The juvenile plumage of Tamarugo Conebill Conirostrum tamarugense

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A diferencia de sus parientes del género *Conirostrum*, el juvenil del recientemente descrito Conirrostro de Tamarugal *Conirostrum tamarugense* posee un plumaje juvenil rayado que se desconocía hasta el momento. Este parduzco plumaje transitorio es reemplazado en el primer invierno por una versión más pálida del plumaje adulto nupcial. Los individuos de primer invierno se reconocen por un límite de muda en las grandes coberteras.

Discovered in 1969 and described in 1972, Tamarugo Conebill *Conirostrum tamarugense* is a small Thraupidae confined to south-west Peru and northern Chile. As noted by McFarlane⁷, there is much confusion concerning the species' different plumages. The sexes are reported to be quite similar in plumage in *C. tamarugense*^{8,10}, which is consistent with close relatives like Rufous-browed Conebill *C. rufum*, Cinereous Conebill *C. cinereum* and White-browed Conebill *C. ferrugineiventre*^{3,8}. However, some authors have reported that females of *C. tamarugense* are 'duller than males, both in richness of rufous markings and in browner wash to grey body plumage'⁵ or are 'duller and browner than males'³. The immature and juvenile plumages appear to be even more open to debate. According to Schulenberg⁸, the initial description of the female by Johnson & Millie⁶ was probably based on 'the juvenal or first basic, not adult, plumage'. The most recent identification guides consider immatures to be 'duller but show enough rufous or buff on face and vent to be identifiable'⁹. In Jaramillo *et al.*⁵, the immature is said to be 'even duller [than female], rufous of throat much paler or almost lacking, restricted to a wash'. Such an immature is depicted therein but labelled as 'juvenile'.

The description by Estades¹ of the only young birds (supposed juveniles) he caught on the breeding grounds in northern Chile (season unknown) is as follows:slightly smaller than the





Figures I–2. Juvenile (first basic) Tamarugo Conebill Conirostrum tamarugense, Arica, Chile, 30 December 2009 (at 980 m). Note prominent rufous-brown streaking below, greyish-brown upperparts and complete absence of rufous on supercilium, throat, breast and undertail-coverts. Low elevation and date indicate proximity to breeding grounds (Laurent Vallotton)

Figure 3. Juvenile (first basic) Tamarugo Conebill *Conirostrum tamarugense*, Arica, Chile, 30 December 2009 (at 980 m). Foreground individual has rufous breast patch. White spot at base of primaries and rufous breast diagnostic of the species, excluding the similar and partially sympatric Cinereous Conebill *C. cinereum*. Low elevation and date indicate proximity to breeding grounds (Laurent Vallotton) adults and showed a dirty grayish colour instead of the characteristic rufous pattern'. Compared to the images presented herein, the few (supposed) juveniles he observed 'looked darker with less pronounced stripes' (C. F. Estades *in litt*. 2012).

Observations of streaked birds in 2009

On 30 December 2009, during a visit to northern Chile, I photographed several *C. tamarugense* in the Azapa Valley, Arica, Chile (18°34.936'S 69°54.004'W; 980 m). A flock of c.5–10 birds was foraging in a dead bush that had been cut down and was lying beside a dirt track. Present were both adult-like and streaked birds, which I identified as juveniles although they did not match descriptions of the species' juvenile plumage available in the literature^{1.5,6,8,9}.

The main plumage characters of the streaked birds were: (1) breast and flanks whitish, longitudinally streaked rufous-brown, (2) throat, malar region and undertail-coverts whitish, (3) absence of deep rufous, (4) crown greyish brown, cheeks greyish, (5) mantle, scapulars and lesser wing-coverts uniform brown, and (6) greater and median coverts plain brown with broad buff fringes (Figs. 1–2).

All of the streaked birds showed a hint of a pale spot at the base of the primaries and two prominent buff wingbars formed by broad pale fringes to the greater and median coverts; one had a rufous spot just below the throat (Fig. 3), excluding the possibility of it being a species other than *C. tamarugense.*

Discussion

Could it be that the evanescent striated juvenile plumage of *C. tamarugense* has been overlooked since the species' description in 1972? In Thraupidae, moult strategy is 'complex basic' or 'complex alternate'⁴, i.e. birds undergo a formative moult. In the descriptions of young birds, claimed as juveniles¹—or individuals in their 'juvenal or first basic plumage⁸—none of those illustrated are streaked, and thus not in juvenile plumage.

The two females described as juveniles with 'completely unossified skull' and 'differing from all other specimens examined'⁸ (LSUMZ 119237 and 119244; Louisiana State University Museum of Zoology, Baton Rouge; Figs. 4–5) are in fact immature females (assuming that sexing during dissection was correct) that have moulted their body feathers as well as some coverts and flight feathers. In LSUMZ 119237, at least three inner primaries are moulted—the outer primaries being older and presumably juvenile—and at least one outer greater covert is juvenile (Fig. 6). In LSUMZ 119244, no moult limits are visible. Otherwise, the plumage looks like a very faded version of the adult, without any streaking.

Moreover, as the species breeds in September– December in northern Chile, the collection dates of LSUMZ 119237 and 119244 (19 August and 4 September) fall before or at the beginning of the breeding season, i.e. well before the presumed fledging period, making it theoretically impossible for these to be juveniles in first basic plumage.

C. tamarugense breeds between c.1,000 m and 2,500 m (near San Pedro de Atacama; F. Schmitt *in litt.* 2015) and thereafter probably migrates north and mostly to higher elevations^{1,2}. There are reports of birds year-round in the northern Azapa, Vitor and Camarones valleys, where breeding perhaps also occurs (F. Schmitt *in litt.* 2015).

As shown in Fig. 7, individuals in transitional or formative plumage occur in March–September, which means that moult limits in greater coverts and remiges (i.e. suspended moult) can be observed up to at least six months after fledging.

Conclusion

Unlike its closest relatives, C. tamarugense shows a distinctive streaked juvenile (or first basic) plumage, which is replaced by a pale firstwinter plumage, showing moult limits in the remiges and greater coverts up to at least six months post-fledging. Skull ossification can still be incomplete at this point. Such first-winter birds occur mainly in the wintering areas, which are thought to lie principally at higher elevations (c.3,500 m), breeders and juveniles being usually observed at lower altitudes (c.1,000 m). However, year-round presence of C. tamarugense in some oases of northern Chile suggests local breeding (F. Schmitt in litt. 2015), which could account for my observation of juveniles in the Azapa Valley. It is unknown if adults also possess a paler winter plumage and if birds can be aged in the field using coloration alone.

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Figures 4–6. Immature female Tamarugo Conebill *Conirostrum tamarugense*, Arequipa, Peru, 4 September 1984 (above, LSUMZ 119244) and 19 August 1984 (below, LSUMZ 119237), collected by G. H. Rosenberg at 3,870 m (J. V. Remsen / Louisiana State University Museum of Zoology, Baton Rouge)

Figure 7. First-winter Tamarugo Conebill Conirostrum tamarugense, Putre, Chile, 20 March 2011 (3,550 m). Striated juvenile plumage has been moulted to a faded version of adult plumage. Two inner tertials and at least two greater coverts have been moulted to adult type (the three outermost greater coverts are juvenile; other remiges, alula, primary-coverts and rectrices juvenile) (Gonzalo González)





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