

## **FONOOO.COM A NEW RESOURCE IN THE WEB FOR THE STUDY OF ANIMAL SOUNDS**

FONOOO.COM, NOV SPLETNI VIR ZA  
PROUČEVANJE ŽIVALSKIH GLASOV

GEMA SOLÍS, XAVIER EEKHOUT & RAFAEL MÁRQUEZ

## ABSTRACT

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We describe the functional structure of the Fonoteca Zoológica (FZ), a scientific collection of animal sounds in the National Natural Science Museum of Madrid. We present statistical data regarding the number of species with sounds in either the Published Sound Collection or the FZ Sound Collection. The Published Sound Collection includes commercially available sound guides published all over the world, and the FZ Sound Collection includes recordings made by researchers in the Museum and other collaborators. Comparisons in holdings are made between the different taxa, and we emphasize the use of bioacoustics for the study of animal behaviour. Finally, we introduce the recently created web page [www.FonoZoo.com](http://www.FonoZoo.com) from where it is possible to access the database of the animal sounds kept in the Fonoteca Zoológica.

*Key words:* Bioacoustics, animal sounds, behaviour, sound recordings, communication.

## IZVLEČEK

**Fonozoo.com, nov spletni vir za proučevanje živalskih glasov**

Avtorji opisujejo funkcionalno strukturo Zoološke fonoteke (FZ), znanstvene zbirke živalskih glasov v Nacionalnem naravoslovnem muzeju v Madridu. Prikazani so statistični podatki o številu vrst z zvočnimi posnetki v Zbirki objavljenih zvokov in Zbirki zvokov fonoteke FZ. Zbirka objavljenih zvokov vsebuje komercialno dostopne zvočne vodnike objavljene kjerkoli po svetu, Zbirka zvokov FZ pa posnetke, ki so jih naredili delavci muzeja ali njihovi zunanji sodelavci. Prikazane so primerjave zvočnih posnetkov posameznih živalskih skupin in poudarjen je pomen bioakustike za študij živalskega vedenja. Na koncu je predstavljena spletna stran [www.FonoZoo.com](http://www.FonoZoo.com) s katere je možno doseči zbirke živalskih glasov shranjene v fonoteki FZ.

*Gljučne besede:* bioakustika, živalski glasovi, vedenje živali, zvočni posnetki, komunikacija.

*Addresses – Naslovi*

Gema SOLÍS  
Fonoteca Zoológica <[www.FonoZoo.com](http://www.FonoZoo.com)>  
Departamento de Biodiversidad y Biología Evolutiva  
Museo Nacional de Ciencias Naturales (CSIC)  
José Gutiérrez Abascal, 2  
28006 Madrid  
España  
E-mail: [gsolis@mncn.csic.es](mailto:gsolis@mncn.csic.es)

Xavier EEKHOUT  
Fonoteca Zoológica <[www.FonoZoo.com](http://www.FonoZoo.com)>  
Departamento de Biodiversidad y Biología Evolutiva  
Museo Nacional de Ciencias Naturales (CSIC)  
José Gutiérrez Abascal, 2  
28006 Madrid  
España  
E-mail: [xeekhout@mncn.csic.es](mailto:xeekhout@mncn.csic.es)

Rafael MÁRQUEZ  
Fonoteca Zoológica <[www.FonoZoo.com](http://www.FonoZoo.com)>  
Departamento de Biodiversidad y Biología Evolutiva  
Museo Nacional de Ciencias Naturales (CSIC)  
José Gutiérrez Abascal, 2  
28006 Madrid  
España

E-mail: rmarquez@mncn.csic.es

## INTRODUCTION

Through bioacoustics we study the communication behaviour of animals using their acoustical signals (TUBARO 1999), and animal vocalizations are useful tools that can be used in taxonomic, ecologic and behavioural studies (BAPTISTA 1993, TUBARO 1999, BAPTISTA & MARTÍNEZ 2002). In addition to basic science, bioacoustics may also have practical applications for conservation and wildlife management (TUBARO 1999, BAPTISTA & MARTÍNEZ 2002), as well as for census and monitoring programs which are based on individual species recognition (BRIDGES & DORCAS 2000, TERRY & MCGREGOR 2002). Thus sound collections can be extremely useful in order to study and conserve biodiversity in addition to being the basis of significant contributions to the study of animal communication (KROODSMA & MILLER 1996, BAPTISTA & GAUNT 1997). Animal sound collections also have educational or plainly recreational purposes as they are the basic source of distribution of animal sounds.

## FONOTECA ZOOLÓGICA (FZ)

The Fonoteca Zoológica is a library of animal sounds located in the National Natural History Museum in Madrid. The collection includes sounds from all groups of animals, mainly birds, amphibians, insects and mammals, and is separated into two different databases: the FZ Sound Collection and the Published Sounds Collection. The FZ Sound Collection includes recordings made by the research staff of the Museum as well as personal recordings donated by other collaborators and nature recorders. The Published Sound Collection includes all the published audio guides that are commercially available, and some vintage sound guides in other formats (vinyl LPs).

Currently (September 2005), the FZ Sound Collection includes 212 cassettes, 127 reels and more than 40 DAT tapes recorded by the staff and collaborators of the FZ. These recordings are digitized, usually at 44.1 kHz sample rate and with a resolution of 16 bits, and saved in CD-Rom format. Until now, 99 CDs with these recordings have been created adding up more than 5600 sound samples, but not all the available recordings have been included in the collection yet. In the Published Sounds Collection we have a total of 655 sound guides (167 cassettes, 137 LP records, 348 CDs and 3 CD-Roms). All volumes are currently being indexed taxonomically and the approximately 50% of those indexed (330 volumes) add up a total of more than 22800 sound samples (see Fig. 1).

## GROUPS OF ANIMALS

In the case of Published Sounds, the number of bird sound samples is by far the most numerous, in agreement with the fact that most of the published sound guides are dedicated to this group (510) (see Fig. 2). In the case of the FZ Sound Collection, the domi-

nant group is Amphibians, due to the fact that it is the group studied by several researchers at the FZ (see Fig. 3). It is worth noting the low number of insect sound samples in both collections, particularly considering that insects are probably the largest and most diverse group of acoustically active animals.

## REGIONS COVERED

The countries for which there are published sound guides are shown in the maps separated by taxonomic groups for the four most important animal groups in our data base (see Fig. 4). The sound guides that are not especially dedicated to any given taxonomic group or have soundscapes were not included. In the case of the FZ Sound Collection, a single map (see Fig. 5) shows a summary of the countries from which there are currently recordings in the FZ from any taxonomic group.

## PUBLISHED BIRD AND ANURAN SOUND GUIDES

Most published sound guides are dedicated especially to birds, and anuran guides are second. Here, we present the proportion of species of birds by Orders with recordings included in published sound guides that are commercially available (see Fig. 6).

## FONOOO.COM: THE WEB SITE

All the data of the FZ is available in its web page: [www.fonozoo.com](http://www.fonozoo.com). From the beginning of 2004, the Fonoteca Zoológica has its own web site, by means of which we pretend to publicise the research carried out here and the information existing in our data base. FonoZoo has different sections including a search engine for animal sounds and sections for sharing information about bioacoustics. This web site is available in two languages, English and Spanish, so we expect it can be visited by a greatest number of people worldwide.

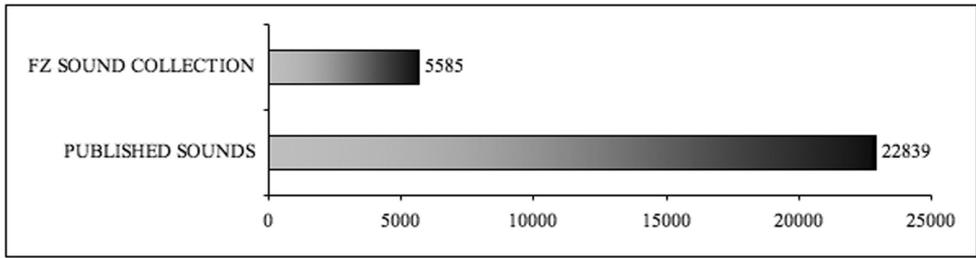
Please, visit us! We appreciate any comments, suggestions, corrections and, of course, any donation of unlisted sound guides and any deposit of original recordings of identified species.

## ACKNOWLEDGEMENTS

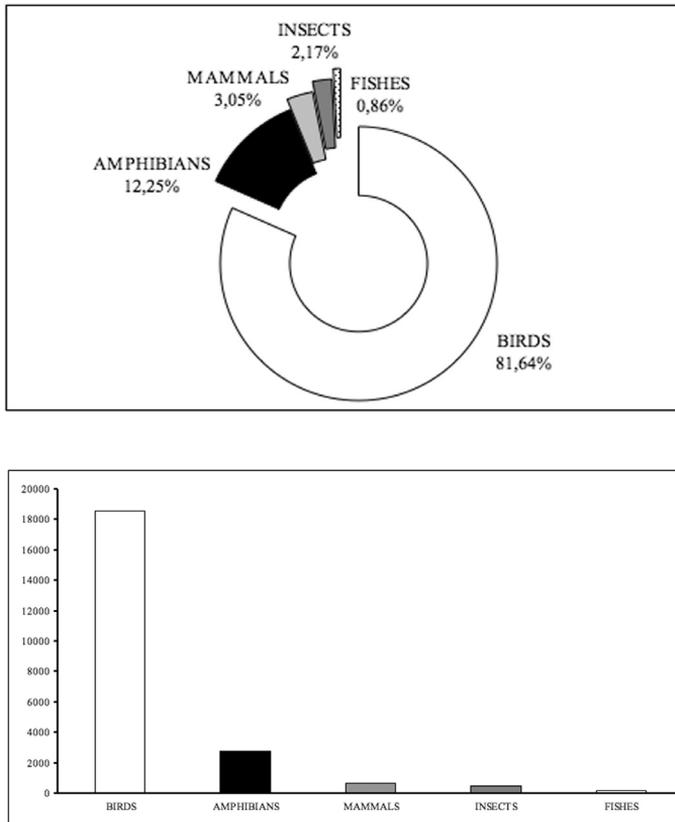
We would like to thank Laura González and Mercedes Pérez, the current Collection Managers, for their precious help in gathering all the updated information of the FZ.

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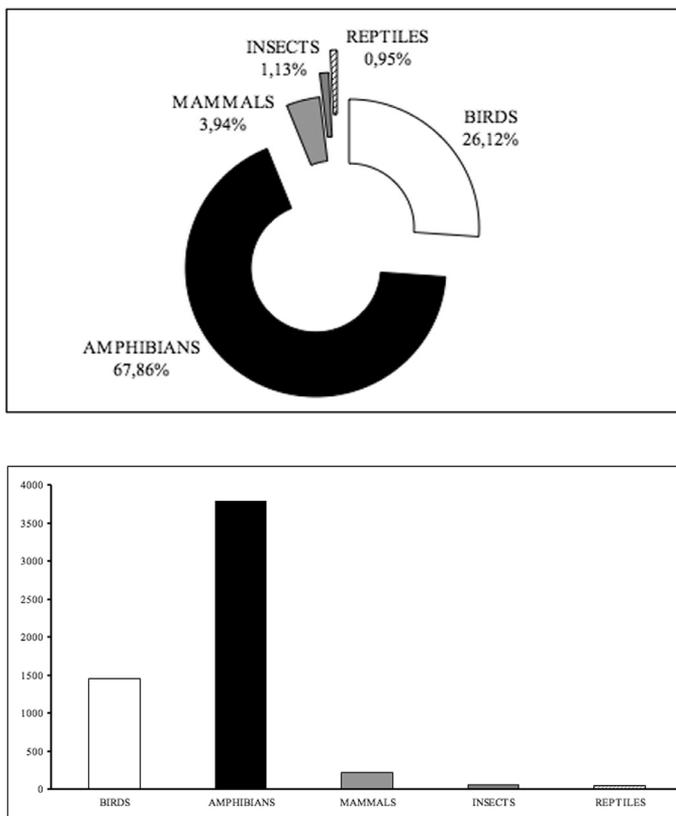
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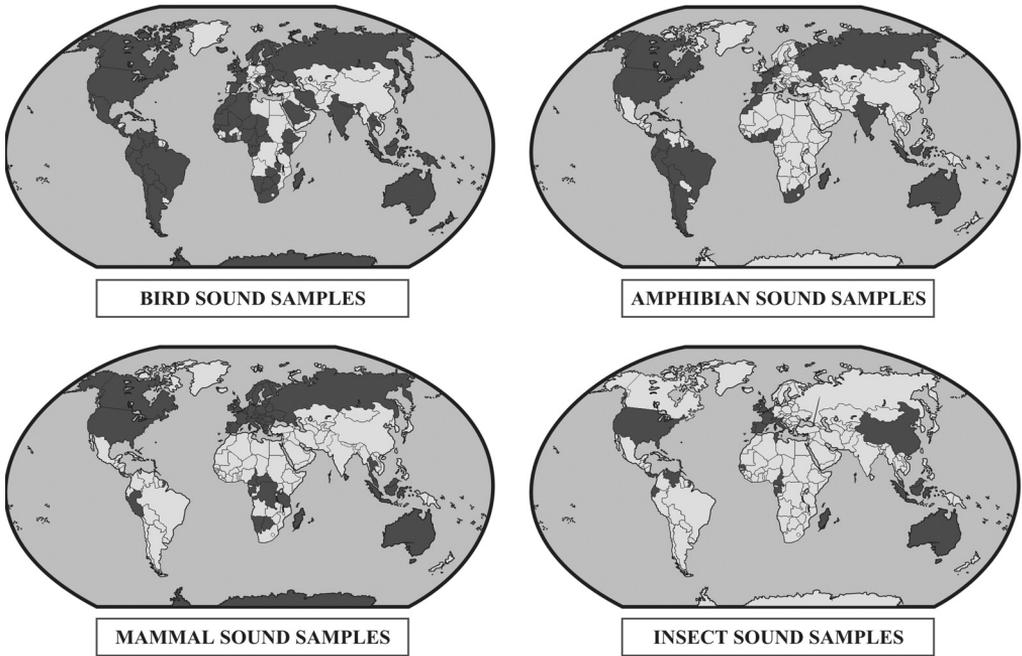
**Figure 1:** Total sound samples in the Fonoteca Zoológica (Sept. 2005).



**Figure 2:** Distribution of recordings included in Published Sounds.



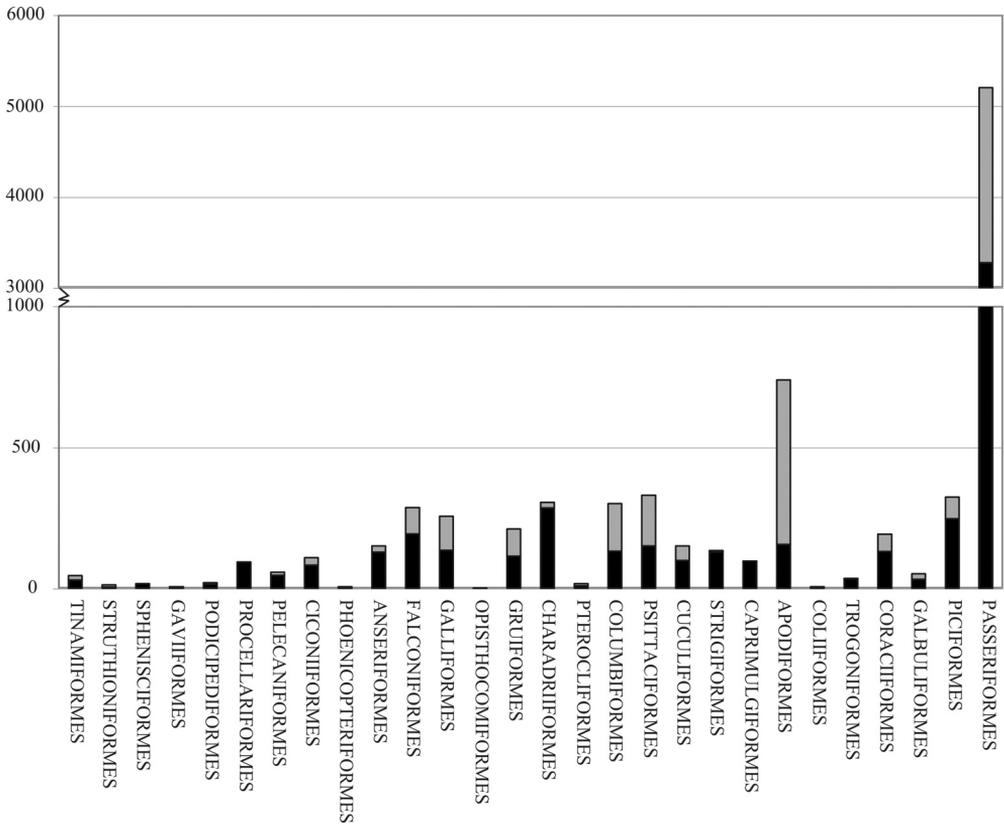
**Figure 3:** Distribution of recordings included in the FZ Sound Collection.



**Figure 4:** Countries with published sound guides, by taxonomic groups.



**Figure 5:** Countries with recordings in the FZ Sound Collection.



**Figure 6:** Proportion of bird species recordings available in published guides. In black, the number of the species recorded, and in grey, the number of species not recorded.