



Københavns Universitet

Two Western Bonelli's Warblers *Phylloscopus bonelli* from Christiansø, Denmark, confirmed by DNA

Thorup, Kasper; Ortvad, Troels Eske; Jønsson, Knud Andreas

Published in:
Dansk Ornitologisk Forenings Tidsskrift

Publication date:
2009

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Thorup, K., Ortvad, T. E., & Jønsson, K. A. (2009). Two Western Bonelli's Warblers *Phylloscopus bonelli* from Christiansø, Denmark, confirmed by DNA. *Dansk Ornitologisk Forenings Tidsskrift*, 103, 28-29.

Mindre meddelelser

Two Western Bonelli's Warblers *Phylloscopus bonelli* from Christiansø, Denmark, confirmed by DNA

KASPER THORUP, TROELS ESKE ORTVAD and KNUD A. JØNSSON

Western *Phylloscopus bonelli* and Eastern Bonelli's Warblers *P. orientalis* occur as vagrants in northwest Europe. Up until 2006, a total of ten Western and five Eastern Bonelli's warblers were recorded in Norway, Sweden and Finland. Only recently have the two taxa attained full species rank, primarily based on differences in DNA, but also in differences in vocalization and minor differences in morphology (BOU 1997).

The two Bonelli's warblers are very similar and identification in the field and even in the hand can prove very difficult. Consequently, many records of vagrants have not been assigned to species, thus obscuring the occurrence pattern of the two species. The Danish Ornithological Society's Rarities Committee is currently reconsidering all records of Bonelli's warblers.

The best way to tell the two species apart in the field is by the contact- and alarm calls, which are strikingly different between the species. The song, on the contrary, are very similar but can perhaps be separated based on sonograms (Helb et al. 1982, Snow & Perrins 1998). Identification based on plumage characters alone is generally considered very difficult, although – at least in spring – there appear to be minor but consistent differences in the coloration of the upper body and the

fringes of the greater wing-coverts (Occhiato 2007). The two species also show minor differences in wing length and wing formula, Western Bonelli's Warbler having a shorter wing (57-68 mm), compared to 63.5-73 mm for Eastern Bonelli's Warbler (Svensson 1992). However, the two species differ by 8% in the cytochrome-b gene region – a substantial difference, equivalent to the difference between either species and the Wood Warbler *Phylloscopus sibilatrix* (Helbig et al. 1995). A difference of this magnitude makes identification based on DNA straightforward and reliable.

To this day, the Danish Rarities Committee has accepted 14 Danish records of Bonelli's warblers, comprising nine individuals caught at ringing stations and five field observations. Four of the ringed birds had wing lengths below the range of Eastern Bonelli's Warbler, four had intermediate wing lengths, while no measurements were taken from the last bird. Only one of the birds observed in the field has been identified to species: a singing male Western Bonelli's Warbler at Dollerup Bakker 23/5-5/6 1990, which was also heard calling.

Here we consider the identification of two Bonelli's warblers trapped on the island of Christiansø in eastern Denmark on 25/8 1990 and 17/10 1991, respectively (the

Table 1. Differences in base pair composition of 375-380 base pairs of the mitochondrial cytochrome-b gene from two birds trapped at Christiansø (B90 and B92), and from two Western *Phylloscopus bonelli* and one Eastern Bonelli's Warbler *P. orientalis* from Genbank.

Forskelle i basepar inden for et 375-380 basepar-område af det mitochondrielle cytochrom-b gen mellem henholdsvis to fugle (B90 og B92) fanget på Christiansø og tre sekvenser fra Genbank (to Vestlige P. bonelli og én Østlig Bjergløvsanger P. orientalis).

Base #	14	20	26	29	35	65	80	104	107	110	122	125	128	131	147	155	165
B90	G	A	C	C	C	C	C	T	C	A	C	C	T	C	T	T	C
B92	A	A	C	C	C	C	C	T	C	A	C	C	T	C	T	T	C
<i>P. bonelli</i> a	A	A	C	C	C	C	C	T	C	A	C	C	T	C	T	T	C
<i>P. bonelli</i> b	A	A	C	C	C	C	C	T	C	A	C	C	T	C	T	T	C
<i>P. orientalis</i>	A	G	T	A	T	T	T	C	T	C	T	A	C	T	C	C	T
Base #	176	192	194	200	215	248	260	263	267	269	284	293	314	350	356	365	371
B90	G	C	C	C	C	G	T	C	T	C	A	G	A	C	C	A	C
B92	G	C	C	C	C	G	T	C	T	C	A	G	A	C	C	A	C
<i>P. bonelli</i> a	G	C	A	C	C	G	T	C	T	C	A	G	A	C	C	A	C
<i>P. bonelli</i> b	G	C	A	C	C	G	T	C	T	C	A	G	A	T	C	A	C
<i>P. orientalis</i>	A	T	A	T	T	A	G	T	C	A	C	A	G	C	T	T	T



Fig. 1. Western Bonelli's Warbler *Phylloscopus bonelli*, Christiansø 17/10 1991. Photo: Per Kjær. Vestlig Bjergløvsanger, Christiansø 17/10 1991.

latter (Fig. 1) also seen on 18/10). For both the wing length indicated Western Bonelli's Warbler. DNA from blood samples from the two birds was sequenced and compared to DNA sequences from Genbank. Fragments (375 and 380 base pairs) of the mitochondrial gene cytochrome-b clearly demonstrate that both individuals were Western Bonelli's Warblers (Table 1).

Thus, until now only Western Bonelli's Warbler has been recorded with certainty in Denmark. Eastern Bonelli's Warbler remains a great rarity in Northwest Europe, whereas the western species is more common and in addition seems to be expanding its range northwards (Hagemeijer & Blair 1997).

We are grateful to Martin Irestedt at the Molecular Laboratory (Molekylärsystematiska Laboratoriet) associated with the Museum of Natural History in Stockholm, Sweden, who helped sequencing the DNA, and to Arnoud B. van den Berg for supplying data on Bonelli's Warblers in the Netherlands.

Resumé: Artsbestemmelsen af to Vestlige Bjergløvsangere *Phylloscopus bonelli* bekræftet af DNA-analyse

Vestig og Østlig Bjergløvsanger *Phylloscopus (bonelli) bonelli* hhv. *orientalis* blev af BOU (1997) givet artsstatus (*P. bonelli*, *P. orientalis*) med henvisning til en konstateret 8,3-8,6% forskel i deres mtDNA (Helbig et al. 1995). Af de 14 godkendte fund af Bjergløvsanger i Danmark (ni fanget af ringmærkere, fem observeret i felten) er fem bestemt til Vestlig Bjergløvsanger på basis af vingelængden (fire ringmærkede fugle) eller kontakt- og alarmkald (en han set og hørt Dollerup Bakker 23/5-5/6 1990). Blodprøver fra to fugle fanget på Christiansø hhv. 25/8 1990 og 17/10 1991 har gjort det muligt at sekventere en del af deres mtDNA, og en sam-

menligning med sekvenser i Genbank har bekræftet den oprindelige bestemmelse af begge fuglene som Vestlig Bjergløvsanger. Til dato foreligger der ingen godkendte fund af Østlig Bjergløvsanger i Danmark.

References

- BOU 1997: Records Committee: Twenty-third Report (July 1996). – Ibis 139: 197-201.
 Hagemeijer, E.J.M. & M.J. Blair 1997: The EBCC Atlas of European breeding birds. – T & A D Poyser, London.
 Helbig, A.J., I. Seibold, J. Martens & M. Wink 1995: Genetic differentiation and phylogenetic relationships of Bonelli's Warbler *Phylloscopus bonelli* and Green Warbler *P. nitidus*. – J. Avian Biol. 26: 139–153.
 Helb, H-W., H-H. Bergmann & J. Martens 1982: Acoustic differences between populations of western and eastern Bonelli's Warblers (*Phylloscopus bonelli*, Sylviidae). – Cellular and Molecular Life Sciences 38: 356-357.
 Occhiato, D. 2007: Western and Eastern Bonelli's Warblers in the field. – Birding World 20: 303-308.
 Svensson, L. 1992: Identification guide to European passerines. 4th ed. – Stockholm.
 Snow, D.W. & C.M. Perrins 1998: The birds of the western Palearctic, Concise Edition. – Oxford University Press.

Kasper Thorup (kthorup@snm.ku.dk),
 Troels Eske Ortvad & Knud A. Jønsson
 Zoological Museum,
 University of Copenhagen,
 Universitetsparken 15,
 DK-2100 Copenhagen,
 Denmark.