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Nectarivorous Feeding by Shiny Cowbirds: a Complex Feeding Innovation

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ABSTRACT.—Here I report a feeding innovation by Shiny Cowbirds (*Molothrus bonariensis*) in which the birds feed on the nectar of flax (*Phormium tenax*) flowers. Flax frequently is cultivated in Mar del Plata City, Buenos Aires Province, Argentina, as an ornamental plant, and the Shiny Cowbird is common there. The length of the cowbird's bill is similar to that of the flax flower tube, which permits the cowbird to access the nectar. Further, the panicle stem of the flax is sufficiently rigid for perching, and the short distance between the stem and the flower enables a perched cowbird to reach the flower. At this site, flax nectar probably is utilized in a sustainable manner, as the flowers apparently are not harmed. Future investigations should examine whether or not the observed behavior is restricted to this particular population and if it is not, determine the spatial and temporal extent to which it occurs. *Received 12 October 2001, accepted 5 September 2002.*

Organisms possessing socially modulated behavioral flexibility may improve their fitness under some circumstances (Bonner 1980). For example, these organisms may identify new foods and food sources, acquire new feeding techniques, increase their exploration and foraging efficiency, and recognize predators and poisonous foods. Many feeding innovations have been reported for birds (Lefebvre et al. 1997). One notable example was the opening of milk bottles by Great Tits (*Parus major*; Fisher and Hinde 1949). Here I report on a feeding innovation by Shiny Cowbirds (*Molothrus bonariensis*) in which the birds feed on nectar from flax flowers (*Phormium tenax*). There are no previously published observations of this feeding behavior in Shiny Cowbirds. However, Morton (1979) recorded three other icterids feeding on nectar, Yellow-backed Orioles (*Icterus chrysater*), Orchard Orioles (*I. spurius*), and Baltimore Orioles (*I. galbula*).

During the 20th Century, the geographic distribution of the Shiny Cowbird increased extensively from its original distribution in southeastern South America. The species currently ranges west to Chile (Marín 2000), and north to the Caribbean islands (Cruz et al. 1985) and (since 1985) Florida in the United States (Lowther and Post 1999). This species benefitted from human-modified environments during the last century by using urban areas and open habitats with dispersed trees (Cruz et al. 1985, Ridgely and Tudor 1989, Canevari

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et al. 1991). The Shiny Cowbird is an extreme generalist in both its breeding and feeding behavior. Shiny Cowbirds are brood parasites, parasitizing >200 host species (Friedmann and Kiff 1985), and feed omnivorously, mainly on seeds and arthropods (Camperi 1984, Canevari et al. 1991). The flexibility displayed by Shiny Cowbirds in both its host generalist strategy and omnivorous diet may be responsible for their range expansion, as such generalist behavior enables them to exploit novel, modified habitats and food sources.

The Shiny Cowbird is a common bird of the urban avifauna of Mar del Plata City, Buenos Aires Province, Argentina (38° 00′ S, 57° 34′ W). Since my first record in 1991 (JPI unpubl. data), I occasionally have observed cowbirds feeding on nectar from flax flowers along the Playa Grande coast of Mar del Plata City. Beginning with the austral spring 1998 through the austral summer 2001, I observed four flax plants on an almost daily basis. From November to January of each year, 1–3 cowbirds fed on nectar, mainly during morning and afternoon. I did not observe cowbirds feeding on nectar from flowers other than flax.

Flax is a rhizomatous plant native to New Zealand (Dimitri 1978). It frequently is cultivated in Mar del Plata City as an ornamental plant. During spring, large leafless stems grow panicles, each containing approximately 400 flowers. Plants have 15–20 panicles, with a total of 6,000–8,000 flowers per plant.

When feeding, the Shiny Cowbird perches on the large stem of the flax panicle and inserts its bill and forehead into the flower tube. Contact with the flowers results in the cowbird's forehead turning orange with pollen. This feeding behavior is facilitated by the flax panicle stem being rigid enough for perching, and by the short distance between the stem and the flower, which allows the cowbird to reach the flower. I measured the bill of a cowbird and 20 flax flowers to assess if the size of the flower constrained access to the nectar by cowbirds. The measurements of the beak and skull of one male cowbird from the collection of Vertebrate Lab, Faculty of Natural Sciences, Mar del Plata Univ., Argentina, were: culmen 16.8 mm, basal bill height 8.7 mm, basal bill width 10 mm, and culmen and forehead 21.5 mm. The flax flower is tubular; mean measurements of the tubes were: length 26 mm, basal diameter 7 mm, and diameter at opening 9 mm. The measurements of the flax flower tube and cowbird bill are similar, reducing the possibility that size differences constrain the cowbird's access to flax nectar.

I also observed two hummingbird species, the White-throated Hummingbird (*Leucochloris albicollis*) and the Glittering-bellied Emerald (*Chlorostilbon aureoventris*), occasionally feed on the nectar of flax flowers, but with a much lower frequency than that observed for cowbirds. I observed no other bird or insect feeding on flax nectar. Shiny Cowbirds are not known to parasitize nectarivorous species in Mar del Plata, so the possibility that this behavior was learned from hosts is unlikely.

During the Miocene, the rapid diversification of flowering plants and insects opened new niches for nectar-feeding birds, resulting in an explosive radiation of birds (Regal 1977). Nectarivorous birds are abundant in many parts of the world and include some of the largest families, such as Meliphagidae in Australia, Nectriinidae and Promeropidae in Africa, and Trochilidae in northern and Neotropical America (Collins et al. 1990). Nectarivory also has arisen in a few species within some otherwise nonnectarivorous families, such as Psittacines in Asia and Oceania (Collar 1997). In each of these cases, species have evolved morphological adaptations to feed on nectar, including changes in bill shape, tongues, and digestive systems, or other adaptations associated with strategies to access flowers (e.g., hovering in hummingbirds; Gill 1994).

To fulfill dietary requirements or to compensate for decreased nectar availability, nectarivorous birds occasionally eat other items such as insects, fruits, and seeds. However, examples of non-nectarivores exploiting nectar are rare, probably because nectarivory is a complex feeding behavior that includes important morphological constrains restricting flower and nectar access. Some insectivorous Old World warbler species (*Sylvia* spp.) exhibit nectarivorous habits after long distance flights during spring migration (Schwilch et al. 2001). Neotropical migrants and nonmigratory species also exhibit nectar feeding in the Panama Canal Zone. These include the Tennessee Warbler (*Vermivora peregrina*), Orange-chinned Parakeet (*Brotogeris jugularis*), White-necked Jacobin (*Florisuga melli-*

vora), Red-crowned Woodpecker (*Melanerpes rubricapillus*), Lesser Antillean Saltator (*Saltator albicollis*), tanagers (*Thraupis* spp. and Crimson-backed Tanager, *Ramphocelus dimidiatus*), and orioles (*Icterus* spp.; Morton 1979, 1980).

Cowbird nectarivory apparently does not harm the flax flower; thus, cowbirds are using the resource in a sustainable manner. This possibility is supported by verification that cowbirds can return at least twice to the same flower at different times (JPI pers. obs.). This sustainability contrasts with granivory and insectivory, both of which are extractive. In the U.S., there have been reports of Northern Cardinals (*Cardinalis cardinalis*) feeding on nectar; however, they nip off and eat nectar-filled flower capsules (Wible 1974). Such destructive behavior is not typical of nectarivorous species that only probe the flower.

Flax was introduced to the region approximately 50 years ago. During the past ten years, cowbirds do not seem to have extended this habit to other localities where flax is common (JPI pers. obs.). Nevertheless, considering that cowbirds are expanding their geographic distribution by colonizing new habitats (Cruz et al. 1985, Lowther and Post 1999, Marín 2000) nectarivory by cowbirds may be expected to spread to other localities (e.g., Lefebvre 1995) by cultural transmission. Thus, future observations should determine if nectarivory is restricted to this population, and if it is not, determine the spatial and temporal distribution in which nectarivory occurs.

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