The forgotten bird islands of São Tomé and Príncipe

From the peak of São Tomé on a rare clear day, you can see the entire island below you: precipitous ridges clothed in primary forest, with agricultural land beyond. You can make out the routes taken by intrepid 19th-century naturalists and the places where you have wandered for days, lost in the constant rain. From within, the forest appears infinite, but from above it seems so small. It is almost inconceivable that this tiny area could support 20 endemic bird species.

TEXT BY MARTIM MELO & PETER RYAN
I
slands are special places for naturalists. Their isolation allows unique species to evolve, often including ‘strange’ creatures that are adapted to island life. These peculiarities contributed significantly to Darwin and Wallace’s understanding of evolution, inspired by the Galápagos and the islands of South-East Asia respectively. São Tomé and Príncipe, two small islands 200 kilometres off the coast of Gabon, are equally fascinating. The biota of these former Portuguese colonies is so distinct that their forests constitute an independent eco-region. Birds are the most visible component of the unique species composition and are recognised as important ambassadors for the conservation of the remaining forest, appearing on the island nation’s coat of arms, stamps and currency.

Relative to their size, São Tomé and Príncipe are the islands with the greatest number of endemic birds globally, with 17 species confined to São Tomé (857 square kilometres in extent), eight restricted to Príncipe (139 square kilometres) and three shared between the two. By comparison, the Galápagos islands have 22 endemics in a land area almost 10 times greater. Only the Hawaiian islands, 20 times larger, support more endemic birds (30 extant species, plus 19 extinctions in historical times). The Democratic Republic of São Tomé and Príncipe is the second smallest country in Africa (after the Seychelles), yet it has only two endemics (a white-eye and a paradise flycatcher). Bioko is the largest island (2,027 square kilometres) in the group, yet it has only two endemics (a white-eye and a batis) because it was connected to Africa during the last glaciation, some 11,000 years ago. The four islands may be quite old, having formed some five to 30 million years ago, but genetic studies suggest that their 32 endemic bird species are the result of recent speciation events rather than being relict species that went extinct on the mainland.

Given their remarkable number of endemics, São Tomé and Príncipe rank high on any African birder’s must-visit list. Living close to the equator, the islands were covered in dense rainforest when they were discovered by the Portuguese in the 15th century. All the endemic birds evolved in these forests. Extensive areas of the islands have since been modified by agriculture, but the rugged terrain has meant that sizeable tracts of primary forest have been preserved. Entering these forests is like stepping into a new world; with a few exceptions (several African bird species have been introduced), all the birds encountered here occur nowhere else. In addition to this astonishing endemism, more than 80 per cent of the land snails are endemic, as are eight reptiles and seven amphibians (which is amazing, given their intolerance of salt water). Mammals are well represented.
by bats, including diurnal species that have evolved in the absence of forest raptors. Each island also has a shrew, although it is hard to imagine how these small animals, which need to feed every few hours, managed to colonise the islands. Plant variety is also impressive, with some 200 endemic flowering plants and the highest diversity of ferns in Africa.

There are no hornbills, one of the more striking aspects of birding on the islands is what is missing; there are no hornbills, woodpeckers, barbets, robins or bulbuls. The demise of speirops

Despite its large size and aberrant plumage, Speirops is quite curious and confiding. Like most white-eyes, this Príncipe species confined to the distant canopy.

One of the most striking aspects of birding on the islands is what is missing; there are no hornbills, woodpeckers, barbets, robins or bulbuls.

Above: Like most white-eyes, this Príncipe Speirops is quite curious and confiding. Despite its large size and aberrant plumage, recent molecular data show that speirops do not form a natural group, having evolved separately on São Tomé/Príncipe and Bioko closer to the Forest and Montane white-eyes, whereas the Príncipe and São Tomé speirops make up part of a radiation of white-eyes on the oceanic islands in the Gulf of Guinea that is linked to the African Yellow White-eye (see figure).

This might seem unlikely, given the similarity in structure within Speirops. However, the four species of Speirops differ considerably from each other (for example, some have eye-rings and others don’t), and their defining character is more one of difference from the typical white-eyes. They provide yet another example of parallel evolution, whereby the same morphological traits evolve independently when organisms face similar environments. It remains to be explained quite what has driven the parallel evolution in this case. However, all four species co-occur with a typical white-eye, and they characteristically are more abundant than their smaller relatives.

The Gulf of Guinea white-eyes join a select group of island birds that have undergone adaptive radiation (others are Darwin’s finches, Hawaiian honeycreepers, Madagascar’s vangas and, at a much smaller scale, Tristan da Cunha’s finches). In terms of phylogenetic theory, Speirops can no longer be treated as a separate genus. Several other small genera within the Zosteropidae have also been found to be recently evolved offshoots from Zosterops white-eyes. In addition, Melo’s study revealed that the two sub-species of Príncipe White-eye found on Príncipe and São Tomé are not sister taxa and so should be treated as separate species. It also confirms that the Forest White-eye is distinct from the African Yellow White-eye, and that the Taï Taï White-eye is not related to the Abyssinian White-eye complex.

The demise of speirops

Parallel evolution in Gulf of Guinea white-eyes

The white-eyes (family Zosteropidae) make up a small, homogenous group allied to the babblers and sylvid warblers. With many island forms, the species-level taxonomy is somewhat contentious, but the Handbook of the Birds of the World recognises 98 species in 14 genera. Of these, 74 species are placed in Zosterops, making it the largest bird genus.

Only two genera are represented in Africa: some 22 species of Zosterops occur throughout sub-Saharan Africa and adjacent islands, and four species of Speirops are confined to a line of volcanoes extending from Mount Cameroon into the Gulf of Guinea. Speirops are larger than typical white-eyes, have stout bills and lack green or yellow coloration in their plumage. The ranges of the four species do not overlap, with one species occurring on Mount Cameroon and one on each of the three large islands in the Gulf of Guinea: Bioko, Príncipe and São Tomé.

Traditionally, the São Tomé Speirops is considered to be closely allied to the Mount Cameroon Speirops and it has been argued that the genus evolved on São Tomé, radiating from there to the adjacent islands and Mount Cameroon. However, recent research by Martim Melo and his colleagues turns these ideas upside down (Molecular Ecology 20: 4953–4967). Evidence from several genetic markers shows that speirops do not constitute a natural group, with the continental forms on Mount Cameroon and Bioko closer to the Forest and Montane white-eyes, whereas the Príncipe and São Tomé speirops make up part of a radiation of white-eyes on the oceanic islands in the Gulf of Guinea that is linked to the African Yellow White-eye (see figure).

The white-eyes (family Zosteropidae) make up a small, homogenous group allied to the babblers and sylvid warblers. With many island forms, the species-level taxonomy is somewhat contentious, but the Handbook of the Birds of the World recognises 98 species in 14 genera. Of these, 74 species are placed in Zosterops, making it the largest bird genus.

Only two genera are represented in Africa: some 22 species of Zosterops occur throughout sub-Saharan Africa and adjacent islands, and four species of Speirops are confined to a line of volcanoes extending from Mount Cameroon into the Gulf of Guinea. Speirops are larger than typical white-eyes, have stout bills and lack green or yellow coloration in their plumage. The ranges of the four species do not overlap, with one species occurring on Mount Cameroon and one on each of the three large islands in the Gulf of Guinea: Bioko, Príncipe and São Tomé.

Traditionally, the São Tomé Speirops is considered to be closely allied to the Mount Cameroon Speirops and it has been argued that the genus evolved on São Tomé, radiating from there to the adjacent islands and Mount Cameroon. However, recent research by Martim Melo and his colleagues turns these ideas upside down (Molecular Ecology 20: 4953–4967). Evidence from several genetic markers shows that speirops do not constitute a natural group, with the continental forms on Mount Cameroon and Bioko closer to the Forest and Montane white-eyes, whereas the Príncipe and São Tomé speirops make up part of a radiation of white-eyes on the oceanic islands in the Gulf of Guinea that is linked to the African Yellow White-eye (see figure).
event. The island’s volcanic origin and high rainfall also played a role, creating a spectacular landscape of towering mountains, deep valleys and volcanic plugs. This topographic diversity created local microclimates, increasing the possibilities for successful colonisation by many different plant and animal species. That said, one of the more striking aspects of birding on the islands is what is missing; there are no hornbills, woodpeckers, barbets, robins or bulbuls.

Why have the endemic birds survived? Almost all bird extinctions during the past 500 years have occurred at oceanic islands, yet as far as we know, no species has disappeared from São Tomé and Príncipe. Compare this with St Helena, a considerably smaller island in the tropical Atlantic that was discovered 300 years later; it has lost at least eight species and only one endemic survives.

São Tomé and Príncipe were settled in the 1490s by a mix of Jewish exiles, slaves and prisoners. Agriculture grew rapidly and by 1529 São Tomé was the world’s primary producer of sugarcane, largely at the expense of the lowland forests. Only the southern forests were spared because of their inaccessibility and extremely high rainfall (more than seven metres per year). We do not know what impact the loss of the lowland forest had on the birds, because ornithological work only began in the late 19th century. The exploitation of lava tubes for sub-fossil remains may yet reveal that some species were extinct before being described.

With the decline in sugarcane production in the 17th century, the island’s economy relied on supplying slave ships en route from West Africa to America. The introduction of coffee and cocoa in the 19th century led to further destruction of the forest up to an altitude of 1 200 metres. From 1908 to 1919 São Tomé and Príncipe was the world’s largest cocoa producer, but these days they are readily accessible. São Tomé can be reached by air from Libreville (45 minutes), Luanda (two hours) or Lisbon (six hours). Príncipe is a 35-minute flight from São Tomé. Accommodation ranges from a basic ‘pensão’ at around US$20 per night to upmarket hotels and lodges. Apart from two main local languages, Portuguese is widely spoken, French is the second most spoken language, and you will hear English used by hotel staff and some guides. You will need a tourist visa to enter the country (bear in mind that obtaining a tourist visa is tricky if there isn’t a consulate or embassy in your country). Malaria is the main health concern, but the situation has improved dramatically in the past five years. Malária is the main health concern, but the situation has improved dramatically in the past five years. The only dangerous snake is the black cobra, believed to have been introduced to control rats in plantations on São Tomé. As in any tropical area, care should be taken with water consumption.

All the endemic birds can be seen at any time of year, but it is best to avoid the rainy season. June–August and December–February can be good for visiting São Tomé’s southern forests. Many of the endemic birds are easily seen in farm bush, but visiting primary forest is essential for locating some species. On São Tomé, the forest surrounding Lagoa Amélia, above Bom Sucesso Botanic Garden, is a good place to find the more common endemics, including the now-scarce Maroon Pigeon. For the more intrepid, a two-day hike to São Tomé peak offers unforgettable views and guarantees the pigeon and, with luck, all the endemics except the Dwarf Olive Ibis. The ibis is now confined to the south-east of the island, where it is most accessible around Ribéira Peixe, on the old Monte Carmo estate. The São Tomé Grosbeak also occurs in this area, but is easier to find in the south-west, where the São Tomé Fiscal is also more common. This requires a one- to two-hour boat trip from Santa Catarina to São Miguel, followed by a couple of hours’ hike into the interior. It is best to spend a couple of nights in the forest to ensure that you get to grips with all the endemics.

Príncipe, most endemics are easily found along the path from the main town to Bela Vista or the path from the airport to Ribéira Ilet. Visiting the southern forests of Príncipe is essential for the Principe Thrush, and the best bet for finding the scarce Principe White-eye. It is also where there have been several reports of an undescribed small owl. Access is simpler by boat, which also allows you to see the subspecies of Principe Seedeater confined to Boré de Jiquil (Jockey’s Cap), two kilometres off the southeast coast. The Tinhoua islets, 20 kilometres south of Príncipe, support up to a million seabirds, including Brown Boobies, Sooty Terns, and Black and Brown noddiest. This makes the Tinhouas the most important seabird site in the eastern tropical Atlantic. Do not land on the islets: besides being extremely dangerous, it causes great disturbance to the birds. To hire a boat, contact the Bom Bom Island Resort or ask for the owners of the Monte Pico Association. This will help with guides and other arrangements. For a detailed guide to finding the birds of Príncipe, see BirdQuest and Tropical Birding. Birding is a great way to experience the nature of the islands, especially the southern forests.
another endemic species for the islands. Breeding sites, this might even represent an island. Given recent splits of Band-rumped Storm-Petrels suggesting that they breed on the main island. Night in the forested interior of São Tomé, where they are at constant risk from illegal hunting.

Right. In a country with four Critically Endangered birds, the Dwarf Olive Ibis is probably the most threatened. Barely 200 survive in the south-central region of São Tomé, where they are at constant risk from illegal hunting.

Opposite. The islands are not just about forest birds; the rich seas support large numbers of tropical seabirds. Breeding species include Brown Boobies (shown here), White-tailed Tropicbirds, Common and Black noddies, and Sooty and Bridled terns. There is probably also a little-known Grosbeak, which went missing for 101 years after three were collected in 1888–90, is now known from several sites in central and southern São Tomé. Cocoa is currently the most important cash crop, which is good for birds. The trees require shade to grow properly and are planted beneath a canopy of taller trees that make a ‘shade forest’, a structure that mimics the original rainforest and supports most of the endemic birds. Some of these species are common even in the capital city, notably the São Tomé Primina which, with its noisy wing-snapping display and repetitive call, is the country’s unofficial 5 a.m. alarm clock. But 11 species are Threatened and an additional three are categorised as Near-Threatened – and the recent split of the white-eyes is likely to further increase this tally. Four species are Critically Endangered: Dwarf Olive Ibis, Principe Thrush, São Tomé Fiscal and São Tomé Grosbeak. Of these, the ibis is probably most at risk because of ongoing illegal hunting, a threat that also faces the increasingly rare Maroon Pigeon.

The future of the endemic birds of São Tomé and Principe, and the islands’ other biodiversity, depends on the effective conservation of the primary forests. In early 2006 almost a third of each island was declared a national park (Parque Natural do Obô), which includes most of the remaining primary forest and a buffer zone of secondary forest. Nevertheless, because of the small size of the islands, conservation efforts cannot be limited to these protected areas. With a human population growth rate of three per cent per year, demand for environmental resources – and ultimately for access to the protected areas – will increase. Agricultural land already covers about half the islands, and finding a model of sustainable agriculture is one of the country’s highest priorities.

The conservation challenges are great, but more and more people in São Tomé and Principe are facing up to them. Besides the government initiatives, two NGOs are playing key roles. The Monte Pico Association brings together the people with the best knowledge of the forests. They supply the guides who can take you to the most difficult endemics and are often the people carrying out environmental awareness and reforestation campaigns, maintaining forest trails or working in the botanic garden and herbarium. The STP Biologists’ Association is the local affiliate of BirdLife International and is the Species Guardians of three Critically Endangered species. Its members conduct censuses of the Dwarf Olive Ibis population, ‘converting’ hunters into field assistants in the process.

The two organisations often collaborate and recently published the first ornithological paper written by Santomeans. The growing awareness among the inhabitants of the islands’ extremely rich environment, together with readily available international help, gives some hope that São Tomé and Principe may yet be spared the massive extinctions and ecological havoc typical of most oceanic islands. The victory is not certain, but the signs are definitely encouraging.

ACKNOWLEDGEMENTS
With thanks to Peter Jones and Nigel Collar. Martim Melo’s research work on the islands is supported by the National Geographic/Walt Grant programme.

RESOURCES
BOOKS


ONLINE RESOURCES
Gulf of Guinea Islands’ Biodiversity Network (www.ggibn.st). Although not regularly updated, this remains a good website for those interested in the biota of the Gulf of Guinea islands.

Island Biodiversity Race (www.calacademy.org/medialibrary/blogs/gulfofguinea). Blog about the California Academy of Sciences’ research into biodiversity on the Gulf of Guinea islands.

Monte Pico Association (montepico.montemelotreinina.com). President: Luis Maria Almeida (lumasonamasca@hotmail.com).

STP Biologists’ Association: Hugo Lay Maia (hugulaymaia25@hotmail.com).

Travel info: www.saoestome.st/travel.php and www.navetur-equatour.st