

SHARP, D. E., AND J. T. LOKEMOEN. 1987. A decoy trap for breeding-season Mallards in North Dakota. *Journal of Wildlife Management* 51:711-715.

TITMAN, R. D. 1983. Spacing and three-bird flights of Mallards breeding in pothole habitat. *Canadian Journal of Zoology* 61:839-847.

WEIDMANN, U. 1990. Plumage quality and mate

choice in Mallards (*Anas platyrhynchos*). *Behaviour* 115:127-141.

WEIDMANN, U., AND J. DARLEY. 1971. The role of the female in the social display of Mallards. *Animal Behaviour* 19:287-298.

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Distinctive Song of Highland Form *maculicollis* of the Red-winged Tinamou (*Rhynchotus rufescens*): Evidence for Species Rank

SJOERD MAIJER¹

Ter Meulenplantsoen 20, 7524 CA Enschede, The Netherlands

The highland subspecies *maculicollis* of the Red-winged Tinamou *Rhynchotus rufescens* is known only from a small number of museum specimens. No life history data have been published. Herein I describe the highly distinctive song of this form. The song was a mysterious sound that I heard and tape recorded in several localities in the Bolivian Andes. I finally tracked down a singing bird in December 1993, near Inquisivi, departamento La Paz, Bolivia.

Rhynchotus rufescens maculicollis occurs on grassy mountain ridges in the eastern Andes of Bolivia and northwestern Argentina at 1,000 to 3,500 m (Fjeldså and Krabbe 1990). The other subspecies of this bird are widely distributed in grassland habitats south of the Amazon, from extreme southeastern Peru to central Argentina, mostly in the lowlands but also in the highlands of eastern Brazil (Sick 1993).

A sonogram from Inquisivi and sonograms of two different birds recorded near Vallegrande, departamento Santa Cruz, are shown in Figures 1A, B, C. The song is aptly described by the local name of the bird,

¹ E-mail: 100046.537@compuserve.com

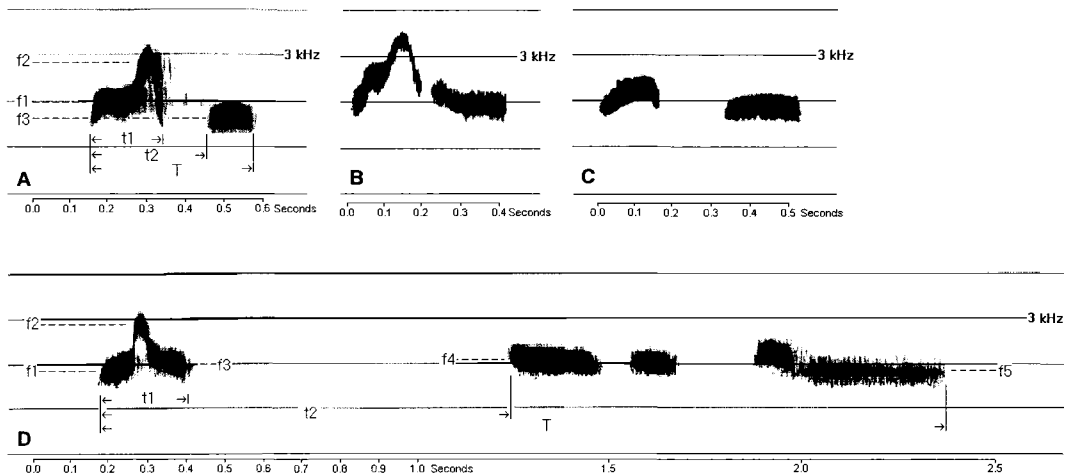


Fig. 1. Songs of *Rhynchotus (rufescens) maculicollis* (highland "race") and *R. r. rufescens* (one of three lowland races) recorded in Bolivia. Values for indicated variables are given in Tables 1 and 2. (A) *maculicollis*, Inquisivi, departamento La Paz (16°52'34"S, 67°11'42"W; 3,500 m), 12 December 1993; (B) and (C) *maculicollis*, Vallegrande, departamento Santa Cruz (18°39'30"S, 63°55'30"W; 2,400 m), 4 February 1993; (D) *r. rufescens*, Serrania de Huanchaca, departamento Santa Cruz (14°43'S, 60°30'W; 500 m), 19 April 1993.

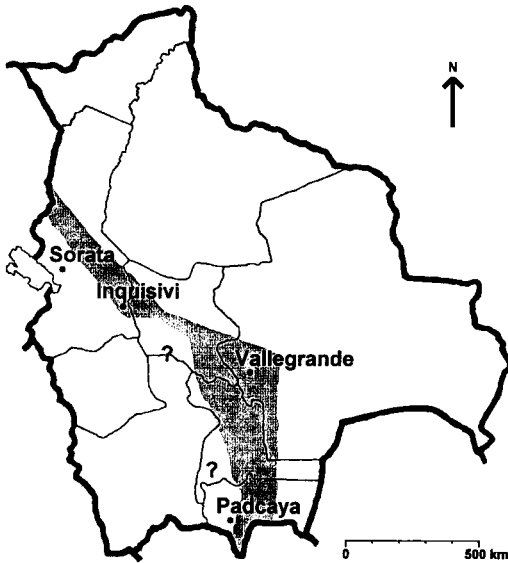


Fig. 2. Map of Bolivia with four highland localities where songs of *Rhynchotus (rufescens) maculicollis* recorded. Known distribution area is shaded.

"huayco," used both in the Inquisivi area and in the southern departamento of Tarija. The song carries a long distance. When the bird sings from a grassy mountain ridge, the song is audible throughout the valley below.

I also have tape recordings from near Sorata, departamento La Paz, at the northern end of the Cordillera Real, and from southeast of Padcaya, departamento Tarija, within 25 km of the Argentinean border. These recordings indicate that *maculicollis* has the same song type all along the eastern Bolivian Andes (Fig. 2). It is highly probable that birds in northwestern Argentina have the same song as well, although morphological differences between specimens from Tucumán, Argentina and from *terra typica* in Bolivia suggest differentiation of local populations (Fjeldsá and Krabbe 1989).

Data on durations and frequencies of *maculicollis* songs are given in Table 1. The two song notes vary conspicuously in "shape" (Figs. 1A, B, C). The difference between songs of the two individuals recorded at Vallegrande (Figs. 1B, C) is especially noticeable, even more so because they were neighbors, taped on the same recording. Even so, all *maculicollis* songs follow the same general pattern of two short notes, the first modulated and the second "flat" and less loud than the first.

The three other subspecies of *R. rufescens* have a different song from that of *maculicollis*; an example is shown in Figure 1D. The first note of this song resembles the first note of the *maculicollis* song in being loud, short, and similarly modulated. The remainder of the song is strikingly different, however; instead of a short note immediately after the first one, there is a long pause of up to 1 s, followed by three melancholic whistles (the second of which is short). This song is described aptly by the Portuguese phrase "Eu, nunca mais" (Sick 1993). This song is the same throughout the extensive range of the three other subspecies (Narosky and Yzurietta 1989, Straneck 1990, Hardy et al. 1993, Sick 1993). I also heard this song in various localities in the departamento of Santa Cruz, Bolivia.

Data on durations and frequencies of these songs are listed in Table 2. As in *maculicollis*, the "shape" of the four song notes varies considerably. Also as in *maculicollis*, I heard song differences between birds in the same locality at the same time. Apart from the obvious difference in "melody" between highland and lowland songs, there also seems to be a difference in loudness. As indicated earlier, the song of *maculicollis* is far-carrying. The sound may seem to come from quite nearby, but the bird actually may be 2 km away. My impression is that the lowland song is weaker, but I never actually located a singing bird.

The difference in song loudness, if real, could be explained as an adaptation to an overall difference in population density. The highland subspecies lives on grassy ridges, which often are rather narrow (with each bird occupying a considerable stretch of ridge)

TABLE 1. Song parameters for *Rhynchotus (rufescens) maculicollis* from various localities in Bolivia (see Fig. 1A for parameter definitions). Each row contains data from a single bird; *n* is number of songs used for measurements. Data are means (range in parentheses). All songs recorded by author except at Sorata (recorded by Rolf de By).^a

Location	<i>n</i>	Length (ms)			Frequency (Hz)		
		<i>t</i> ₁	<i>t</i> ₂	<i>T</i>	<i>f</i> ₁	<i>f</i> ₂	<i>f</i> ₃
Sorata	1	193	416	474	2,050	3,500	1,800
Inquisivi	13	183 (174–192)	303 (294–308)	396 (375–418)	1,960	2,900	1,640
Vallegrande A	2	188	215	417 (413–422)	2,050	3,350	1,950
Vallegrande B	1	147	317	529	1,950	2,400	1,900
Padcaya	2	185 (155–215)	370 (360–380)	510 (470–550)	2,400	3,200	1,850

^a Recording data: Sorata, departamento La Paz (15°46'S, 68°38'W; ≥2,700 m), 21 December 1991; Inquisivi, departamento La Paz (16°52'34"S, 67°11'42"W; 3,500 m), 12 December 1993; Vallegrande, departamento Santa Cruz (18°39'30"S, 63°55'30"W; 2,400 m), 4 February 1993; Padcaya, departamento Tarija (21°54'S, 64°34'W; 3,350 m), 17 October 1992.

TABLE 2. Song parameters for lowland subspecies of *Rhynchotus rufescens* from three widely separated localities (see Fig. 1D for parameter definitions). One song measured at each locality.

Location	Length (ms)			Frequency (Hz)				
	t1	t2	T	f1	f2	f3	f4	f5
Bahia, Brazil ^a	180	1,160	2,220	2,050	3,200	2,100	2,300	2,000
Huanchaca, Bolivia ^b	220	1,060	2,180	1,800	2,900	2,000	2,050	1,800
Entre Ríos, Argentina ^c	300	1,100	2,050	1,700	2,700	2,200	2,200	1,800

^a Subspecies *catingae* or *rufescens*; recorded Capím Grosso, 24 January 1974, by Jacques Vieillard (Hardy et al. 1993).

^b Subspecies *rufescens*; recorded Serranía de Huanchaca, departamento Santa Cruz (14°43'S, 60°30'W; 500 m), 19 April 1993, by author.

^c Subspecies *pallascens*; recorded P. N. El Palmar, October, year unknown (Straneck 1990).

and far away from the next ridge on the other side of the valley. Thus, the birds typically live quite far apart. Another indication of its low density is that I never heard more than two singing *maculicollis* at the same time, and usually only one. Lowland populations occur in much higher densities. Sick (1993) wrote that they were "formerly abundant" in suitable habitats in Brazil. My own experience in suitable habitats in Bolivia is that, more often than not, several singing birds are heard at the same time. The louder song of *maculicollis* would facilitate communication with its rivals (and with prospective mates).

The songs of most tinamou species are surprisingly uniform (Hardy et al. 1993). The song differences between *maculicollis* and the lowland populations of *R. rufescens* are as great as between closely related species in other tinamou genera (pers. obs.). Although individual songs vary (Figs. 1A, B, C), this variation is minor compared with the difference between lowland and highland populations. In my judgment, the difference is too great to be considered as dialectal.

In Bolivia, the highland and lowland populations appear to be separated everywhere by extensive foothill forests, and sympatry is not likely to exist anywhere. Judging from published distribution maps (Narosky and Yzurieta 1989, Fjeldsá and Krabbe 1990), highland and lowland populations probably are allopatric in Argentina also.

In the original description of *maculicollis*, Gray (1867) treated it as a separate species (in agreement with the species concept of that time). In accordance with the tendency toward lumping in the early 20th century, however, Peters (1931) treated *maculicollis* as a subspecies, although it has been recognized as a "strongly marked highland race" (Blake 1977:55). I am not aware of any supporting evidence for lumping *maculicollis* with *R. rufescens*. Based on the exclusive ecological zone inhabited by this form, and its distinctive vocalizations, I suggest that species rank be reconsidered. If *maculicollis* is reinstated as a full species, I propose the English name Huayco Tinamou.

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LITERATURE CITED

- BLAKE, E. R. 1977. Manual of Neotropical birds, vol. 1. University of Chicago Press, Chicago.
- FJELDSÁ, J., AND N. KRABBE. 1989. An unpublished major collection of birds from the Bolivian highlands. *Zoologica Scripta* 18:321-329.
- FJELDSÁ, J., AND N. KRABBE. 1990. Birds of the High Andes. Zoological Museum, Copenhagen and Apollo Books, Svendborg, Denmark.
- GRAY, G. R. 1867. 2. *Rhynchotus*. List of Specimens of Birds in the Collection of the British Museum 5:102.
- HARDY, J. W., J. VIEILLARD, AND R. STRANECK. 1993. Voices of the tinamous. ARA Records, Gainesville, Florida [cassette tape].
- NAROSKY, T., AND D. YZURIETA. 1989. Birds of Argentina and Uruguay. A field guide. Vazquez Mazzini Editores, Buenos Aires, Argentina.
- PETERS, J. L. 1931. Check-list of birds of the world, vol. 1. Harvard University Press, Cambridge, Massachusetts.
- SICK, H. 1993. Birds in Brazil, a natural history. Princeton University Press, Princeton, New Jersey.
- STRANECK, R. 1990. Canto de las Aves Pampeanas I. Literature of Latin America, Buenos Aires, Argentina [cassette tape].

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