Notes on the vocalizations of Blue-and-yellow Tanager (*Thraupis bonariensis*)

Peter Boesman

In the following we briefly analyze and compare voice of the different races of Blue-and-yellow Tanager (*Thraupis bonariensis*). We also try to quantify the extent of any vocal differences using the criteria proposed by Tobias *et al.* (2010), as a support for taxonomic review. We have made use of sound recordings available on-line from Xeno Canto (XC).

Our main interest is to compare green-backed northern race *darwinii* with other races. A comparison, illustrated with sonograms:

darwinii
Ecuador

Peru

Other races

Bolivia

Argentina

Brazil (*bonariensis*)

Song is quite variable, typically a sub-phrase of 2-3 notes repeated several times, sometimes with slight changes. Often alternating downslurred and (lower-pitched) upslurred notes. Pace also quite variable. Some song (?) phrases lack the typical regular pattern. Overall, song is quite similar over entire range, but:

darwini can be recognized from all other races by the presence of lower-pitched notes, which reach a max. frequency of c 3.5-6kHz (vs c 6-8kHz in southern races, even more in *bonariensis*) and cover a much smaller frequency range (c 2-3kHz vs 3-6kHz) (score 1+1=2). *bonariensis* apparently lacks a clear pattern of alternating downslurred and upslurred notes, notes are higher-pitched and less melodious.

We can thus conclude that race *darwini* can be identified by alternating high-pitched and low-pitched notes, races *composita/schulzei* has alternating upslurred and downslurred notes, while race *bonariensis* has high-pitched repeated notes but lacks upslurred notes.

This note was finalized on 5th July 2016, using sound recordings available on-line at that moment. We would like to thank in particular the many sound recordists who placed their recordings for this species on XC.

References

Tobias, J.A., Seddon, N., Spottiswoode, C.N., Pilgrim, J.D., Fishpool, L.D.C. & Collar, N.J. (2010). Quantitative criteria for species delimitation. *Ibis* 152(4): 724–746.

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