FIELD VERIFICATION OF ZIMMER'S WING-FORMULA FOR IDENTIFICATION OF *ELAENIA ALBICEPS CHILENSIS*

Steven M. McGehee [A B] & Jack C. Eitniear [B]

[A] Parque Etnobotánico Omora, Puerto Williams, Magallanes, Chile.
whitethroatedcaracara@yahoo.com

[B] Center for the Study of Tropical Birds, Inc., 218 Conway Drive, San Antonio, Texas 78209, U.S.A.
jce@cstbinc.org

Abstract

Based on examination of museum specimens, Zimmer proposed that *Elaenia albiceps chilensis* could be differentiated from all other *Elaenia albiceps* spp. by the longer length of the 10th primary (compared to that of the 5th). We confirm the theory, with limitations, using wild caught birds.

Key words: Chile, wing-formula, identification, *Elaenia albiceps chilensis*

Resumen

Basado en el estudio de especimenes, Zimmer propuso que *Elaenia albiceps chilensis* se podría diferenciar de las demás subespecies de *Elaenia albiceps* por poseer la décima primaria mas larga (comparada con la quinta). Confirmamos esta teoría, con limitaciones, usando individuos capturados en la naturaleza**.**

Palabras Clave: Chile, fórmula del ala, identificación, *Elaenia albiceps chilensis*

The White-crested Elaenia, *Elaenia albiceps* (Tyrannidae), is a small flycatcher distributed from southern Colombia and eastern Brazil to Cape Horn, Chile and the Diego Ramirez Islands (Ridgley & Tudor 1994, Couve & Vidal 2003, Schlatter & Riveros 1997). It is usually divided into five (Zimmer 1941) or six (Fjeldså & Krabbe 1990, del Hoyo et al. 2004) subspecies. Disagreement remains as to its taxonomic status with several authors supporting the elevation of *E. a. modesta* to full species status (Fjeldså & Krabbe 1990, Ridgley & Tudor 1994, Jaramillo 2003, Zimmer 1941).

Of the five subspecies of *E. albiceps* most are considered resident with only a single race (*chilensis*) classified as migratory (Ridgley &

Tudor 1994, del Hoyo et al 2004). Currently subspecies are differentiated by geographic location, strength of wing bars, paleness of under parts, amount of white in eye ring, dullness and shape of crown patch and thickness of bill (Fjeldså & Krabbe 1990, del Hoyo et al 2004). All of these characteristics vary between individuals, age and often time of year, making subspecies identification difficult even with live specimens. Zimmer (1941) proposed that *E. a. chilensis* could be differentiated from all other *E. a. spp*. by the longer length of the 10th (outermost) primary (compared to that of the 5th) (Figure 1). Zimmer speculated that this was to aid *chilensis* in migration. Other author's have also used this wing formula for separating *chilensis* from the other subspecies (Fjeldså & Krabbe 1990, Kratter et al. 1993, Sick 1993, Jaramillo 2003, Brumfield et al. 2004). While Zimmer (1941) examined 89 museum specimens of *chilensis* (52 males, 31 females, 6 unsexed) one can only assume that all specimens examined supported the wing formula, as he provided no detailed statistical analysis. We felt that since there are no published data on wild caught *E. a. chilensis*, verification of the validity of the wing formula with wild caught birds was justified. Below we report on data collected from *E. a. chilensis* caught in mist nets in southern Chile.

Figure 1. Adult White-crested Elaenia *(Elaenia albiceps chilensis)* showing 10th (outer primary) longer than 5th (Photo: Steven McGehee).

Elaenia were mist netted at Omora Ethnobotanical Park (54º57'S, 67º39'W) and other localities (within 25 kilometers of the park) on Navarino Island from 1999-2005 (Anderson & Rozzi 2000, Anderson et al. 2002). Each captured bird had its right wing visually inspected (Figure 1). *E. a. chilensis* was the only race documented to occur at the capture site. All birds captured had two white wing bars, strong eye ring, pure white crown patch and white edges on secondaries characteristic of *E. a. chilensis* (Fjeldså & Krabbe 1990, del Hoyo et al 2004). The only vocalizations heard in the forests of Navarino Island were ones associated with *chilensis* (Fjeldså & Krabbe 1990).

We examined 330 *E. a. chilensis* with the results indicating that 88% of the birds caught complied with Zimmer's wing formula (Table 1). There was a slight difference between male and female and a greater difference between unknown adults and known sexed adults. 82% of juveniles fit Zimmer's formula. There were differences in months with January having the most birds with the shorter wing. *E. albiceps* arrives on Navarino the third week in October and departs by the fourth week in March with a few juveniles remaining until the end of April (McGehee et al. *in prep.*). The 39 birds with a shorter tenth primary did not have any worn feathers. Molting was not noted in any bird (McGehee & Elphick *in prep.*).

Month	Adult Male	Adult Female	Unsexed Adults	Juvenile	N
Nov	14 (2)	17 (3)	11 (2)	0 (0)	49
Dec	58 (1)	45 (6)	22 (3)	0 (0)	135
Jan	18 (1)	13 (1)	8 (5)	7 (3)	56
Feb	5 (0)	20 (1)	3 (1)	36 (7)	72
Mar	0 (0)	0 (0)	0 (2)	12 (2)	16
Apr	0 (0)	0 (0)	0 (0)	2 (0)	2
Totals	95 (4)	95 (11)	44 (12)	57 (12)	330

Table 1. White-crested Elaenia (*Elaenia albiceps chilensis)* with P10 primary longer then P5. ( ) Indicate number of birds where P5 is longer than P10.

Molting in this species is said to be between March and October (Zimmer 1941) presumably on the wintering grounds. Ten adults were

subsequently recaptured from one month to two years later. Six of the 10 (60%) had the 10th primary the longest each time. Four had the 10th primary longer (40%) in the first capture and shorter in the next capture (one year later). One adult that was first captured with a 5th primary longer was recaptured one month later and had the 10th primary longer. It appears that some birds arrive from migration still growing in their 10th primary. Juveniles were identified by their lack of white crest and buffy wing bars (Jaramillo 2003). Adults were identified as female if they had a brood patch and as male if they had a large cloacal protuberance. These sexual characters are fairly reliable for use as sexing in the breeding season for Tyrannidae (Pyle 1997). However in this study 56 adults were unable to be sexed having neither character. Of these unsexed adults 79% had their 10th primary longer than the fifth. Many of these could be second year birds. Second year males are considered less likely to obtain mates or prime breeding territories (Greenwood et al. 1983, Heise & Rimmer 2000). Evolution could favor a more prolonged molt in second year birds that have a long migration to reach a summer grounds with limited availability of mates and breeding sites. Less energy expended in a rapid molt means first year birds do not have to find as much food on their wintering grounds. This hypothesis awaits further study.

To enhance probability of an accurate *E. a. chilensis* identification we encourage Zimmer's wing formula be used in association with plumage and morphological characterristics.

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