

the Belgian Network for DNA Barcoding (BeBoL)

<http://bebol.myspecies.info>

Massi Virgilio

**Joint Experimental Molecular Unit
(RMCA-RBINS, Belgium)**

the Belgian Network for DNA Barcoding (BeBoL)

- financed by the Fund for Scientific Research – Flanders (FWO) (2011-2015)
- financially administrated by the University of Antwerp - Evolutionary Ecology Group (T. Backeljau)
- daily management by RBINS (Brussels; T. Backeljau) and RMCA (Tervuren; M. De Meyer)
- the “Joint Experimental Molecular Unit (JEMU)” executes most of the organisational network tasks

the Belgian Network for DNA Barcoding (BeBoL)

partners:

1. **BGM**(Botanic Garden Meise)
2. **CBOL** (Consortium for the Barcode of Life)
3. **CRA-W** (Walloon Centre for Agronomic Research)
4. **CRC** (Centre for Research and Conservation of the Royal Zoological Society of Antwerp)
5. **ECBOL** (European Consortium for the Barcode of Life)
6. **FUNDP** (UCL) (Laboratory of Evolutionary Ecology and Genetics)
7. **ILVO** (Plant-Crop Protection Group)
8. **ILVO** (Technology & Food – Food Safety Group)
9. **INBO** (Genetic Diversity Group of the Institute for Nature Conservation and Forest Research)
10. **ITM** (Institute of Tropical Medicine, Entomology Group)
11. **JEMU-RBINS** (Joint Experimental Molecular Unit, RBINS)
12. **JEMU-RMCA** (Joint Experimental Molecular Unit, RMCA)
13. **KULeuven** (Laboratory for Animal Diversity and Systematics)
14. **NICC** (Biology Group, National Institute for Criminalistics and Criminology)
15. **SPHERE** (Systemic Physiological and Ecotoxicological Research)
16. **UCL** (Biodiversity Research Centre)
17. **UGhent** (Laboratory for Microbiology)
18. **UGhent** (Marine Biology Group)
19. **UGhent** (Phycology Research Group)
20. **UGhent** (Protistology and Aquatic Ecology Group)
21. **UHasselt** (Biodiversity and Toxicology Group)
22. **ULB** (Biological Evolution & Ecology Group)
23. **ULg** (Cyanobacteria Group)
24. **UMons** (Laboratory of Zoology)
25. **VUB** (Plant Biology and Nature Management Group)

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objectives

- coordinating the efforts and knowledge in the field of molecular systematics and DNA barcoding in Belgium,
- exchanging expertise and providing training opportunities in this respect
- stimulating joint research activities in which molecular systematics and DNA barcoding are essential for resolving taxonomic and phylogenetic problems
- centralizing and integrating DNA barcoding activities in Belgium within the international frameworks of CBOL, ECBOL and iBOL, TBI, QBOL, etc.

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operational tools

- website (<http://bebol.myspecies.info>)
- joint research papers
- organization of congresses, symposia, workshops, courses, and informal meetings
- joint research project applications
- training of students

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Research focus #1: DNA barcoding in a variety of organisms

COI (most metazoans) and *matK* and *rbcL* (plants)

but also

nuclear rDNA in Platyhelminthes (UHasselt, RMCA, RBINS)

trnH-psbA and ITS2 for plants of the family Hydrocharitaceae (VUB)

ND2 and H3 in terrestrial gastropods (RBINS, UAntwerp)

Part of this work co-financed by

- DNA barcoding initiatives:

EU FP7 project QBOL (Quarantine Barcode of life): ILVO (Plant-Crop Protection Group) and UGhent (Laboratory for Microbiology)

TBI (Tephritid Barcode Initiative): RMCA

- JEMU
- FWO

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Research focus #2: exploring complementary identification tools

microarrays, [UA (Ecophysiology, Biochemistry and Toxicology Group)
microsatellites (UAntwerp, RBINS, RMCA, INBO, FUNDP, CRC)

Research focus #3: DNA barcoding of difficult (degraded) samples

museum material, forensic / nature conservation research samples (RMCA, RBINS, KULeuven and CBOL: MOLCOL project, finaced by Belspo, connection to JEMU)

good practices for DNA sample and data storage, establishment of DNA collections (collaboration with NICC, INBO, UGhent (Marine Biology Group), UHasselt, FUNDP, ITM, CRC, and CRA-W)

ABCtaxa publication (AGORA-MOLCOL project)

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Research focus #4: Improving and developing new statistical and software tools for DNA barcoding data

RMCA, RBINS (both with the JEMU team), UAntwerp

links up with the EU FP7 project ViBRANT (development of internet applications for organizing DNA barcoding communities through scratchpads)

Research focus #5: Exploring Next Generation Sequencing (NGS) for DNA barcoding (KULeuven, RBINS, RMCA, INBO and UGhent with KULeuven and UAntwerp acting as NGS core facilities)

workshops on eDNA metabarcoding

symposium on the Genome Analysis ToolKit (GATK) software package

mini-symposium on comparative barcoding, KULeuven

MOLCOL project (testing the use of museum samples for NGS)

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main DNA barcoding partnerships developed in the network:

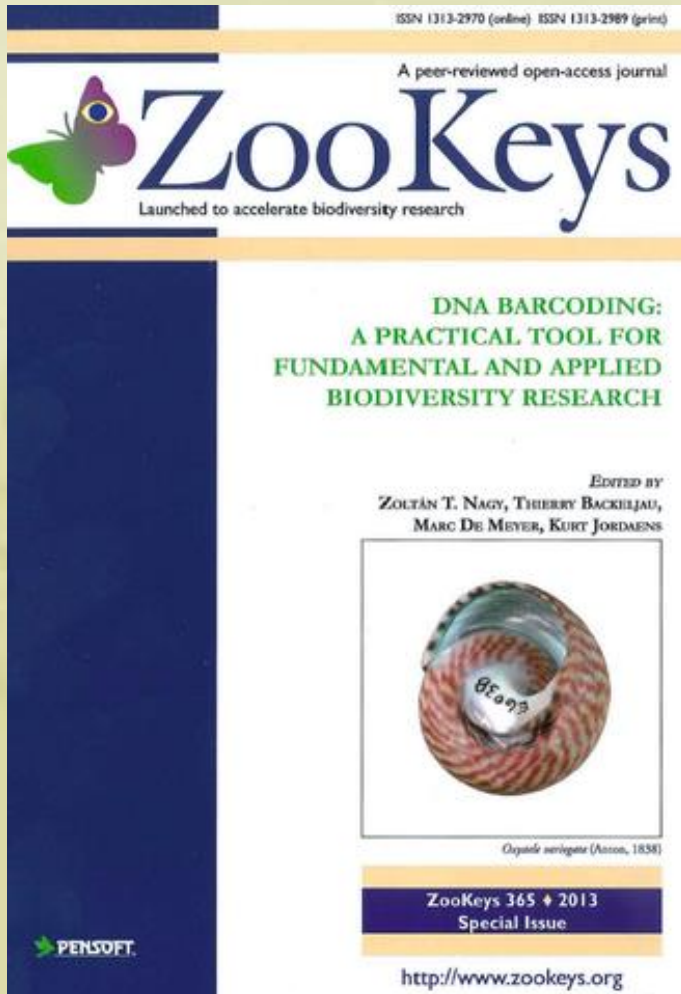
- **Reptiles:** RBINS, UAntwerp
- **Forensic animals:** NICC, RBINS, RMCA
- **Bacteria and Fungi:** UGhent (Laboratory for Microbiology), UCL, RMCA, RBINS
- **Platyhelminthes:** UHasselt, KULeuven, RMCA, RBINS
- **Nematoda:** UGhent (Marine Biology Group), RBINS
- **Gastropoda:** RBINS, RMCA, UAntwerp, INBO
- **Acari:** UAntwerp, RBINS, ITM
- **Lepidoptera:** RMCA, INBO, UAntwerp;
- **Trichoptera:** UAntwerp (Ecophysiology, Biochemistry and Toxicology Group), RBINS
- **Hymenoptera and Isoptera:** ULB, RBINS
- **Diptera:** RMCA, RBINS, NICC, ITM, CRA-W
- **Amphipoda** RBINS, UCL
- **Fishes:** RMCA, RBINS, KULeuven
- **Mammals (including forensics):** UAntwerp, RMCA, RBINS, NICC

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DNA barcoding identification activities:

- JEMU-RMCA, DNA barcoding identifications of bird remnants at request of the Belgian Air Force (2011-2015)
- participation in ringtest of DNA barcoding identification of *Eisenia fetida* (earthworms) in ecotoxicological testing (EBI: Eisenia Barcoding Initiative)
- DNA barcoding of introduced banana slugs in The Netherlands
- barcoding of tephritid fruit flies for several NPPO's in Africa
- + isolated requests of DNA barcoding ID (from FPNI Belgium, from the Laboratory of the General Administration of the Customs and Taxes (Brussels, Belgium), from Dr. Jocelyn Riggins (Royal Veterinary College, London, UK), ...)

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network events

...

17-20 September 2012:
“ECBOL3 - Third European Conference for the
Barcode of Life”

ZooKeys 365 (2013) Special Issue
ZT Nagy, T Backeljau, M De Meyer, K Jordaens

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budget

- no separate budgets for “pure” DNA barcoding activities
- all DNA barcoding activities are part of other research activities (including those of BeBoL FWO and JEMU)

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<http://jemu.myspecies.info>



The screenshot shows the homepage of the Joint Experimental Molecular Unit (JEMU). The header is red with the JEMU logo and navigation links: HOME, HIGHLIGHTS, RESEARCH, RESOURCES, COLLABORATIONS, ORGANISATION, EVENTS, CONTACT. A search bar and 'SEARCH' button are also present. The main content area is white and features several sections:

- Welcome to JEMU:** A text block describing the unit's mission, supported by the Belgian Science Policy and the Royal Museum for Central Africa. It includes logos for Africa Tervuren, JEMU, and the Belgian Science Policy.
- Highlights:** Three featured articles: 'Next-generation sequencing (Dec. 2014)', 'Genetics of African Cape buffalo (Nov. 2014)', and 'DNA barcoding Belgian mosquitoes (Sep. 2014)'. Each article has a small thumbnail image.
- Research:** A section with 'Research projects' and 'Publications'. The 'Publications' sub-section lists journals like Zootaxa, PLOS ONE, ZooKeys, and ZooKeys.
- Resources and expertise:** Three sub-sections: 'Primer database' (with a diagram of DNA sequences), 'DNA analysis' (with a colorful gel electrophoresis image), and 'Infrastructure' (with a photo of a laboratory).
- Collaborations:** Two sub-sections: 'BeBoL' (Belgian Network for DNA Barcoding) and 'ECBOL' (Third European Conference for the Barcode of Life, Brussels, 2012).
- Organisation:** Two sub-sections: 'Integrated unit' (Shared LAB facilities, Knowledge Transfer) and 'Lab guidelines' (with an image of a lab notebook and equipment).

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SEARCH

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JOINT PUBLICATION
LITERATURE
PAST EVENTS

Welcome to the Belgian Network for DNA Barcoding

The Belgian Network for DNA Barcoding aims at establishing a research network that provides an integrated and multidisciplinary molecular systematic and DNA barcoding task force. The network will:

1. coordinate the efforts and knowledge in the field of molecular systematics and DNA barcoding in Belgium
2. exchange experience and provide training opportunities for people in the field of molecular systematics and DNA barcoding
3. stimulate joint research in animal and plant groups where molecular systematics and DNA barcoding plays a pivotal role
4. centralize and integrate DNA barcoding activities in Belgium in international initiatives such as the Consortium for the Barcode of Life (CBOL), the European Consortium for the Barcode of Life (ECBOL) and the International Barcode of Life project (IBOL).

BeBoL is supported by:






BeBoL encourages publishing in the [European Journal of Taxonomy \(EJT\)](#), an international, fully electronic and Open Access journal, which complies with the EU Gold Open Access rules and Zookeys:




Joint publication by BeBoL



The special issue entitled "DNA barcoding: a practical tool for fundamental and applied biodiversity research" has been published in Zookeys. This is a joint publication by the FWO research community "Belgian Network for DNA barcoding" (BeBoL) and includes, among others, contributions of members of the BeBoL network and participants of the [ECBOL3 conference](#). All articles are available on the [website of Zookeys](#) with open access. The complete special issue (one single pdf file) is also available [here](#).

BeBoL at the 5th International Barcode of Life Conference



The network and the activities of BeBoL were presented at the 5th International Barcode of Life Conference in Kunming, China, 27-31 October 2013.

Past events



BeBoL supports the organisation of scientific workshops or symposia. Please regularly visit this website to be informed of upcoming events. The following events were organised by BeBoL since 2013: [Workshop Genetic Analysis using R](#) (27-31 October 2014); [Workshop Variant Discovery in Next-Generation Sequencing \(NGS\) Data](#) (24-26 June 2014); [Mini-Symposium: Comparative Barcoding](#) (20 June 2014); [DNA in forensics 2014](#) (14-16 May 2014); [Symposium: next generation sequencing, applications in science](#) (21 October 2013, Brussels); [Workshop: VIBRANT tools for the DNA taxonomist](#) (11 June 2013, Brussels); [Symposium: metabarcoding of environmental samples](#) (19 April 2013, Brussels).

Common scientific interest



Molecular systematic studies provide biologists, and particularly taxonomists, with a wealth of data that enable a far better assessment and understanding of Earth's biodiversity, than hitherto was possible with traditional, morphology-based approaches. As such, molecular systematics plays a pivotal role in (1) the recognition, identification and classification of taxonomic units, (2) the assessment of patterns of inter- and intraspecific biodiversity, and (3) the reconstruction of the historical and spatial relationships among taxonomic entities.

Members of the network



Here is the list of the current members of the Belgian network for DNA Barcoding. If your research unit conducts projects related to DNA Barcoding, you are welcome to contact us. All members briefly presented their activities at the informal meeting "Towards a Belgian network of DNA barcoding laboratories" organized by JEMU on June 28th 2010.