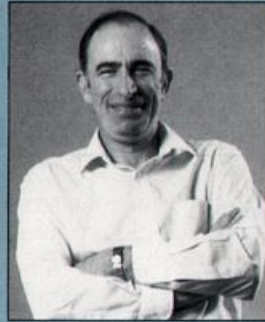


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BIRDING FOR FUN



Dominance and Dickey-Bird Dining

Illustrations
by Darryl Wheye

BIRDING IS GREAT in the temperate zones, but from a “twitcher’s” viewpoint, there’s nothing like a jungle. We checked off over 100 species, for example, at our Costa Rican field site, the Wilson Botanical Garden, in a 24-hour Birdathon last year with Stanford colleague Tom Sisk.

But much of the action in tropical forests is concentrated in the canopy far above one’s head, or takes place within mixed species foraging flocks that move cohesively through forests otherwise nearly bird free. For a great deal of their time, birders in a jungle are hard-pressed to see many birds.

That’s one of the reasons we started working at the relatively short fruiting trees in the botanical garden. They attract a diverse assemblage of species from the adjacent 225-hectare patch of tropical forest, and provide an excellent opportunity to study the interactions of fruit-eating birds from close up. But why, you ask, would anyone want to spend many hours watching the details of dickey-bird dining? It might seem about as interesting as watching paint dry. Actually, it was fascinating.

First of all, we were able to determine how the social status of the birds influenced their access to the fruit resources. How resources are shared by similar species is a topic of considerable interest to ecologists trying to understand the web of relationships among organisms living in the same place.

Then, we laid the groundwork for

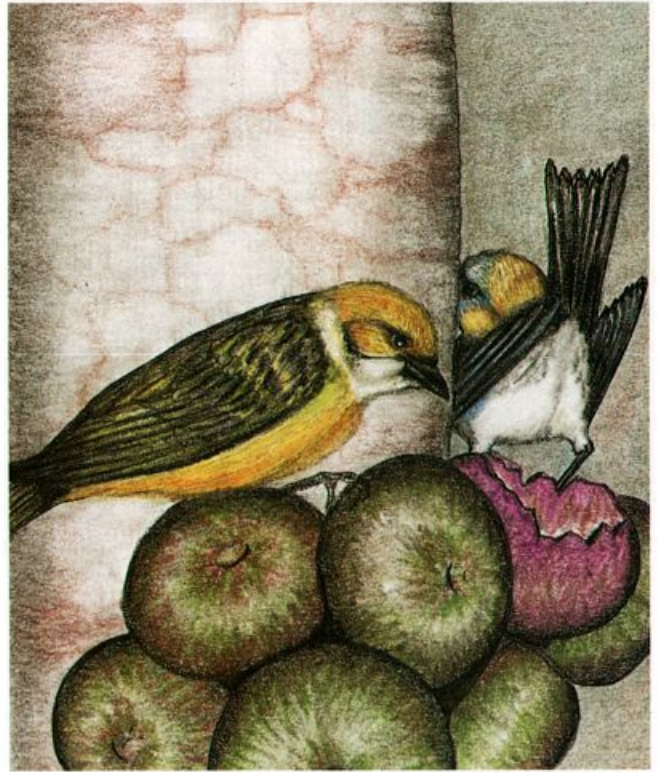
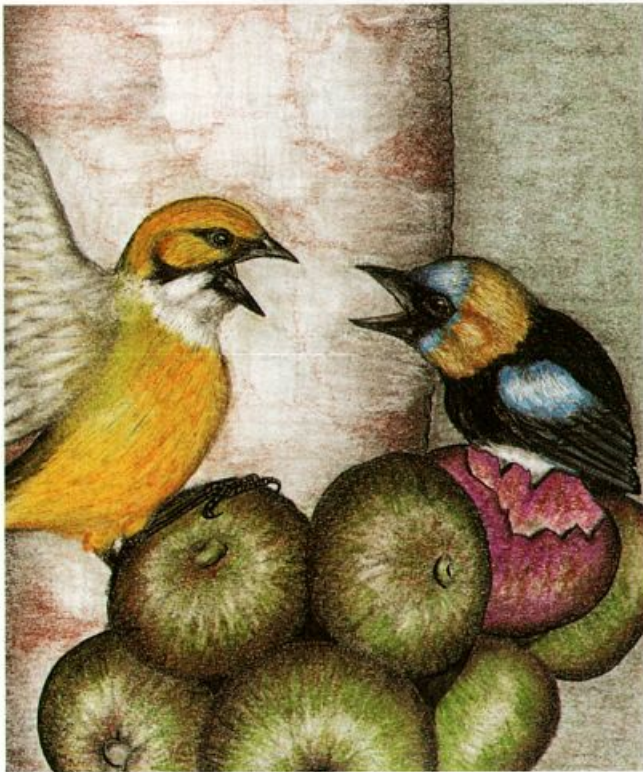
some questions important to conservation biologists, as we will shortly explain. But above all, we had the kind of fun in discovery that is available to any birder with the patience to watch carefully and take notes. Although our operations were sort of “high tech,” the only equipment required beyond that of the average birder was a video camera and an inexpensive laptop computer. Neither was essential to getting our most important results.

Our observations were made at two trees in February and March in both 1991 and 1992. One was a native *Cecropia*, a member of a common genus of Latin American trees that grows in disturbed areas, bearing many slender, hanging fruits one to one-and-a-half feet long. The other

was a fig from Southeast Asia, which bore abundant globe-shaped fruits directly on its trunk and branches. About a dozen species of birds commonly fed on the fruits of both trees, often in mixed-species flocks. Most frequent were spectacularly colored tanagers, which typically hung upside down on the *Cecropia* fruits while dining, and which stuck their heads deep inside figs to scoop out the edible contents. Only some of the fruits on each tree were ripe at any given time, so there were often more potential diners than places at the table.

Our observational procedures were simple. Most of the feeding activity

**If social status
does indeed influence
the survival of a
species, it could be
used as an easily
assessed indicator
of vulnerability to
extinction.**



A Golden-hooded Tanager (right) dining on a ripe fig first resists, but then gives up his position at the table to a Silver-throated Tanager (left). Drawings based on stop-action video tape.

occurred early in the day. Over the course of 24 mornings, we timed over 1000 feeding bouts (the time from start to end of feeding) of individual birds, and we recorded the outcome of 422 interactions between 13 species of birds at the fruits. Thus, note was made if one bird chased another from a fruit, or if a bird waited to feed until another was finished. We also kept record of the total amount of feeding activity in the tree at a given time, so that we could tell, for example, if breakfasts were briefer when the avian restaurant was crowded.

Our high-tech part of the operation involved videotaping feeding bouts at the fig tree. The video camera could be plugged directly into the field station's TV set and used as a VCR. This allowed us to relive the morning's repast in slow motion each afternoon and evening, while measuring the precise fraction of time that birds spent feeding as opposed to looking about for possible competitors or predators.

What did we find out? First of all, as we had expected from reports in the literature, there was an inter-

specific dominance hierarchy. That means that birds of some species always or almost always deferred to those of others either by leaving a fruit when an individual of the dominant species approached, or by patiently waiting for a dominant to finish feeding. For example, Palm and Blue-gray tanagers interacted nine times, and every time the Blue-gray gave way to the Palm. The numerous interactions we observed gave us an unprecedentedly detailed picture of the structure of this 13-species hierarchy.

In general, larger species and those with longer beaks were dominant over those that were smaller and had shorter beaks, but this was not invariably true. Silver-throated Tanagers were smaller in every measure (and less colorful) than Bay-headed Tanagers, but they had higher social status. As one might expect, there were more "reversals" of dominance in direct interactions between this pair of species than any other pair. Silver-throateds "won" in 20 of 25 interactions, but Bay-headed came out on top in the other five.

At the very top of the hierarchy was the Buff-throated Saltator, a large finch, and right below it the Clay-colored Robin. At the very bottom was a migrant from North America, the Tennessee Warbler, which had to give way to everyone else. Among the ten tanager species, the Scarlet-rumped was king-of-the-hill. The Thick-billed Euphonia had to defer to everything except Tennessee Warbler.

Dominance hierarchies were first described by Norwegian scientist Thorleif Schjelderup-Ebbe within a single species. He showed that barnyard hens had carefully worked out systems of social status (peck orders) that prevented most squabbling over food. We did not observe any signs of such intraspecies dominance relationships except among the Scarlet-rumped Tanagers. Mature males were jet black with a bright scarlet rump that they flashed like Red-winged Blackbirds do their epaulettes; females, immatures, and even some breeding males (as we found from museum specimens) sported a much less striking olive-green and orange plumage.