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BREEDING OF THE GRAY-WINGED TRUMPETER IN FRENCH GUIANA¹

PIERRE DE MERCEY² AND MARC THÉRY³

CNRS—UMR 8571, Laboratoire d'Ecologie Générale, Muséum National d'Histoire Naturelle,
4 Avenue du Petit Château, 91800 Brunoy, France, e-mail: thery@mnhn.fr

Abstract. In French Guiana, a territorial group of Gray-winged Trumpeters (*Psophia crepitans*) laid three eggs in a cavity atop a *Vouacapoua vouacapoua* snag, 13.5 m up. At least two individuals alternated incubation, as in White-winged Trumpeters *P. leucoptera* in Peru. One egg had a dead embryo, and the two nidifugous chicks disappeared in their first week. Some previous field records of nests or eggs are probably incorrect.

Key words: breeding, clutch size, eggs, Gray-winged Trumpeters, incubation, nesting, *Psophia crepitans*.

Psophiidae (Gruiformes) include only three species of trumpeters (*Psophia crepitans*, *P. leucoptera*, and *P. viridis*) that are allopatric in lowland rain forests of the Amazon basin and Guyana shield. The Gray-winged Trumpeter (*P. crepitans*) has the widest distribution: it occurs north of the Amazon River from northeastern Brazil through the Guyanas and southern Venezuela, to southeastern Colombia, eastern Ecuador, and north-eastern Peru (Sherman 1996). Trumpeters are chicken-sized ground birds that live in groups of 6–8 individuals on large permanent territories, searching for fallen ripe fruits and arthropods (Sherman 1995b, 1996). A recent five-year study of the White-winged Trumpeter (*P. leucoptera*) showed a cooperatively polyandrous breeding system, in which one dominant female per group copulates with up to three adult males (Sherman 1995a). Otherwise, knowledge of trumpeter breeding is poorly documented. The Gray-winged Trumpeter bred in captivity in two North American zoos (Horning et al. 1988, Male 1989). Early naturalists often cited local reports (Chubb 1916), whereas other information

comes from general or regional bird books in which the exact source is usually not indicated (Haverschmidt 1985, Hilty and Brown 1986, Sick 1993). This paper reports observations of Gray-winged Trumpeter breeding in French Guiana during a preliminary ecological study.

METHODS

Field work was conducted at the Nouragues Biological Station, French Guiana (4°03'N, 52°42'W), by the first author (PM) during four months at the beginning of the dry season (1 July to 13 September 1993 and 16 July to 5 September 1994), and by PM and MT during three months in the middle of the rainy season (28 February to 31 May 1995). One habituated group of Gray-winged Trumpeters was followed by sight, and a few observations were made on other groups. Groups contain an average of seven birds. Seven laying dates were calculated from sightings of chicks or juveniles, six coming from the Nouragues field station and one from another site in French Guiana (St. Eugène, on Petit Saut hydroelectric dam, 4°59'N, 53°08'W). Hatching date of the focal group was determined using morphological description of newly hatched chicks by Horning et al. (1988). Approximate laying date was defined using a mean incubation length of 28 days (Horning et al. 1988) and 2 days between successive egg layings (Sherman 1995a) subtracted from estimated date of hatching. The times of nest relief were determined by following the group to the nest area, not by watching the nest. Data on offspring production were gathered for four different groups in 1993, 1994, and 1995, giving the number of juveniles which can reach adulthood for seven group-years (4 groups × 3 years). Values presented are means ± SD.

RESULTS

The seven estimated laying dates, spread over five years (1993 to 1997), were in February and March.

One occupied nest was found on 4 April 1995 by following the group. It was located in *terra firme* or

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² Deceased 25 June 1999.

³ Corresponding author.

upland forest at one end of the group's territory, in an area where numerous trees were fruiting during the incubation period. The nest cavity was atop a standing snag of *Vouacapoua vouacapoua*, 13.5 m high, isolated from the surrounding canopy. With walls 0.2–0.5 m high, the nest cavity had no roof except for leaves of a 0.5 m epiphyte. Two V-shaped entrances were cut into the wall, with a shallow lip on one side and no lip on the other. The cavity diameter was 30–40 cm. Laying dates of the three eggs were estimated as 14, 16, and 18 March 1995. Two eggs hatched on 15 April. The cavity was investigated on 29 April, 13 days after two young had left. One egg, white with dirt stains, 65.3×48.1 mm, had a small dead embryo. It was laid directly on a thick layer of rotten wood shavings.

The rotten egg was still incubated on 25 April, 10 days after two other eggs hatched. At least two different adult birds were sharing incubation duties, but as they were not banded, we were unable to identify them individually. The bird that spent the night on eggs was relieved at $12:59 \pm 56$ min ($n = 8$). The bird that incubated during the afternoon was relieved at $17:22 \pm 9$ min ($n = 11$).

An average of 0.57 ± 0.53 young per group seemed to reach adulthood each year (range 0–1, $n = 7$). This estimate is increased to 0.67 ± 0.82 (range 0–2, $n = 6$) if one group of three birds with which the focal group merged temporarily is considered to be a subgroup. The two chicks of the only nest found were observed the second day after hatching but disappeared during their first week, probably eaten by a predator. Two other trumpeter groups observed during 1995 also had no chicks.

DISCUSSION

Previous records of Gray-winged Trumpeter breeding are all between December and May on the Guyana shield: chicks in March in French Guiana (Tostain et al. 1992) and in February and April in Guyana (Haverschmidt 1985), layings in December and May for a captive pair in Suriname (Haverschmidt 1963), and one adult male in breeding condition collected in March on the upper Orinoco, Venezuela (Hilty and Brown 1986). In French Guiana, laying in February and March allows trumpeters to incubate and feed young during the peak of fruit production, December to May, which coincides with the rainy season (Sabatier 1985). Similarly in southeastern Peru, White-winged Trumpeters begin to breed at the end of the dry season and eggs hatch at the beginning of the rainy season, when fruit and arthropod abundances are increasing (Sherman 1995a).

Our observations of Gray-winged Trumpeter nest and eggs are congruent with results of recent studies on Psophiidae, but contradict some older information. The nest site that is described here is similar to those reported for the White-winged Trumpeter, which were all "elevated cavities in trees" (Sherman 1995a). Most cavities used by *P. leucoptera* were protected from rain (Sherman 1995a), which was not the case here. Sherman also cited two unroofed cavity-like spaces, at forks of the main tree trunk. Similar nest sites were already reported for the Gray-winged Trumpeter: in hollows well up in trees (Haverschmidt 1985, Sick

TABLE 1. Trumpeter^a clutch sizes (mean \pm SD) in the literature.

Clutch size	<i>n</i>	Study
3.0	1	This study
2.5 ± 0.7	2	Haverschmidt 1963
2.7 ± 0.7	19 or 21 ^b	Horning et al. 1988
3.2 ± 0.5	4	Male 1989
3.0 ± 0.8	4	Sherman 1995a

^a All data are for *Psophia crepitans*, with the exception of Sherman's which are for *P. leucoptera*.

^b If eggs separated by a 4-day interval are included in the same clutch.

1993), in the fork of a tree (Chubb 1916), or in the crown of a palm (Johnsgard 1983). The height of the nest in our study also is similar to those of White-winged Trumpeters (13.5 m compared to an average of 11 ± 2.0 m, range 7.6–12.8 m for 6 used cavities, plus 14 other visited cavities which all fell in this interval except three: 3.7 m, 15.2 m, and 16.8 m; Sherman 1995a). According to recent studies (Horning et al. 1988, Sherman 1995a), trumpeters do not build a nest, but instead remove any loose debris present in the nesting cavity and lay their eggs directly on its floor, which is congruent with the bare nest floor observed in our study. Reports of nests built with twigs and leaves at 4–5 m up a tree (Hilty and Brown 1986) or lined with leaves (Meyer de Schauensee and Phelps 1978) may be inaccurate. Captive *P. crepitans* and wild *P. leucoptera* produced clutches of two to four white eggs (Table 1). Reports of *Psophia* nests on the ground with blue or green eggs may be of Great Tinamous (*Tinamus major*) (Chubb 1916, Johnsgard 1983).

In a captive pair of Gray-winged Trumpeter in Suriname, the female incubated alone from 18:00 until 13:30 the next day (Haverschmidt 1963). Eggs laid by captive Gray-winged Trumpeters were incubated by all three adults (one male and two females, Horning et al. 1988) or by both members of the breeding pair (Male 1989). In the White-winged Trumpeter, incubation duties were shared primarily by the dominant pair (83% of incubation shifts, $n = 71$, Sherman 1995a), but both subordinate males and a one-year-old offspring also participated (Sherman 1995b). As in French Guiana, two incubation shifts occurred every day, the dominant female normally incubating from dusk until early morning, and the dominant male from late morning until dusk (Sherman 1995a). The times of nest relief also were similar at both sites.

In captivity, 5 eggs laid by one female were infertile (Haverschmidt 1963), up to 44.4% of eggs laid by two females were infertile ($n = 27$, Horning et al. 1988), whereas only 1 slightly punctured (with dead embryo) egg out of 10 failed to hatch from three successive clutches (Male 1989). The rotten egg that we found had a dead embryo but no puncture. Four of 10 clutches of wild White-winged Trumpeters were probably lost to predators (Sherman 1995a, 1996). Many White-winged Trumpeter chicks are lost their first month (42%, $n = 12$, Sherman 1995a), potentially predated at night when the non-flying chicks roost alone and

close to the ground, and in one instance pecked to death by adults from neighboring groups during territorial fights. A mean of 1.60 ± 1.19 young per year survived to adulthood in each group (range 0–3, $n = 13$; Sherman 1995a), which is similar to data from French Guiana. Our estimate of 0.57 ± 0.53 young per year can be low if the three groups watched in 1995 had laid a replacement clutch at the end of the rainy season. Dominant White-winged Trumpeter females can lay up to two consecutive replacement clutches (Sherman 1995a).

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A LATE TERTIARY WOODCOCK FROM MENORCA, BALEARIC ISLANDS, WESTERN MEDITERRANEAN¹

BARTOMEU SEGUÍ

Departament de Ciències de la Terra, Universitat de les Illes Balears, Cra. Valldemossa km 7.5 E-07071 Palma de Mallorca, Balearic Islands, Spain, e-mail: dctbsc4@ps.uib.es

Abstract. *Scolopax carmesinae* n. sp. is described from late Tertiary coastal outcrops of Punta Nati (NW Menorca, Balearic Islands). The species is known from one proximal fragment and one complete humerus. Estimated size is 10–20% smaller than living Eurasian Woodcock *S. rusticola*. Although osteological features in the humerus are not as specialized as in modern woodcocks, resembling in some aspects Gallinagininae, the general Scolopacinae conformation is fully recognizable. Differentiation of these two subfamilies must have taken place before the end of the Tertiary.

Scolopax carmesinae n. sp. might have been the ancestor of *S. rusticola*. Except for the recent Nearctic form *S. minor* and the fossil *S. hutchensi*, remaining living and fossil species of *Scolopax*, which are all insular endemic forms, probably originated from sedentary, insular populations of *S. rusticola*.

Key words: biogeography, Late Tertiary, Menorca, paleontology, *Scolopax carmesinae*, Western Mediterranean, woodcock.

Resumen. Se describe *Scolopax carmesinae* n. sp. a partir de un fragmento proximal de húmero y de un húmero completo, extraídos de brechas fosilíferas del Terciario tardío de Punta Nati (NO de Menorca, Islas

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