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BREEDING PARAMETERS OF THE SLENDER-BILLED GULL *LARUS GENEI* IN A NEW COLONY LOCATED AT L'ALBUFERA DE VALENCIA (E SPAIN)

PARÁMETROS REPRODUCTORES DE LA GAVIOTA PICOFINA *LARUS GENEI* EN UNA NUEVA COLONIA LOCALIZADA EN L'ALBUFERA DE VALENCIA (E DE ESPAÑA)

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The Slender-billed Gull *Larus genei* shows a scattered distribution, appearing at isolated localities from Senegal through the Mediterranean to E Kazakhastan and NW India (Del Hoyo *et al.*, 1996). In the western Mediterranean it breeds in about ten colonies, located in Tunisia, Italy, France and Spain (Fasola, 1986; Schenk, 1986; Isenmann, 1993; Paterson, 1996). The population of these colonies has recently increased from 750 breeding pairs estimated at the beginning of the 1980's to 3,000 (Isenmann & Goutner, 1993). The Spanish population averages from 440 to 470 pairs, with breeding colonies in the Ebro Delta (Tarragona), Santa Pola saltpans (Alicante), Guadalquivir marshes and l'Albufera de Valencia (Purroy, 1997). There exists a shortage of information on the breeding biology of the species (*i.e.* Isenmann, 1976; Fasola *et al.*, 1993), particularly that referred to the Iberian population (Weickert & Cano, 1963; Costa, 1985).

The regular presence of the Slender-billed Gull at l'Albufera de Valencia (East Spain; 39°20' N – 0°20' W) is a recent phenomenon (Dies *et al.*, 1999). It is coincident with the ecological restoration of the Racó de l'Olla, a saltmarsh (*ca.* 64 ha) located on the barrier island which isolated the coastal lagoon from the Mediterranean sea. Habitat management and limited access have lead to the regular breeding of up to 23 waterbird species in the saltmarsh (Dies, 2000).

This note shows the first data on phenology, reproductive parameters and breeding habitat of the Slender-billed Gull at l'Albufera de Valencia.

Slender-billed Gull nesting was confirmed at the Racó de l'Olla in 1994 for the first time (Table 1). Islands used in consecutive seasons were small (0.12 ha and 0.22 ha) and nearly flat (< 50 cm), with a muddy substrate, containing some pebble and shells (*Cardium* sp.). Vegetation cover of the islands was scarce, consisting mainly of halophytic species (*Arthrocnemum* spp., *Salicornia* sp., *and Suaeda* sp.). Up to eleven other Charadriiformes species bred on the same saltmarsh, and species such as the Common Tern (2,104 pairs in 1999), the Sandwich Tern (823 pairs) and the Gull-billed Tern *Gelochelidon nilotica* (281 pairs) were the most abundant.

Nests were settled on bare substrate and mainly composed of *Phragmites* spp. and *Scirpus* spp. stems, with the occasional presence of other plant species (*Typha* spp., *Arthrocnemun* spp. and *Oryza* spp.). There were also some feathers and artefacts (shells, small bones, and rope from fertilizer sacks). Nests showed a white rim of faeces.

Data were obtained during seven breeding seasons (n = 7, from 1993 to 1999). Phenology is expressed on the basis of days counted from January 1 (mean ± S.D. (range); n). Colonies were visited once (approximately before hatching) each breeding season. Additional information was obtained from regular observations from a hide placed close to the colony, from where nests were checked with a telescope (zoom 15-45x) without disturbing the colony. Egg measurements (to the nearest 0.1 mm) were obtained using a vernier calliper. Distance and size of nests (to the nearest 1 cm) were obtained with a metric tape. Relative position of the nest within the island was analysed using an arbitrary division (centre *vs.* periphery) and comparing observed and expected frequencies. We also tested the sig-

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TABLE 1

Main breeding parameters of the Slender-Billed Gull *Larus genei* at l'Albufera de Valencia (E Spain) (1994-1999).
[Parámetros reproductores de la Gaviota Picofina Larus genei *en la Albufera de Valencia (1994-1999)]*

	1994	1995	1996	1997	1998	1999	Total	%
Num. of nests. *[Num. de nidos.]*	1	3	2	2	3	11	22	—
Num. of eggs. *[Num. de huevos.]*	2	9	5	4	5	26	51	100
Eggs preyed. *[Num. huevos depredados.]*	2	0	0	0	0	0	2	3.9
Eggs failed. *[Num. huevos no eclosionados.]*	2	0	2	1	0	17	22	43.1
Eggs hatched. *[Num. huevos eclosionados.]*	0	9	3	3	5	9	29	56.9
Juveniles fledged. *[Num. pollos volados.]*	0	8	3	3	5	0	19	37.3
Hatching success (%). *[Tasa de eclosión.]*	0.0	100.0	60.0	75.0	100.0	34.6	56.9	—
Fledging success (%). *[Tasa de vuelo.]*	0.0	88.9	100.0	100.0	100.0	0.0	65.5	—
Productivity (per nest). *[Productividad por nido.]*	0.00	2.67	1.50	1.50	1.67	0.00	0.86	—

nificance of the difference between the average height (in cm) of a random sample of points and a random sample of nests, within the same island. Nest height data were obtained from the Slender-billed Gull and two other accompanying species (Sandwich Tern *Sterna sandvicensis* and Common Tern *S. hirundo*) in 1999. Elevations above water level were obtained using a graduated stick (measurements adjusted to the nearest 1 cm), once the breeding season was over.

Slender-billed Gulls were present from the beginning of March until the first half of September. During the study period, the mean arrivals date was April 4 (95.4 ± 15.74 (70-112); $n = 7$), and the last records on August 10 (223.0 ± 29.07 (180-248); $n = 7$). Individuals remained for 127.6 ± 40,18 ($n = 7$) days each year in the study area. Maximum number of individuals censused averaged 18.7 birds (8-31). Nine individuals, marked with darvic rings, were recorded during the study period. They were involved in breeding activities and were all ringed as chicks at the Guadalquivir marshes (37°01' N – 06°11' W).

Nests built during 1999 ($n = 11$) showed a mean external diameter (mean ± S.D.) of 298.2 ± 21.36 mm (260-320) and a mean internal diameter of 120.9 ± 11.36 mm (100-140). Nests were grouped with a mean inter-nest distance of 45.0 (4.34 cm ($n = 9$), with nine nests within one meter and two other separated 140 cm and 173 cm from this group.

There was no significant difference in the relative position (centre *vs.* periphery) of the Slender-billed Gull nests in occupied islands (χ^2 with Yates' correction = 1.14; $P < 0.05$; df = 1). Nevertheless, compared to a random sample, nests of both Slender-billed Gulls and Sandwich Terns, were placed on the higher parts of the island (> 30 cm) ($U = 54.5$; $P < 0.05$ and $U = 48.0$; $P < 0.05$; Mann-Whitney *U*-test). This was not true for the elevation of the nests of the Common Tern ($U = 449.0$; Mann-Whitney *U*-test). At the same time, there was a significant difference between the elevation of the nests of Slender-billed Gulls and Sandwich Terns, the later using even higher places ($U = 17.0$, $P < 0.05$; Mann-Whitney *U*-test) (Table 2).

Mean laying date was May 16 (136.5 ± 10.58 (116-159); $n = 22$). Modal clutch size was three (45.5 % of the nests) and mean clutch was 2.3 ± 0.72 ($n = 22$). Mean egg measure-

TABLE 2.

Frequency distribution of elevations above water level, obtained for a random sample of points and for a sample of nests of three species breeding, at the same island, during 1999.
[Distribución de los nidos de las tres especies estudiadas según su altura sobre el nivel del agua y frecuencias obtenidas por medio de una muestra aleatoria en la misma isla y durante 1999.]

		Random points *[Puntos aleatorios]*	L. genei	S. sandvicensis	S. hirundo
Elevation *[altura]*	< 0.15 m	11	0	0	3
	0.15-0,30 m	5	0	0	21
	> 0.30 m	14	11	30	6
Mean (cm) *[media]*		23.7	37.5	47.1	26.7
S. D.		13.34	4.63	3.77	5.97
N		30	11	30	30

ments were 54.9 ± 2.60 mm × 37.5 ± 1.72 mm (range 51.6-60.1 × 34.9-39.6; $n = 13$) and mean hatching success was 56.9 %. Failed eggs were due to nest desertion during incubation and only two egg losses (3.9 %) were due to predation (Table 1). No predation upon chicks was registered. Table 1 shows hatching success, fledging success and productivity registered each year. There was a single predatory event recorded upon Slender-billed Gulls and it consisted in a nocturnal visit of a Fox *Vulpes vulpes* to an island, which affected the single nest installed in 1994.

Our data are consistent with those recorded in other locations (Isenmann, 1976; Costa, 1985; Fasola *et al.*, 1993), although hatching and breeding success were higher than previously recorded (Gowthorpe, 1979; Costa, 1985; Chernichko, 1993). These authors described looses caused by human activity (disturbance, egg collection, artificial water discharges), natural colony flooding (storms) and predation. The management tasks carried out in the Racó de l'Olla saltmarsh reduced the effect of these factors, both natural and caused by humans. The position of the nests within the colony and placement of nests on the higher parts of the island, indicates that the species could occupy breeding grounds disturbed by floods.

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