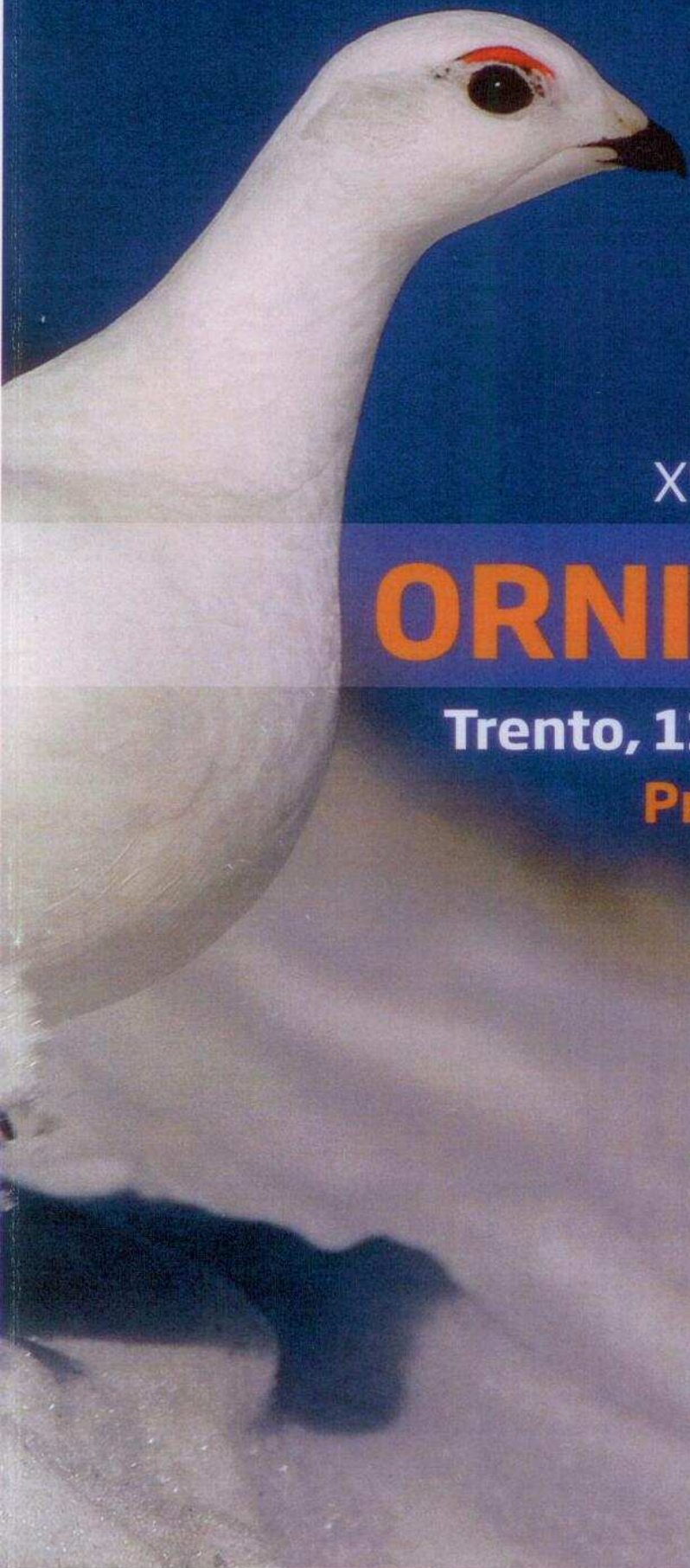




UNIVERSITÀ DEGLI STUDI  
DI TRENTO  
Dipartimento di Ingegneria Civile,  
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XVII Convegno Italiano di

# ORNITOLOGIA

Trento, 11-15 settembre 2013

**Programma e Abstract**

**Curatori:**

Daniela Campobello  
Paolo Pedrini  
Marco Ciolli  
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## **Programma e Abstract**

**A cura di:** Daniela Campobello, Paolo Pedrini, Marco Ciolli,  
Claudio Carere, Dan Chamberlain, Lorenzo Serra

**Con la collaborazione di:** Aaron Iemma, Francesca Rossi

Trento, 2013

## Comparison of methods for preparing bird feathers for stable isotope ratio analysis (C, N, H, O)

LUANA BONTEMPO<sup>1,3</sup>, FLORENCIA CEPPA<sup>1</sup>, LUCA ZILLER<sup>1</sup>, PAOLO PEDRINI<sup>2</sup>, FEDERICA CAMIN<sup>1</sup>

<sup>1</sup>*Fondazione Edmund Mach, Department of Food Quality and Nutrition, Research and Innovation Centre, San Michele all'Adige (TN)*

<sup>2</sup>*Museo delle Scienze di Trento, Sezione Zoologia dei Vertebrati*

<sup>3</sup>*corresponding author (luana.bontempo@fmach.it)*

Natural variations in the stable isotope ratios of bioelements (C, N, H, O, S) in bird feathers have been increasingly used by animal ecologists over the last 25 years to unravel trophic relationships in food webs and to discriminate between animals living in different biomes, as well as to trace the breeding and wintering origins of migratory animals. However, to ensure that the data are correctly obtained, mainly in relation to  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$ , a critical and very delicate aspect is the preparatory phase preceding SIR analysis of feathers. In particular, the three key points are the cleaning, drying and sub-sampling of feathers. In this work we compared the washing mixture most commonly used in the literature (chloroform : methanol 2:1) with a 'new' one proposed here for the first time (diethylether : methanol 2:1), making it possible to avoid the use of the carcinogenic solvent chloroform. We then evaluated whether there were any differences between samples dried or not dried in an oven after cleaning. Finally, evaluation of how stable isotope ratios could vary along the vane and between the rachis and vane was carried out. The results showed that no statistically significant differences were detected between the isotopic values obtained using chloroform:methanol and diethylether: methanol as cleaning mixtures, so we suggest the use of the latter mixture, as it is safer for laboratory workers. Similarly, no differences were found between the two drying methods, therefore the use of an oven at the drying stage can be suggested to speed up this phase a little, without causing any variation in stable isotope ratio values. Finally, we found that in some cases stable isotope ratios can vary considerably, both along the vane and between the rachis and vane. This is due to the fact that stable isotope ratios register all changes in diet, area and climate. This underlines that the kind of feather to be used for SIR analysis is very important, as the choice must be closely related to the information required. For example, if we wish to know where a bird was born, it is very important to choose a feather grown totally in the nest. Furthermore, we suggest not using the rachis for analysis of stable isotope ratios, as in some cases the values were totally different from those of the corresponding vane.