

## THE BLACK SWIFT (*CYPSELOIDES NIGER*) NESTING IN GUADELOUPE

PASCAL VILLARD<sup>1</sup> AND ALAIN FERCHAL<sup>2</sup>

<sup>1</sup>AEVA, c/o C. Pavis, Hauteurs Lézarde, F-97170 Petit-Bourg, Guadeloupe, French West Indies; e-mail: pascalvillard@yahoo.fr; <sup>2</sup>Parc National de la Guadeloupe, Habitation Beausoleil, Montéran, 97120 Saint Claude, Guadeloupe; e-mail: alain.ferchal@guadeloupe-parcnational.fr

**Abstract:** In Guadeloupe, the Black Swift (*Cypseloides niger*) nests mainly along rivers with rocky cliffs and canyons on the leeward coast. Nests were found in shaded, rocky substrates near running water. Egg volume ( $n = 4$ ) was the smallest of the three subspecies of Black Swift. One young fledged after 51 days.

**Key words:** Black Swift, breeding sites, chick growth, *Cypseloides niger*, Guadeloupe

**Résumé :** NIDIFICATION DU MARTINET SOMBRE (*CYPSELOIDES NIGER*) EN GUADELOUPE. En Guadeloupe, le martinet *Cypseloides niger* sombre niche principalement sur les rivières de la côte-sous-le-vent, le long des berges rocheuses, des falaises et des canyons. Les nids se trouvaient dans des zones sans ensoleillement direct, avec un substrat rocheux, et à proximité immédiate d'une rivière. Le volume de l'œuf ( $n = 4$ ), était le plus petit des trois sous espèces de martinet sombre. L'élevage d'un jeune suivi durait 51 jours.

**Mots clés :** croissance du jeune, Guadeloupe, Martinet sombre, sites de nidification

**Resumen:** NIDIFICACIÓN DEL VENCEJO NEGRO (*CYPSELOIDES NIGER*) EN GUADALUPE. En Guadalupe, el Vencejo Negro (*Cypseloides niger*) nidifica principalmente a lo largo de ríos con acantilados rocosos y cañones en la costa de sotavento. Los nidos fueron encontrados en sustratos rocosos y a la sombra, cerca de aguas en movimiento. El volumen del huevo ( $n = 4$ ) fue el más pequeño de las tres subespecies de Vencejo Negro. Un pichón eclosionó a los 51 días.

**Palabras clave:** crecimiento del pichón, *Cypseloides niger*, Guadalupe, sitios de cría, Vencejo Negro

The Black Swift (*Cypseloides niger*), a New World species, has three recognized subspecies (Chantler 1999). One breeds in the Nearctic region (*C. n. borealis*) and the other two in the Neotropical region (*C. n. costaricensis* and *C. n. niger*; Dickinson 2003). Marín (1999) studied the breeding biology of *C. n. borealis* and *C. n. costaricensis* in California and Costa Rica, respectively. The nominate race is found in the West Indies. In Guadeloupe, it has been mentioned for decades as a common breeding resident (April through September; Bond 1985, Raffaele *et al.* 1998). But it was not until 2007 that the first nest was discovered (hereafter nest 1), by Sébastien Rives, a ranger of the national park of Guadeloupe.

### STUDY SITE AND METHODS

On the island of Basse-Terre, a 500–800 m high mountain runs roughly north to south and is cut by many streams flowing toward the east or west coasts. From 20 March to 20 August 2009 we surveyed 270 km of 44 selected rivers (total length 391 km) distributed around the island. Before starting, we visited nest 1, still in place from previous years, to develop a search image for nest habitat. Our goals were to identify potential nest sites (with birds flying near cliffs with waterfalls or clinging to

rocks), find additional Black Swift nests, and to follow the growth of a nestling Black Swift.

A caliper was used to measure (mm) the width and height of nests, and the length and width of eggs. Egg volume was measured using the equation of length  $\times$  width<sup>2</sup>  $\times$  0.507 (Hoyt 1979). The growth rate of a chick was studied by measuring (mm) wing length and tail length with a caliper. Body mass of the chick was measured (g) with a pesola.

### RESULTS

In addition relocating the old nest at site 1, we found six new nests at three new sites: one nest without an adult (the nest contents could not be seen) at site 2; three nests (nests 2–4), each with an incubating adult, at site 3; and one nest with an adult probably incubating at site 4. The four nest sites were at an average altitude of  $305 \pm 117$  m.

The sites were within 1.5–10 m of running water, and were in shade or indirect sunlight on cliffs, providing ample protection against land predators such as the Black Rat (*Rattus rattus*) and Small Asian Mongooses (*Herpestes javanicus*).

Nest 1 was on a ledge just a few cm wide (Fig. 1). Nest 4 was built on a ledge with a 60° slope, which explained why the front part was more than three times the average height (Table 1). The inside cup



Fig. 1. Nest 1 built on a tiny ledge with the single egg on a dry filling. Photo by Pascal Villard.



Fig. 2. Black Swift chick aged at 5 days. Photo by Pascal Villard.



Fig. 3. Black Swift chick aged 11 days. Photo by Pascal Villard.



Fig. 4. Black Swift chick almost full grown 39 days old. Photo by Pascal Villard.

of the nests was very shallow with an average depth of 15 mm ( $n = 4$ ). In April, at the time nest 1 was inspected, it was brown. After the return of adults from winter quarters, nest 1 was reused with the exterior lined with green moss and the interior lined with dry roots and grass stems (Fig. 1), as described for *costaricensis* (Marín and Sánchez 1998). The interior of nests 2–4 were lined with green moss only. A single white egg was laid, with an average size of  $24.7 \pm 3.2$  mm  $\times$   $16.4 \pm 2.5$  mm ( $n = 4$ ). Egg

volume was  $3.37$  cm<sup>3</sup>.

From late June to mid August, nest 1 was checked eight times at intervals of 4–10 days (Figs. 2–4). Growth rate of body mass and wing length for the chick in nest 1 are presented in Fig. 5. By day 39, the chick of nest 1 (Fig. 5) had some fat filling up the abdominal and furca areas. At fledging (days 51–52), wing and tail lengths of the chick were 95% and 81%, respectively, of an adult skin specimen of nominate *niger* collected in Guadeloupe (wing, 145

Table 1. Sizes (mm) of four Black Swift nests in Guadeloupe.

Variables	1	2	3	4	$\bar{x}$	SD	$n$
Width	115	110	100	120	111	9	4
Back to front	95	93	70	100	90	13	4
Top to bottom	50	65	85	240	67 <sup>a</sup>	18	3

<sup>a</sup>nest 4 is not included, see text.

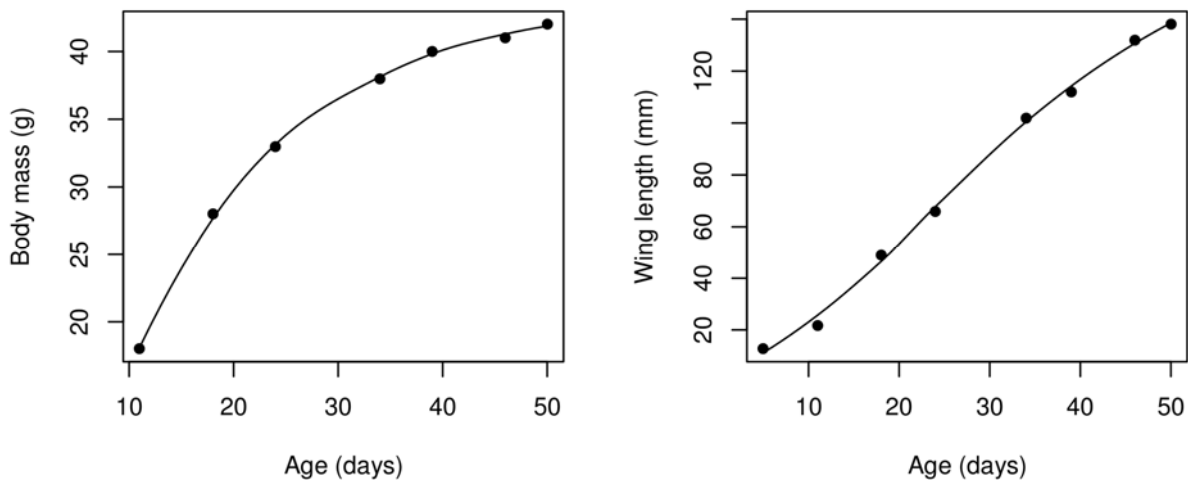


Fig. 5. Body mass (g) and wing growth (mm) of a nestling Black Swift.

mm; tail, 58 mm) (Fig. 5). The moss of the nest had turned brown by fledging.

#### DISCUSSION

Nest 1 was used in 2007 and reused at least in 2009. High individual nest-site fidelity is known for Black Swifts (Collins and Foerster 1995), each pair reusing its old nest every year (Marín 1997). In Guadeloupe, all four nest sites were found beside running water along three rivers flowing toward the west coast and one toward the east. On the leeward coast, rivers often wind through rock cliffs and canyons that are more suitable for nest sites. This is much less the case on the windward coast, where the only potential nest sites were found in places with waterfalls 40–110 m high. *Borealis* and *costaricensis* are both known to nest in dark to semi-dark, deep gorges, canyons, and caves near water, waterfalls, or rivers (Marín 1997). High humidity may be required for successful nest attachment (Marín and Stiles 1992), as nest 1 was still muddy 7 months after fledging.

We compared egg volume among the three subspecies. The eggs of *borealis* were the largest (5.14 cm<sup>3</sup>), followed by *costaricensis* (4.84 cm<sup>3</sup>; 5.9% smaller than *borealis*) and nominate *niger* (3.37 cm<sup>3</sup>; 4.6% smaller than *costaricensis*). Growth curves for body mass and wing length of the chick in nest 1 were similar to those of two chicks of *costaricensis*, with fledgling wing and tail lengths slightly smaller (90–95% and 90%, respectively) than *costaricensis* (Marín 1999). Nominate *niger* is known to be the smallest subspecies, with a wing length 14.1% shorter than *costaricensis*, which in

turn is 5.4% shorter than *borealis* (Marín 1999).

Regarding conservation of the Black Swift in Guadeloupe, a major source of disturbance during the breeding season may be the sport of canyoning. This activity is most common on streams along the leeward coast because cliffs, canyons, and short waterfalls abound there, which also provide the best habitat for nesting swifts. We observed several bolts anchored in rocks for attaching climbing ropes, sometimes very close to Black Swift nesting sites. Canyoning is forbidden within Guadeloupe National Park (decree in June 2009), but three of the four nest sites found were outside the park. Consideration should be given to placing artificial platforms in suitable locations within the national park. The potential effects of human recreational activities on Black Swifts should be studied, with focused surveys conducted in all suitable river canyons to estimate the breeding population of Black Swifts for the entire island of Basse-Terre and to determine the period when the birds must not be disturbed.

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