COMPETING FOR NECTAR

Niche separation in sunbirds

DAVE RICHARDS

Golden-winged Sunbird

In the summer of 1956, the great ecologist Robert MacArthur embarked on a study addressing one of the most fundamental questions in ecology. In the boreal forests of the north-eastern United States, he had noticed that no fewer than five warbler species belonging to the genus *Dendroica* occurred together, living in the same habitats, feeding on similar food items and using similar nesting sites. Logic would dictate that if several co-occurring species are competing for the same resources, over time one species should out-compete the others, thereby excluding them from that habitat. So how, he wondered, did these warblers successfully coexist?

MacArthur's data, painstakingly collected over many months of observation, revealed that the coexistence of the warblers is facilitated by subtle differences in foraging and breeding behaviour. Cape May Warblers *D. tigrina* spend most of their time feeding near the tops of trees, readily hawking flying insects and frequently flitting from one tree to the next, and build their nests 10 to 20 metres above the ground. Bay-breasted Warblers *D. castanea* tend to forage in the shady interiors of trees, spend long periods methodically searching a single tree for branch- and twig-dwelling insects, and nest between two and seven metres up. Each of the remaining three species shows comparable differences in how they forage and where they build their nests. This study of niche separation among New World warblers represented a fundamental advance in our understanding of how species coexist, and to this day remains one of the classic papers encountered by students of ecology.

It is easy to imagine Robert MacArthur (had he been born in Africa instead of America) being equally intrigued by the sight of multiple sunbird species feeding on the nectar produced by flowering plants. Like the warblers of New World boreal forests, African sunbird communities beg the question: how can species that are so similar in their requirements for food, nesting sites and other resources occur together? Not surprisingly, competition for food resources among sunbirds has long received attention from ornithologists. Most recently, a group of Czech and Polish scientists investigated the feeding niches of two syntopic (i.e., co-occurring and ecologically similar) sunbird species in north-west Cameroon.

The researchers examined interactions between Northern Double-collared *Cinnyris reichenowi* and Orange-tufted sunbirds *C. bouvieri* in the Bamenda Highlands, a mountainous area heavily impacted by deforestation. They argued that there are two possible ways in which the sunbirds might avoid an overlap in their feeding niches. First, the two species could use the same plants, but feed at different times of day. The data did not support this idea; in both species, nectar feeding peaked in the early morning and again in mid-afternoon.

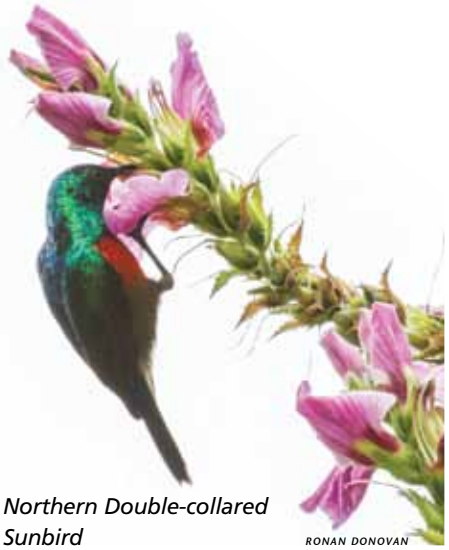
The second possibility the ornithologists considered was that the birds feed on nectar from different plant species, and this turned out to be the case. Whereas Orange-tufted Sunbirds spent by far most of their time sipping on the nectar of just one species, the giant lobelia *Lobelia columnaris*, Northern Double-collared Sunbirds mainly visited three plant species, with about half their time spent utilising flowers of the ribbon bush *Hypoestes aristata*.

The fact that Orange-tufted Sunbirds evidently prefer lobelia nectar over that of other plants probably reflects the lobelia's comparatively higher sugar content, which makes it a more profitable resource in terms of energy gain per unit time spent feeding. The major mechanism sustaining this pattern of niche separation appears to be aggression between the two species, with the more dominant Orange-tufted regularly chasing Northern Double-collared away from lobelias and presumably leaving them with little option but to feed on other flowers. Similar aggressive behaviour relating to competition for nectar resources is common among hummingbird communities in the New World, as well as in species like the Golden-winged Sunbird *Nectarinia reichenowi* of East Africa.

ANDREW McKECHNIE □

REFERENCE

Riegert, J. et al. 2011. 'Food niche differentiation in two syntopic sunbird species: a case study from the Cameroon Mountains.' *Journal of Ornithology* 152(4): 819–825.



RONAN DONOVAN

Northern Double-collared Sunbird