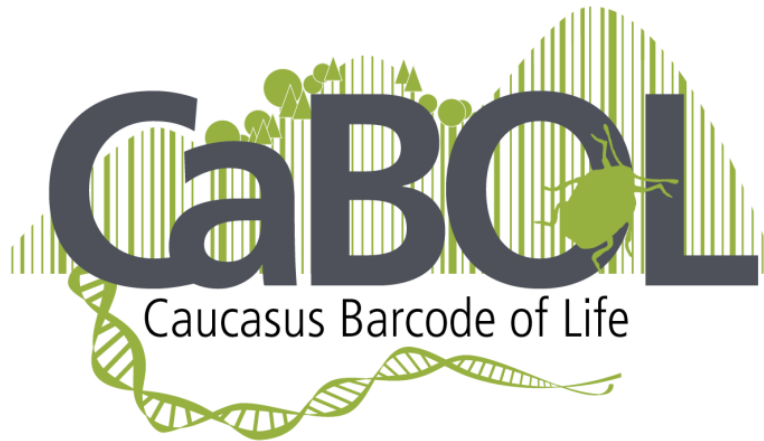


# Caucasus Barcode of Life

... and an invitation to contribute



**Russian Arachnologists Meeting**

13., 19., 25. February, 2021 (Zoom)

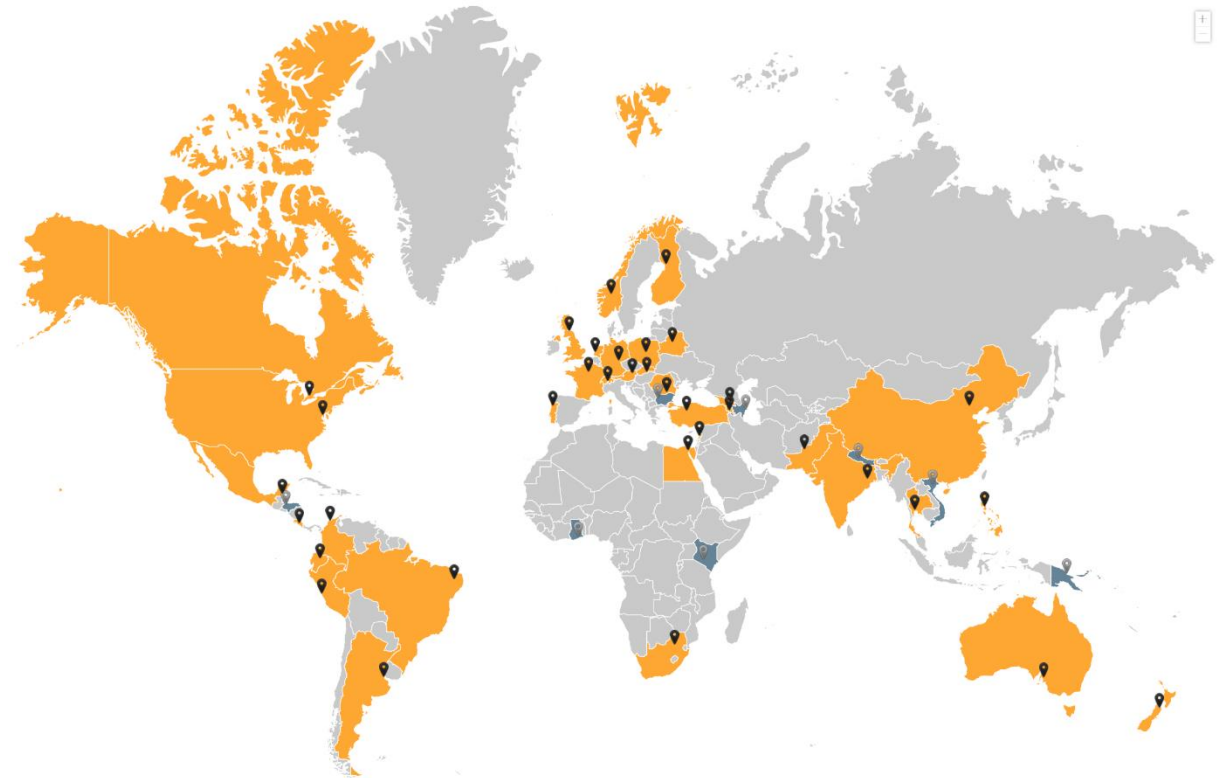
**February 13<sup>th</sup> 2021**

**Stefan Otto & Nils Hein**



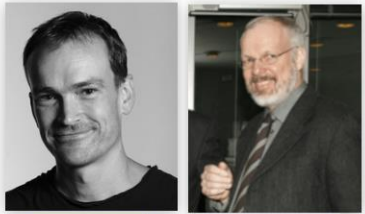
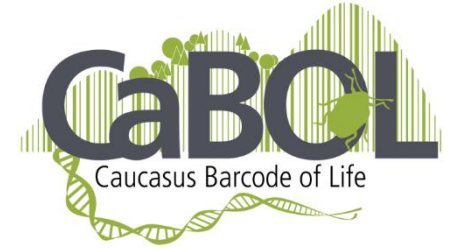
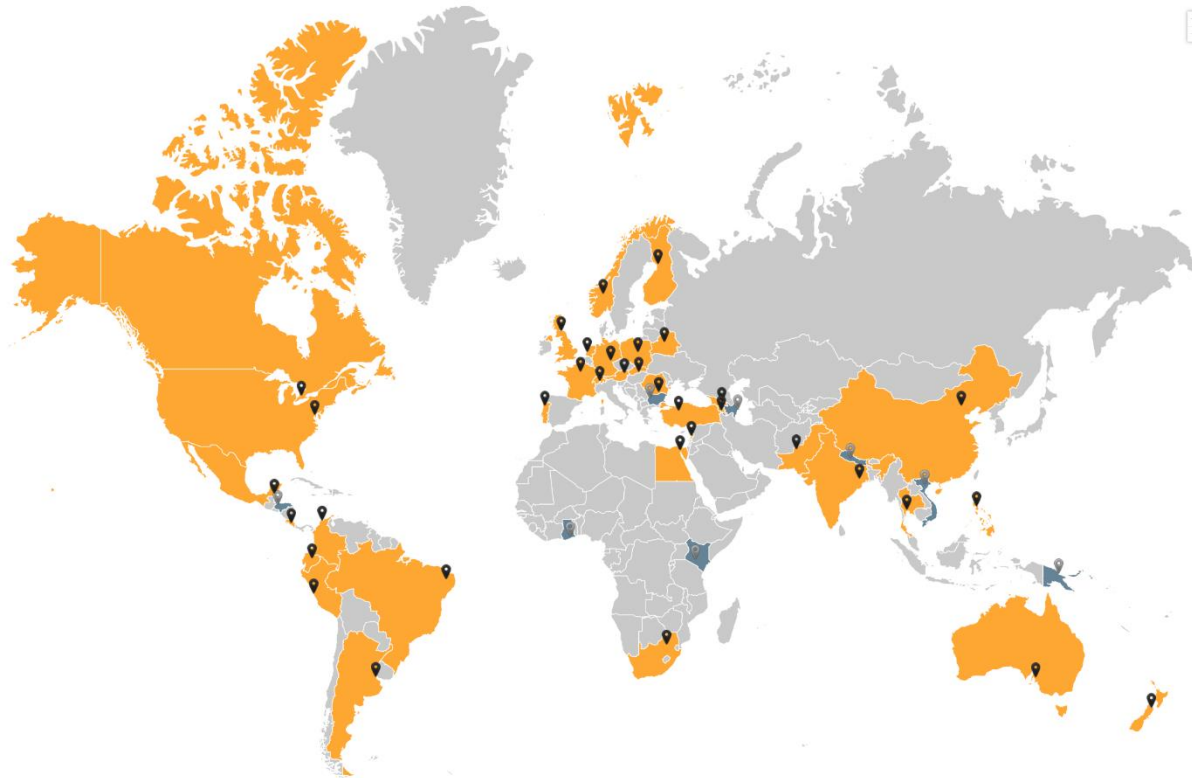


THE IBOL CONSORTIUM HAS 35 MEMBER AND 8 ASSOCIATE MEMBER NATIONS





THE IBOL CONSORTIUM HAS 35 MEMBER AND 8 ASSOCIATE MEMBER NATIONS



JONAS ASTRIN

AXEL HAUSMANN

GERMANY



DAVID TARKHISHVILI

GEORGIA



ROUBEN AROUTIOUNIAN

ARMENIA

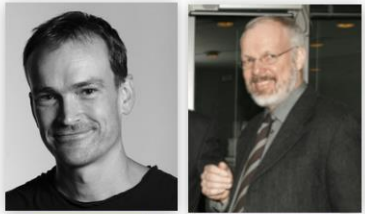
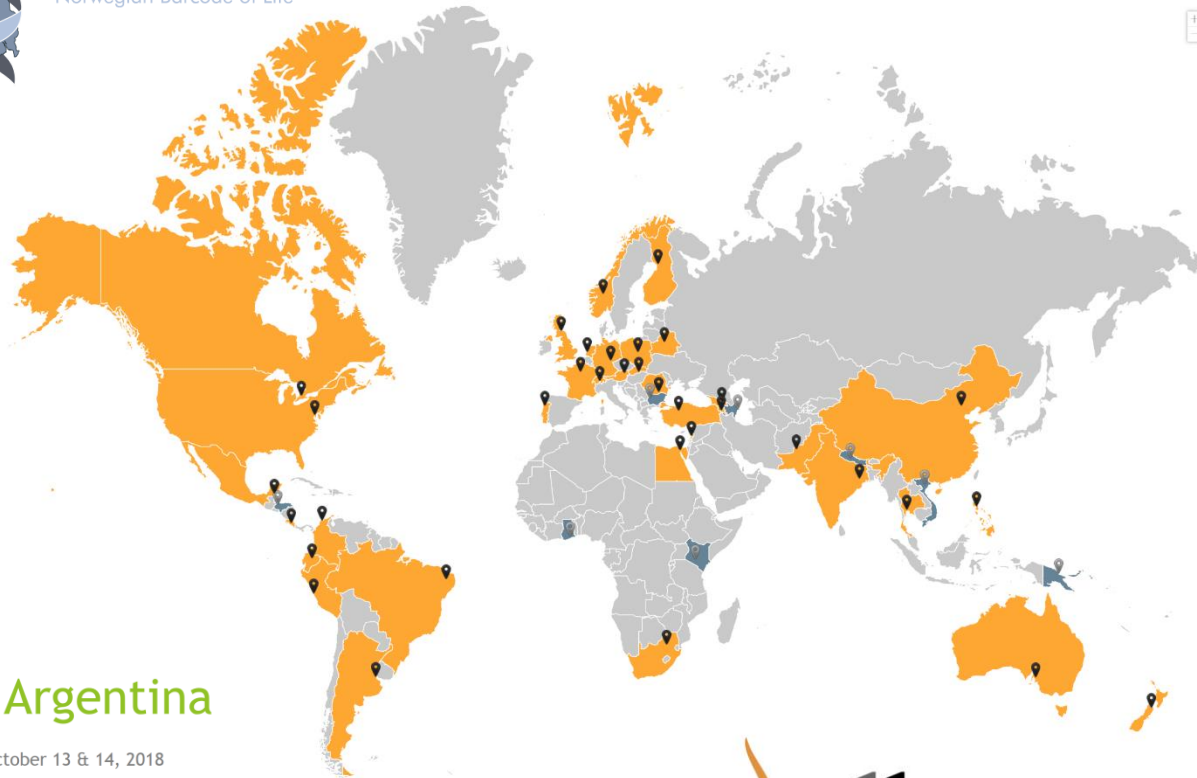
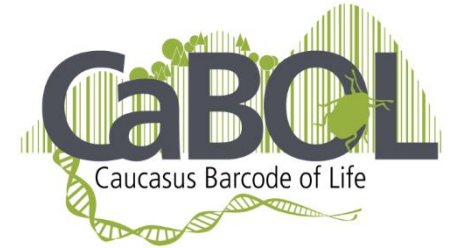


BARDUKH GABRIELYAN





THE IBOL CONSORTIUM HAS 35 MEMBER AND 8 ASSOCIATE MEMBER NATIONS



JONAS ASTRIN  
AXEL HAUSMANN  
GERMANY



DAVID TARKHISHVILI  
ROUBEN AROUTIOUNIAN  
BARDUKH GABRIELIAN  
GEORGIA  
ARMENIA



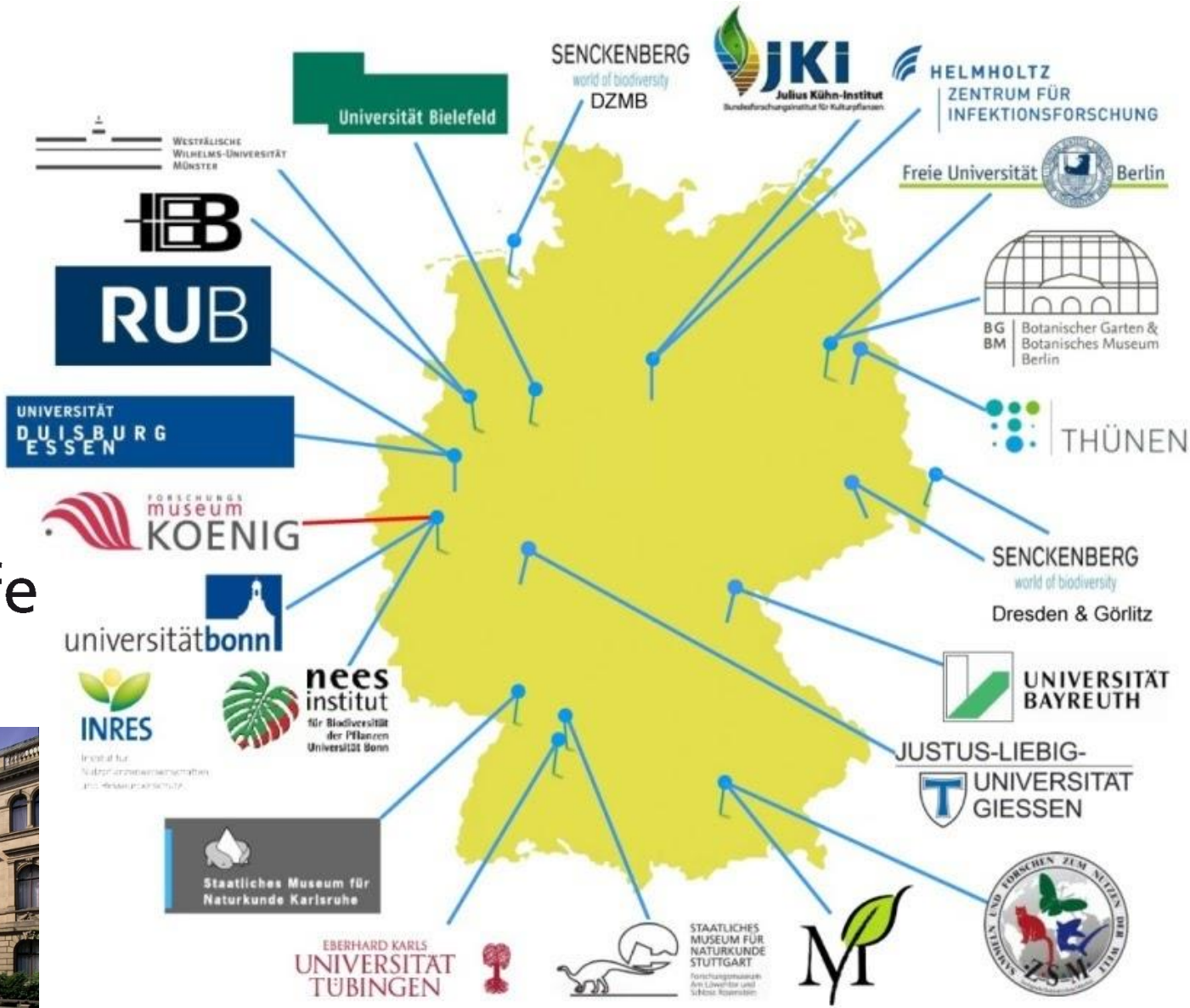
Node Report - **Argentina**

Scientific Steering Committee, October 13 & 14, 2018



# GBOL

German Barcode of Life



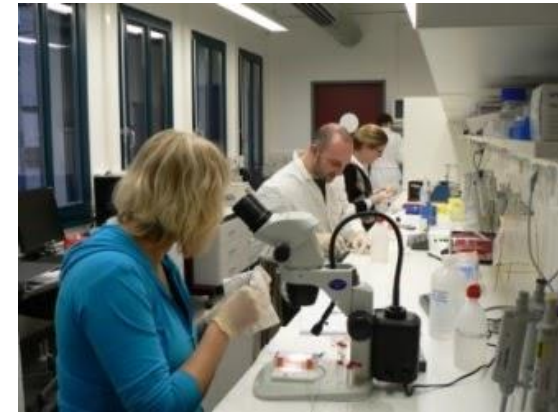
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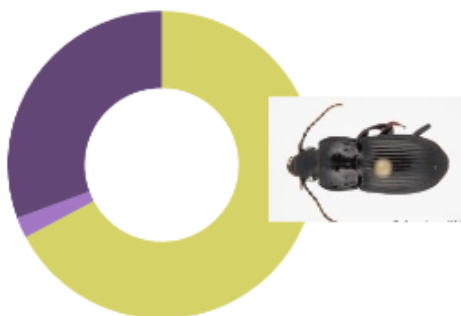
## *Leibniz Institute for Animal Biodiversity*

- Collection-based work on terrestrial and freshwater animal biodiversity, taxonomy, systematics, evolution
- approx. 7 Million voucher specimens in the collection
- since 2010 methodological focus: Center for Molecular Biodiversity (bioinformatics, genomics, DNA barcoding, biobanking)

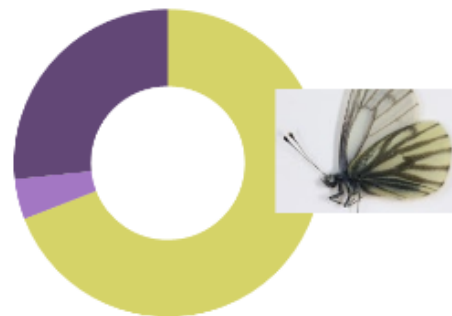


# GBOL I & II – DNA Reference Database

Coleoptera (6738 spp.)



Lepidoptera (3791 spp.)



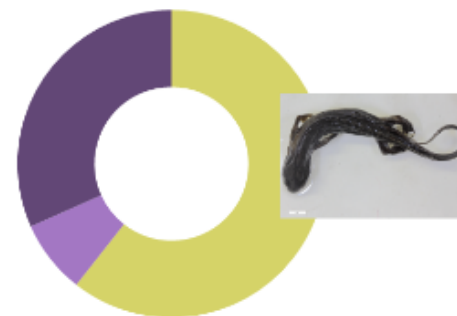
Heteroptera (892 spp.)



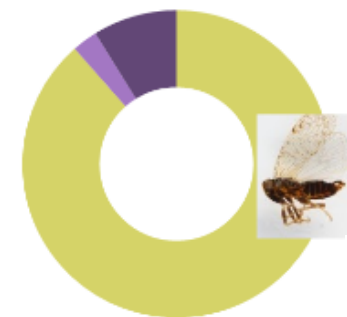
Araneae (1100 spp.)



Chordata (802 spp.)



Auchenorrhyncha (635 spp.)



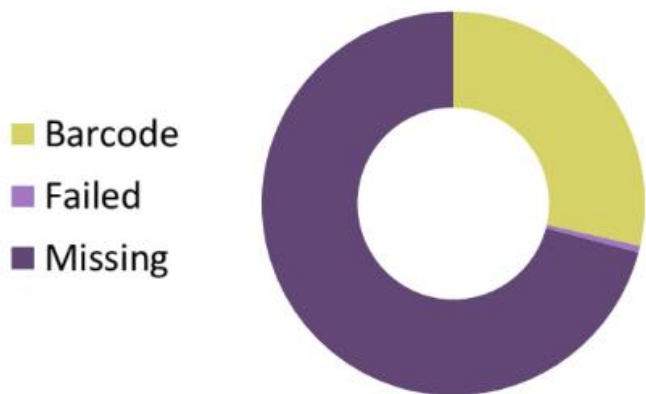
■ Barcode  
 ■ Failed  
 ■ Missing

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# GBOL III *Dark Taxa*



Hymenoptera (9833 spp.)



Diptera (9451 spp.)







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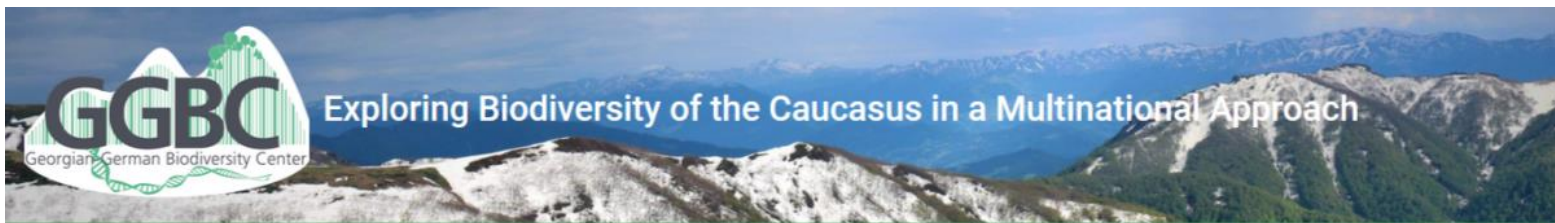


LEVAN MUYLADZE

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GGBC Capacity building DNA Barcoding Kintrishi Project Forestry Projects News

## GGBC

We plan to set up a **Georgian-German Biodiversity Center** (GGBC) as a multinational approach to explore the biodiversity of the Caucasus area.

The research center will be located at Ili State University (Tbilisi, Georgia) and is to be jointly established and used by scientists from Germany and from Georgia as well as from neighboring countries, and will be open to researchers worldwide who are interested in Caucasian biota.

The center is meant to foster international collaboration, will improve science infrastructures, engage in education, and explore Caucasian biodiversity, with a strong, but not exclusive focus on molecular methods. The current (pilot) project phase is an institutional partnership grant, financed by the German Federal Ministry of Education and Research ([www.bmbf.de](http://www.bmbf.de)) under grant number 01DK17048. One of the main initial project targets is to start a Georgian Barcode of Life database.

Current project partners are:

*Ili State University, Tbilisi, Georgia*<sup>1</sup>

*Zoological Research Museum Alexander Koenig, Bonn, Germany*<sup>2</sup>

*Faculty of Forest Sciences and Forest Ecology, Forest Inventory and Remote Sensing, Göttingen, Germany*<sup>3</sup>

We are in the process of adding project partners (University of Bonn, Nees Institute for Botany, Agricultural University of Georgia, Tbilisi). Please contact us if you are interested to collaborate:

1 (Tbilisi): D. Tarkhishvili, C. Anderson, L. Muyladze, G. Chaladze

2 (Bonn): B. Misof (project PI), J. Astrin, B. Rulik; turs: E. Bärmann

3 (Göttingen): C. Kleinn, L. Fehrmann (forestry)

## Recent Posts

Illustrated Field Guide to Georgian Flora

January 29, 2019

BioBlitz 2019

January 28, 2019

BioBlitz in Kintrishi

October 5, 2018

Type your search



## GGBC Project Funding

SPONSORED BY THE



Federal Ministry  
of Education  
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## Project Partners



# The Kintrishi Malaise Transect 2018



BERNHARD MISOF



DAVID TARKHNISHVILI



JONAS ASTRIN



BJÖRN RULIK



NILS HEIN



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# The Kintrishi Malaise Transect 2018



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# The Kintrishi Malaise Transect 2018



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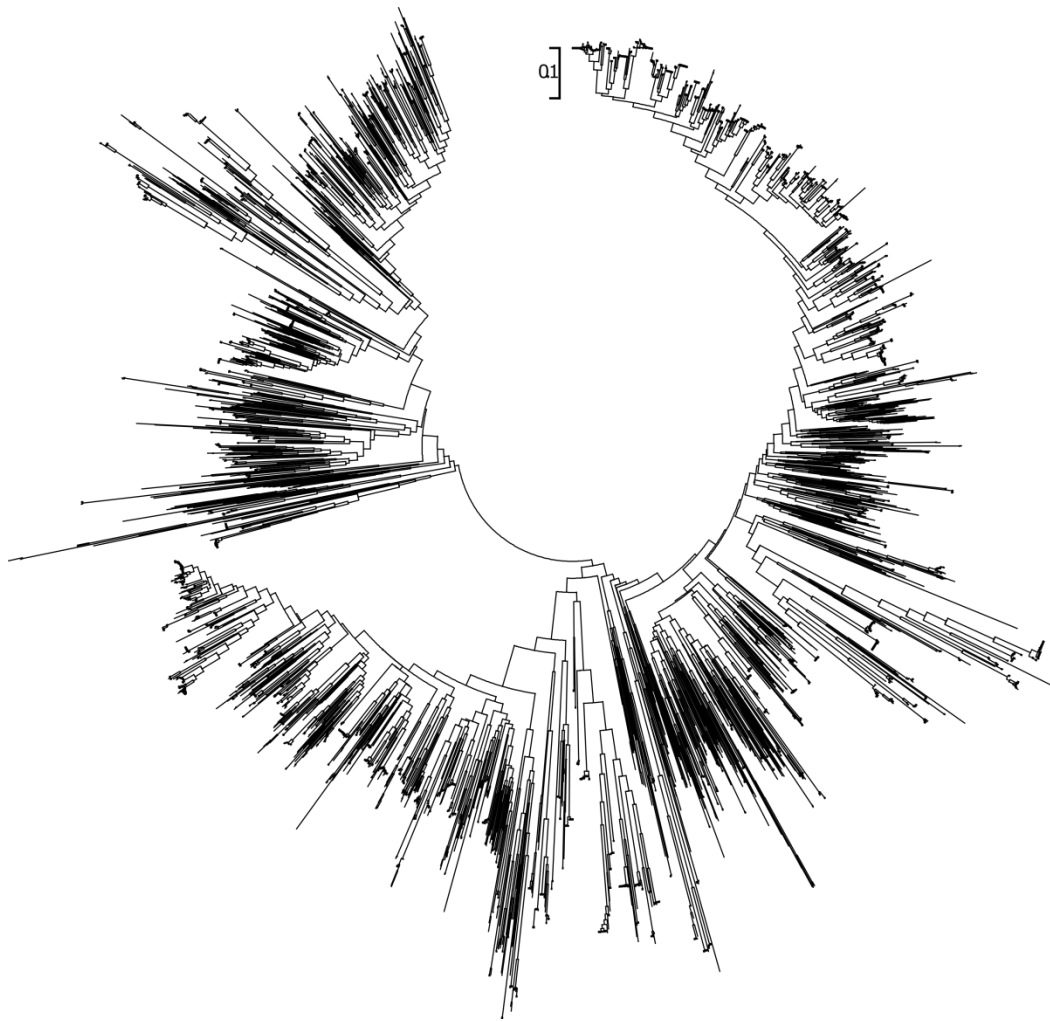
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**Diversity collection:**

- Georgia: 4752 (with Barcode: 3783)
- Armenia: 916 (with Barcode: 443)

Report\*\*

**A prelude to the Caucasus Barcode of Life Platform (CaBOL):  
Biodiversity Days in Georgia in 2018 and 2019**

Jana Thormann<sup>1</sup>, Dirk Ahrens<sup>1</sup>, Cort Anderson<sup>2</sup>, Jonas J. Astrin<sup>1,†</sup>, Levan Mumladze<sup>3</sup>, Björn Rulik<sup>1</sup>,  
David Tarkhishvili<sup>1</sup>, Marianne Espeland<sup>1</sup>, Matthias Geiger<sup>1</sup>, Nils Hein<sup>4</sup>, Giorgi Iankoshvili<sup>2</sup>,  
Elisabeth Karalashvili<sup>2</sup>, Ximo Mengual<sup>1</sup>, Carsten Morkel<sup>5</sup>, Marco T. Neiber<sup>6</sup>, Ralph S. Peters<sup>1</sup>,  
André Reimann<sup>7</sup>, Axel Ssymank<sup>8</sup>, Thomas Wesener<sup>1</sup>, Joachim Ziegler<sup>9</sup> & Bernhard Misof<sup>1,†</sup>



Research Article

**Towards retrieving the Promethean treasure: a  
first molecular assessment of the freshwater  
fish diversity of Georgia**

Giorgi Epatashvili<sup>†</sup>, Matthias Geiger<sup>§</sup>, Jonas J Astrin<sup>§</sup>, Fabian Herder<sup>§</sup>,  
Bella Japoshvili<sup>†</sup>, Levan Mumladze<sup>†</sup>

<sup>†</sup> Institute of Zoology, Ilaa State University, Tbilisi, Georgia  
<sup>§</sup> Zoological Research Museum A. Koenig, Bonn, Germany



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Research article

[urn:lsid:zoobank.org:pub:1358E5B2-056C-4DF2-9C4E-0189E1086712](http://urn:lsid:zoobank.org:pub:1358E5B2-056C-4DF2-9C4E-0189E1086712)

**Five new Palaearctic species of *Docosia* (Diptera: Mycetophilidae),  
with updated molecular phylogeny of the genus**

Jan ŠEVČÍK<sup>1,\*</sup>, Nikola BURDÍKOVÁ<sup>2</sup>, David KASPRÁK<sup>3</sup> & Olavi KURINA<sup>4</sup>

CHECKLIST

**Checklist of hover flies (Diptera, Syrphidae)  
of the Republic of Georgia**

Ximo Mengual<sup>1</sup>, Sander Bot<sup>2</sup>, Tinatin Chkhartishvili<sup>3</sup>,  
André Reimann<sup>4</sup>, Jana Thormann<sup>1</sup>, Laura von der Mark<sup>1</sup>



EBERHARD FISCHER



DAVID TARKHISHVILI



STEFAN OTTO



BERNHARD MISOF



NILS HEIN



BARDUKH GABRIELYAN



MARINE ARAKELYAN



GIORGI JAOSHVILI



CHRISTOPH KLEIN

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**Caucasus Barcode of Life -- <https://ggbc.eu/>**



## Caucasus Barcode of Life

CaBOL Biodiversity DNA Barcoding Results News History/GGBC ▾ Contact

### CaBOL

The BMBF-funded project Caucasus Barcode of Life (CaBOL) aims to catalogue numerous animal and plant species of the Caucasus. The Caucasus region is one of our planet's biodiversity hotspots containing a vast amount of animal and plant species. The DNA barcodes of these species will be stored in a reference database and made publicly available. Initially, the project focus lies on the



English ▾

Username

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## 1. Sampling



## 2. Collection data



## 3. Photographs



## 6. PCR



## 5. DNA Extraction



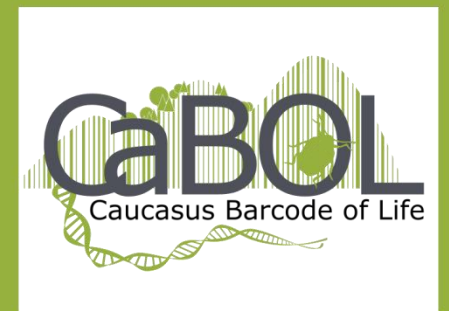
## 4. Collection



## 7. Sequencing



## 8. Data validation



## 9. NCBI

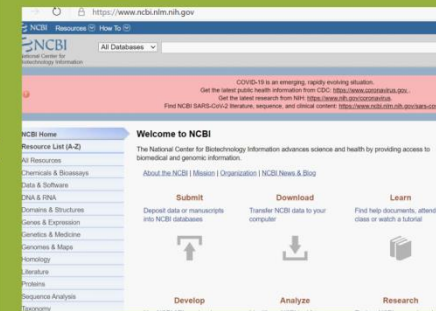




Fig. 22

Photo: Jana Thormann

Thormann et al. 2020 // Bonn Zoological Bulletin 68 (2): 275–296.

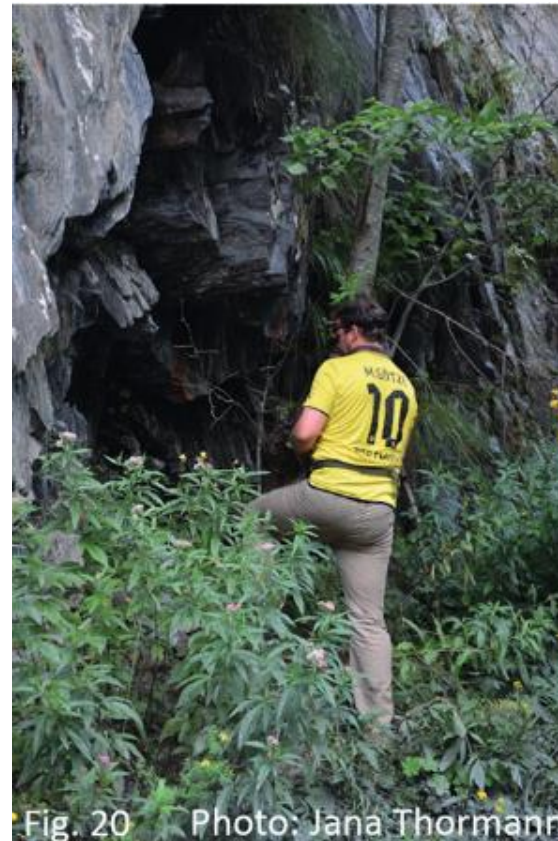


Fig. 20

Photo: Jana Thormann



Fig. 21

Photo: Jana Thormann

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## Sammelinfos

Fundortbeschreibung	Ortsangaben			Datum	Sammelmethode	Breitengrad	Längengrad
	Region	Bundesland	Land				
Grainfield east of Butzheim, Butzheim Bruchstraße	Butzheim, Romerskirche	Nordrhein-Westfalen	Deutschland	26.07.20	hand collecting	51,045100	6,713490
rainforest, riverside,	Kintrishi NR	Adjara	Georgia	29.07.2018	hand collecting	41,736940	41,983890
rainforest	Kintrishi NR, Khino monestr	Adjara	Georgia	29.07.2018	hand collecting	41,728610	42,078060
rainforest	Kintrishi NR, picnic spot	Adjara	Georgia	21.07.2018	hand collecting	41,731940	41,975280
rainforest	Kintrishi NR, picnic spot	Adjara	Georgia	21.07.2018	hand collecting	41,731940	41,975280
rainforest	Kintrishi NR, picnic spot	Adjara	Georgia	21.07.2018	hand collecting	41,731940	41,975280
rainforest	Kintrishi NR, picnic spot	Adjara	Georgia	21.07.2018	hand collecting	41,731940	41,975280
rainforest	Kintrishi NR, picnic spot	Adjara	Georgia	21.07.2018	hand collecting	41,731940	41,975280
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180
beach	Grigoleti, Ilia State Universt	Guria	Georgia	18.07.2018	hand collecting	42,052910	41,727180

# Photographs



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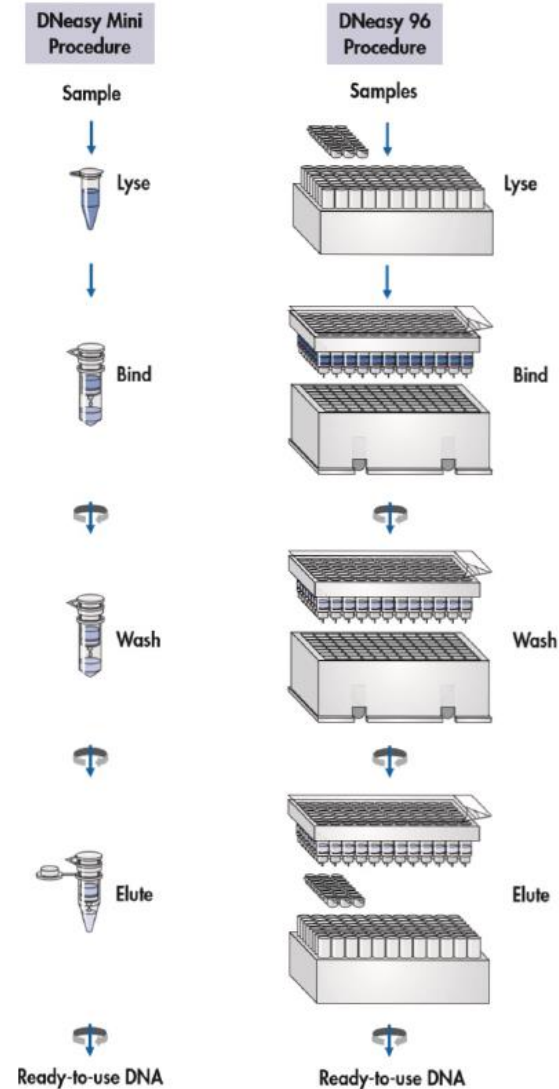
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## DNA Extraction



In the laboratory technicians isolate a small piece of tissue from each specimen and extract DNA.



September 2020, ISU Laboratory

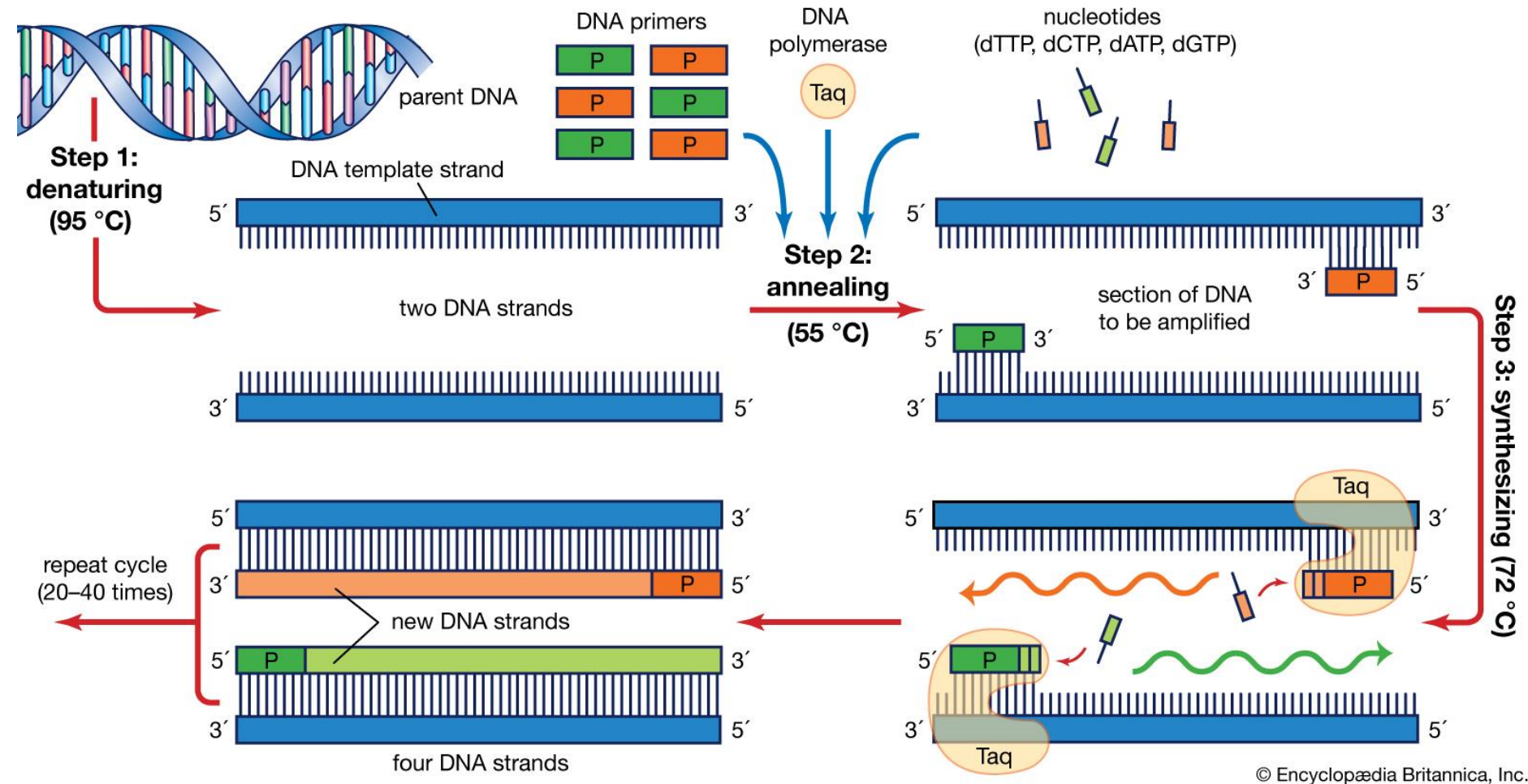


CORT ANDERSON



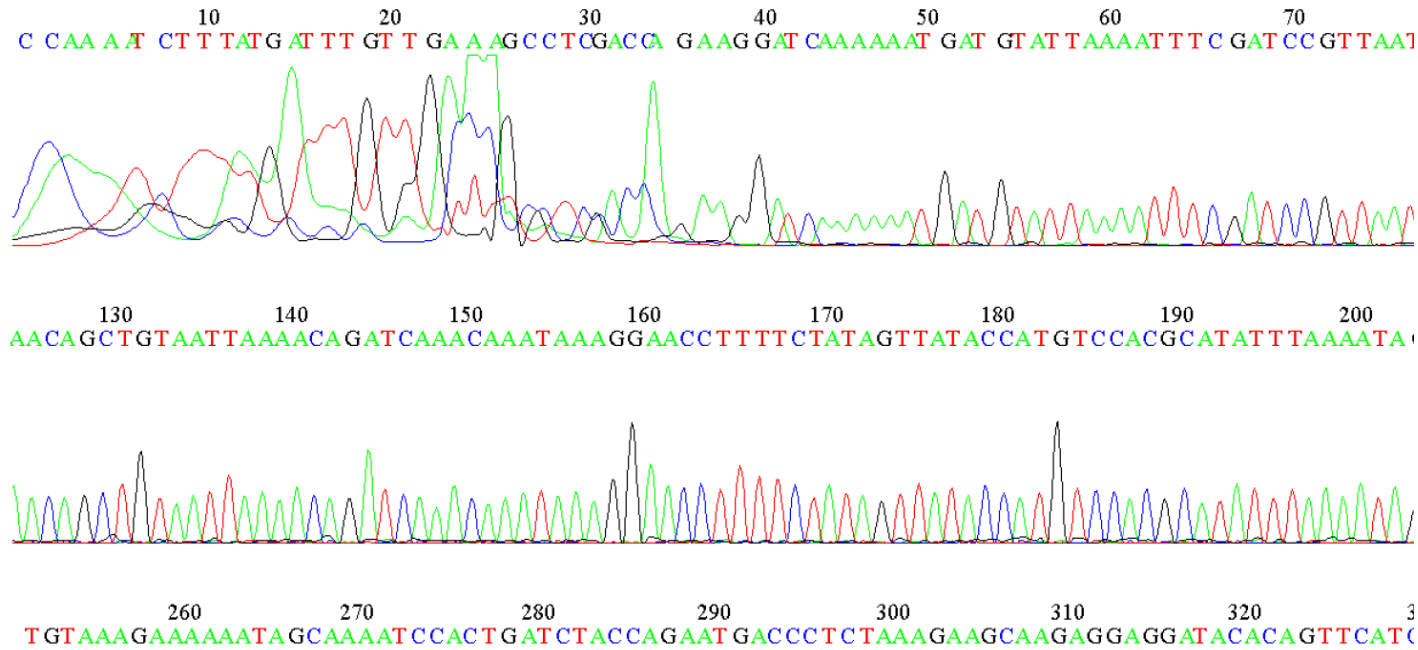
MARI  
MURTSKHVALADZE

**PCR**



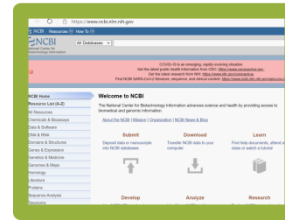


File: A\_4\_HCO2198.ab1    Run Ended: 2012/8/28 9:34:41    Signal G:1877 A:3472 C:3089 T:3079  
 Sample: A\_4\_HCO2198    Lane: 47    Base spacing: 14.817353    1499 bases in 16302 scans    Page 1 of 1



AACTTTATACTTGATTTTTGGAGCTTGAGCTGCTATAGTGGGTACAGCAATAAGAGTATTGATTCGAATTGAATTAGGACAGCCTGGGAGATTTATGGGTG  
 ATGATCAATTATATAATGTAATTGTTACAGCTCATGCATTTGTAATAATTTTTTTATAGTTATACCAATCTTGATTGGGGGTTTTGGGAACTGGTTAGTTCCT  
 TTAATATTAGGAGCTCCTGATATAGCATTTCACGAATGAATAATTTAAGTTTTGGTTATTACCTCCTTCATTATTTCTTTTAATTGTTTTCTTCAATAGTAGAA  
 ATAGGAGTAGGAGCAGGATGAACAGTGTATCCCCATTGGCTGGATTAGAAGGTCATGCTGGGAGATCCGTAGATTTTGCAATTTTTCTTCACTTCATTTGG  
 CTGGGGCTTCTTCAATTATAGGAGCAATTAATTTATTTCAACAATTATTAATATGCGATTTATGGAATAACAATAGAAAAGGTACCTTTATTTGTTTGGTC  
 TGTTTTAATTACGGCTGTTCTTTTATTATTATCTTTACCTGTTTTAGCAGGGGCTATTACAATATTATTAAGTATCGAAATTTAATACTTCTTTTTTTGATCCT  
 TCAGGGGGTGGGGATCCTATTTTATTTTCAGCATTATTT





The species profile including the DNA sequence is fed into global reference databases for DNA barcodes

NCBI Resources How To Sign in to NCBI

Nucleotide Nucleotide Argiophe bruenrichi Search

COVID-19 is an emerging, rapidly evolving situation. Get the latest public health information from CDC: <https://www.coronavirus.gov>. Get the latest research from NIH: <https://www.nih.gov/coronavirus>. Find NCBI SARS-CoV-2 literature, sequence, and clinical content: <https://www.ncbi.nlm.nih.gov/sars-cov-2/>

Species Summary 20 per page Sort by Default order Filters: Manage Filters

Animals (2,232) Customize ...

Molecule types genomic DNA/RNA (2,232) Customize ...

Source databases INSDC (GenBank) (2,231) RefSeq (1) Customize ...

Sequence Type clear Nucleotide (2,232)

Genetic compartments clear Mitochondrion (2,232)

Sequence length Custom range...

Release date Custom range...

Revision date Custom range...

Clear all

Items: 1 to 20 of 2232

Filters activated: Nucleotide, Mitochondrion. Clear all

1. [Argiophe bruenrichi mitochondrion, complete genome](#)  
14,063 bp circular DNA  
Accession: NC\_024281.1 GI: 651424659  
[BioProject](#) [Protein](#) [Taxonomy](#)  
[GenBank](#) [FASTA](#) [Graphics](#)

2. [Argiophe bruenrichi mitochondrion, complete genome](#)  
14,063 bp circular DNA  
Accession: KJ594561.1 GI: 641804290  
[Protein](#) [Taxonomy](#)  
[GenBank](#) [FASTA](#) [Graphics](#)

3. [Argiophe bruenrichi isolate UaQ05 cytochrome oxidase subunit 1 \(COI\) gene, partial cds; mitochondrial](#)  
1,199 bp linear DNA  
Accession: KC195752.1 GI: 471257930  
[Protein](#) [PubMed](#) [Taxonomy](#)  
[GenBank](#) [FASTA](#) [Graphics](#) [PopSet](#)

Results by taxon

Taxonomic Groups [List](#)

- arthropods (2232)
  - arachnids (2231)
    - hexapods (1)

Find related data

Database: Select

Find items

Search details

```
("Argiophe bruenrichi"[Organism] OR Argiophe bruenrichi[All Fields]) AND (is_nucleore[filter] AND mitochondrion[filter])
```

Search See more...

<https://www.ncbi.nlm.nih.gov>

AACTTTATACTTGATTTTTGGAGCTTGA  
GCTGCTATAGTGGGTACAGCAATAAGA  
GTATTGATTTCGAATTGAATTAGGACAGC  
CTGGGAGATTTATGGGTGATGATCAAT  
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TTTGTATAAATTTTTTTATAGTTATACC  
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CAGGGGCTATTACAATATTATTAECTGA  
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CTTCAGGGGGTGGGGATCCTATTTTAT  
TTCAGCATTATTT

# Progress until February 2021

- **Field Work in Georgia and Armenia 2020**
- **Lab Startup at ISU, Tbilisi**
  - **Procurement of equipment and consumables, workflow, quality control**
- **Preparing space for collection at Zool. Inst./ISU Tbilisi**
- **Setting up the CaBOL Database and Web Portal**
- **Sorting Kintrishi Samples (200 malaise bottles, approx. 2 Mio. Insects)**
  - **Sending taxa to taxonomists for determination**

# Current Focus (early 2021)

- **Finding taxonomists who can determine Caucasian specimens to species level**
- **Finding individual collectors and taxonomists who submit their determined material to the CaBOL Collection in Tbilisi and get the COI barcode in exchange for their own publications**
- **Plants, Vertebrates, Invertebrates**
  - **! Hymenoptera, Diptera, Coleoptera, Lepidoptera Acari**

# Thank you for your attention!

... and please get in contact  
about cooperation at [ggbc.eu](http://ggbc.eu)!

Special thanks to: Jonas Astrin, Matthias Geiger, Hans-Joachim Krammer, Vera Rduch,  
Jana Thormann



[cabol\\_biodiversity\\_caucasus](https://www.instagram.com/cabol_biodiversity_caucasus)