

SHORT COMMUNICATION

First attempted breeding of Manx Shearwater (*Puffinus puffinus* Brünnich, 1764) on Santa Maria, Azores

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The Manx Shearwater *Puffinus puffinus* (Brünnich, 1764) is a north Atlantic seabird which mainly breeds in Europe. In the Azores, its breeding colonies occur exclusively on the islands from the western group (Flores and Corvo). Here, we report the first breeding attempt observed on Vila islet, Santa Maria (the easternmost island of the archipelago, situated *circa* 600 km from Flores and Corvo). Our observation confirms that Manx Shearwaters can settle far from their usual breeding localities and enhances the importance of Vila islet for the Azorean marine avifauna.

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INTRODUCTION

Many petrel species (seabirds from the Order Procellariiformes) are known to exhibit strong philopatry (i.e., a high proportion of the juveniles that survived until adulthood return to their birthplace to breed), despite remarkable dispersal abilities which enable them to perform long migration trips (up to several thousands of kilometres, Brooke 2004). The Manx Shearwater *Puffinus puffinus* is an Atlantic petrel whose breeding area ranges from the eastern United States, Newfoundland and Iceland to Madeira and the Canary islands, with Britain and Ireland harbouring the bulk of the world population (BirdLife International 2004; Brooke 2004). In the Azores archipelago (36°55'–39°43'N, 24°46'–31°16'W), the only Manx Shearwater breeding colonies so far known are situated on the two islands from the western group, Flores and Corvo,

totaling *ca* 200 pairs (Le Grand 1993; Monteiro et al. 1999). Out of these islands, and although a seabird likely to be the Manx Shearwater was very abundant throughout the archipelago upon the arrival of the Portuguese in the 15th century (Frutuoso 1561; Le Grand 1993), only one breeding attempt by this species was reported. It occurred on São Miguel island (in the eastern group), in 1983 (Le Grand 1993). However, two old specimens collected on Santa Maria, the easternmost island of the Azores, and stored in the Carlos Machado Museum on São Miguel (Le Grand 1993), and another individual ringed on Vila islet (situated only 300 m off Santa Maria) in August 1994 (Monteiro et al. 1996), led Monteiro et al. (1996) to wonder if breeding might actually occur on Santa Maria. Three more individuals were ringed on Vila islet between 1998 and 2002 (Monteiro et al. 1999; V.C. Neves, unpubl. data). Although the latter captures occurred in spring

and in summer (which corresponds to the breeding period in Great Britain, Cramp & Simmons 1977), evidence of breeding on Santa Maria was still lacking.

Here, we report on the first known breeding attempt by a Manx Shearwater on this island, situated only 70 km from São Miguel, but almost 600 km from Flores and Corvo.

MATERIAL AND METHODS

The petrel populations from Vila islet (36°55'N, 25°10'W; 0.08 km²), Santa Maria, have been annually monitored since 2002 in the frame of long-term demographic studies. During field sessions, accessible cavities that are potentially suitable for breeding are searched for as exhaustively as possible.

RESULTS

On 29 June 2007 a Manx Shearwater incubating an egg in a burrow on Vila islet was incidentally found by one of the authors (J. Bried). The egg was measured using a vernier calliper correct to 0.1 mm, and its dimensions were 62.1 mm length × 41.3 mm maximum width. The burrow had been dug under a stone. It was situated on the eastern slope of the islet, *ca* 10 m a.s.l. Its dimensions were 750 mm depth, 170 mm width at the entrance and 135 mm height at the entrance. During a second visit on 7 August 2007, we found that the egg shell was cracked and that the egg was smelly, indicating that the breeding attempt had failed. An examination of the egg content did not allow detecting the presence of any embryo, strongly suggesting that the egg was infertile.

DISCUSSION

Generally, colonization of new breeding areas by seabirds seldom occurs and mainly concerns areas that were previously deserted and/or that are adjacent to extant colonies (Podolsky & Kress 1989; Podolsky 1990; Micol & Jouventin 2003; Nonetheless, long range movements can occur

(Lequette et al. 1995). Although Manx Shearwaters tend to be highly philopatric (Brooke 2004), our observation and that on São Miguel are compatible with the fact that some individuals from this species can colonize locations distant from their established breeding localities (Newfoundland was colonized only a few decades ago, apparently from the British Isles; Storey & Lien 1985). Nonetheless, and because individuals have been observed at sea and on land in the central group since the end of the 20th Century (although irregularly and in very small numbers, Le Grand 1993; Monteiro et al. 1999; J. Bried & R. Guerreiro, pers. obs.), it should be worth searching for breeding Manx Shearwaters on the five islands from the central group (Monteiro et al. 1999).

Concerning phenology, on Flores and Corvo, young Manx Shearwaters usually fledge during the second half of August (V.C. Neves, M.C. Magalhães & P. Domingos, unpubl. data). Considering that incubation and chick-rearing in this species last on average 51 and 71 days respectively (Brooke 2004), eggs must be laid around mid-April and chicks must hatch during the first half of June. This strongly suggests that this breeding attempt on Vila islet was a late one, possibly involving one first-time breeder, at least (Brooke 1978). Because Procellariiform adults almost always return to breed at the locality where they made their first breeding attempt (Cooper & Weimerskirch 2003; Brooke 2004), the lack of observations of Manx Shearwaters on Vila islet between 2002 and 2006 (despite extensive search for occupied burrows during field sessions) supports this hypothesis. Additional support comes from the fact that the egg failed to hatch. In birds indeed, young breeders often perform less well than older, more experienced individuals (Curio 1983). Besides, egg and burrow dimensions fall within the range of those typically observed in this species (Cramp & Simmons 1977). In any case, however, this breeding attempt enhances the status of Vila islet as an Important Bird Area in the Azores (Monteiro 2000; Costa et al. 2003).

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REFERENCES

- BirdLife International 2004. *Birds in Europe: population estimates, trends and conservation status*. BirdLife International, Cambridge. 374 pp.
- Brooke, M. de L. 1978. Some factors affecting the laying date, incubation and breeding success of the Manx Shearwater, *Puffinus puffinus*. *Journal of Animal Ecology* 47: 477-495.
- Brooke, M. 2004. *Albatrosses and petrels across the world*. Oxford University Press, Oxford. 499 pp.
- Cooper, J. & H. Weimerskirch 2003. Exchange of the Wandering Albatross *Diomedea exulans* between the Prince Edward and Crozet Islands: implications for conservation. *African Journal of Marine Science* 25: 519-523.
- Costa, L.T., M. Nunes, P. Geraldés & H. Costa 2003. *Zonas Importantes para as Aves em Portugal*. Sociedade Portuguesa para o Estudo das Aves, Lisboa.
- Cramp, S. & K.E.L. Simmons 1977. *Handbook of the birds of Europe, the Middle East and North Africa. The birds of the western Palearctic*. Vol. I. Oxford University Press, Oxford. 722 pp.
- Curio, E. 1983. Why do young birds reproduce less well? *Ibis* 125: 400-404.
- Frutuoso, G. 1561. *Saudades da terra*. 2nd edition published in 6 volumes from 1978 to 1983.
- Rodrigues, J.B.O. (Ed). Instituto Cultural de Ponta Delgada, Ponta Delgada.
- Le Grand, G.W. 1993. *Recherches sur l'écologie des Vertébrés terrestres de l'archipel des Açores*. Ph.D thesis. Ecole Pratique des Hautes Etudes, Montpellier. 393 pp.
- Lequette, B., D. Berteaux & J. Judas 1995. Presence and first breeding attempts of southern gannets *Morus capensis* and *M. serrator* at Saint Paul Island, southern Indian Ocean. *Emu* 95: 134-137.
- Micol, T. & P. Jouventin 2003. Eradication of rats and rabbits from Saint-Paul Island, French Southern Territories. Pp. 199-205 in: Veitch, C.R. & M.N. Clout (Eds). *Turning the tide: the eradication of invasive species*. IUCN SSC Invasive Species Specialist Group. IUCN, Gland, Switzerland, and Cambridge, UK.
- Monteiro, L.R. 2000. The Azores. In: Heath, M.F. & M.I. Evans (Eds). *Important Bird Areas in Europe: Priority sites for conservation*. Vol. 2 (*BirdLife International Conservation Series* No. 8). BirdLife International, Cambridge. 463-471 pp.
- Monteiro, L.R., J.A. Ramos & R.W. Furness 1996. Past and present status and conservation of the seabirds breeding in the Azores archipelago. *Biological Conservation* 78: 319-328.
- Monteiro, L.R., J.A. Ramos, J.C. Pereira, P.R. Monteiro, R.S. Feio, D.R. Thompson, S. Bearhop, R.W. Furness, M. Laranjo, G. Hilton, V.C. Neves, M.P. Groz & K.R. Thompson 1999. Status and distribution of Fea's Petrel, Bulwer's Petrel, Manx Shearwater, Little Shearwater and Band-rumped Storm-Petrel in the Azores Archipelago. *Waterbirds* 22: 358-366.
- Podolsky, R.H. 1990. Effectiveness of social stimuli in attracting Laysan Albatross to new potential nesting sites. *Auk* 107: 119-124.
- Podolsky, R.H. & S.W. Kress 1989. Factors affecting colony formation in Leach's Storm Petrel. *Auk* 106: 332-336.
- Storey, A.E. & Lien, J. 1985. Development of the North American colony of Manx Shearwater. *Auk* 102: 395-401.

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