



baby ON board

THE TUBENOSE PROJECT © HADORAM SHIRIHAI (3)

Mascarene Petrel unveiled

Despite comprising only about three per cent of all birds, seabirds hold a special allure for many birders. And for some, these birds can become an obsession. Hadoram Shirihai is one such fanatic. For more than a decade his Tubenose Project has attempted to document all albatrosses and petrels worldwide. This has taken him to some of the most remote islands, where he arranges dedicated pelagic trips to photograph the world's most elusive seabirds as they gather offshore at their breeding sites.

Some of his greatest successes have been with the genus *Pseudobulweria*. Of the four species, only the Tahiti Petrel *P. rostrata*

above *A Mascarene Petrel, photographed on 22 December 2012, showing a distinct bulge in its lower abdomen, thought to be from an egg about to be laid.*

right *The Mascarene Petrel is one of several all-brown petrels found in the tropical Indian Ocean. Separation from the larger Great-winged Petrel and smaller Jouanin's Petrel requires careful attention to body proportions and structure. Note the long uppertail coverts.*

(Near Threatened) can be regarded as remotely easy to see. The other three species are all Critically Endangered. Beck's Petrel *P. becki* resembles a diminutive Tahiti Petrel and is thought to breed on New Ireland. Hadoram visited the Bismarck Sea in 2007 and managed to get the first good images of the bird at sea. Even more challenging was the Fiji Petrel *P. macgillivrayi*, a virtually mythical species known from only a handful of specimens. Hadoram visited Gau Island twice in 2009, where he managed to obtain stunning images of this tiny, all-dark petrel, which could be confused with a *Bulweria* petrel.

The final species in the genus is the Mascarene Petrel *P. aterrima*, which has a tiny remnant population on Réunion in the tropical Indian Ocean. It is best known from the occasional bird that crashes into buildings after becoming disoriented by the island's many lights. Although there have been several sightings from the waters around the island, its identification has been handicapped by the lack of well-documented records, resulting in limited understanding of how it differs from other all-dark gadfly petrels at sea.



Together with Tony Pym and María San-Román, Hadoram visited Réunion in December 2012, and managed to see more than 30 Mascarene Petrels during three days at sea, 30 to 45 kilometres off the island's south coast. They attracted the petrels with massive, 25-kilogram blocks of frozen chum, which slowly release a fragrant cocktail of fish oils as they melt. All sightings were made in the late afternoon and evening, as the petrels presumably returned to the island. One of the birds photographed on 22 December showed a distinct bulge in its lower abdomen, which is thought to be caused by an egg about to be laid. If correct, this provides the first strong evidence of the laying date for the species. Until now the breeding season was only inferred from the timing of fledglings crashing into the island's lights.

Despite being considerably smaller, the Mascarene Petrel proved hard to tell apart from the Great-winged Petrel *Pterodroma macroptera*. Close attention to the bill shape as well as the body and wing structure is essential to differentiate the two species. Care is also needed to separate it from the smaller Jouanin's Petrel *Bulweria fallax*,

which is now known to be widespread in the south-west Indian Ocean. The Mascarene Petrel has a stout bill, a large, squarish head, a long hind body tapering into a graduated tail, and very long, slender wings with rounded tips. The dark brown plumage offers few characters to aid identification, but at very close range it shows fine yellowish streaks on the sides of the neck.

A full discussion of the identification of the Mascarene Petrel is presented in the *Bulletin of the British Ornithologists' Club* (Shirihai et al. 2014, 134: 194–223). This paper is essential reading for any birders visiting the tropical Indian Ocean, and will allow us to gain a much better idea of the species' at-sea distribution. Although it is currently only known from waters east of Madagascar, there's a small chance that the bird might stray into southern African waters.

PETER RYAN

Compared to a Great-winged Petrel, the Mascarene Petrel has a heavier bill base, longer neck and straight, narrow wings with rounded tips (but beware Great-wings completing primary moult).



SCALING... UP & DOWN

It is widely accepted that birds evolved from theropod dinosaurs, but there has been considerable debate as to how and why predominantly small-bodied birds evolved from their massive dinosaur ancestors.

A recent paper (Lee et al. 2014, *Science* 345: 562–566) uses novel analytical approaches to infer the rate of change in body size and other structural characters in the evolution of modern birds. It suggests that the evolution of small body size resulted from sustained selection for smaller body size lasting about 50 million years, from ancestors weighing in excess of 160 kilograms around 200 million years ago to bird-like forms weighing less than one kilogram around 160 million years ago.

The decrease in body size was most rapid during a 10-million-year period from 175 to 165 million years ago, when body size decreased from around 50 kilograms to one kilogram. Interestingly, the rate of morphological evolution in the lineage of dinosaurs leading to birds is estimated to have been about four times greater than in other lineages at this time.

Lee and his colleagues argue that traits favoured by miniaturisation, such as reduced teeth, short snouts and relatively large brains and eyes, all predisposed birds to take to the air. The enhanced insulation provided by feather-like structures also contributed to the ability to evolve small body size. They conclude that because of the

complex set of traits associated with miniaturisation it's unlikely we'll be able to deduce what drove the trend towards reduced body size, but that together this set of characters ultimately contributed to the long-term success of the avian lineage.

At the same time, another paper (Hospitaleche and Reguero 2014, *Geobios* 47: 77–85) reports the discovery of the largest known penguin. Fossil remains of the giant penguin dubbed *Palaeudyptes klekowskii* were found on Seymour Island, off the east coast of the Antarctic Peninsula. Dating back 37 to 40 million years ago, the giant penguin is estimated to have stood almost two metres tall and weighed over 100 kilograms, more than double the weight of the Emperor Penguin, the largest living species. At that time, the climate was sub-Antarctic, and fossil remains indicate that at least 10 species of penguin lived in the region.

Large size enhances dive depth and endurance, and it is possible the giant bird could have dived for as long as 40 minutes. It lived well before the ancestors of seals moved back into the sea, at a time when whales and dolphins were just starting to evolve. It is possible that competition from marine mammals contributed to the demise of the large penguins and other flightless marine birds. It is striking that currently there is virtually no overlap in body size between marine mammals and birds.

PETER RYAN