

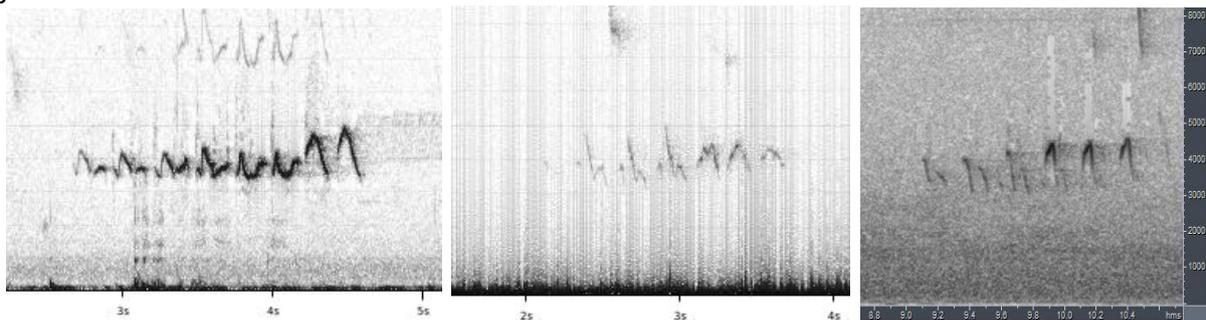
Notes on the vocalizations of Yellow-throated Warbler (*Dendroica dominica*)

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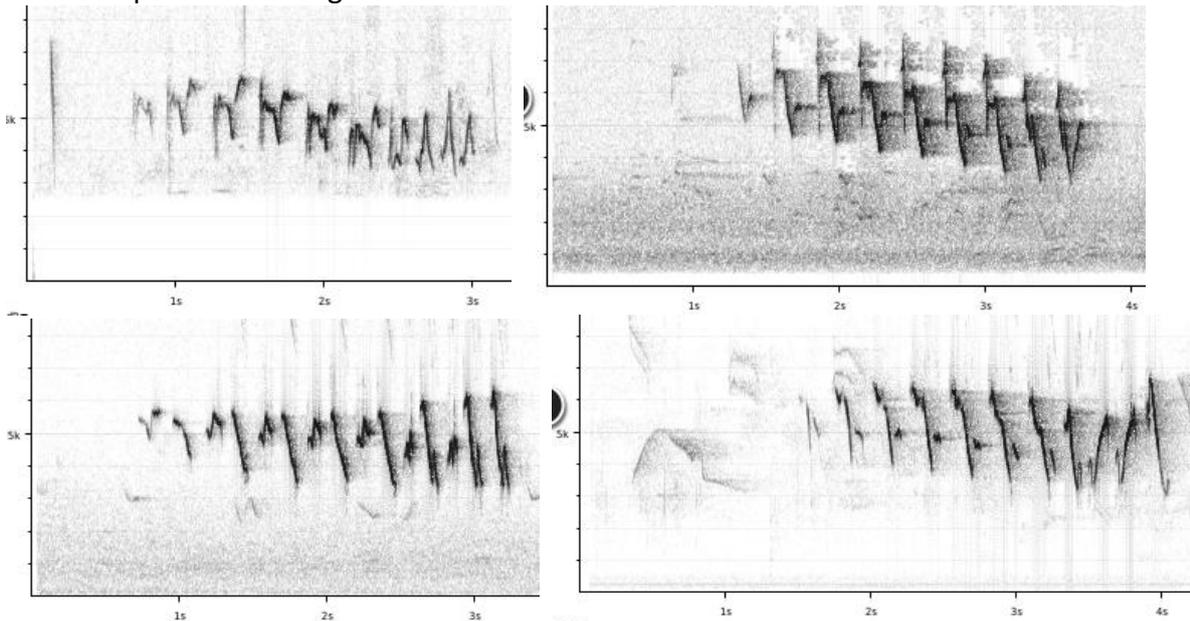
In the following we briefly analyze and compare voice of the races of Yellow-throated Warbler (*Dendroica dominica*). We also try to quantify the extent of any vocal differences using the criteria proposed by Tobias *et al.* (2010), as a support for taxonomic review. We have made use of sound recordings available on-line from Xeno Canto (XC) and Macaulay Library (ML).

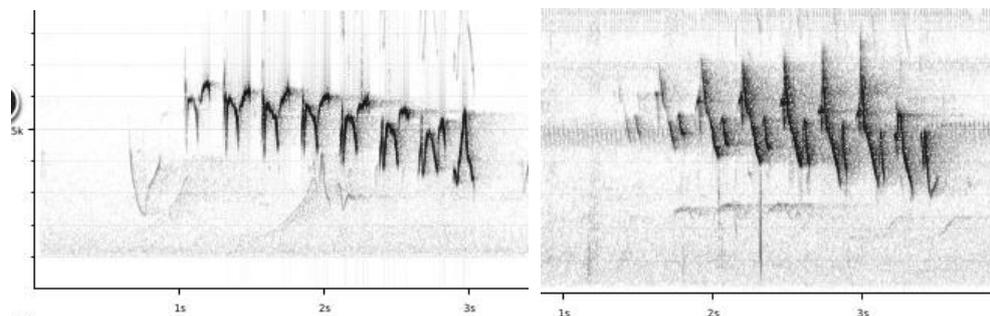
Our main interest is to compare song of the race *flavescens* from the Bahamas with the mainland race. There are only a few sound recordings available of the song of *flavescens*:

flavescens



to be compared with song from the mainland:





The difference in song is quite clear from the sonograms, with *flavescens* having a song starting at stable pace and with a narrow frequency range, and ending with notes somewhat louder, higher-pitched and having a wider frequency range. Birds of the mainland have a song with notes covering a much wider frequency range, starting at much higher frequency, and showing a downward trend in pitch.

A quantified analysis was recently made by McKay *et al.* (2010), where following table can be found:

TABLE 3. Song characters (means \pm SE and range, or proportion) of continental *dominica* (including two continental subspecies) and *flavescens* forms of the Yellow-throated Warbler. Changes in pitch (ascending or descending) and tempo (increasing or decreasing) are dichotomous characters; change in pitch of final syllable is trichotomous.

Song character	<i>dominica</i> (n = 58)	<i>flavescens</i> (n = 11)	Test statistic	P
Number of syllables	9.0 \pm 0.2 (6–14)	7.3 \pm 0.3 (6–9)	t = 3.28, df = 67	0.002
Number of phrases	2.7 \pm 0.2 (1–5)	2.1 \pm 0.1 (2–3)	t = 1.68, df = 67	0.099
Song lowest frequency (Hz)	2,912 \pm 30 (2,409–3,574)	2,999 \pm 82 (2,400–3,295)	t = -1.13, df = 67	0.262
Song highest frequency (Hz)	7,057 \pm 66 (5,643–8,510)	5,519 \pm 154 (4,741–6,188)	t = 9.26	<0.001
Song delta frequency (Hz)	4,142 \pm 72 (2,865–5,754)	2,556 \pm 199 (1,729–3,688)	t = 8.49, df = 67	<0.001
First syllable lowest frequency (Hz)	4,262 \pm 67 (3,177–6,162)	3,124 \pm 117 (2,227–3,803)	t = 7.05, df = 67	<0.001
First syllable highest frequency (Hz)	6,479 \pm 60 (5,479–7,782)	4,140 \pm 88 (3,790–4,668)	t = 16.30, df = 67	<0.001
Song duration (s)	2.258 \pm 0.048 (1.529–3.261)	1.730 \pm 0.063 (1.373–2.011)	t = 4.63, df = 67	<0.001
Mean duration of syllables (s)	0.198 \pm 0.004 (0.143–0.291)	0.177 \pm 0.008 (0.136–0.220)	t = 2.38, df = 67	0.020
Mean interval between syllables (s)	0.062 \pm 0.002 (0.038–0.097)	0.075 \pm 0.004 (0.053–0.107)	t = -2.72, df = 67	0.008
Mean duration of syllables and subsequent intervals (s)	0.264 \pm 0.004 (0.197–0.353)	0.257 \pm 0.006 (0.224–0.283)	t = 0.73, df = 67	0.468
Pitch descending (by middle frequency [%])	100.0	0.0	$\chi^2 = 69.00$, df = 1	<0.001
Pitch change in final 1 or 2 syllables				
Ascending pitch (%)	53.4	0.0		
No change (%)	46.6	54.5	$\chi^2 = 32.37$, df = 2	<0.001
Descending pitch (%)	0.0	45.5		
Tempo accelerating by				
Syllables (%)	69.0	81.8	$\chi^2 = 0.74$, df = 1	0.389
Intervals between syllables (%)	98.3	81.8	$\chi^2 = 6.02$, df = 1	0.014

(Standard error rather than standard deviation is calculated (SE = SD divided by sq. root of sample size)!).

Based on these data we get following scores:

Highest freq. of song: *flavescens* significantly lower (Effect size 3.05, score 2)

Freq. change (start/end): *flavescens* has much smaller pitch change (Effect size 2.62, score 2)

Max. freq. of first note: *flavescens* much lower (Effect size 6.12, score 3)

Furthermore, from the sonograms, it is also clear that freq. range of both the total phrase and single notes is much smaller in *flavescens*.

Application of Tobias criteria leads to a total vocal score of 5.

This note was finalized on 27th June 2016, using sound recordings available on-line at that moment. We would like to thank the many sound recordists who placed their recordings for this species on XC and ML, in particular Jesse Fagan, Jim Holmes and Linda Macaulay for recordings of *flavescens*.

References

- McKay, B.D., Reynolds, M.B.J., Hayes, W.K. & Lee, D.S. (2010). Evidence for the species status of the Bahama Yellow-throated Warbler (*Dendroica "dominica" flavescens*). *Auk* 127(4): 932–939.
- 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.

Recommended citation

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