

GROUP SIZE AND NESTING IN THE RUFIOUS-VENTED CHACHALACA (*ORTALIS RUFICAUDA*) IN NORTH AND CENTRAL VENEZUELA

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Abstract. I recorded data on group sizes and nesting habits of Rufous-vented Chachalacas (*Ortalis ruficauda*) at two locations in north-central Venezuela. Three types of chachalaca group associations were described: basic unit, family group, and flock. Observed group sizes were significantly different between the reproductive season (2.7 ± 1.5 individuals) and the non-reproductive season (3.7 ± 1.8 individuals), although the mode for both periods was 2 individuals. Nests of Rufous-vented Chachalacas are not elaborate and appear to be made with material found near the nest site. These birds do not seem to be specialists in their requirements for nesting.

Resumen. En el presente trabajo recolecté información sobre tamaños de grupo y hábitos de anidación de la Guacharaca del Norte (*Ortalis ruficauda*) en dos localidades de la zona centro-norte de Venezuela. Fueron descritas tres tipos de asociaciones grupales para la especie: la unidad básica, el grupo familiar y la bandada. Los tamaños de grupo observados fueron significativamente diferentes entre la estación reproductiva (2.7 ± 1.5 individuos) y la no reproductiva (3.7 ± 1.8 individuos), aunque la moda para ambos períodos fue de 2 individuos. Los nidos de las Guacharacas del Norte no son muy elaborados y parecen ser construidos con materiales encontrados alrededor del sitio de anidación. Estas aves no parecen ser especialistas en sus requerimientos para anidación. *Aceptado el 12 de Febrero de 1998.*

Key words. Rufous-vented Chachalaca, *Ortalis ruficauda*, Cracidae, chachalaca, guacharaca, nesting, group size, Venezuela.

INTRODUCTION

The family Cracidae (Galliformes), is restricted to the Neotropics from north-central Mexico to southern Uruguay and northern Argentina (Delacour & Amadon 1973). Cracids range in size from chachalacas (genus

Ortalis: 400–750 g) to curassows (genera *Crax*, *Mitu*, *Pauxi*, and *Notbocrax*: 2.0–3.5 kg) (Silva & Strahl 1991). Chachalacas (*Ortalis* spp.) are the smallest and most abundant members of the Cracidae. They generally do not inhabit humid forests, as do the rest of the genus, preferring instead thickets, bushy borders of streams, or the low woodlands typical of the drier parts of the tropics (Schaefer 1953, Delacour & Amadon 1973). A few papers have described the habits and reproductive behavior of *Ortalis* (Haverschmidt 1956,

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Skutch 1963, Fleetwood & Bolen 1965, Lapham 1970, Schmitz-Ornés 1991, Schmitz-Ornés in press, K. J. Simas, unpubl.). Marion & Fleetwood (1974, 1978) and Marion (1975, 1976, 1977) carried out the most complete study of the ecology of the Plain Chachalaca (*O. vetula*) in Texas. Chachalacas are mainly frugivorous and herbivorous, eating soft fruits, seeds, flowers, green shoots and leaves (Vaurie 1968, Delacour & Amadon 1973, Arriaga & Bermudez 1988). Their breeding season seems to coincide with the beginning of the rainy season (Schaefer 1953), and for the Rufous-vented Chachalaca may also be related to an increase in photoperiod (Arriaga & Bermudez 1988). Chachalacas usually lay between two and four eggs, although large clutches (nine eggs from three different females of *O. vetula*), which may be the result of intraspecific egg parasitism, have been reported (Fleetwood & Bolen 1965).

The family Cracidae is widely recognized as the most hunted of all avian families in Latin America (Redford & Robinson 1987), becoming also the most endangered avian group in the region (Delacour & Amadon 1973, Silva & Strahl 1991). Information on their natural history is needed for development of conservation plans (e.g., Strahl & Grajal 1991). In fact, due to the status of many of their populations, the species of the genus *Ortalis* may be the only ones in the family in which the developing of management programs would be in order to conserve them. Very limited information, is available on the biology of the Rufous-vented Chalaca (*O. ruficauda*) (Lapham 1970, Schmitz-Ornés 1991). Therefore, from 1988 to 1990, a study was conducted on one species of cracid, the Rufous-vented Chachalaca in different areas of north-central Venezuela (Schmitz-Ornés 1991). The objectives of that study were to compare the effects of human impacts on densities of the species in areas under different degrees of human impact (Schmitz-Ornés

in press), and to record life history data that would complement that information. Here, I present information on the natural history of the Rufous-vented Chachalaca, with emphasis on group sizes and physical description of nests from two locations in Venezuela.

STUDY AREA

In 1988 (April-September), I worked at Fundo Pecuario Masaguaral (site A) a 10,000 ha cattle ranch bordering the Guárico river in central Venezuela at 6735'W, 0834'N, at an altitude of about 65 m (Schmitz-Ornés 1991). The vegetation of Masaguaral ranges from open *Copernicia* palm savannas with isolated woodlands and forests in the west to thick gallery forest along the Guárico river and Caracol Creek in the east (see Ewel *et al.* 1976). The climate in the Venezuelan llanos is strongly seasonal, with a six-month rainy season (May-October), a four-month dry period (December-March), and two months of transitional seasons. Annual rainfall over the past 25 years has been, on average, between 1400 and 1500 mm (Strahl & Schmitz 1990). The main environmental perturbation in this area is due to cattle ranching.

From June 1989 to July 1990, I worked at the experimental wildlife station of the Venezuelan Ministry of Environment (site B), which is located in the suburbs of the city of Maracay, Aragua State, at the border of Henry Pittier National Park (107,800 ha) at approximately 1019'N, 6739'W and an altitude of 515–630 m (Schmitz-Ornés 1991). The landscape includes a mosaic of habitats, with deciduous and semi-deciduous forest, secondary savannas, and "chaparrales" (Huber & Prance 1986). The savanna habitats are dominated by grass and short shrubs, comprising a mosaic of microhabitats. In more disturbed sites, introduced pasture grasses predominate, together with some forest trees that are typical of secondary forest. At higher elevations,

TABLE 1. Plants used as material to build the nests of Rufous-vented Chachalacas in the study areas A and B in central Venezuela. Number of nests: 10 in site A, 14 in site B.

Family	Species	Frequency	
		Area A	Area B
Gramineae	<i>Panicum maximum</i>	-	6
Smilacaceae	<i>Smilax</i> sp.	4	-
Malpighiaceae	<i>Byrsonima crassifolia</i>	3	-
Papilionaceae	<i>Machaerium</i> sp.	2	-
Annonaceae	<i>Annona jabnii</i>	2	-
Flacourtiaceae	<i>Casearia mollis</i>	1	-
Rubiaceae	<i>Randia formosa</i>	1	-
Flacourtiaceae	<i>Hecastostemon completus</i>	1	-
Loranthaceae	<i>Phthirusa</i> sp.	1	-
	<i>Dendrophthora</i> sp.	-	1
Passifloraceae	<i>Passiflora serrulata</i>	1	-
Moraceae	<i>Ficus trigonata</i>	1	-
Sapindaceae	<i>Serjania mexicana</i>	-	1
Bignoniaceae	<i>Amphilophium paniculatum</i>	-	1
	Unidentified genus	3	-
	Unidentified vines	-	7

these savannas converge toward a deciduous forest (see Ramia 1967, 1981).

METHODS

I conducted systematic searches for nests in both study sites to record: 1) species and height of the supporting tree(s), 2) species of plants making up the nest structure, 3) height of the nest from the ground, and 4) dimensions of the nest (largest and shortest diameters). I pooled the data together after a comparison between the two areas revealed no significant differences.

In addition, I determined chachalaca group sizes in site B. When birds were heard calling in the field, the pitch of the voice was

used to identify their sex. I recorded the number of individuals that were within 20 m of each other during each bout of visual observation, and called this number the "group size". I used the Wilcoxon Rank Sum test ($P \leq 0.05$) (SAS 1988) to compare group sizes between reproductive and non-reproductive periods.

Due to the characteristics of the terrain and the lack of banded birds, it was impossible to determine the home ranges of the groups. In addition, chachalaca young tend to reach adult shape and size in approximately 3 months (pers. observ.), a fact which made it difficult to understand the social structure of this species, since juveniles could easily be mistaken as adults.

TABLE 2. Plants directly supporting the nests of Rufous-vented Chachalacas in the study areas A and B in central Venezuela. Number of nests: 10 in site A, 14 in site B.

Family	Species	Frequency as			
		principal species		associated species	
		Site A	Site B	Site A	Site B
Malpighiaceae	<i>Byrsonima crassifolia</i>	3		-	
Vitaceae	Unidentified genus	-	3		-
Mimosaceae	<i>Acacia</i> sp.	-	2	-	-
Papilionaceae	<i>Machaerium biovolatum</i>	2	1	-	-
Smilacaceae	<i>Smilax</i> sp.	1		2	
Annonaceae	<i>Annona jabnii</i>	1		2	
Flacourtiaceae	<i>Casearia mollis</i>	1		1	
Rubiaceae	<i>Randia formosa</i>	1		1	
	<i>Guettarida divaricata</i>	-	1	-	-
Moraceae	<i>Ficus trigonata</i>	1		-	
(Palmae)	<i>Copernicia tectorum</i>	-		1	
Sterculiaceae	<i>Guazuma ulmifolia</i>	1		-	
Mimosaceae	<i>Albizzia</i> sp.	1		-	
Bombadaceae	<i>Pachira insignis</i>	-	1	-	-
Malpighiaceae	<i>Byrsonima coecolobrefolia</i>	-	1	-	-
Anacardiaceae	<i>Astronium graveolens</i>	-	1	-	-
	<i>Anacardium occidentale</i>	-	1	-	-
	<i>Spondias mombin</i>	-	1	-	-
Leguminosae	Unidentified genus a	1	1	-	-
	Unidentified genus b	1		1	
	Unidentified genera	-	6	-	-

RESULTS

Group Size. During this study, three Rufous-vented Chachalaca group associations were observed. They can be described as follows: a) the "basic unit", the most common type of association observed, consisting of a male and a female who usually called in duets during mornings and evenings; b) the "family

group," consisting of a breeding pair and associated juveniles and young that usually shared the same sleeping site; and c) the "flock", consisting of two or more pairs or family groups that shared a general area and foraged together.

I found ten "sleeping sites" in study area B, where family groups perched close together on a branch (usually 2 or 3 adults,



FIG. 1. Top: Nest of Rufous-vented Chachalacas (*Ortalis ruficauda*) found in a disturbed, grassland habitat in El Limón, Aragua State, Venezuela. Bottom: Close up of the nest with three eggs.

plus 2 or 3 young). They spent the night in that same place, and usually used the same site for several consecutive days.

The mean group size (\pm SD) was 3.1 ± 1.7 individuals ($n = 197$). However, the mode was 2 individuals, indicating that adults typically occurred in pairs. Group sizes were sig-

nificantly different between the reproductive season (February-August) with a mean of 2.7 ± 1.5 individuals ($n = 122$), and the non-reproductive season (September-January) with a mean of 3.7 ± 1.8 individuals ($n = 75$); however, the mode for both periods was still 2. It is important to point out that only

adults were counted in group size determinations, due to the difficulty of watching young, which in most cases was not possible.

Nesting habits. Advanced active nests were first found on 21 and 29 April. The first young were found May (11th). Twenty five nests were found and measured in the two study sites. Nests were generally supported by one or two main plant species and surrounded directly by associated species. Nests were composed of dry sticks and leaves from the plants directly around them (main and associated trees), although, frequently, a group of tangled vines was used as nest support. Some pairs used grass from the area around the nest, folding it toward the center to make a structure comparable to a basket (Fig. 1). In general, nests were not elaborate and appeared to be made with material found near the nest site (see Tables 1–2). Mean nest height was 3.6 ± 1.8 m, and the supportive plants averaged 6.3 ± 2.1 m in height. Nest dimensions were 30.4 ± 5.2 by 24.9 ± 5.0 cm.

DISCUSSION

Group size. According to Marion (1976), Plain Chachalacas in Texas, become gregarious in fall and winter, forming feeding flocks that concentrate near food sources. In this study, Rufous-vented Chachalacas showed a similar pattern. During the non-breeding season (September-January) each flock tended to stay together most of the time, although basic units (pairs) were maintained within the flock. Even during the breeding season, however, it was possible to see large feeding flocks under mango trees (*Mangifera indica*). The smaller mean group size observed during the breeding season could have been a result of different pairs remaining separated and more independent during that period.

Cracids in general are thought to be territorial (Delacour & Amadon 1973), but little

has been written on the territorial behavior of the genus *Ortalis* other than Lapham's (1970) study of Rufous-vented Chachalacas and K. J. Simas's (unpubl.) study of White-bellied Chachalacas (*O. leucogastra*). Lapham (1970) reported that flocks appeared territorial. However, during the nesting period, pairs seemed to claim part of their flock's territory and to defend it vigorously. In the present study, Rufous-vented Chachalacas did not seem to be strongly territorial and agonistic encounters between flocks were never observed. Nevertheless, these chachalacas seemed to have the same home range in the long term. Each flock seemed to move around a general area throughout the year depending on food availability, since the latter usually coincides with the seasonality of the plant species in the area. According to observations made during this study and information received from local residents, groups of chachalacas may be seen in specific places at the same time each year. For these reasons, chachalaca flocks may have the same movement pattern each year.

Nesting habits. Rufous-vented Chachalacas have been reported to start nesting during the first rains of the year, which usually occur in May (Schaefer 1953, Lapham 1970, Delacour & Amadon 1973). The results of this study indicate that the nesting season did not start with the onset of the rains, but in April, a month earlier. Additionally, in the vicinity of the present study, Arriaga & Baquero (1988) found young during the first week of March, which means that adults had started mating at the end of January or the beginning of February. Arriaga & Baquero (1988), after a gonadal development study, concluded that the reproductive activity had started in February and extended to August and September.

Although most cracids seem to be sensitive nesters, reproducing only in undisturbed primary forest (Angier 1989), chachalacas are

an exception. Besides the nests reported in this study, Lapham (1970) reported three nests of Rufous-vented Chachalacas in the llanos of Venezuela in a habitat similar to that of Study site A. Two of the nests she studied were 15–25 m above the ground, built on a fork, giving them broad support. One of these two nests was on a *Pereskia guamacho* tree and the other on a *Pterocarpus podocarpus*. The third nest was 8.2 m high on an upper limb of a *Pterocarpus podocarpus* and made with dry leaves and grass (*Sporolobus indicus*). This grass was found in abundance along the forest paths and other cleared areas. Arriaga & Baquero (1988) reported two nests of the same species: one on a "cañafistola" (*Cassia moschata*) and the other one at ground level, built over "capín melao" (*Melinis minutiflora*) grass under a "chaparro" tree (*Curatella americana*). Friedmann & Smith (1955) found two of four nests of the Rufous-vented Chachalaca on the ground at the edge of grassy areas. In other locations in the llanos three nests were found on the ground (Gonzalez-Fernandez pers. comm.). Two other nests, found at no more than 2 m, were completely different, one being on the "Y" of a wire fence, and the other on the sagging mosquito netting covering a window, thus making a kind of basket (Gonzalez-Fernandez pers. comm.). According to Marion (1977), Plain Chachalacas nest exclusively in trees or in vines supported by trees. Rufous-vented Chachalacas clearly differ in their nest site selection from Plain Chachalacas.

In this study, searches for nests were mostly possible during the final stages of the nesting season when most of the nests were no longer active. For this reason, I was probably biased in my ability to find nests, and therefore was unlikely to find nests on the ground or on any other kind of unusual material. According to Marion & Fleetwood (1978), Plain Chachalacas nest extensively in old nests that they restructure or in nests of

smaller birds. During my study one Rufous-vented Chachalaca was found nesting in a dove's nest.

Chachalacas seem to be generalists and use different species of plants or other materials for nesting. For example, Gray-headed Chachalacas (*O. cinereiceps*), build their nests with whatever suitable material is most easily available, often using green vegetation (Skutch 1963). Rufous-vented Chachalacas nest in many different places, including sites that have been recently cleared and burned, which only have second growth vegetation. This flexibility constitutes an advantage for these species, since habitat suitable for them is disappearing quickly.

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