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A NEW SUBSPECIES OF *SCHIZOEACA HARTERTI* WITH NOTES ON TAXONOMY AND NATURAL HISTORY OF *SCHIZOEACA* (AVES: FURNARIIDAE)

J. V. Remsen, Jr.

Abstract.—A new subspecies *Schizoeaca harterti bejaranoi,* is described om Dpto. Cochabamba, Bolivia, and existing information on the natural story of *Schizoeaca harterti* is summarized. After a discussion of species nits in the genus *Schizoeaca,* it is recommended that eight species should e recognized until further information is obtained.

Introduction

As I examined latitudinal trends in color variation in Andean birds, I ound that populations of the Black-throated Thistletail, *Schizoeaca harterti* Furnariidae), from Dpto. Cochabamba, Bolivia, differed in plumage characters from those of Dpto. La Paz, Bolivia. I propose to call the Cochabamba population:

Schizoeaca harterti bejaranoi, new subspecies

Holotype.—Louisiana State University Museum of Zoology (LSUMZ) lo. 36040; male, collected by F. Steinbach (no. 14,375) on 3 September 962 at kilometer 104, Prov. Chapare, Dpto. Cochabamba, Bolivia, elevaon 3200 m (about 55 km ENE of the city of Cochabamba).

Description.—Entire dorsum Dresden Brown, becoming slightly more ufescent on forecrown. Remiges Raw Umber; outer edges of secondaries Dresden Brown, upper wing coverts Raw Umber, broadly edged Sudan Brown. Indistinct superciliary Ochraceous-Tawny. Lores mixed Chaetura Black and Buckthorn Brown, this combination extending to the subocular egion. Malar region and auriculars Ochraceous-Tawny; some auriculars mmediately behind eye Brussels Brown. Sides of neck Buckthorn Brown, oticeably but not sharply defined from lower throat and breast, which are losest to Light Drab with some feathers faintly tipped Buckthorn Brown. Chin and upper throat mixed black and white. Sides slightly darker and browner than breast. Belly closest to Light Drab. Flanks Dresden Brown, ent area slightly paler. Tail Brussels Brown (capitalized colors from Ridgway 1912).

Diagnosis.—Differs from nominate subspecies by having more extenively (and intensely) ochraceous cheeks and sides of neck, leaving a narrower area of pale brownish gray on throat (about as wide as width of dark throat patch). Other, less diagnostic differences are discussed below.

Measurements of holotype (in mm).—Wing (chord) 54.0, tail 96.3, tarsus 22.3, culmen (from base) 11.6.

Range.—Humid Temperate Zone of the eastern slope of the Andes in the Departamento de Cochabamba and adjacent Dpto. Santa Cruz, Bolivia, 2500–3500 m.

Specimens examined.—*Schizoeaca h. harterti* (28), all from Dpto. La Paz, Bolivia: Cotapata, 4.5 km WNW Chuspipata, 3300 m (8 ♂♂, 12 ♀♀, LSUMZ 95957–95976); 3 km NE Unduavi, 3400 m (♀, LSUMZ 90669); Hichuloma, 10,700 ft (5 ♂♂, 2 ♀♀, ANSP 120444, 120448–120453).

Schizoeaca h. bejaranoi (41): Dpto. Cochabamba, Bolivia: kilometer 104, Prov. Chapare, 3200 m (13 ♂♂, 5 ♀♀, 2 ?, LSUMZ 36027–36041, 37611–37615); Choro, Prov. Ayopaya, 3500 m (3 ♂♂, FMNH 217717–217718, LSUMZ 37616); Aduana (Incachaca), 3100 m (2 ♂♂, 1 ♀, FMNH 180138–180140); Incachaca, 2800–3100 m (5 ♂♂, 5 ♀♀, CM 85055, 85700, 85830, 85962–85964, 85972, 86036, 119725, 120298; ♂, FMNH 180136); San Benito, 3400 m (♂, FMNH 180142); 101 km (by road) southeast Espizana, Siberia cloud forest, Cordillera Oriental, 2989 m (1 ♂, 1 ♀, DMNH 67054–67055); Dpto. Santa Cruz: 30 km W Comarapa, 8200 ft (FMNH 293880). The latter two localities are probably very close to one another, if not identical; this patch of cloud forest on the Cochabamba-Santa Cruz road is apparently on the boundary between the two departments.

Etymology.—I take pleasure in naming this form for Gastón Bejarano B. of La Paz. Prof. Bejarano, often at tremendous personal sacrifice, has furthered the study of Bolivian fauna and flora through his encouragement and aid to visiting scientists. His incomparable knowledge of his country's topography and ecology has proved invaluable to my own studies and those of many others.

Remarks.—Although not a strikingly marked taxon, *bejaranoi* can be separated from the nominate race with nearly 100% certainty in the above series on the basis of extent of ochraceous color in the cheeks and sides of the neck. A similar trend of increasing extent or intensity of ochraceous or chestnut color in the southernmost form is widespread among polytypic Andean forest bird species and superspecies (Remsen, in prep.).

Another useful character to separate *bejaranoi* from the nominate race is the color of the lores and subocular region, which show a reduced tendency towards blackishness in *bejaranoi*. Using three categories for amount of black, "heavy," "moderate," and "light to absent," the series of *bejaranoi* scored 0, 11 (27%), and 30 (73%) individuals in the respective categories, whereas the series of the nominate race scored 14 (50%), 11 (39%), and 3 (11%) individuals in the same procedure ($\chi^2 = 34.7$, $P < .001$). Additionally, in material of comparable age (same collecting year), the fore-

Table 1.—Means and ranges (parentheses) of measurements (mm) and weights (grams) of the two subspecies of *Schizoeaca harterti*.

		N[1]	Wing (chord)	Tail	Tarsus	Culmen (from base)	Body weight[3]
S. h. harterti	♂♂	11–13	52.4 (49.2–55.6)	96.9 (92.6–110.1)	22.2 (20.1–23.5)	11.4 (10.3–13.4)	13.6 (12.5–15.5)
	♀♀	14–17	51.8 (49.8–53.4)	92.3 (86.1–99.4)	21.9 (20.8–22.9)	11.2 (10.7–12.0)	12.8 (10.8–14.0)
	all	26–30	52.1	94.1	22.1	11.3	13.1
S. h. bejaranoi	♂♂	20–25	53.1 (51.2–56.2)	94.4 (77.3–106.8)	22.1 (19.9–24.4)	11.4 (10.5–13.0)	14.2 (14–14.3)
	♀♀	19–20	50.9 (49.3–53.9)	88.4 (85.5–93.5)	21.8 (20.9–22.6)	11.5 (10.5–12.8)	13.2 (13.1–13.2)
	all[2]	34–38	52.5	93.5	22.0	11.4	13.8

[1] Sample sizes varied between categories depending on suitability of specimen for measure in question.
[2] Total sample size for *bejaranoi* included two unsexed birds.
[3] Sample for *S. h. harterti* included two skeletal specimens. See Niethammer (1956) for additional body weights for *S. h. harterti*. Sample for *S. h. bejaranoi* for body weight was only four individuals (1 courtesy F. Vuilleumier).

crown of *bejaranoi* is slightly paler and more ochraceous than in individuals of the nominate form, the sides of the breast are paler and slightly more rufescent in *bejaranoi* than *harterti*, and the general facial coloration of *bejaranoi* is more extensively and intensely ochraceous. Post-mortem color changes in the breast and back plumage complicate further color comparisons.

Two subspecies (Table 1) are extremely similar in measurements (no significant difference in any mensural character by the Mann-Whitney U-test, $P < .05$). Sexual dimorphism is slight, with males larger than females in all 5 measurements in both subspecies.

Notes on *Schizoeaca harterti*

Vuilleumier (1969a) described the nest, young, and habitat of *S. harterti* about 10 km by road from the type locality of *bejaranoi*. Niethammer (1956) also gives some natural history information on *S. harterti* from Dpto. La Paz.

Although I have not observed *S. h. bejaranoi* in life, the following observations of *S. h. harterti* almost certainly apply as well to the former. In Dpto. La Paz, the species is found from timberline *pajonal* at about 3400 m down into cloud forest edge, approximately to 2900 m, where replaced by the ecologically similar furnariid *Synallaxis azarae*. From 27 May to 25

June 1980, *Schizoeaca harterti* was observed daily at Cotapata, 4.5 km WNW Chuspipata, 3300 m, and 23 specimens (20 skins, 2 skeletons, 1 in alcohol) were obtained. This thistletail was common (5–10 noted per day) in bamboo thickets and bushes at forest-edge often mixed with tall grass, but was seldom noted inside continuous forest. Most foraging took place within 1.5 m of the ground and within dense foliage rather than at its edge. Foraging movements were rather slow and deliberate, involving climbing rather slender stems, stretching acrobatically to glean prey items, and maneuvering through dense foliage. The flight was fluttery and weak, seldom covering distances greater than 1 m. Although occasionally seen in pairs, this species is not as consistently noted in pairs as are many of the taxonomically related and ecologically similar spinetails of the genus *Synallaxis*. At Cotapata, *Schizoeaca harterti* seldom joined mixed-species flocks of undergrowth birds. (*Cranioleuca albiceps, Basileuterus luteoviridis, Atlapetes rufinucha*).

None of the eight males of *S. h. harterti* was in full breeding condition, with testes ranging in size from 3 × 2 mm to 1 × 1 mm. In the 14 females collected, ovaries ranged from 4 × 2 to 8 × 5 mm and ova from minute to 1 × 1 mm. No relationship was found between gonad size and degree of skull ossification (ranging from 10 to 90%); Vuilleumier (1969a) found a breeding female of *S. h. bejaranoi* with an incompletely ossified skull. Fat condition ranged from "heavy" (1) to "moderate" (3) to "light" or "trace" (12) to no fat (6). The 19 stomachs examined (2 saved, LSUMZ Stomach Contents Collection) all contained insects, and two also contained 1–2 seeds 1 mm in diameter. The iris was pale brown in 14 individuals and brown in 5 others. The maxilla was dark gray or blackish. The mandible varied in its tendency to be solid dark gray (concolor with the maxilla) to two-toned with the base paler gray or fleshy gray. The tarsi and feet were blue-gray or light gray, but became much darker after death. None of the variability in soft part coloration showed any obvious relationship to sex or degree of skull ossification. Three specimens of *S. h. bejaranoi* with soft part color data show no differences from *S. h. harterti* in iris or tarsus color, but the mandibles of all three were described as paler than the maxillae with no indication of being bicolored.

Species Limits in *Schizoeaca* and Patterns of Geographic Variation

Vaurie (1971, 1980) considered the six *Schizoeaca* species recognized by Cory and Hellmayr (1925), Peters (1951), and Meyer de Schauensee (1966) to be members of a single polytypic species, *S. fuliginosa*. The reasons for changing the established taxonomy were primarily subjective and

direct relation to

(1980:73) stated that "My opinion that they are conspecific is based on their morphology, distribution, and ecology." As for morphology, Vaurie's (1980:73) statement that each form "differs only by various combinations of the same characters developed to greater or lesser degree" is misleading in giving the impression of gradation among the forms, when in fact each set of "combinations" is unique to each previously recognized species with virtually no tendency towards intergradation. Vaurie ignored the substantial size differences among the forms (up to 41% difference in mean body weight; Table 2) that themselves could act as isolating mechanisms. These differences counter Bergmann's Rule for within-species latitudinal variation; in this genus, the largest forms are found closest to the equator. Neither the allopatric distribution of the taxa nor their ecological similarity provides definite information concerning species limits. Furthermore, *S. helleri* (Parker and O'Neill, 1980) and *S. harterti* both extend in elevational distribution well below the timberline zone to which several of the other forms seem to be restricted (O'Neill and Parker 1976; Vuilleumier and Ewert 1978).

Vaurie (1980) did not discuss any behavioral or plumage differences that bear more directly on the question of isolating mechanisms. Although knowledge of vocalizations in this genus is incomplete, some comparative information on songs and calls is available. Call notes are very similar in several species (Parker and O'Neill 1980), but the songs of several taxa differ: T. A. Parker (pers. comm.) has found that the songs of *S. f. fuliginosa* and *S. f. plengei* are very similar, but those of *S. griseomurina* and *S. helleri* differ rather substantially from those of *S. fuliginosa* and from each other. In October 1980 T. S. Schulenberg (pers. comm.) obtained little response from breeding *S. helleri* in Dpto. Puno, Peru, to playbacks of songs of *S. fuliginosa plengei* from Dpto. La Libertad. In the first trial, a silent bird already moving toward the observer continued in the same direction when the *plengei* tape was turned on; it approached to within a few feet and then continued in the original direction without giving any vocal or visual responses. In the second trial, a *plengei* tape was played at ca. 15 sec intervals intermittently for 5 minutes to an already singing *helleri*, which continued to sing without changing its song or approaching more closely. Brief periods of silence seemed to be terminated in response to the playback, but this was the only reaction that could be interpreted as a response. At the end of the 5 minutes no further singing occurred and no further approach was observed. Although certainly not conclusive concerning species status (especially as no *helleri* recordings were available for testing intraspecific response), these trials provide no evidence for conspecificity.

Several species of *Schizoeaca* have colored throat patches that seem similar in feather structure to those found in many species of *Synallaxis* and *Asthenes*, several of which display these erectile feathers during intraspecific interactions (pers. obs.). Some species of *Asthenes* and *Synallaxis* are

Table 2.—Body weight (grams) of nine forms in the genus *Schizoeaca*[1].

	Mean[2]	SD	Range	N
S. coryi[3]	16.8	0.87	15.5–17.5	4
S. f. fuliginosa[3]	18.5	—	18–19	2
S. f. peruviana	16.8	1.61	14–19.3	20
S. f. plengei	18.5	1.19	17–21	22
S. griseomurina	17.1	1.35	15.1–19.0	9
S. v. ayacuchensis	18.0	—	17.8–18.2	2
S. helleri	15.0	1.20	13.0–17	13
S. h. harterti	13.1	1.04	10.8–15.5	23
S. h. bejaranoi	13.7	0.59	13.1–14.3	4

[1] All weights taken from specimens at LSUMZ except those for *S. h. bejaranoi*. Both sexes are included in the samples.
[2] All means are significantly different (Mann-Whitney U-test, $P < .05$) except for *S. griseomurina* vs. *S. f. plengei* or *S. f. peruviana* and *S. f. plengei* vs. *S. f. peruviana* (excluding comparisons involving *coryi*, nominate *fuliginosa*, *ayacuchensis*, and *bejaranoi*).
[3] Weights from Vuilleumier and Ewert (1978).

than are the species of *Schizoeaca*. Perhaps differences in throat coloration within *Schizoeaca*, in concert with differences in facial pattern, could act as isolating mechanisms if secondary contact were to be established. Weak as these arguments are, they would seem to carry at least as much weight as those presented by Vaurie.

In light of the above arguments, I feel that the long-established species limits should be followed until some pertinent data are produced concerning isolating mechanisms. I propose recognizing eight species of *Schizoeaca*: the six species recognized by earlier authors, *coryi, fuliginosa* (with 4 races including *fumigata* [Borrero, 1960] which was apparently overlooked by Vaurie), *griseomurina, palpebralis, helleri,* and *harterti* (with 2 races); *S. perijana* (Phelps, 1977); and *S. vilcabambae* (Vaurie et al., 1972; here tentatively raised to species status and including *ayacuchensis* of the same authors to form another polytypic species).

The species of this genus, with their strong tendency for differentiation in isolation, are excellent subjects for the study of patterns of evolution in the Andes. Rather than standard clinal variation, this genus shows a rather chaotic pattern of character distribution. For example, two disjunct subspecies of *S. fuliginosa* (*S. f. fuliginosa* in northern Ecuador and *S. f. peruviana* in northern Peru, which differ from one another in only minor ways) are separated from one another by the very different *S. griseomurina*, which occupies the intervening region. Thus *griseomurina* separates two populations obviously more closely related to one another than either is to *griseomurina*. This pattern is also shown by *Diglossa carbonaria* (Vuilleumier, 1969b; Graves, 1981) and several other Andean bird taxa (Remsen, in prep.).

Similarly, two forms close to the latitudinal extremes of the range of the

genus, *S. coryi* and *S. harterti*, share a buffy eyebrow, ochraceous cheek, rusty-tinged breast, and small size not shown by the eight geographically intervening forms. Squamation on the breast appears in *S. p. plengei*, *S. v. ayacuchenis*, and *S. v. vilcabambae*; *plengei* is separated from the other two by an intervening, non-squamated form, *S. palpebralis*. Similarities between *S. griseomurina* and *S. palpebralis*, separated from each other by *S. f. peruviana* and *S. f. plengei*, have already been pointed out by O'Neill and Parker (1976).

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Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 70893.

Note added in proof.—Fieldwork in July–August 1981 (at 1 km S Chuspipata, 3050 m, Dpto. la Paz, Bolivia) showed that *Schizoeaca harterti* and *Synallaxis azarae* are syntopic from about 2900 to 3075 m, indicating that these two species are not altitudinal replacements and may not be ecologically similar as implied on p. 1070. Eleven specimens (8 skins, 3 skeletons, all LSUMZ) of *S. h. harterti* were collected at this locality; none was in breeding condition.