



# AmiBio NEWSLETTER



With the contribution of the LIFE financial instrument of the European Community

4th Issue, April 2011

[WWW.AMIBIO-PROJECT.EU](http://WWW.AMIBIO-PROJECT.EU)

## LIFE+ NATURE AND BIODIVERSITY

### Contact Us

Nikos Fakotakis, Project Coordinator  
Wire Communication Laboratory,  
University of Patras,  
26500 Rion-Patras, Greece

E-mail: [fakotaki@upatras.gr](mailto:fakotaki@upatras.gr)

Phone: +30 2610 996 496

<http://www.amibio-project.eu/>

### CONTENTS

#### Pages 2 & 3

Bridging the gap between human expertise  
and artificial intelligence

Public awareness on Hymettus area conserva-  
tion plans

#### Page 4

AmiBio meets OpenUp!, the new link  
between Europeana and biodiversity data  
resources



# Ami Bio

LIFE08 NAT/GR/000539



# BRIDGING THE GAP BETWEEN HUMAN EXPERTISE AND ARTIFICIAL INTELLIGENCE

## ZFMK'S CONTRIBUTION TO MAKING THE AMIBIO CONCEPT WORK

by O. Jahn, K. Riede, V. Eschen, K.-L. Schuchmann, R. van den Elzen, and T. Kostoulas

The provision of biological baseline data is one of the main responsibilities of the Zoological Research Museum A. Koenig (ZFMK) in the AmiBio project. Species have to be inventoried and recordings of their vocalizations have to be compiled, identified, tagged, and archived in order to calibrate the sound identification software (AmiBio Newsletter, July 2010 issue, [www.amibio-project.eu/en/resources/dissemination/newsletter/2010-july](http://www.amibio-project.eu/en/resources/dissemination/newsletter/2010-july)). Without this preparative work the automatic acoustic monitoring of wild animal species at Hymettus would not be possible. When the biodiversity assessment officially finished in July 2010, we were well aware of the fact that our lists of sound-producing insects, amphibians, reptiles, birds, and mammals were not entirely conclusive. For instance, apart of the 116 bird species that already were known to occur in the project area, we estimated that 150+ additional species might occur there at least seasonally on migration. Therefore, the first author continued to collect field data in December 2010 and in February, March, and April of the present year. During the same period we also continued the sound recording campaign at five independent locations, using commercially available Song Meter recorders of Wildlife Acoustics Inc. ([www.wildlifeacoustics.com/sm2\\_platform.php](http://www.wildlifeacoustics.com/sm2_platform.php)). Until the end of April we gathered over 2000 hours of stereo recordings (48kHz, 16 bit), corresponding to roughly 1.5 TB of audio data. During the next several months these recordings will be used for extracting additional reference vocalizations and for testing the species-specific detectors with real Hymettus recordings.

On the basis of the above-mentioned observer-based bird surveys, the Hymettus bird list has grown to 122 species and the number of species that were recorded by ZFMK staff from 68 to 88 species, corresponding to 72% of the total. At least nine bird species were not previously reported in the literature on the avifauna of Hymettus. From the latter, all but one were already on our list of potentially occurring species. The species not included in the aforementioned list was a big surprise indeed: it refers to the first record of the Lemon-rumped Warbler *Phylloscopus proregulus* for Greece. On 5 April 2011, in the park-like area that belongs to the Monastery Kaisariani, the first author of this article took notice of a rather complex warbling song, which he could not identify immediately. While searching for the bird he discovered a very small warbler with a whitish underside, broad yellowish-white superciliary, and two distinct whitish wing bars (see cover of this newsletter). Although he could neither see the distinctive coronal strip nor the yellow rump of the bird, because it moved around in the crown of a pine about 12 meters above the ground, a positive identification was still possible by comparing the song heard in the field with vocalizations of the other look-alike "leaf warblers" at [www.xeno-canto.org](http://www.xeno-canto.org). Subsequent searches in the Internet revealed that the bird was previously discovered and photographed by Michalis Kotsakis and by several other observers on 2 April 2011 and the following days (see photos at <http://deepinbirds.wordpress.com/2011/04/04/phyloscopus-proregulus-update>, [www.facebook.com/photo.php?fbid=10150187718288933&set=o.175254428030&type=1](http://www.facebook.com/photo.php?fbid=10150187718288933&set=o.175254428030&type=1), and [www.ppetrou.gr/2011/04/444](http://www.ppetrou.gr/2011/04/444)). The Lemon-rumped Warbler (or Pallas's Warbler, as it is sometimes called after its describer) breeds in southern Siberia, northern Mongolia, and northeastern China. It is a long-distance migrant, which mainly winters in subtropical southern China and northeastern Indochina. However, a tiny fraction of its population winters in western Europe, which explains the unusual spring record in Greece.

Less exciting, but much more important for the outcomes of the AmiBio Project, is ZFMK's work on the reference library of animal sounds for the Hymettus. During the past months we have been compiling 11,000+ sound recordings for the 175 sound-producing animal species already recorded there as well as for the 148 potentially occurring bird species. The sources for this comprehensive sound collection were online archives, such as Xenocanto ([www.xeno-canto.org](http://www.xeno-canto.org)), McCaulay Library (<http://macaulaylibrary.org/index.do>), SysTax ([www.biologie.uni-ulm.de/systax/portal/index.html](http://www.biologie.uni-ulm.de/systax/portal/index.html)), and the Tierstimmenarchiv ([www.tierstimmen.org](http://www.tierstimmen.org)). In addition we extracted hundreds of recordings from commercial audio publications. However, compiling the sounds is not enough for making automatic computer-based biodiversity monitoring feasible. Evidently, mathematical algorithms for sound classification are not as flexible as human brains in learning animal sounds. After a few test runs with a tiny subsample of the aforementioned audio

**(continuation on Page 3)**

archive, it was clear that the recordings were not clean enough for developing species-specific sound detectors. The reason is that most audio recordings were made in natural environments and do not only contain the target species but also many other kinds of natural and anthropogenic audio signals. Although some types of noises, such as wind, rain, and airplanes, can be removed by filtering, current sound classification software cannot successfully learn the vocalizations of a target species unless the reference recordings have a good noise-to-signal ratio. That is, they must be virtually free of undesired background species and other noises. Therefore we started to manually select those sections of the recordings that contained exclusively call notes and song phrases of the target species. This is a laborious endeavor indeed! We estimate that about 70% of the original target species' vocalizations must be discarded during the procedure because they overlapped with other (mostly animal-produced) sounds in time and frequency range. In order to comply with the conservation-oriented aims of the Life+ program we are currently focusing on those species that are protected under EU legislation (examples of such species have been mentioned in AmiBio Newsletter, October 2010 issue, [www.amibio-project.eu/en/resources/dissemination/newsletter/2010-october](http://www.amibio-project.eu/en/resources/dissemination/newsletter/2010-october)). In other words, the sound detectors will be developed first for the conservation-dependent species and then for more common ones. However, for some rarer species we will have to add sound examples of our own passively collected Song Meter recordings (see first paragraph) in order to obtain enough examples for training the detectors. All in all this task alone will keep us busy until the end of the AmiBio project in July 2013.

## PUBLIC AWARENESS ON HYMETTUS AREA BIODIVERSITY

by V. Nomikos and V. Dimitriou



The Union for the Protection & Development of Hymettus mountain (SPAY) is a group of eleven (11) municipalities around the Hymettus mountain and we have joint the AMIBIO consortium as we believe that the project fulfills our scope. The target of the project is the acoustic monitoring of the fauna in the mountain, as a measure to allocate the means for its protection and advise the appropriate authorities for the measures to be taken.

The innovative project's methods for biodiversity monitoring in the area must be also accompanied by actions leading to awareness of the general public that would benefit from the project either directly or indirectly.

Following our initial plans we have started pretty early in the project implementation to keep people informed, through releases in Greek and other European mass media, in the scope of the project and the task we have undertaken. The initial reaction was lukewarm, from the mass media and the general public, a fact that changed dramatically after the installation of the two (2) on-site panels that have been placed in areas of high visiting traffic. Mountain visitors were calling asking for additional information for the project and the mass media were attending our press releases. Visitors on SPAY's website increases dramatically, more than 32% in comparison with the same period last year, with the same almost reaction for the AMIBIO website.

The press conference, on the occasion of one year from the kick-off of the project, was attended by many journalists, covering electronic mass media, newspapers and periodicals, despite the heavy publicity on recent government and European economic measures that they had to cover. This proves, once again, that the general public when given something innovative for the protection of the environment and in particular the only remaining oxygen source for the Athens metropolitan area, are fully aware of the effects and interested on the particulars of such innovation. The project shall continue the efforts for public awareness and sensitiveness, since we believe that even only this task justifies the purpose of our LIFE – NATURA - AMIBIO project under development.

# AMI<sup>BIO</sup> MEETS OPENUP!

## THE NEW LINK BETWEEN EUROPEANA AND BIODIVERSITY RESOURCES

by K. Riede

From 8<sup>th</sup> to 11<sup>th</sup> of March 2011, the new EU CIP project OpenUp! was launched at a kick-off meeting at the Botanical Garden Berlin, where the project leader, Prof. Walter Berendsohn, received a highly diverse group of 8 workpackage leaders and an impressive total of 23 European institutions providing biodiversity data providers by “opening up” their natural history collections (group photo).

Most of these institutions are already member of the “Consortium of European Taxo-



nomic Facilities” (CETAF - <http://www.cetaf.org/>), publishing considerable amounts of their valuable collection data via the “Global Biodiversity Information Facility” ([www.gbif.org](http://www.gbif.org)). Connecting their data with Europeana, the ambitious European cultural database ([www.europeana.org](http://www.europeana.org)), would further increase the visibility of Natural History data and underline the importance of biodiversity for our cultural heritage.

At present, Europeana is aggregating cultural data from digital libraries and archives, including pictures, videos and snippets of music. A search for “nightingale” provides a wide variety of pictures, poems and folk songs, reflecting the enigmatic cultural significance of the bird, but not yet covering the biological facts, such as its proper scientific name, subspecies, museum specimens, biology and, of course, full recordings of its variable, melodic song, preferably from distinct areas of its wide distribution area. This will change soon, because OpenUp! will develop interfaces between already existing biodiversity data exchange protocols such as ABCD and Tapir, and Europeana Aggregator software. Once connected, a steady stream of new natural history objects offered via GBIF will also become searchable and visible for Europeana users (see [http://ec.europa.eu/information\\_society/apps/projects/factsheet/index.cfm?project\\_ref=270890](http://ec.europa.eu/information_society/apps/projects/factsheet/index.cfm?project_ref=270890) and OpenUp! press release <http://open-up.eu/content/openup-press-release>).

Following the kick-off presentations of the first day, special sessions on outreach and technical details were held on the second day. The Outreach and Dissemination Group targets at the general public, decisions makers, schools and media to promote the new platform bridging culture and natural history, laymen and science. A webpage with information and promotion materials is already available at <http://open-up.eu>.

Recordings of animal sounds will be provided by the Tierstimmenarchiv Berlin and The Museum Koenig, Bonn, with its collection of more than 5,000 Orthoptera recordings. But how can the AmiBio project profit from this initiative? Besides the aforementioned improved visibility, accessibility to multimedia objects – in our case sound files will be improved, exploiting the already available harvesting tools provided by Europeana. At present, downloading sound files from the DORSA Orthoptera multimedia database ([www.dorsa.de](http://www.dorsa.de)) is tedious and user-unfriendly.

In the future, the best AmiBio recordings will be integrated into the DORSA and the Tierstimmenarchiv, from where they can be accessed both by Global Biodiversity Information Facility ([www.gbif.org](http://www.gbif.org)) and by Europeana in a user-friendly way. While GBIF is still pondering on multimedia standards, Europeana is far more advanced, supporting a multidisciplinary team working on multimedia standards and protocols. A real and hitherto unsolved challenge is efficient search and retrieval of multimedia content, and even though existing Europeana tools will probably not yet cover the requirements of biologists or naturalists searching for example for a “high-pitched, tweeting bird”, complementing his search with an uploaded sound snippet recorded with his cell phone, Europeana experts might contribute interesting fresh ideas to get closer to our ambitious goals.

**AUTHOR’S PROFILE:** Klaus Riede is director’s assistant and senior researcher at the ZFMK. His research focuses on bioacoustics, ecology and taxonomy (including barcoding) of Orthoptera, with a strong focus on tropical species. He managed major biodiversity database projects, such as a global geo-database on migratory species (Global Register of Migratory Species -[www.groms.de](http://www.groms.de)) and a web-based multimedia database on Orthoptera specimens with song recordings ([www.dorsa.de](http://www.dorsa.de)). As Project manager of a workpackage on “All Taxa Biodiversity Inventories within the EU FP6 Network of Excellence “European Distributed Institute of Taxonomy” (EDIT) he gathered experience in coordination of amateur and professional taxonomists. At present, he is working on the biological aspects of the AmiBio project.

**Cover photo:** Lemon-rumped Warbler *Phylloscopus proregulus*, by K. Lin (<http://www.flickr.com/photos/hiyashi/4028464920/>).