Hybridization between the Scarlet Ibis *(Eudocimus ruber)* and the White Ibis *(Eudocimus albus)* in Venezuela

CRISTINA RAMO AND BENJAMIN BUSTO

Universidad Nacional Experimental de los Llanos Occidentales
"Ezequiel Zamora", Guanare, Portuguesa State, Venezuela

Abstract.— We have recorded 40 mixed pairs and observed 14 mixed copulations between Scarlet and White Ibises in the Venezuelan Llanos. Considering the largely separate distributional ranges of both birds, we propose that this bird is a single species composed of two subspecies: *Eudocimus ruber ruber* and *E. ruber albus*. A hybrid zone exists in Colombia and Venezuela, which time separates and connects the populations of White Ibis (North and Central America) and the Scarlet Ibis (Guianas and Brazil). In Venezuelan Llanos the White Ibis population accounts for less than 10% of the total of the two forms.

Resumen.—Hasta la fecha se han registrado 40 parejas mixtas y observado 14 cópulas mixtas entre el Corocoro Rojo y Blanco en los Llanos de Venezuela. Considerando la distribución ampliamente separada de ambos corocoros, se propone la denominación de una sóla especie dividida en dos subespecies: *Eudocimus ruber ruber* y *E. ruber albus*, con una zona híbrida (Colombia y Venezuela) que al mismo tiempo separa y conecta la población de Corocoro Blanco (Norteamérica y Centroamérica) y de Corocoro Rojo (Guyanas y Brasil). En los Llanos de Venezuela el Corocoro Blanco no llega al 10% de la población total de corocoros.

Key words.—*Eudocimus albus*, *Eudocimus ruber*, hybridization , Scarlet Ibis, White Ibis.

Colonial Waterbirds 10(1): 111-114, 1987

In 1981, we observed 12 mixed pairs of White Ibis *(Eudocimus albus)* and the Scarlet Ibis *(Eudocimus ruber)* in a nesting colony in Portuguesa state, Venezuela. Considering the largely separate ranges of both species (Fig. 1), we tentatively proposed at these birds should be considered a single species composed of two subspecies. Linnaeus in his Systema Naturae (1758) described both ibises as *Scolopax rubra* and *Scolopax alba* on the same page, but the Scarlet Ibis was mentioned first, so we selected *ruber* as species name proposing that the species consisted of two subspecies, *Eudocimus ruber ruber* and *Eudocimus ruber albus* (Ramo and Busto 1982). After further observations of mixed pairs and evaluation of the reproductive

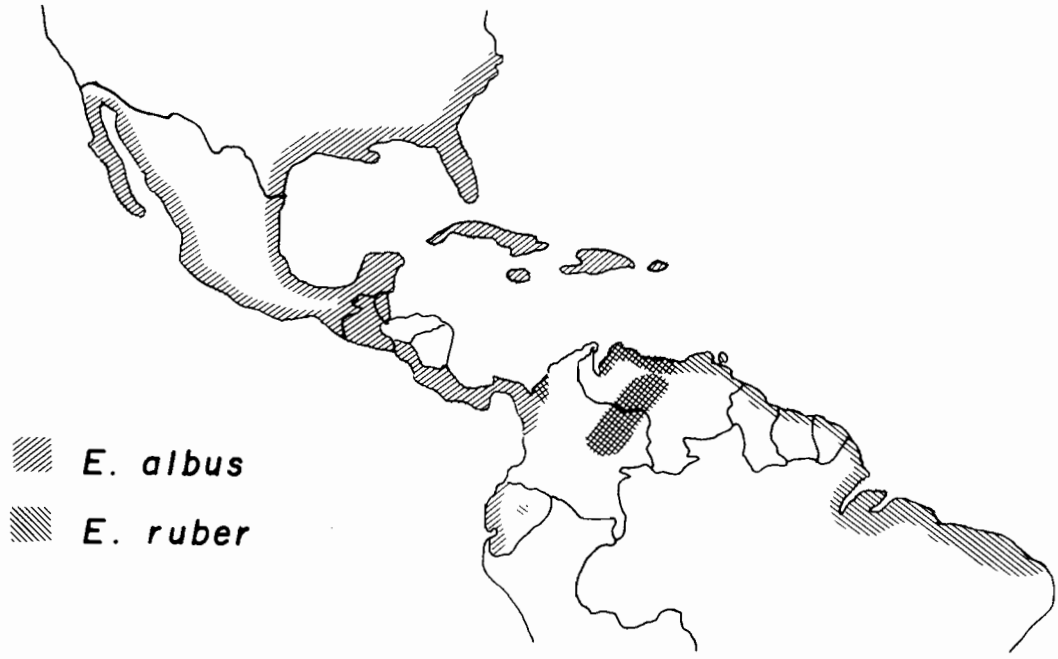


Figure 1. Distribution of Scarlet and White ibises.

behavior of the Scarlet and White Ibises in the Llanos of Venezuela (Ramo and Busto 1985), we wish to reaffirm our initial proposal concerning this change in taxonomic status.

In the fluctuating savanna of the Orinoco Llanos, both ibises appear to occupy the same ecological niche. They intermingle while feeding in the same places, fly together in the same formations, and occupy common roost and nesting colonies. There are no obvious differences in their diets (Aguilera pers. comm.), neither are there differences in reproductive behavior (Ramo and Busto 1985).

Within the population in the Llanos the percentage of White Ibis is much less than that of Scarlet Ibis. The percentage of White Ibis in roosts varies between 1.40% and 13.58%, the average being 7.28%. In censuses of feeding groups in the savanna, White Ibis comprise between 0.71% and 9.52% of the two ibises, with an average of 4.83% (Ramo and Busto 1982). During aerial censuses in 1983 and 1984, we located nesting colonies of this species (Fig. 2) (Ramo and Busto 1984 and unpub.) and calculated the percentage of White Ibises from aerial photographs. In that most of the colonies were mixed, assembleges of ibises and other white herons, to prevent confusion with White Ibis, we calculated the percentages of White and Scarlet Ibis from slides showing areas of the colony containintg ibis alone. The percentages of White Ibis found varied from 3.48 and 8.51, the average being 6.26 (Table 1). Thus it appears that White Ibis made up a small percentage of the ibis population, rarely exceeding 10%.

At the present time, we have recorded 40 mixed pairs of White and Scarlet Ibises (Table 2) and observed 14 mixed copulations between 1981 and 1984. The fact

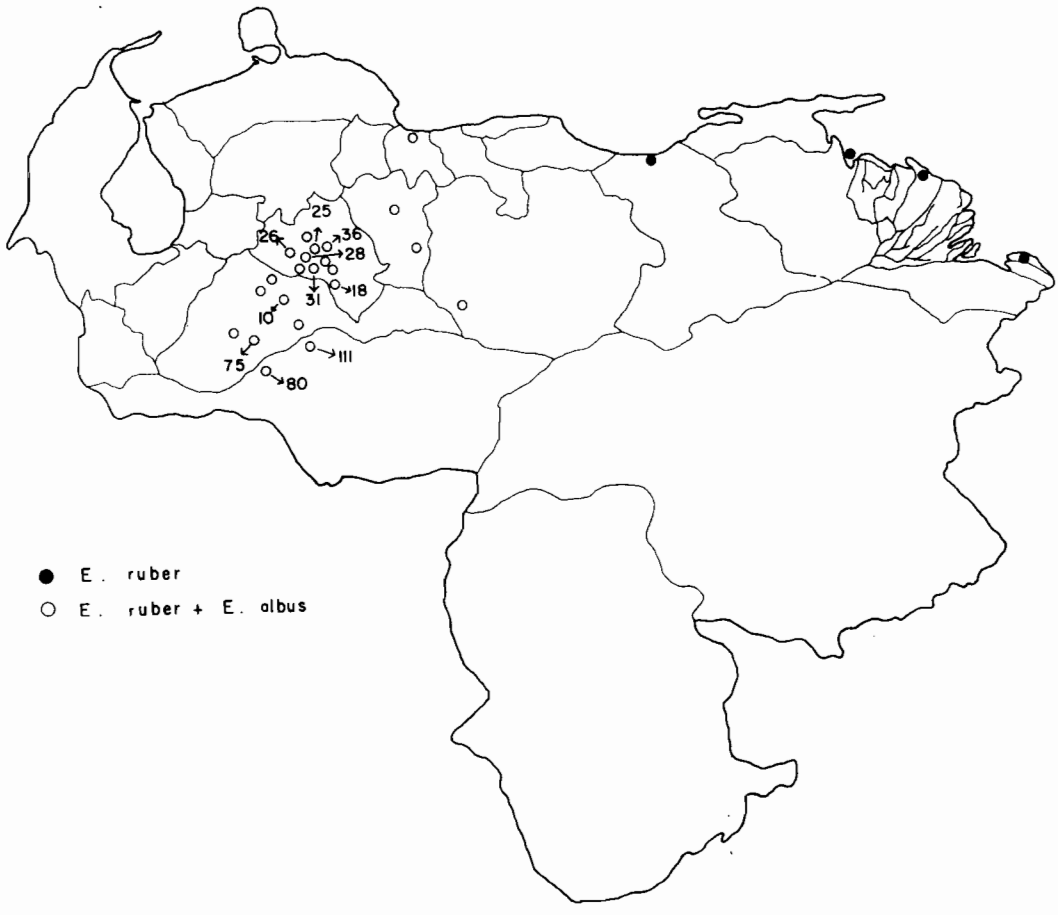


Figure 2. Localities of Scarlet and White ibises colony sites in Venezuela. Numbers are colony site codes.

Table 1. Percentages of Scarlet and White Ibises in Colony censuses. Colony locations are in Figure 2.

Year Colony site (State)	Estimated pairs	Calculation base[1]	Scarlet Ibis number (%)	White Ibis number (%)
1983				
No. 10 (Barinas)	26,219	6,968	6,583 (94.5)	386 (5.5)
No. 18 (Portuguesa)	9,867	2,077	1,942 (93.5)	135 (6.5)
No. 26 (Portuguesa)	108	102	96 (94.1)	6 (5.9)
No. 28 (Portuguesa)	170	160	150 (93.7)	10 (6.3)
No. 31 (Portuguesa)	241	235	215 (91.7)	20 (8.5)
No. 33 (Portuguesa)	1,082	761	709 (93.2)	52 (6.8)
No. 75 (Barinas)	402	402	388 (96.5)	14 (3.5)
No. 80 (Apure)	8,886	160	147 (91.9)	13 (8.1)
No. 111 (Apure)	13,771	8,969	8,449 (94.2)	520 (5.8)
1984				
No. 18 (Portuguesa)	3,897	1,190	1,121 (94.2)	69 (5.8)
No. 25 (Portuguesa)	6,705	3,581	3,388 (94.6)	193 (5.4)
No. 36 (Portuguesa)	88	88	82 (93.2)	6 (6.8)
No. 111 (Apure)	30,583	14,561	13,616 (93.5)	945 (6.5)

[1]Number of pairs from which the percentages of ibises was calculated.

Table 2. Mixed pairs of Scarlet Ibises and White Ibises recorded in the Venezuelan Llanos.

Year	Colony site (state)	No. mixed pairs	♂ S[1]+ ♀ W	♂ W+ ♀ S	Unknown	Source of information
1981	No. 25 (Portuguesa)	12	2	9	1	Ramo & Busto 1982
1981	Flores Moradas Guárico)	1	-	-	1	Luthin in prep
1982	No. 31 (Portuguesa)	9	3	4	2	This paper
1984	No. 25 (Portuguesa)	18	9	4	5	This paper
	TOTAL	40	14	17	9	

[1]S = Scarlet Ibis, W = White Ibis

that mixed pairs have been observed in different locations over a period of several years implies it is not a rare event. From experience, we consider the scarcity of data about mixed pairs to be principally due to the difficulty in obtaining access to the colony sites and difficulty in finding a good point of observation, rather than the rarity of hybridization. The fact that there is no behavioral barrier when pairs are formed or young are raised support this contention (Ramo and Busto 1985).

If pairing were random, a White Ibis would have a much higher probability of finding a Scarlet Ibis mate. In a colony of approximately 200 pairs, one pair was composed of White Ibises, 12 were mixed, and the rest were Scarlet Ibises (Ramo and Busto 1982). The color of the Scarlet Ibis in the colonies varied from light orange to scarlet. Some White birds had scattered orange feathers, further evidence of hybridization.

We conclude that a hybrid population exists in the overlapping ranges of the Scarlet and White Ibises along the coast and in the Llamos of Colombia and Venezuela. The Check-list North American Birds (A. O. U. 1983) considers that *E. albus* and *E. ruber* constitute a superspecies despite the slight overlap in the mixed colonies in Venezuela. At that time the existence of hybridization was only known in captivity and a Florida colony where Scarlet Ibis eggs introduced from Trinidad (Zahl 1967). There had been no record of hybridization under natural conditions in South America.

The term superspecies (Amadon 1966, Short 1969) basically implies allopatry with some or no sympatry between the semispecies and hybridization raraly occurring between them owing to effective isolating mechanisms. This term does not fit the present case because there is a hybrid zone which at the same time separates and connects the populations of the White Ibis (North and Central America) and the Scarlet Ibis (Guianas and Brasil). Reproductive isolating mechanism do not exist, and fol-

lowing the definition of subspecies by Mayr (1968) and Short (1969), we think that the Scarlet Ibis and White Ibis should be considered subspecies.

LITERATURE CITED

Amadon, D. 1966. The superspecies concept. Systematic Zoology 15:245-249.

A. O. U. 1983. Checklist of North American Birds. 6th Ed. Lawrence, Kansas, USA: Allen Press.

Linnaeus, O. 1758. Systema Naturae. Tomus I. Holmias Impensis Direct Laurentii Salvii.

Mayr, E. 1968. Especies Animales y su Evolución. Barcelona, Spain: Universidad de Chile.

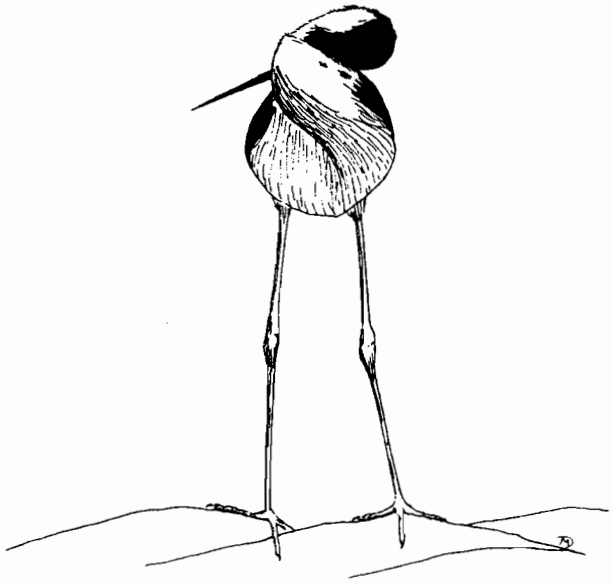
Ramo, C. and B. Busto 1982. Son *Eudocimus ruber* y E. albus distintas especies? Doñana Acta Vertebrata 9:404-408.

Ramo, C. and B. Busto 1984. Censo aéreo de corocoros (*Eudocimus ruber*) y otras aves acuáticas en Venezuela. Boletín de la Sociedad Venezolana de Ciencias Naturales 39:65-88.

Ramo, C. and B. Busto 1985. Comportamiento reproductivo del Corocoro Rojo (*Eudocimus ruber*) en los Llanos de Venezuela. Memorias de la Sociedad de Ciencias Naturales La Salle 123:77-113

Short, L. 1969. Taxonomic aspects of avian hybridization. Auk 86:84-105.

Zahl, P.A. 1967. New Scarlet Ibis in Florida skies. National Georgraphic 32:847-882.



Black-necked Stilt (*Himantopus mexicanus*), pen and ink by Dave Maehr