

## IS THE RING-NECKED SEEDEATER (*SPOROPHILA INSULARIS*) FROM TRINIDAD EXTINCT, OR IS IT A CRYPTIC SPECIES WIDESPREAD IN VENEZUELA?

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**ABSTRACT.**—*Sporophila intermedia insularis* was described as a subspecies of the Gray Seedeater in 1946 from a specimen collected in Trinidad, but was synonymized with *S. i. intermedia* in 1952. Based on a reanalysis of museum specimens and live birds captured recently in the field, I found that 37 adult male specimens of *insularis* differed consistently from *S. i. intermedia* by several plumage traits and bill colouration. Furthermore, bill size, tarsus length and body mass were significantly greater in *insularis*. Because the two taxa occur sympatrically in Trinidad (possibly extirpated) and throughout Venezuela north of the Orinoco River, I propose that *S. insularis* should be recognised as a distinct, cryptic species, given the English name of Ring-necked Seedeater and Spanish name Espiguero Collarblanco.

**RESUMEN.**—En 1946, *Sporophila intermedia insularis* fue descrito como una subespecie del Espiguero Pico de Plata basado en un espécimen colectado en Trinidad, pero en 1952 fue sinonimizado con *S. i. intermedia*. Basándome en un nuevo análisis de ejemplares de museo, y de ejemplares vivos capturados recientemente en el campo, he encontrado 37 machos adultos de *insularis* que se diferencian consistentemente de *S. i. intermedia* en varias características de plumaje y color del pico. Más aún, el tamaño del pico, la longitud del tarso, y la masa corporal son significativamente mayores en *insularis*. En vista de que las taxa ocurren simpátricamente en Trinidad (donde posiblemente han sido erradicados) y por todo Venezuela al norte del Orinoco, propongo el reconocimiento de *S. insularis* como una especie distinta, críptica, con el nombre en inglés de Ring-necked Seedeater y en español de Espiguero Collarblanco.

**KEY WORDS.**—cryptic species, distribution, Gray Seedeater, morphology, plumage, Ring-necked Seedeater, *Sporophila intermedia*, *Sporophila insularis*, taxonomy, Trinidad, Venezuela

The Gray Seedeater (*Sporophila intermedia*) is widespread in Colombia, Venezuela and Trinidad (Ridgely and Tudor 1989). It is primarily a lowland species, but wanders up to lower subtropical levels. It is generally considered a resident, somewhat sedentary species (Thomas 1996); most movements are probably due to either dispersal of young birds,

habitat disturbance or extreme weather conditions. Like most species of *Sporophila*, it is a stem gleaner, taking seeds from grasses and forbes on the stem, but its feeding strategy is flexible. It has been observed hawking termites and other succulent, slow flying alates (Sick 1993, Thomas 1996, pers. obs.). It will also take buds and stems of tender

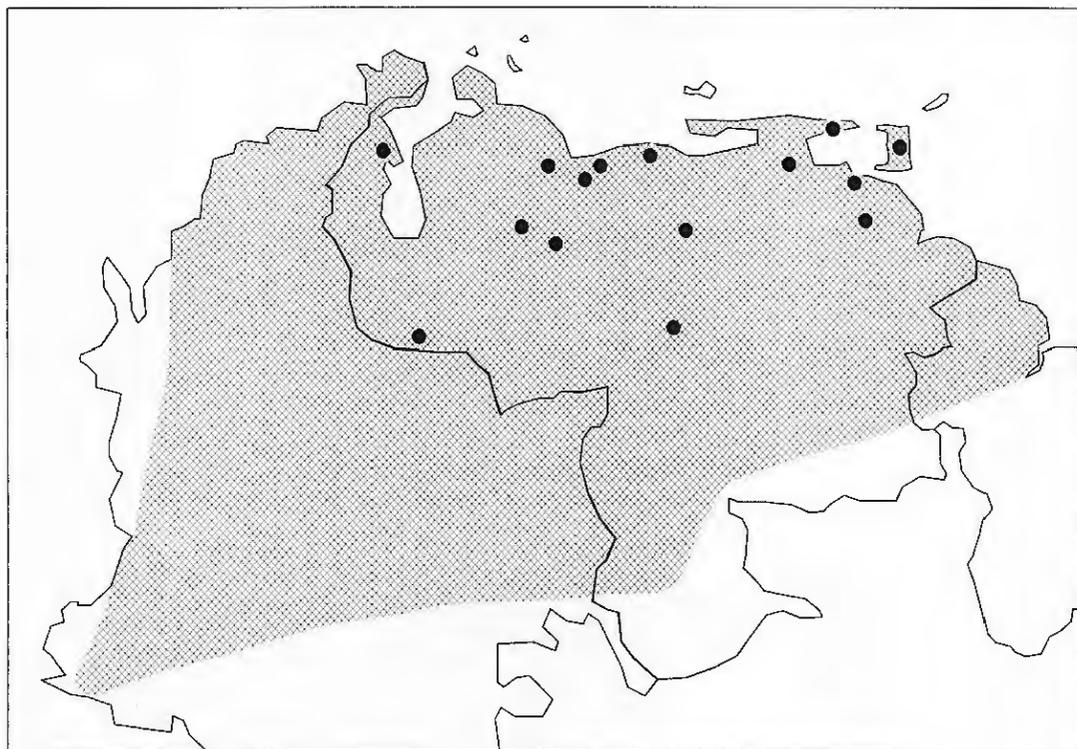


FIG. 1. Geographical distribution of Gray Seedeater (*Sporophila intermedia*), indicated by shading based on Ridgely and Tudor (1989), and Ring-necked (*S. insularis*), indicated by dots (see localities in Appendix).

leaves, and under some circumstances will take fallen seed from the ground (pers.obs.).

The Gray Seedeater was long considered a monotypic species until Gilliard (1946) examined a full series and noticed that there were birds with post-auricular whitish patches on the sides of the neck. When arranged geographically, these birds clustered into two groups, each at the extreme ends of the species' distribution. Gilliard (1946) first described the birds from Trinidad, the type from Princes Town, naming them *S. i. insularis*. He then described some darker birds from Cauca, southwestern Colombia, as *S. i. bogotensis*. The intervening population was retained as nominate *S. i. intermedia*. However, in a subsequent revision of *Sporophila*, Meyer de Schauensee (1952) synonymized *insularis* with nominate *intermedia*. This was later accepted by Storer (in Paynter 1970). Thus, *insularis* was relegated to taxonomic oblivion.

Surprisingly Gilliard and apparently all others who examined Gray Seedeater specimens failed to notice the white bar across the rump of *insularis*, resembling the apparent bar that occurs when the pale feathers of the flanks are laying up under the wings and almost join across the lower rump. In the case of nominate *intermedia*, these can be brushed back into position to leave the lower rump all grey, but in *insularis* the white is in the actual lower rump feathers. My attention was drawn to this by a careful examination of some boldly marked specimens of *insularis* in the Colección Ornitológica Phelps (COP), Caracas, that had been collected in the Delta Amacuro of Venezuela.

A thorough review of the full series of *S. i. intermedia* in COP resulted in the discovery that several males labelled as nominate *intermedia* possessed a white bar across the rump, together with some degree of white or light grey on the throat; these specimens were diagnosable as Gilliard's *S. i.*

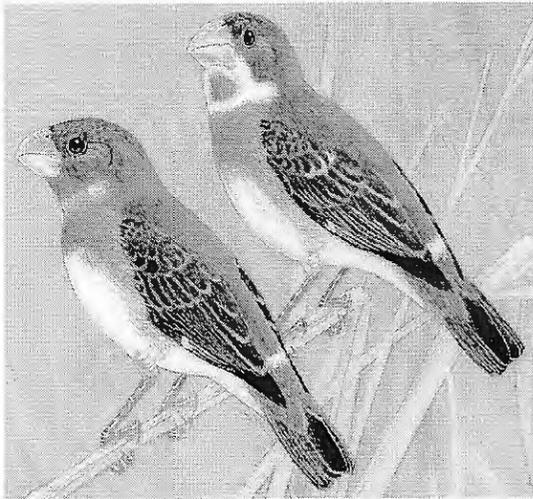


FIG. 2. Type specimen (left) and white-throated variant (right) of male Ring-necked Seedeater (*Sporophila insularis*). See monograph cover for colour portrait. The white band across the rump is normally concealed as the wings are usually carried flush along the back.

*insularis*. Subsequent field trips to the Venezuelan llanos resulted in several examples of *insularis* being mist-netted. In this paper I reevaluate the status of *S. i. insularis*, which I tentatively recognise as a distinct species, the Ring-necked Seedeater (*S. insularis*).

#### METHODS

Based on museum specimens (see Acknowledgements) and recently captured live individuals, I examined plumage and soft part colouration of 92 adult male *S. i. intermedia* and 37 (five live) adult male *S. insularis* (see Appendix). Colour references follow those used by Ridgway (1912).

To compare morphological differences between the two taxa, I measured each bird with a Helios digital caliper. Measurements (mm) taken include: exposed culmen length; bill length from nostril to tip of maxilla; bill height in an axis running vertically through the nostril; bill width at the base from one side of the inner extremity of the mandibula to the other; wing chord length; tail length; and tarsus length (Baldwin et al. 1931). Body mass (g)

was obtained from specimen labels or measured in the field. Student's *t* tests (*t* statistic; Sokal and Rohlf 1981) were used to compare differences between *S. intermedia* and *S. insularis* for each variable. I also estimated bill volume (mm<sup>3</sup>) of each species using the tetrahedron formulae (Blondel et al. 1984).

#### RESULTS

*Geographical distribution.*—*S. insularis* has been collected in Trinidad and throughout Venezuela north of the Orinoco, where it occurs sympatrically with *S. i. intermedia* (Fig. 1).

*Plumage and soft parts.*—In *S. i. intermedia*, the male is uniform medium or dark grey from the forehead to the uppertail coverts. The colour is somewhat variable depending on the age of the bird, with older birds being a more intense and deeper slate grey. The tail and wings are fuscous to blackish with fine grey edges to the greater wing coverts and remiges, and there is a small white speculum on the base of the inner primaries. The underwing coverts are mostly white with dark centres in the outer coverts and the outermost coverts being completely dark grey. The head completely lacks white. It is usually a lighter grey from the chin downward to the breast and flanks. This grey merges into the ivory white of the underparts, becoming more cleanly divided and contrasting with advanced age. The bill is pale and generally pinkish buff, occasionally with brownish streaks, and usually with slightly yellowish cutting edges. I have not seen a live adult *S. i. intermedia* male with the dark, purplish grey on the maxilla that seems to occur with some regularity on the bill of *S. insularis*. The legs, feet and toes and toes are slate-grey to blackish, and the toenails are dark brown or blackish.

The female *intermedia* is brown above and also on the breast and flanks, which have a distinct warm tone. The belly and undertail coverts are white with a buffy tinge. The underwing coverts have the same pattern as that of the male. The bill is dark brown, appearing black. The legs, feet and toenails are vinaceous grey to vinaceous slate. It is slightly smaller than the male but has a slightly more massive bill.

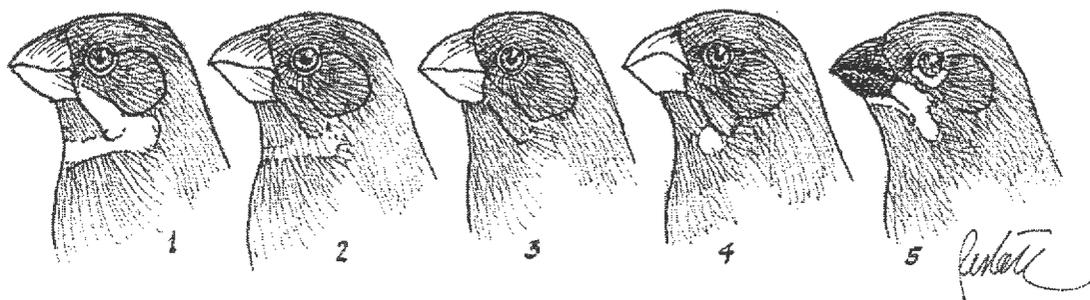


FIG. 3. Heads of grey seedeaters to show comparative amounts of white on throat and neck. (1) white-throated variant of Ring-necked Seedeater (*Sporophila insularis*); (2) typical *S. insularis*; (3) Gray Seedeater (*S. intermedia*); (4) Slate-colored Seedeater (*S. schistacea*) with white on sides of throat, not post-mesial or post-auricular; and (5) Plumbeous Seedeater (*S. plumbea*) with dark bill.

The type specimen of *S. insularis* was described from Princes Town, Trinidad, as "similar to *S. i. intermedia* of Venezuela, but adult males with whitish post-auricular patches" and "sides of throat immediately posterior to auriculars strongly tipped with white" (Gilliard 1946:571). Gilliard examined 14 males from Trinidad, of which 12 conformed to the type description. A white-throated variant possessed "broad white margins on sides of throat; throat and chin whiter than in any other bird in the extensive series; inner median upperwing-coverts tipped with white" (Gilliard 1946:571). An immature specimen (P. Sweet pers. comm.) had no white post-auricular tipping. Gilliard also construed from the specimens that the bill of *S. insularis* was a darker pink with a cinnamon wash, especially noticeable on the maxilla. However, this was impossible to tell from old specimens with accuracy. The bills of live male *S. insularis* that I have examined seem to be a more greyish pink, actually a light cinnamon drab with deep cinnamon buff cutting edges. I have noticed in live birds a streaking of dark purplish grey on the maxilla, which may be extensive; in one bird dark purplish grey covers the entire maxilla except the cutting edge. This may also occur on the base of the mandible. I suspect this trait may be usually if not always present in *insularis*. In contrast, the bills of all live adult male *intermedia* I have examined have been generally pinkish buff, occasionally with brownish streaks, with slightly yellowish cutting edges.

A diagnostic plumage character not mentioned by Gilliard but present in all *insularis* specimens that I have examined is a soft white bar across the lower rump. Also, the outer underwing coverts tend to be pale grey, or white in the more strongly marked individuals. This apparently applies to the females as well.

The type specimen and a white-throated variant of male *S. insularis* are depicted on the monograph cover (colour portrait) and in Fig. 2. The variable amount of white in the throat and neck of male *S. insularis* is illustrated and compared with other *Sporophila* species in Fig. 3.

*Morphometrics.*—In comparison with *S. intermedia*, *S. insularis* averaged significantly larger in bill size (culmen length, bill height and bill width), tarsus length and body weight, but there were no differences in bill length from nostril, wing length and tail length (Table 1). The calculation of bill volume using mean data revealed average volumes of 107.1 mm<sup>3</sup> for *S. intermedia* and 124.63 mm<sup>3</sup> for *S. insularis*, a difference of 16.4%.

#### DISCUSSION

My initial hypothesis was that *insularis* simply represented plumage and morphological variation within *S. intermedia*. This was the conclusion of Meyer de Schauensee (1954), Junge and Mees (1958), Herklots (1961), French (1973, 1991) and Stiles (1996). However, my reanalyses revealed consistent differences in plumage and soft part traits as

TABLE 1. Morphological measurements (mm) and body mass (g) of male Gray Seedeater (*Sporophila intermedia*) and Ring-necked Seedeater (*S. insularis*), with results of Student's *t* tests comparing differences between the two taxa.

Variable	<i>Sporophila intermedia</i>		<i>Sporophila insularis</i>	
	$\bar{x}$ (SD)	Range (n)	$\bar{x}$ (SD)	Range (n)
Bill length from nostril	7.23 (0.38)	5.79-8.14 (98)	7.36 (0.36)	6.59-8.11 (37)
Exposed culmen length	9.87 (0.48)	8.77-10.89 (100)	10.43 (0.46) <sup>b</sup>	9.49-11.35 (35)
Bill height at nostril	8.20 (0.35)	7.56-9.07 (99)	8.68 (0.51) <sup>b</sup>	7.94-9.89 (35)
Bill width at gape	8.01 (0.68)	7.14-9.02 (99)	8.26 (0.46) <sup>a</sup>	6.63-9.10 (35)
Tarsus length	15.17 (0.93)	11.7-17.11 (103)	16.18 (1.25) <sup>b</sup>	14.36-19.7 (36)
Wing chord length	56.37 (1.77)	51.36-59.84 (102)	56.24 (2.36)	49.96-61.64 (36)
Tail length	43.13 (1.97)	38.43-49.06 (102)	44.02 (2.74)	37.47-52.13 (36)
Body mass	11.24 (0.82)	10.0-13.0 (19)	13.4 (1.56) <sup>b</sup>	11.0-15.0 (5)

<sup>a</sup>differs from *S. intermedia*,  $P < 0.01$

<sup>b</sup>differs from *S. intermedia*,  $P < 0.001$

well as statistically significant morphological differences between the two taxa. Furthermore, their sympatry suggests an obvious alternative hypothesis that *insularis* is a sibling (Mayr 1963, 1982) or cryptic species (Paterson 1993).

The two taxa differ morphologically in bill size, tarsus length and weight. Although bill size may function in sexual selection, as in Asian munias (Restall 1995), the most likely explanation is that each taxon may have a marginally different feeding ecology. The larger bill of *S. insularis* suggests it may be feeding, at least in part or at certain times of the year, on larger or harder seeds. This deduction is supported by a comparative study of sympatric ground doves and *Sporophila* seedeaters in the Venezuelan llanos (Pérez 1999). In this study, the congeners fed on the same assortment of seeds and other foods until the dry season caused shortages of certain favoured seeds. At this time, the species with larger bills tended to feed on larger seeds and those with smaller bills fed on smaller seeds. This was true for both the doves and seedeaters.

It is also possible that when foraging, *S. insularis* perches on more slender stems, whether these are grasses and forbes, or branches of trees. Grey seedeaters will take insects, buds and fruit (Sick 1993, Thomas 1996), but on each occasion it was assumed that the species under observation was *S. intermedia* although it could have been *S. insularis*.

On several occasions I have seen *S. insularis* (identity confirmed by mist-netting the individuals) foraging among the slender outer branches of small trees, searching beneath leaves in a similar manner to that associated with warblers and Bananaquits (*Coereba flaveola*). In addition, there is the possibility that *S. insularis* has a more terrestrial foraging strategy. This has been demonstrated as a correlate with length of tarsus in a comparative context between different subspecies of Lesser Antillean Bullfinch (*Loxigilla noctis*; Bird 1983). It is certain that *S. insularis* will also forage on the ground, albeit rarely (pers. obs.). Obviously further behavioural studies of the two taxa are needed.

That two closely related and morphologically similar grassland finches can appear to be fully sympatric in every sense yet occupy different foraging niches is comparable to the Black-faced Grassquit (*Tiaris bicolor*) and Yellow-faced Grassquit (*T. olivacea*), which are sympatric in parts of their ranges in the West Indies (Pulliam 1969). Where they both occur in Jamaica, the Black-faced Grassquit forages at two distinct and disjunct levels: either on the ground or from 1 m above ground to the canopy. In contrast, the Yellow-faced Grassquit tends to forage between the ground and 1 m above ground; whilst it may be seen on the ground, it feeds by reaching up to the seeds of growing grasses, a foraging mode not seen in Black-faced Grassquit. Where the two are not sympatric, such

as Panamá and Costa Rica, the Yellow-faced Grassquit forages freely on the ground (Wetmore et al. 1984, Slud 1964) as does the Black-faced Grassquit in Venezuela and Colombia (Ridgely and Tudor 1989).

The females of *S. insularis* are exceedingly difficult to identify. With so few specimens that can be regarded as *S. insularis* with certainty, consistent distinguishing plumage characters have not been found. A preliminary statistical analysis suggests that bill size of female *S. insularis* is larger than that of *S. intermedia* (Restall, unpubl. data). On one occasion in the field we mist-netted only *S. insularis* males; thus, the females caught at the same time and place were tentatively assumed to be *S. insularis*. The bills of these females were only slightly smaller than those of the males, in contrast with female *S. intermedia* which has on average a larger bill than the male.

The biology and behaviour of the two species are poorly documented, primarily because most observations were assumed to be of *S. intermedia*. Nevertheless, I have deduced a few differences in nest construction and egg colouration, based on the scant literature available (Cherrie 1916, Belcher and Smooker 1937, ffrench 1973, 1991, Ferraro and Lentino 1992) and limited personal observations in the field.

The typical cup-shaped nest of *S. intermedia* is made entirely of root fibres and fine tendrils and fibres. The similarly-shaped nest of *S. insularis* is also made of root fibres and fine tendrils, but in addition includes grasses.

The eggs of the two species appear to differ primarily in ground colouration. The eggs of *S. intermedia* are variable, with a dull white, greyish, buffy or creamy white ground colour, spotted and blotched with greys and browns, and overlaid with irregularly distributed and much darker markings of rich brown. Based on a description of a nest in San Juan, Trinidad, found on 14 July 1933, Belcher and Smooker (1937) described the eggs of *S. insularis* (attributed to *S. plumbea colombiana*, though clearly referring to *S. insularis*) having a greenish-grey or greenish ground colour marked with blotches of greyish or greyish-brown, overlaid with blotches of darker and richer browns, thickest around the larger end. They are slightly glossy or

quite glossy (Belcher and Smooker 1937), perhaps glossier than those of *S. intermedia*.

Based on observations of captive males, the song of *S. insularis* is similar to that of *S. intermedia* in that it consists of a set of several distinct phrases rapidly following each other. The notes vary from chew and chirp to clear and mellifluous trills and whistles. The sets are often of different lengths and seldom in the same sequence. In the case of *S. insularis*, the series always begins with four to six sharp "bzzi" notes followed by usually three "tew" or "chew" notes. Then follow in rapid succession several different notes, each repeated five or six times. The longer series always ends with a set of loud, clear and musical canary-like notes "sweet sweet sweet sweet..." or "twee twee twee twee..."

*S. intermedia* is often referred to as an accomplished mimic (e.g., Cherrie 1916, Thomas 1996), incorporating into its repertoire various notes and noises from other sources, including, for example, even the calls of frogs and a squeaking gate. I have not been able to detect this tendency in the few *S. insularis* studied so far.

In conclusion, the consistent differences in plumage, bill colouration, morphology and perhaps behaviour between *S. insularis* and *S. intermedia*, combined with their sympatric distribution, strongly suggest that they may be distinct, cryptic species (Paterson 1993) whose biology needs further study. I tentatively propose recognition of *S. insularis* as a valid species. In view of the use of the name 'Ring-neck' on Trinidad (ffrench 1973, 1991), I suggest using the English name of Ring-necked Seedeater and the Spanish name of Espiguero Collarblanco

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#### APPENDIX

Museum specimens of *S. insularis* examined.

COP = Colección Ornitológica Phelps, Caracas; AMNH = American Museum of Natural History, New York.

VENEZUELA: Pedernales, Delta Amacuro: COP 67720, 67721; Capure, Delta Amacuro: COP 67718,

67719, 67722; Caño Merejina, Delta Amacuro: COP 64701; Curiapo, Delta Amacuro: COP 50043; Mision Araguimujó, Delta Amacuro: COP 48270; Guaniamo, Bolívar: COP 26132; Caracara, Bolívar: COP 45800; Los Caracas, Distrito Federal: COP 18225; Villa del Rosario, Zulia: COP 7113; Quebrado El Charal, Aroa, Yaracuy: COP 77418; San Vicente, Maturín, Monagas: COP 53923; Piritú, Portuguesa: COP 80201, 80202, 80203, 80208, 80209, 80210; Guiria, Sucre: AMNH 514433.

TRINIDAD: Chaguaramas: AMNH 514436; Caparo: AMNH 514427, 514428, 514429, 514430, 514431; Pointe Gourde: AMNH 514435; Leclet: AMNH 514433, 514434; Valencia: AMNH 514437; San Fernando: AMNH 59105; no locality: AMNH 41265.