



PETER RYAN (2)

contact. tracing

Feather lice transmission between seabirds

Most seabirds breed on islands where they are safe from terrestrial predators – or at least they were until people started moving rats and cats and other commensal species around the planet. By breeding on islands, seabirds can occur at high densities, gaining social benefits from foraging together and sharing colony defence against avian predators such as skuas or gulls.

However, one drawback to having large numbers of birds breeding together in the same place year after year is that seabird colonies often accumulate high densities of parasites. Mostly this ancient conflict between host and parasite goes on unnoticed, but in the past few decades we have come to appreciate how internal parasites and diseases have major evolutionary implications for seabirds.

Ectoparasites are more readily detected – seabird biologists have a wealth of anecdotes about the challenges posed by ticks and fleas on seabird islands.

The brooding Cape Gannet (left bird) speckled with feather lice prepares to greet its mate, which lacks any visible lice. Seconds later, the partner also has lice on its feathers (right).

Fortunately, to the casual observer, the main indicator of ectoparasites is the large amount of time breeding seabirds spend preening while incubating their eggs or brooding their chicks.

Among the most abundant ectoparasites are feather lice (Phthiraptera). Albatrosses and petrels can host up to seven species, each adapted to different parts of the bird's body. Some are so thin they can fit between feather barbs where they are almost impossible to dislodge by preening. One genus of petrel ectoparasite, *Longimenopon*, burrows into the bases of primary feathers, where they hollow out a sheltered home for themselves and their eggs.

But most feather lice are more mobile. They occasionally appear as black specks on a bird's plumage, but generally they shun the light, creeping around under the feathers where they subsist on a diet of feathers and dead skin. Although they are relatively benign parasites, they do accelerate feather wear, reducing insulation and flight performance and speeding the need for moulting. They can also act as vectors for other bird parasites and diseases.

Feather lice carry out their entire life cycle on their host and cannot survive for long away from their warm and sheltered environment. When a bird dies, its menagerie of ectoparasites also perishes. Because they are wingless and most are slow moving, feather lice struggle to colonise new hosts.

Some species have been recorded hitching a ride on parasitic louse flies (Hippoboscidae), which can fly between hosts. But most feather lice move between birds during direct contact. 'Vertical' transmission from parents to their offspring is quite easy, given protracted periods of contact in the nest. However, 'horizontal' transfers between adults can also occur, even during fleeting contacts. For example, lice have been recorded moving between Common Pheasants during the few seconds it takes the birds to mate.

Recently, while observing Cape Gannets at the mega-colony on Bird Island in Algoa Bay, I watched an adult gannet return to its nest to relieve its partner brooding a small chick. When the brooding bird got up to greet its mate, I was amazed by the extremely high density of lice visible on its head and neck. Gannets are host to two species of feather lice: *Pectinopygus bassani* and *Eidmanniella pustulosa*. Judging from the images, the lice on this gannet appear to be *Pectinopygus*.

I can't be absolutely sure, but I didn't notice any lice on the bird when it was sitting brooding its chick. It was almost as though the lice knew that this was their chance to find a new host and they moved to the surface of the feathers. Changeovers at gannet nests are accompanied by ritualised sky-pointing and bill-fencing, when the birds often rub their necks together. Within a few seconds the mate – which had been pristine on arrival at the nest – also was speckled with lice.

This kind of exchange probably is inevitable in a bustling gannet colony, but I couldn't help feeling it was a good example of the benefits of social distancing!

PETER RYAN



TREVOR HARDAKER

change your tune

Coping with noisy neighbours

The 2006 Oscar-winning movie *Happy Feet* tells the story of Mumble, an Emperor Penguin that can't sing, in a world where penguins must sing a 'heart song' to attract a soul mate. The animated film takes numerous liberties: the protagonist is a chick, which would be more focused on its next meal than finding a mate, and Emperor Penguins show the lowest mate fidelity among penguins because of the intense time pressures they face as they pair up at the start of the long Antarctic winter.

But penguins do use vocalisations to help find their partners and offspring in the often dense colonies where they breed. We also know that some species

alter their calls depending on conditions in the colony. Specifically, King Penguins intensify the frequency and length of their calls on windy days, presumably to increase the chance of being detected by their mate. Now a study by Helen Rößler and colleagues in *Ornithology* (doi: 10.1093/ornithology/ukac031) suggests that Gentoo Penguins modify their songs depending on colony composition.

The authors recorded ecstatic display calls by all three *Pygoscelis* species at 23 penguin colonies on the Antarctic Peninsula and adjacent islands. The Gentoo Penguins' calls were similar at monospecific colonies and at those shared with Chinstrap Penguins, but tended to be

A Gentoo Penguin in Antarctica advertises its presence in the colony by giving its ecstatic display call.

lower pitched at colonies where Gentoos bred alongside Adélie Penguins. Chinstrap Penguin calls are appreciably higher pitched than those of Gentoos, whereas those of Adélie Penguins are more similar to those of Gentoos and thus present more of an impediment to effective signalling. The study provides a nice example of how birds adjust their calls to accommodate their immediate acoustic landscape, even in simple systems with only a few species.

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