

SHORT COMMUNICATIONS

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NOTES ON THE VOCALIZATIONS OF THE MEXICAN CHICKADEE

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AND

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The natural history of the Mexican Chickadee (*Parus sclateri*), which nests in the United States only in the upper reaches of mountain ranges in southeastern Arizona and adjacent New Mexico, has received scant attention. Although this species was considered by Snow (1956) to be closely allied to the Black-capped and Carolina chickadees (*P. atricapillus* and *P. carolinensis*), descriptions (e.g., Peterson 1961:212) suggest that its vocalizations are aberrant within the group. R. T. Peterson (quoted by Brandt 1951:601) observed that "instead of clear whistling notes, the bird sings a nasal 'dzay dzee,' so low in pitch that this seems to belong to a much larger bird and is not chickadee-like at all". J. T. Marshall (*in Pough 1957:195*) commented on variations in the songs, characterizing a common version as "ka-breee, ka-breee, ka-breee." He noted that the voice of *P. sclateri* was "quite different" from that of the Mountain Chickadee (*P. gambeli*). In view of these apparent departures from the norm for the North American gray-backed chickadees, we endeavored to obtain tape recordings of the vocalizations of the Mexican Chickadee during the breeding season.

METHODS

Visits to the Chiricahua Mountains of southeastern Arizona were made by Dixon, 25-28 April 1968, and by both of us, 15-19 April 1972. These dates may be compared to that for the earliest set of chickadee eggs from this locality (10 May) reported by Brandt (1951:673). On the first visit, when we were stopped by persisting snowbanks, chickadees were inconspicuous and few recordings were obtained. In 1972 we played back tape-recorded vocalizations to the chickadees, and recorded the responses of individuals occupying five contiguous territories. Most of the recordings were made at Rustler Park, 2,590 m elevation, 17 and 19 April 1972 using a Nagra III BH recorder at 19 cm/s. The sounds were analyzed on a Kay Electric Co. Sona-Graph, Model 661 A, using a wide band-pass filter. After some 70 representative sonograms were made, we listened to the tapes again to review aspects of the birds' encounters. In addition, we reviewed tape recordings of Mexican Chickadee vocalizations made in the Chiricahuas in May 1977, by investigators from Cornell University.

RESULTS AND DISCUSSION

A call considered representative of the species and corresponding to the "chickadee dee" call of *P. atricapillus* appears as Figure 1a. The distinctive buzzy quality of the introductory notes is evident in this figure, which was recorded from a lone individual encountered at 1,525 m elevation in South Fork Canyon on 15

April 1972. The harsh "dee" notes are more prolonged and lack the overtone structure of those of the Black-capped Chickadee shown in Figure 1c. Vocalizations resembling this pattern were uttered by presumed females accompanying their mates at Rustler Park on 17 and 19 April. The pattern shown in Figure 1b was heard in only one case, after calls of the Figure 1a type were played back to the lone individual on 15 April. This figure is included here because the duration of the "dee" calls of this agitated individual is similar to those of *P. carolinensis* (Smith 1972:51) and of *P. atricapillus* (Fig. 1c).

Of particular interest are those vocalizations uttered by one member of each of several pairs in the coniferous forest in the vicinity of Rustler Park in response to simulated intrusion (= playback of vocalizations similar to Fig. 1a) or to the calling of neighbors. One of several distinctive sounds was a sequence of notes we dubbed "swehbegeet" (Fig. 2a). A version apparently unique to one individual appears in Fig. 2c. A series of syllables "peeta-peeta," resembling a song of the Plain Titmouse (*Parus inornatus*), occupies the first part of Figure (2b). The same syllable, coupled with an introductory component and repeated in slower cadence, constituted another pattern (2d). At least one individual used a sequence of notes (Fig. 2e) as a separate utterance, "sitchowee," although this sequence usually was a prefix to the common form of "swehbegeet" (as in Fig. 2a) and to "speetit-speetit" (Fig. 2d). In one bout this phrase was appended as a suffix.

These signals of the Mexican Chickadee are loud and ringing and can be heard readily for 150 to 200 m. They are well characterized by Chapman's (1898:38) observation from Veracruz: "The call of this titmouse is a rapid, vigorous double-noted whistle repeated three times, and not at all like the notes of *Parus atricapillus*."

Bouts of singing by one individual usually consisted of repetitions of one of these "themes." One chickadee on 19 April, provoked by broadcast vocalizations, uttered the "swehbegeet" pattern 31 times in three minutes of uninterrupted and (to our ears) unanswered calling. Occasionally an individual shifted to another form within a bout (as shown in Fig. 2b and c). However, there was little tendency of the responding individual to duplicate the motif of the bird initiating the exchange (Table 1). In this respect, the behavior of the Mexican Chickadee is similar to that found in *P. carolinensis* by Smith (1972:104).

The vocalizations shown in Figure 2 were used in territorial defense. One member of each of what we judged to be six pairs responded by approaching the source of broadcast signals while uttering one or another of those vocalizations. Those individuals aroused by the calling of neighbors moved toward what we inferred to be common boundaries for further exchanges of "motifs" from this general class of displays that had evoked the initial response. Thus these signals reflect "aggressive states" as asserted for the Carolina Chickadee by Smith (1972:91). However, the responses differ from those seen in Black-capped (Dixon and Stefanski 1970), Carolina (Smith 1972:33) and

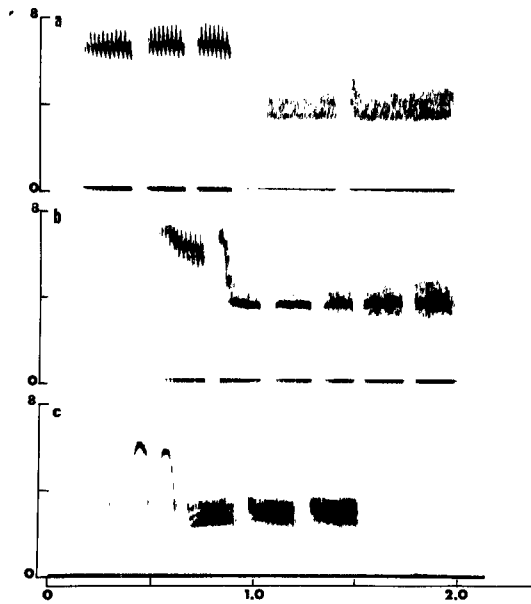


FIGURE 1. Audiospectrograms a and b are the calls of the Mexican Chickadee (see text); c, is the corresponding "chickadee-dee" call of the Black-capped Chickadee. The values on the ordinate refer to frequency in kHz; those on the abscissa, time in seconds.

Mountain (Dixon 1972) chickadees, in which the vocalizations eliciting the approach of the rivals were not those uttered in the subsequent confrontations along the boundary. In these other gray-backed chickadees, those vocalizations, usually transliterated as "fee-bee" and considered to be the songs, serve chiefly to attract the skirmishers to a common boundary. Although this song may be uttered throughout the day, its common use is in a "dawn song" context. Similarly, on 27 April 1968 and 19 April 1972, the "peeta-peeta" vocalization (Fig. 2b) was uttered as a dawn song while the sun was rising. Inasmuch as the "peeta-peeta" vocalization is used interchangeably with the other "aggressive state" signals, and functions both in attracting a rival to a

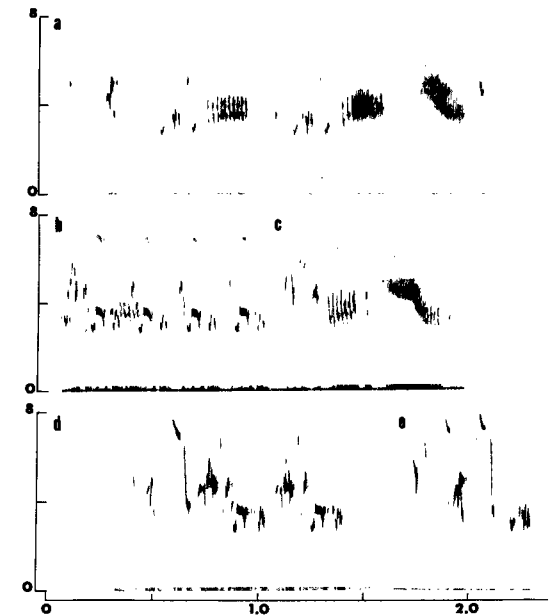


FIGURE 2. Audiospectrograms of vocalizations uttered by Mexican Chickadees during territorial disputes. a, "swehbegeet swehbegeet cheeyay;" b, "peeta-peeta" shifting (c) to "swehbegeet cheeyay;" d, "speetit-speetit" (compare to b); e, "sitchowee."

boundary and in reiterating boundaries from a distance, we consider them to be the songs of the Mexican Chickadee. Strikingly absent from the exchanges we witnessed on 17 and 19 April 1972 were any vocalizations resembling the sustained pure tones of the "fee-bee" song of the Black-capped Chickadee (see Dixon and Stefanski 1970:Fig. 1). In this respect our findings match those of Peterson quoted above. R. P. Balda (pers. comm.) likewise stated that he did not recall having heard such an utterance from the Mexican Chickadee during visits to Rustler Park in May in each of several years. The rate of delivery and manner of singing of four individual Mexican Chickadees recorded by J. L. Gullede and associates in the Chiricahua Mountains 24-27 May 1977 (presumably during incubation) reflect the responses described above.

Careful scrutiny leads us to suggest that there are certain similarities in the form of constituent notes of

TABLE 1. Vocalizations given by Mexican Chickadees in response to broadcast or natural vocalizations of conspecifics.

Initial vocalization	Answering vocalization				
	see zay zay	swehbegeet	speetit	peeta-peeta	sitchowee
Broadcast					
see zay zay (Fig. 1a)	0	1	0	0	0
swehbegeet (Fig. 2a, 2c)	0	0	1	3	0
Spontaneous					
swehbegeet (Fig. 2a, 2c)	0	3	0	2	0
speetit-speetit (Fig. 2d)	0	3	0	0	0
peeta-peeta (Fig. 2b)	0	1	0	0	0
sitchowee (Fig. 2e)	0	0	0	1	0
Responder answered with same vocalization (motif)	3				
Responder answered with different motif	12				
Total Responses	15				

some of the vocalizations of several species of *Parus*. In particular, there are resemblances among elements of the "sitchowee" of *P. sclateri*, "T-slink" of *P. carolinensis* (Smith 1972:24-26), "musical call" and components of the "trilled call" of *P. hudsonicus* (McLaren 1976), and one of the songs of the Plain Titmouse (Dixon 1969:Fig. 2a). A more general trait is the tendency for repetition of a syllable several times within an utterance, a pattern that Thielcke (1968) found characteristic of the organization of songs of many species of *Parus*. Such repetition is evident in *P. sclateri* in which the loudness of the songs and the pattern of boundary defense appear to parallel those of the Plain Titmouse (Dixon 1969). In both species loud song advertises the presence of males and serves for repelling intruders at a distance or for defending boundaries in close encounters. In the Black-capped Chickadee, song is less readily located (Ficken et al. 1978:44) and territories are not proclaimed regularly (Brewer 1961:355). Furthermore, the boundaries shrink as the breeding cycle advances (Stefanski 1967). From the structural features of the songs of the Mexican Chickadee and the manner of response of the males to their neighbors' singing, we infer in this species a system in which territorial boundaries are more precise than those of the Black-capped Chickadee, and are maintained by repeated signalling from a distance rather than by recurring skirmishes.

SUMMARY

Vocalizations of Mexican Chickadees, tape-recorded in the Chiricahua Mountains, Arizona, are described with the aid of audiospectrograms. The "chickadee dee" call is characterized by buzzy introductory notes, and the energy in the "dee" notes is not concentrated in distinct bands. Several signals exchanged by breeding males consist of repetitions of complex syllables. The same utterances that attract rivals to a common boundary are used in the skirmishes that follow, and one also in dawn singing. Accordingly, these are considered the territorial advertising songs of this species. Thus the pattern of singing in the maintenance of territories differs from that of the other gray-backed North American chickadees in which a "whistled" song attracts neighbors to boundaries but more complex vocalizations are delivered in the subsequent encounters. A "whistled" song has not been confirmed in the Mexican Chickadee.

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INCIDENCE OF DISTRESS CALLS IN MIST-NETTED BIRDS

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In most species of passerine birds some individuals give distress calls when captured by a predator or when handled by a human in a mist net. Distress vocal-

izations are distinct from the mobbing and alarm calls of free birds, being typically harsh and easily located (Stefanski and Falls 1972). The percentage of individuals that call differs widely among species (Norris and Stamm 1965, Rohwer et al. 1976, Balph 1977, Perrone, in press). We asked whether this percentage also differs between samples of a single species when handled by different observers.

We analyzed the behavior of mist-netted birds at Finca Las Cruces (1,300 m elevation), 6 km south of San Vito, Puntarenas Province, Costa Rica. Sebastian Patti worked in late February and Andrea Meyer continued at the same place from 18 March-11 April 1975. These are dry-season dates, when breeding is minimal.