, but which a statistically significant differences in width (Table 1).

TABLE 1. Cave Swallow nest measurements (mm) at two study localities in Matanzas Province, Cuba.

	San Antonio (n = 32)	Agramonte (n = 35)	*t*-test
Width	154.7	140.2	2.095*
Internal diameter	87.0	72.0	4.002**
External diameter	113.4	103.0	2.282**
Depth	46.4	40.9	1.776 ns
Height	72.0	74.7	0.499 ns

*$P < 0.05$; **$P < 0.01$.

Although height and depth are important parameters in nest-boxes nesting birds in order to increase the number of eggs and nestlings (East & Perrins 1988, Pascual 1994), also the nest width could implicate differences in clutch size. Unfortunately, clutch size in the San Antonio colony was impossible to record and no comparisons with the Agromonte colony (with an average clutch size of two eggs by nest) are possible. The larger structural dimensions of the nests in the factories may be due to their support on beam-buildings with the need of larger and more robust nest-material on these structures without walls. In contrast, the nests on natural depressions are firmly attached to the rocky walls and do not need the support of large material. However, Martin & Hector (1988) observed the use of wool as a lining material in the nest of cave swallows in Texas (US) with potential negative effects on the breeding perfomance of the birds due to lack of proper nestling thermoregulation. In our populations no lining material of human origin was observed, in spite of the nearby high population density in both localities. However, if temperature has an indirect effect on nest-building (Elkins 1983) the differences found in nest´s size could indicate the warmer environment of the buildings, and a need for larger nest structure in order to avoid hyperthermia, in comparison with the natural caves.

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REFERENCES

Bond, J. 1990. Birds of the West Indies. Collins, Hong-Kong.

East, M. L., & C. M., Perrins.1988. The effect of nestboxes on breeding populations of birds in broadleaved temperate woodlands. Ibis 130: 393–401.

Elkins, N. 1983. Weather and bird behaviour. Poyser, Calton, U.K.

Fowler, J., & L. Cohen. 1987. Statistics for ornithologist. BTO Guide 22. Tring, U.K.

Garrido, H. H. 1988. La migración de las aves en Cuba. Publ. Asoc. Amigos de Doñana nº 0. Sevilla.

Huels, T. R. 1985. Cave Swallow paired with Cliff Swallows. Condor 87: 441–442.

Martin, R. F., & D. Hector.1988. Nest lining with sheep wool. Potential negative effects on cave swallows. Wilson Bull. 100: 294–296.

Pascual, J. A. 1993. Ocupación de distintos modelos de nidal por el Estornino negro (*Sturnus unicolor*). Doñana Act. Vertebrata 20: 165–178.

Ridgely, R. S., & G. Tudor. 1989. The birds of South America. The oscine passerines. Univ. of Texas Press, Austin, Texas.

Svensson, L. 1975. Identification guide to European passerines. Naturhistoriska Riskmuseet, Stockholm.

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