

The White Ibis *Eudocimus albus* subspecies of South America

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The *Eudocimus* ibises have a complex systematic history. Depending on the taxonomist's predilection, White Ibis *E. albus* (Linnaeus, 1758) and Scarlet Ibis *E. ruber* (Linnaeus, 1758) have been treated as species, as subspecies, or as colour morphs of a monotypic species (Ramo & Busto 1982, van Wieringen & Brouwer 1990, Hancock *et al.* 1992, AOU 1998). Their geographic ranges are largely disjunct. White Ibis occupies North America, the West Indies, and parts of north-western South America (from Colombia south to northern Peru and east to western Venezuela), whereas Scarlet Ibis occupies northern and eastern South America (Ramo & Busto 1987). Hybridisation occurs where their ranges meet (Ramo & Busto 1982, 1987), but mating tends to be assortative (Remsen *et al.* 2011) even though breeding displays are similar (Ramo & Busto 1985, Hancock *et al.* 1992) and they are 'entirely interfertile' (Hancock *et al.* 1992: 154). Because hybridisation is limited, White and Scarlet Ibises generally are treated as biological species (AOU 1998, Remsen *et al.* 2011).

By contrast, in their treatise on the family Threskiornithidae Hancock *et al.* (1992) reached a conclusion in accord with Ramo & Busto (1982, 1987), who recommended treating them as conspecific. Hancock *et al.* (1992) recognised two subspecies, but these were not diagnosed by adult colour. Their *E. r. albus* applied to larger birds of North America and the West Indies that have the bill base pale when breeding, and *E. r. ruber* applied to smaller birds of South America that have the bill all dark when breeding. They considered the large subspecies to be monomorphic—adults are always white—but the latter subspecies to be dimorphic—some adults are white, others are scarlet. In this respect, the situation is akin to that of Reddish Egret *Egretta rufescens* (J. F. Gmelin, 1789), in which the nominate subspecies of the Gulf of Mexico and Caribbean is either rufous or white, with proportions of these colour morphs varying geographically (Bolen & Cottam 1975), but in which *E. r. dickeyi* (van Rossem, 1926) of the Pacific coast of Middle America is only rufous (Hamilton *et al.* 2007: 127; *cf.* Ridgway 1884).

The taxonomy of Hancock *et al.* (1992) poses no problems if the two *Eudocimus* ibises are treated as conspecific. Yet their treatment as two biological species, e.g., by the AOU (1998, Remsen *et al.* 2011), leaves the southern subspecies of White Ibis without a name because the name *E. ruber*, attached to the smaller taxon best treated as a separate species, cannot apply to the southern population. For this population, I propose:

Eudocimus albus ramobustorum subsp. nov.

Holotype.—Adult female, Colección Ornitología de Phelps, Caracas (COP 45686); collected at Tacarigua de La Laguna, Miranda, Venezuela (10°30'N, 65°87'W), on 10 February 1949 by W. H. Phelps. Measurements: wing-chord 257 mm, culmen 117.8 mm, tarsus 75.4 mm.

Diagnosis.—During courtship, bill all or mostly dark (black in males, brown in females; Sick 1993) both sexes have well-developed gular sac in breeding condition (van Wieringen & Brouwer 1990); size averages smaller (Table 1).

TABLE 1
Measurements (mean [range; n]) of White Ibis *Eudocimus albus* across the species' range (data from Oberholser 1974, Kushlan 1977, van Wieringen & Brouwer 1990, and specimens). Males are larger than females in all dimensions and have the bill disproportionately longer (Bildstein 1987, Babbitt & Frederick 2007).

Location	Wing chord (mm)	Bill (mm)	Tarsus (mm)	Mass (g)
<i>Males</i>				
Florida	302 [295–315; 12]	142 [136–148; 12]	102 [91–110; 12]	1,036 [873–1,261; 12]
Texas	283 [276–287; ?]	151 [131–163; ?]	98 [91–104; ?]	—
Northern Mexico	287 [270–298; 9]	155 [125–165; 8]	93 [80–101; 9]	—
Southern Mexico	280 [269–285; 4]	154 [132–163; 4]	88 [79–101; 4]	—
Central America	273 [263–286; 5]	139 [121–153; 3]	88 [83–94; 5]	—
Venezuela	277 [272–292; 10]	145 [140–152; 10]	93 [85–98; 11]	783 [750–800; 9]
<i>Females</i>				
Florida	277 [262–288; 12]	111 [102–121; 16]	87 [79–97; 16]	765 [593–864; 16]
Texas	265 [260–271; ?]	124 [117–129; ?]	86 [82–91; ?]	—
Northern Mexico	271 [259–285; 6]	126 [106–137; 4]	83 [72–93; 6]	857 [1]
Southern Mexico	263 [245–282; 12]	126 [106–137; 12]	85 [69–93; 13]	730 [659–901; 2]
Central America	266 [254–277; 4]	123 [115–135; 4]	75 [66–83; 4]	—
Venezuela	256 [250–279; 16]	117 [107–128; 20]	80 [76–85; 20]	639 [550–730; 8]

Distribution.—The South American portion of the range of *E. albus* (i.e., from central Colombia east to the *llanos* of Venezuela and, locally, south to northern Peru) as well as Panama, on the basis of measurements of specimens (Fig. 1).

Etymology.—Named in honour of Cristina Ramo and Benjamin Busto for their extensive work on the ecology, demography and systematics of White and Scarlet Ibises in Venezuela. Their research has played a key role in our understanding of the ecological and evolutionary relationships between these species.

With this trinomial, the geographic distribution and nomenclature of the nominate subspecies of *E. albus* would be restricted as follows:

- Eudocimus albus albus* (Linnaeus, 1758)**
Scolopax alba Linnaeus, 1758, *Syst. nat.*, 10th edn. {Carolina (adult)}
Scolopax fusca Linnaeus, 1758, *Syst. nat.*, 10th edn. {Carolina (juvenile)}
Tantalus coco Jacquin, 1784, *Beytr. Gesch. Vögel* {Caribbean Islands}
Ibis longirostris Wagler, 1829, *Isis* {Mexico}

Holotype.—Linnaeus based his description on Catesby’s (1731: 82) ‘White Curlew’, the type locality for which has been restricted to South Carolina (AOU 1998).

Diagnosis.—During courtship, bill pale (usually reddish) basally and dark distally (van Wieringen & Brouwer 1990); only the female has a well-developed gular sac in breeding condition (Rudegeair 1975, Hancock *et al.* 1992: 155); size averages larger (Table 1).

Distribution.—Breeds from the south-eastern USA through Middle America to at least Costa Rica, with some in the north of the breeding range wintering far to the south, occasionally reaching north-west South America (Fig. 1).

As Hancock *et al.* (1992) noted, more work is needed to quantify the full extent of geographic variation in form and colour of the bill and gular during courtship, but on the basis of data in van Wieringen & Brouwer (1990), it is fair to say Hancock *et al.* (1992) concluded that phenotypic differences are of a kind that separate subspecies consistent with the



Figure 1. Geographic distribution of White Ibis *Eudocimus albus* (dark grey) and Scarlet Ibis *E. ruber* (pale grey). The species are broadly parapatric in parts of Colombia and Venezuela (Ramo & Busto 1987). The dashed line marks the approximate division between *E. albus* subspecies, and the arrow denotes populations of *E. a. ramobustorum* in coastal southern Ecuador and northern Peru. Species range limits are taken from Ridgely *et al.* (2007).

75%-rule (Patten & Unitt 2002). That development of the gular sac varies geographically is unsurprising as this pattern is evident among subspecies of other ibises. For example, in Black-faced Ibis *Theristicus melanopis* (J. F. Gmelin, 1789) of western South America, the Andean subspecies (*fide* Remsen *et al.* 2011; *cf.* Collar & Bird 2011) *T. m. branickii* Berlepsch & Stolzmann, 1894, differs from the nominate subspecies chiefly in its lack of a prominent gular sac. In any case, it is especially critical to assess variation in bare-part colour and form in *E. albus* given that wing chord—and thus, by inference, body size—appears to vary along a smooth cline (Fig. 2) and hence would not be helpful for diagnosis except at size extremes.

As a final point, when these ibises are treated as conspecific, *E. ruber* has been used as the specific name despite it being unclear whether *E. albus* or *E. ruber* has priority because these names appear on the same page of Linnaeus' *Systema naturae* (E. C. Dickinson *in*

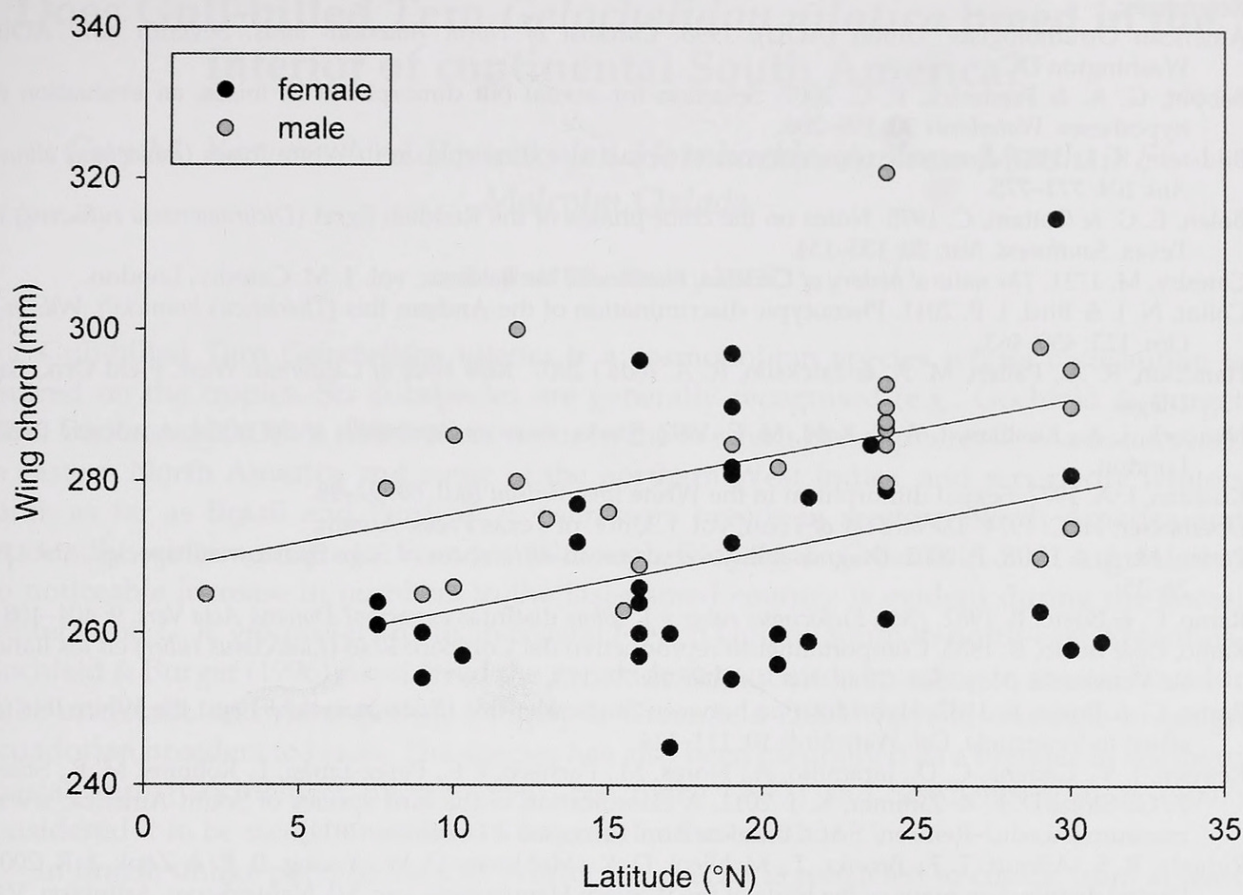


Figure 2. Variation in wing length with latitude in White Ibis *Eudocimus albus*. Data are from specimens of females ($n=33$) and males ($n=27$). Males average larger than females, but slopes relating wing chord to latitude are similar (male: wing = $0.77 \times \text{latitude} + 268$ mm; female: wing = $0.80 \times \text{latitude} + 255$ mm). As such, for either sex, wing-chord increases c.0.4 mm with every 5° of latitude.

litt. 2012). Yet Ramo & Busto (1982) invoked line precedence in their preferential use of *E. ruber*—‘Ya que *E. ruber* fue descrita en primer lugar (Linnaei, 1758) creemos que sería más correcto denominación de *E. ruber ruber* para el Corocora Rojo, y *E. ruber albus* para el blanco’ (p. 405)—and thus they should be considered First Revisers.

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References:

- American Ornithologists' Union (AOU). 1998. *Checklist of North American birds*. Seventh edn. AOU, Washington DC.
- Babbitt, G. A. & Frederick, P. C. 2007. Selection for sexual bill dimorphism in ibises: an evaluation of hypotheses. *Waterbirds* 30: 199–206.
- Bildstein, K. L. 1987. Energetic consequences of sexual size dimorphism in White Ibises (*Eudocimus albus*). *Auk* 104: 771–775.
- Bolen, E. G. & Cottam, C. 1975. Notes on the color phases of the Reddish Egret (*Dichromanassa rufescens*) in Texas. *Southwest. Nat.* 20: 133–134.
- Catesby, M. 1731. *The natural history of Carolina, Florida and the Bahamas*, vol. 1. M. Catesby, London.
- Collar, N. J. & Bird, J. P. 2011. Phenotypic discrimination of the Andean Ibis (*Theristicus branickii*). *Wilson J. Orn.* 123: 459–463.
- Hamilton, R. A., Patten, M. A. & Erickson, R. A. (eds.) 2007. *Rare birds of California*. West. Field Orn., San Diego.
- Hancock, J. A., Kushlan, J. A. & Kahl, M. P. 1992. *Storks, ibises and spoonbills of the world*. Academic Press, London.
- Kushlan, J. A. 1977. Sexual dimorphism in the White Ibis. *Wilson Bull.* 89: 92–98.
- Oberholser, H. C. 1974. *The bird life of Texas*, vol. 1. Univ. of Texas Press, Austin.
- Patten, M. A. & Unitt, P. 2002. Diagnosability versus mean differences of Sage Sparrow subspecies. *Auk* 119: 26–35.
- Ramo, C. & Busto, B. 1982. ¿Son *Eudocimus ruber* y *E. albus* distintas especies? *Doñana Acta Vert.* 9: 404–408.
- Ramo, C. & Busto, B. 1985. Comportamiento reproductivo del Corocoro Rojo (*Eudocimus ruber*) en los llanos de Venezuela. *Mem. Soc. Cienc. Nat. La Salle* 45: 77–113.
- Ramo, C. & Busto, B. 1987. Hybridization between the Scarlet Ibis (*Eudocimus ruber*) and the White Ibis (*E. albus*) in Venezuela. *Col. Waterbirds* 10: 111–114.
- Remsen, J. V., Cadena, C. D., Jaramillo, A., Nores, M., Pacheco, J. F., Pérez-Emán, J., Robbins, M. B., Stiles, F. G., Stotz, D. F. & Zimmer, K. J. 2011. A classification of the bird species of South America. www.museum.lsu.edu/~Remsen/SACCBaseline.html (accessed 7 December 2011).
- Ridgely, R. S., Allnutt, T. F., Brooks, T., McNicol, D. K., Mehlman, D. W., Young, B. E. & Zook, J. R. 2007. Digital distribution maps of the birds of the Western Hemisphere, ver. 3.0. NatureServe, Arlington, VA.
- Ridgway, R. 1884. Remarks upon the close relationship between the White and Scarlet Ibises (*Eudocimus albus* and *E. ruber*). *Auk* 1: 239–240.
- Rudegeair, T. 1975. The gular pouch of the female White Ibis. *Auk* 92: 168–169.
- Sick, H. 1993. *Birds in Brazil: a natural history*. Princeton Univ. Press.
- van Wieringen, M. & Brouwer, K. 1990. Morphology and ecology of Scarlet (*Eudocimus ruber*) and White Ibis (*E. albus*): a comparative review. Pp. 7–15 in Frederick, P. C., Morales, L. G., Spaans, A. L. & Luthin, C. S. (eds.) *The Scarlet Ibis (Eudocimus ruber): status, conservation, and recent research*. Intern. Waterfowl Wetlands Res. Bureau, Slimbridge.

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