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BILL MALFORMATION OF JUVENILE CORY'S SHEARWATERS (*CALONECTRIS DIOMEDEA BOREALIS*) ON SELVAGEM GRANDE

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With 3 figures

ABSTRACT. During a ringing expedition of 1988 three juvenile Cory's Shearwaters with malformation of their bills were found among a total of 801 birds (0.375 %).

No adults with similar malformations were observed, and it is suggested that these juvenile birds will die because they will not be able to capture food when left to themselves. The cause of this malformation is not known and it is suggested that other cases observed should be recorded in future. The hypothesis that these malformations are to pollution of the sea is not excluded.

RESUMO. MALFORMAÇÕES DO BICO DE JUVENIS DE CAGARRA (*CALONECTRIS DIOMEDEA BOREALIS*) NA SELVAGEM GRANDE. Na sequência de uma campanha de anilhagem, os autores encontraram 3 aves com malformações do bico, o que corresponde a 0,375 % do número total de aves observadas (801).

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Nenhum adulto com malformações semelhantes foi encontrado, presumindo-se que estes juvenis venham a morrer por falta de capacidade de captura de alimento. São desconhecidas as causas destas malformações, pelo que é sugerido um acompanhamento futuro. Não é excluída a hipótese destas deformações estarem relacionadas com aspectos de poluição.

The slaughter of Cory's Shearwater (*Calonectris diomedea borealis*) for human consumption has been practiced on Selvagem Grande since at least the 19th century (Zino, 1985) and, judging from the comments of Berthelot & Webb (1842) it may well have started a good deal earlier. The Webb, Berthelot & Moquin-Tandon (1842) it may well have started a good deal earlier. The annual slaughter of the chicks on this island continued until 1967 when the culling rights were purchased by P. A. Zino in order to prevent further killing of these birds. In 1971 the island was bought by the Portuguese Government and declared a nature reserve. In 1977, a wardens' house was built and scientists' quarters were added later. The island thus became permanently manned by two wardens who, among their other duties, provided protection for the birds breeding on this island.

While official action took place in 1971 to save this important breeding site of Cory's Shearwaters, a ringing scheme had been started in



Fig. 1 a & b.—Types of malformations in the beak of *Calonectris diomedea borealis* in Selvagem Grande (1988). The angles of deviation between maxillaries and mandibles were calculated from the centre of each one respectively.

1968 (Jouanin & Roux, 1980). A total of about 28,000 chicks have been ringed to date. During all these years of ringing no (juvenile) bill malformation had been reported in the literature. However, during the 1988 ringing expedition (13-19 September), we found three juvenile Cory's with malformation of their bills. This was from a total of 801 birds ringed (0.375%).

The first case (ring number L32275, weight 1200 g., bill length 54.6 mm.) showed mandibular deviation of 7.5° to the right (see Fig. 1a). The nest was in a wall on the central plateau of the island.

The second case (ring number L29510, weight 775 g., bill length 30.75 mm., mandible length, measured from the proximal end of the nasal tube, to the cranium, 45.65 mm.) showed a 6° deviation of the mandible to the right and also a reduction in size of the maxilla. Almost all the *maxillary unguis* was missing (see Fig. 1b). The nest was on the "Enseada das Pedreiras".



Fig. 2 — Front view of the third case of malformations as mentioned above.

The third case was in study area ABCD on the southern end of "Enseada das Pedreiras". Ring number L32612, weight 1200 g., nest number (11). Though no equipment was available to make exact measurements, we did take a photograph to demonstrate the abnormality (see Fig. 2).

In the procellariiformes, certain deformities have been described in some species, e. g. *Oceanodroma leucorhoa* and *Hydrobates pelagicus* where the morphological abnormalities were found in the feet and eyes (Waters, 1964 ; Murray, 1984). Pomeroy (1962), cites an example of a malformation of the bill in a specimen of *Puffinus puffinus* found in the Irish Sea. Furthermore, Campbell & Lack (1985) suggest that if a malformation is found in the bill, (provided it is not too marked) the birds may survive by altering their feeding habits to a lesser or greater degree.

Though the three chicks mentioned in this paper have comparable weight to those with no abnormalities, it seems likely that they will die from lack of food when left to feed for themselves. No adults with bill malformations similar to those mentioned above have been observed or recorded. Though nothing is known about the cause of such malformations we feel they should be recorded on a yearly basis, as it is quite possible that there is a relationship between pollution of the sea (thus the Cory's food) and the incidence of malformations. In 1989 one of us (F.Z.) ringed 600 juvenile Cory's and only noted a single bill malformation (0.166%). As we were only equipped for ringing no measurements or photographs were taken. The deformity was very similar to that in Fig. 2.

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