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NESTING BEHAVIOR OF THE SLATE-COLORED SEEDEATER (*SPOROPHILA SCHISTACEA*) IN PANAMA

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The nesting behavior of the Slate-colored Seedeater (*Sporophila schistacea*) is virtually unknown, and few nests have been described previously (Wetmore *et al.* 1984, Hilty & Brown 1986). This species is highly nomadic and tends to breed in areas with large seed crops, particularly bamboo (Willis & Eisenmann 1979, Ridgely & Tudor 1989, Stiles & Skutch 1989). In 1994 and 1995, Slate-colored Seedeaters were abundant along the Pipeline Road in Parque Nacional Soberania (9°9'N, 79°51'W), Panama, and territorial ♂ were associated with patches of seeding bamboo *Chusquea simpliciflora* (Neudorf & Blanchfield 1994). In this paper we describe a nest, eggs and nesting behavior of the Slate-colored Seedeater.

Nest Description. The nest was discovered along the Pipeline Road, at 6.5 km, on 24 February 1995. It hung over the road, 4 m off the ground, in a thorny vine (*Machaerium* spp., Leguminosea) in a similar situation as previously described for this species (Wetmore *et al.* 1984, Hilty & Brown 1986). The nest measured 8 cm in diameter and 5 cm in depth, and was loosely constructed with vine tendrils and gray/brown rootlets. A conspicuous long (15 cm) thin (1–2 mm) piece of white fungal material was wrapped around the entire outside edge of the nest near the rim. The nest was attached to the supporting vine with rootlets and spider web. It was lined with long (15–20cm) rootlets that were reddish brown or shiny black in color. This nest was similar to those described from Colombia (Hilty & Brown 1986) and Panama (Wetmore *et al.* 1984), but differed in that it contained no horse hair or leaves.

Chronology. On 24 February courtship behavior was observed near the nest (see below). On 25 February the nest was checked with a mirror, and contained 2 white eggs with brownish markings (see similar description in Hilty & Brown 1986). The ♀ appeared to be incubating, and we estimated the incubation period to be about 12 days. On 9 March the nest contained 2 nestlings, about 2–3 days of age. The 2 nestlings were present on 16 March (about 9–10 days old), but on 17 March the nest was hanging down from the vine and the nestlings were gone. We could not locate the ♀ or any fledglings nearby, so the nestlings may have been preyed upon.

Nest Behavior. Courtship behavior was observed when the nest was discovered, late in the afternoon. The ♀ was perched 5–6 m from the nest, and an adult ♂ perched and then hovered near the ♀, intermittently giving full song. This adult ♂ had slate-gray upperparts with a yellow-orange bill (see also description in Stiles & Skutch 1989). The ♀ flew to a perch 2–3 m from the nest, and the ♂ followed and hovered near her for 2–4 sec while giving a brief "tititiri" song. The ♀, closely followed by the ♂, flew to

the nest where the ♂ hovered near her silently, then flew away. The ♀ remained at the nest for 30 s and then departed. During the next 20 min, the ♀ visited the nest 3 times, each time perching on the nest while the adult ♂ hovered only briefly beside her before flying away. The ♀ perched at the nest for less than a minute each time, before departing.

Incubation behavior was not observed closely. On the afternoons of 25 and 26 February the ♀ was incubating, and flushed off the nest when an observer was 5 m away or when a car drove by on the dirt road. No nest defense behaviors were given by the ♀, even when the nest was inspected. Upon return to the nest, the ♀ would consistently perch 5—7 m away, move to 3—4 m away, then fly directly to the nest, hover briefly, and alight on the nest. On the afternoon of 26 February a subadult ♂ (determined by the olive-brown plumage) was seen singing 20 m from the nest, but did not approach the nest any closer.

Feeding trips to nestlings were documented on three mornings (9, 11, 16 March) during 1—1.5 h observation periods after 09:00 h. In a total of 4 h of observation, only the ♀ was seen feeding the nestlings (n = 17 trips to the nest). No adult ♂ was seen or heard singing near the nest. When the nestlings were 2—3 days old, the ♀ made 6 feeding trips in 90 min (4/h). She brooded the nestlings on each trip to the nest, for an average of 2.9 min per trip. Intervals between nest departure and the next feeding trip averaged 14 min. On two occasions the ♀ gleaned insects off leaves on her flight away from the nest, and did this once when approaching the nest to feed the nestlings. This suggests that invertebrates comprised some part of the nestling diet. When the nestlings were 4—5 days old, she made only 2 feeding trips during the 75 min watch, and brooded only once for 4 min. When the nestlings were 9—10 days old, she made 8 feeding trips in 75 min (5.3/h). She did not brood the nestlings and intervals between feeding trips averaged 8.6 min. The nestlings gave conspicuous high-pitched begging calls that could be heard from 25 m away.

Late during the nestling stage, we observed a subadult ♂ (plumage description) displaying courtship behavior toward the ♀ on 3 different occasions when she approached the nest to feed. In every case, the ♀ perched 2—3 m from the nest in the vine prior to feeding. The subadult ♂ immediately perched beside her and sang full song (described by Stiles *et al.* 1989 as *tlee lee lee see-see-see-see-see*) several times. The ♀ then crouched with her tailed raised, and within 20 sec flew to the nest to feed. In one case the ♂ hovered over the ♀ twice, but never made cloacal contact. In all cases, the ♂ followed the ♀ closely when she went to or from the nest, but he did not land on the nest. We did not see any evidence of an adult ♂ during this courtship behavior.

Males are strongly territorial and defend an area averaging 60 m x 60 m (Neudorf & Blanchfield 1994). The adult ♂ seen singing and courting the fertile ♀ was not seen at or near the nest subsequently. Our observations of a subadult ♂ singing 20 m from the nest during early incubation and interacting with the ♀ at the nest during the late nestling stage suggest that the adult ♂ was not defending the nest area after the ♀ laid her eggs.

The nest of *Sporophila schistacea* is similar to other species in the genus (e.g., *S. nigricollis, S. minuta, S. torquela, S. aurita*) in that it is cup of woven grasses or rootlets so thin that light passes through, with pale eggs (grayish white, pearl gray) spotted with dark brown (Wetmore *et al.* 1984, Stiles *et al.* 1989). Fungal filaments woven into the outside of the nest have also been described for *S. aurita* (Stiles *et al.* 1989). Incubation by the female only is typical for this genus, and biparental care to young occurs in *S. nigricollis, S. torquela,* and *S. aurita* (Wetmore *et al.* 1984). In *S. schistacea* no male assisted with feeding the young, suggesting that this bamboo specialist may not have a socially monogamous mating system.

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