



Research Letter from: ... a lovely Italian island

Fat Birds Fly On Faster

By our corresponding author, **Horst Unruhe**

As the weather improves, thoughts inevitably turn to that annual summer migration. But spare a thought for those poor researchers shut up in air-conditioned laboratories under artificial light. Always the same summer stress, balancing experimental deadlines and unproductive holidays. However, some lucky researchers have found the ideal solution, combining work and pleasure. All you need is to find an excuse to do research in a holiday destination!

Consider Wolfgang Goymann from the Max Planck Institute for Ornithology in Seewiesen (near Munich). Inspired by birds migrating from Africa towards their breeding grounds in Europe, he went off to meet them halfway at their idyllic stopover site on a sunny Italian island. In his report, "Body fat influences departure from stopover sites in migratory birds: evidence from whole-island telemetry," (*Biol. Lett.*, published online before print February 17, 2010), Goymann tries his best to make his destination sound boring and functional, "Ventotene is an approximately 1.5 km² island in the Tyrrhenian Sea (40°47'N, 13°24'E), which is visited by songbirds during migration".

Or as a travel reporter waxed lyrically, this "tiny, charming island offers a taste of pure Italy".

But then Goymann's interest is in migrating birds (of the feathered kind) and furthering "more than 200 years of studies starting with Naumann (1795-1817)". In this study, he considers whether "fat reserves predict stopover duration", a variant of a previous working holiday on the equally lovely island of Ponza that found a relationship between fat on migrating birds and their "Zugunruhe" = migratory restlessness (Fusani *et al.*, *Biol. Lett.* 5: 302-5).

Using what he terms a "quasi-experimental" telemetric approach (telemetry = measuring at a distance), Goymann caught migrating birds during 2009's "main period of broad-front garden warbler migration along the Pontinian islands" (8th to 13th May). Garden warblers (*Sylvia borin*) are common songbirds that winter in central Africa and then return each summer to breed throughout northern Europe. One of their favoured migration routes across the Mediterranean includes a stopover on Ventotene, where they can eat their fill of insects before flying on.

Already fat on arrival?

Goymann measured and weighed birds caught on 10th May, assessed their subcutaneous fat on a 0-8 scale and the size of their pectoral flight muscles on a 0-3 scale. He chose ten lean ones (fat score 0-1, muscle 1-2, weight 13.9-16.4g) and ten fat ones (score 3-4, muscle 2-3, weight 15.4-19.1g) then glued a "Holohil LB-2 radio transmitter" onto their backs with "skin glue". These transmitters, representing 2-3% of the bird's body mass, could signal for up to two weeks.

Birds were immediately released and their presence on the island monitored every two hours for the first 48 hours, then

every four hours until the last bird had gone, using a stationary receiver up a tower and a mobile receiver at six other locations around the island (the accompanying map suggests agreeable walks with terrific sea views and majestic cliffs).

Although two of the transmitters (or their bearers?) were lost, 18 birds were followed until they flew away from the island.

Half the birds left on the first day after tagging, four the day after and the final two moved on after five days. All except one bird left after sunset, strongly "suggesting that they resume migration at night". Sure enough, the birds that left first were fat – they only stayed for a mean time of 8.8 hours, while the thinner birds lingered for an average 41.3 hours.

A clear result! "Fat stores predict stopover duration in migratory garden warblers," concludes Goymann.

But then in the Discussion, he admits, "We do not know exactly how long birds may already have stayed on the island before we caught and equipped them with a radio transmitter." But surely, this means that, since the garden warblers started arriving en masse four days before he caught them, then it's actually quite possible his "fat" birds weren't fat when they arrived at Ventotene? They could, in fact, have been "refuelling" their fat stores for a day or two prior to tagging!

Goymann shrugs, "We assume that the majority of the birds arrived on the island the morning we caught them" because previous studies had already found that birds arriving on the island could have "variable fat scores from 0-5".

Brushing doubts aside, Goymann continues, "Even if this were not the case, our data clearly revealed that fat garden warblers only waited until nightfall on the same day to move on. As opposed to this, the thin birds had to wait until they accumulated sufficient fat reserves for the next leg of their journey."

Who needs refueling?

So, let's get this right, you don't know when the birds arrived (or how long or far they had been flying since their previous stopover site) but, nevertheless, you're sure that the fat birds were already "fat" when they arrived on the island? And because they're fat, they don't need to refuel before take-off? Meanwhile, thin birds (unknown previous flight plan) need to eat an awful lot before flying on (unknown future flight plan)?

Okay, so Goymann did state that his study was "quasi-experimental", but surely there's still room for a few more "quasi-controls" before a "real" conclusion that "fat stores are the main factor behind the varying durations of the stopovers made during avian migration". For example, why not try tagging the birds at their stopover sites before Ventotene and then trace their real arrival and departure from the island? There are no doubt many other lovely islands between Ventotene and the North African coast. Another great idea for a working holiday!

