

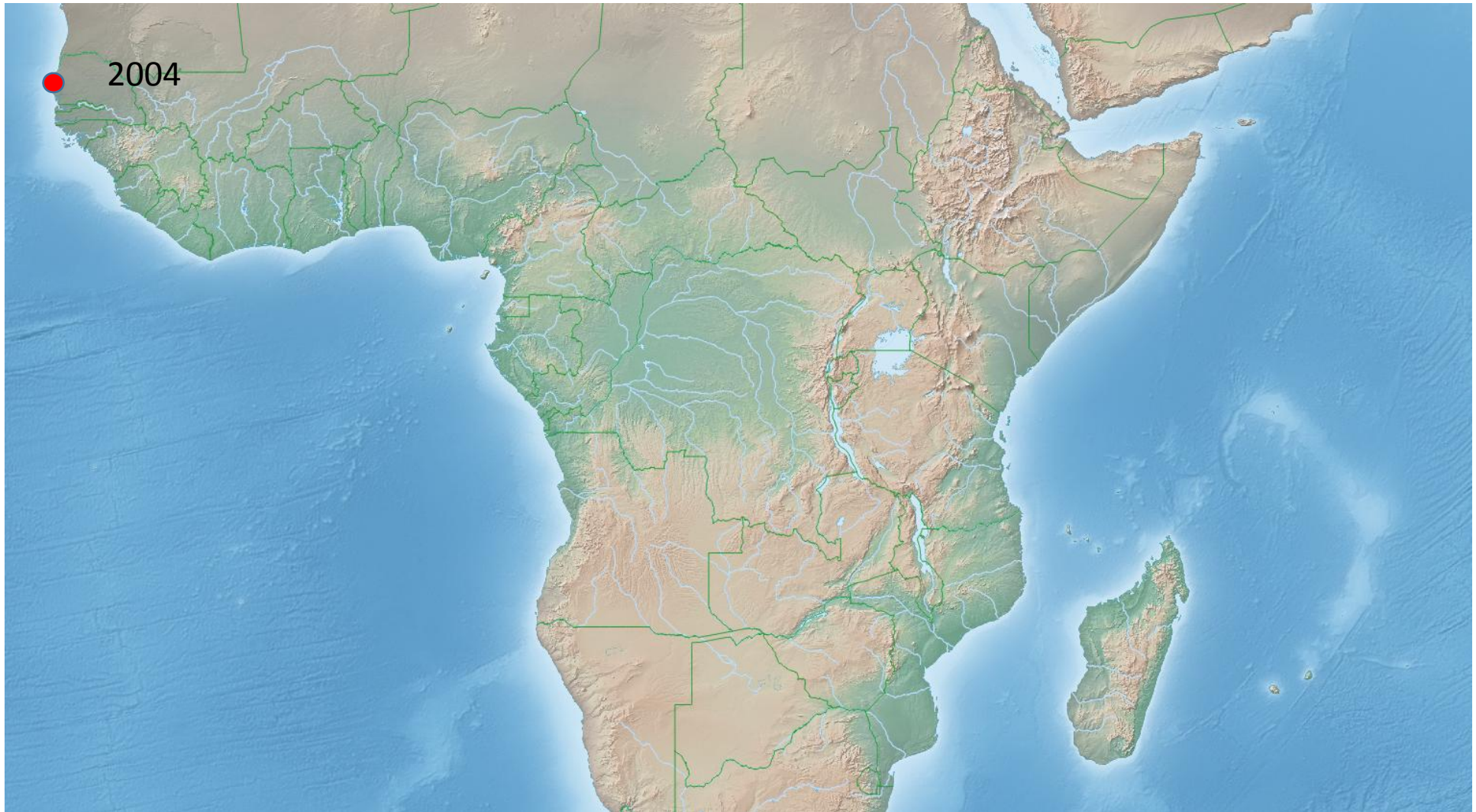
News from the other side (of Africa)

Evolution of rodent hosts and
their parasites in Eastern Africa

Josef Bryja and many others

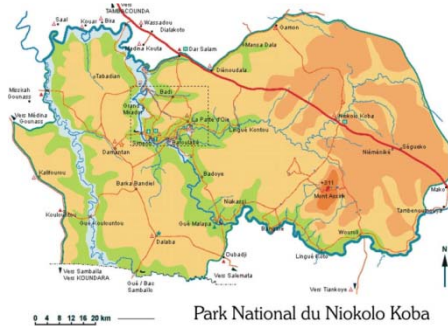
Institute of Vertebrate Biology, Czech Academy of Sciences, Brno
Institute of Botany and Zoology, Faculty of Science, Masaryk
University, Brno, Czech Republic

How it started ... (Czech „rodentologue“ activities in Africa)



2004 Dakar

Niokolo Koba National Park – biodiversity survey

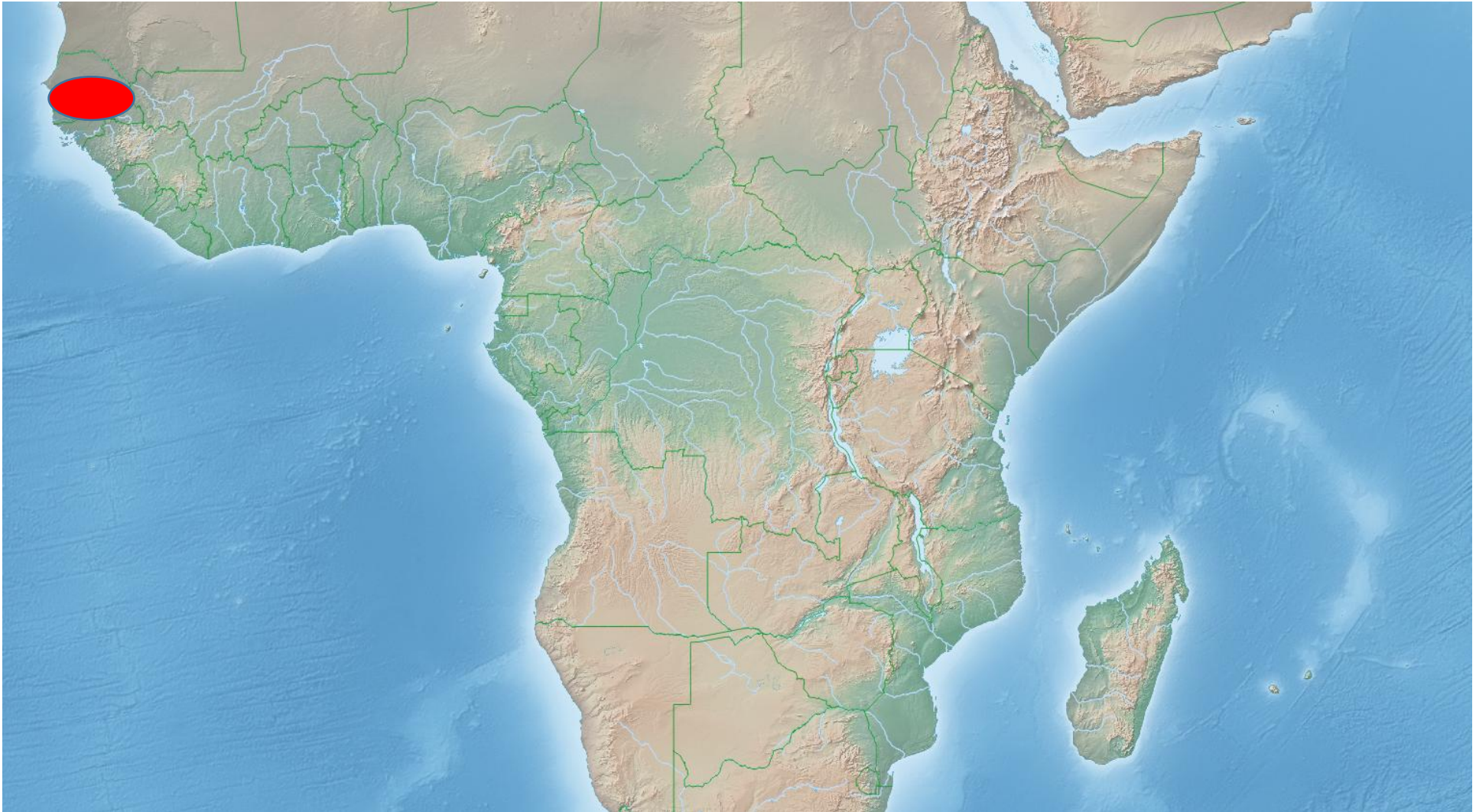


Guinean forest

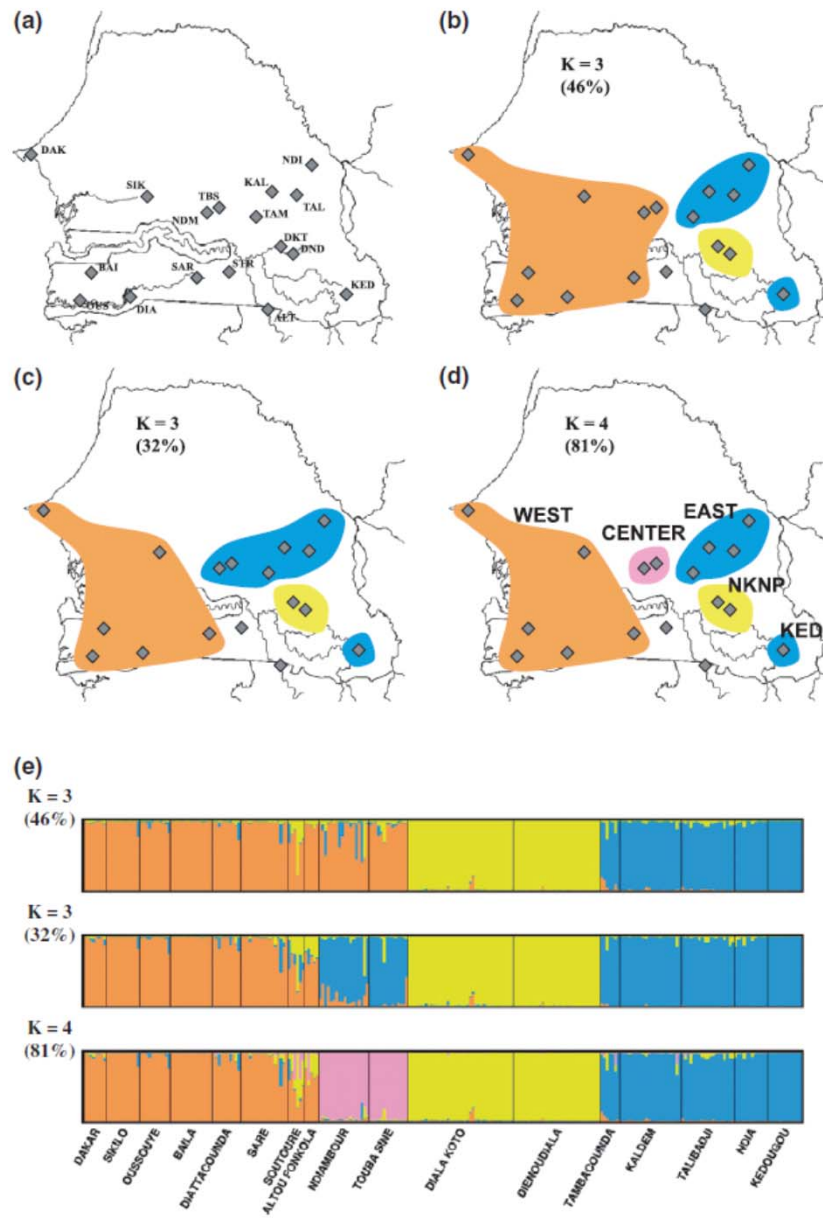


Sudanian savanna

„Black rat survey“



2006 Dakar



MOLECULAR ECOLOGY

Molecular Ecology (2013) 22, 286–300

doi: 10.1111/mec.12112

Invasion genetics of the introduced black rat (*Rattus rattus*) in Senegal, West Africa

ADAM KONEČNÝ,*†‡ ARNAUD ESTOUP,* JEAN-MARC DUPLANTIER,§ JOSEF BRYJA,† KHALILOU BÂ,¶ MAXIME GALAN,* CAROLINE TATARD* and JEAN-FRANCOIS COSSON*
 *INRA, CBGP, Campus international de Baillarguet, CS 30016, Montpellier-sur-Lez cedex F-34988, France, †Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Květná 8, Brno 603 65, Czech Republic, ‡Department of Biodiversity and Molecular Ecology, Fondazione E. Mach, Research and Innovation Centre, Via E. Mach 1, San Michele all'Adige (TN) 38010, Italy, §IRD, CBGP, Campus international de Baillarguet, CS 30016, Montpellier-sur-Lez cedex F-34988, France, ¶IRD, CBGP, BP 1386, Dakar, Senegal

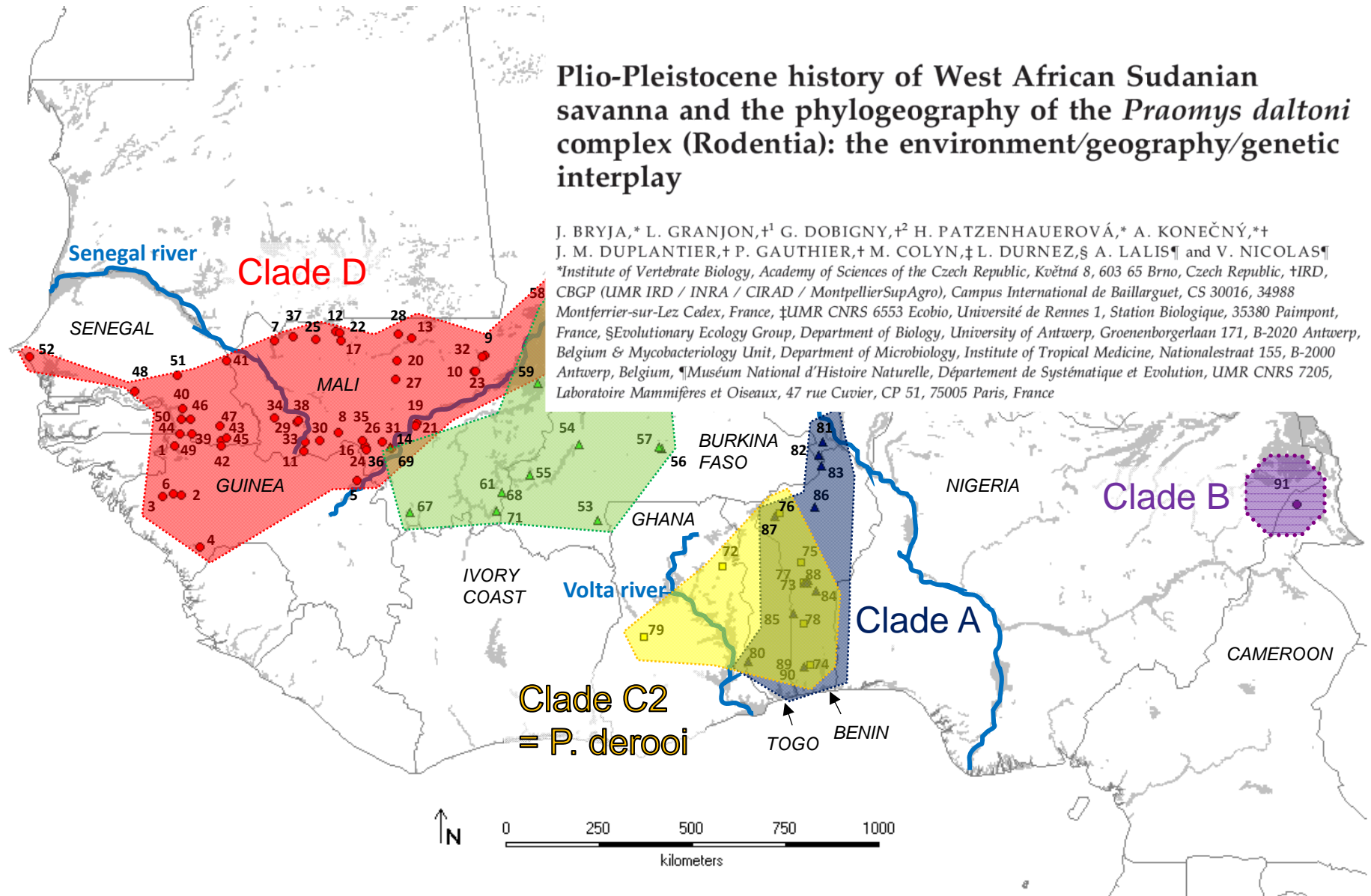


„first phylogeography papers“

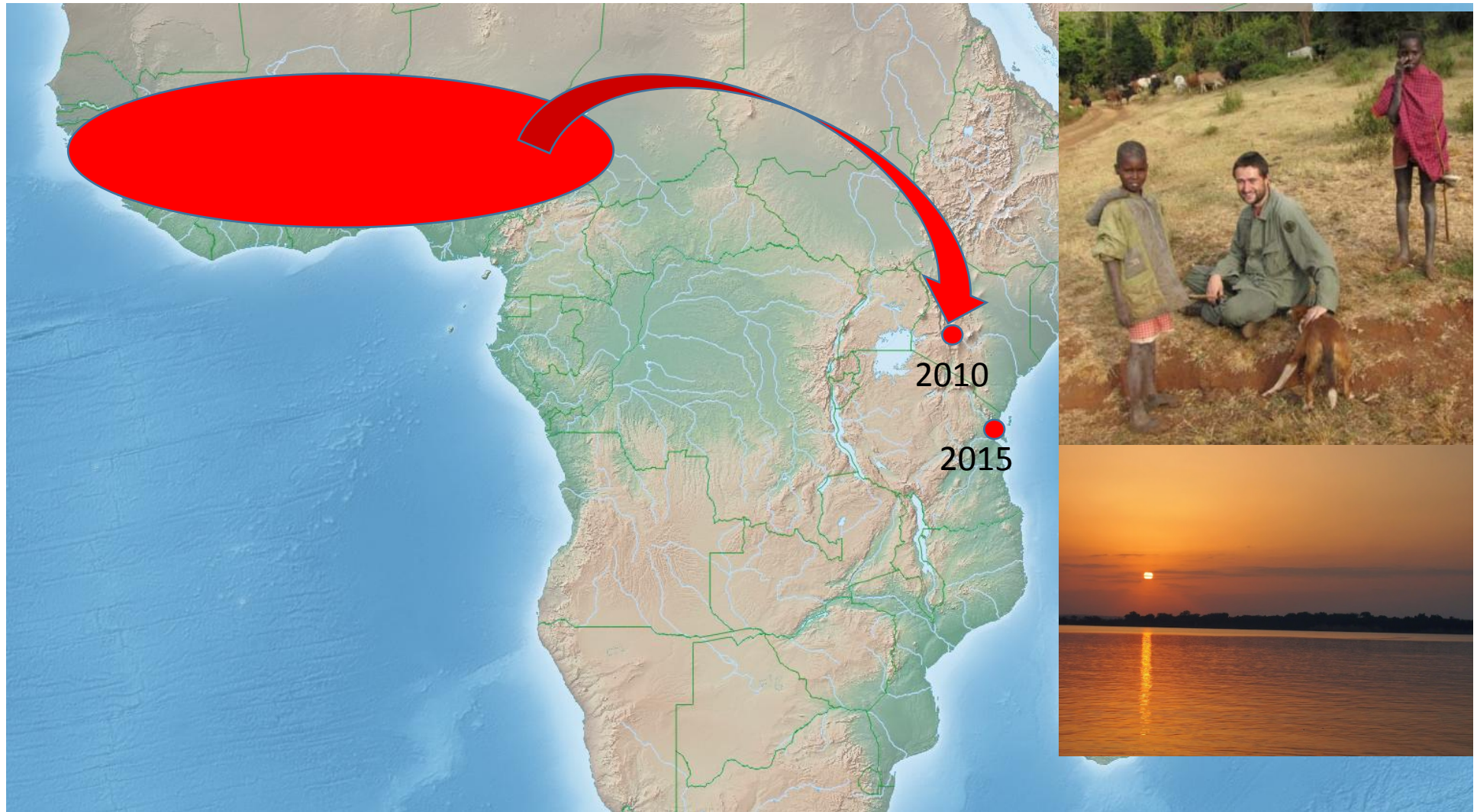


Plio-Pleistocene history of West African Sudanian savanna and the phylogeography of the *Praomys daltoni* complex (Rodentia): the environment/geography/genetic interplay

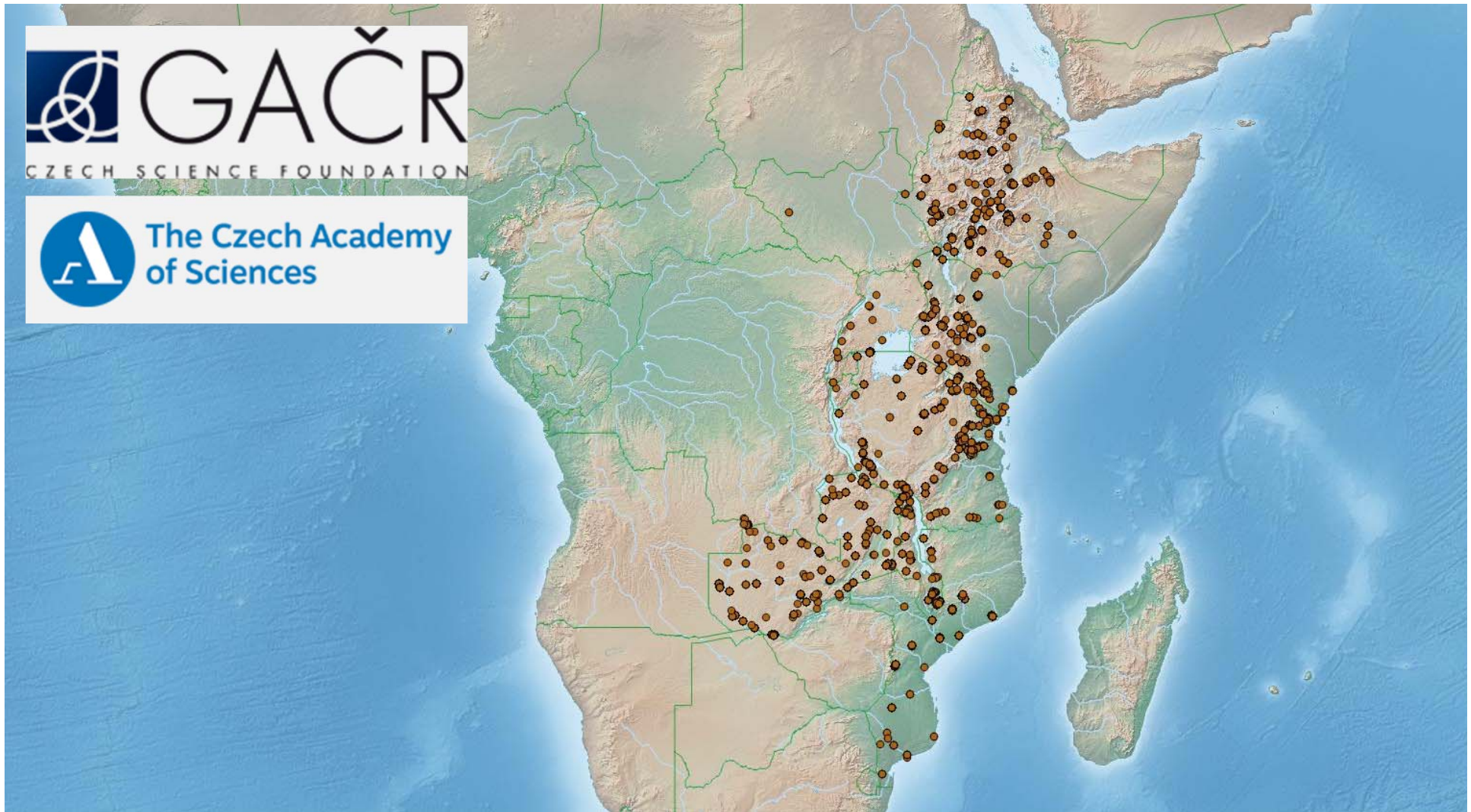
J. BRYJA,* L. GRANJON,+¹ G. DOBIGNY,+² H. PATZENHAUEROVÁ,* A. KONEČNÝ,++
 J. M. DUPLANTIER,+ P. GAUTHIER,+ M. COLYN,‡ L. DURNEZ,§ A. LALIS¶ and V. NICOLAS¶
 *Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Květná 8, 603 65 Brno, Czech Republic, †IRD,
 CBGP (UMR IRD / INRA / CIRAD / MontpellierSupAgro), Campus International de Baillarguet, CS 30016, 34988
 Montpellier-sur-Lez Cedex, France, ‡UMR CNRS 6553 Ecobio, Université de Rennes 1, Station Biologique, 35380 Paimpont,
 France, §Evolutionary Ecology Group, Department of Biology, University of Antwerp, Groenenborgerlaan 171, B-2020 Antwerp,
 Belgium & Mycobacteriology Unit, Department of Microbiology, Institute of Tropical Medicine, Nationalestraat 155, B-2000
 Antwerp, Belgium, ¶Muséum National d'Histoire Naturelle, Département de Systématique et Evolution, UMR CNRS 7205,
 Laboratoire Mammifères et Oiseaux, 47 rue Cuvier, CP 51, 75005 Paris, France



Jump to the „other side“ ...



September 2015 – 8336 rodents and shrews ...



... comparative phylogeography, evolution of viruses, taxonomic implications, etc.

... again influenced by „Montpellier“ people

Acta Oecologica xxx (2012) 1–9



Contents lists available at [SciVerse ScienceDirect](#)

Acta Oecologica

journal homepage: www.elsevier.com/locate/actoec



Original article

Systematics and evolution of the African pygmy mice, subgenus *Nannomys*: A review

J. Britton-Davidian^{a,*}, T.J. Robinson^b, F. Veyrunes^a

^aInstitut des Sciences de l'Evolution, Université Montpellier 2, cc065, Pl. E. Bataillon, 34095 Montpellier cedex 05, France

^bEvolutionary Genomics Group, Department of Botany and Zoology, University of Stellenbosch, Private Bag XI, Matieland 7602, South Africa

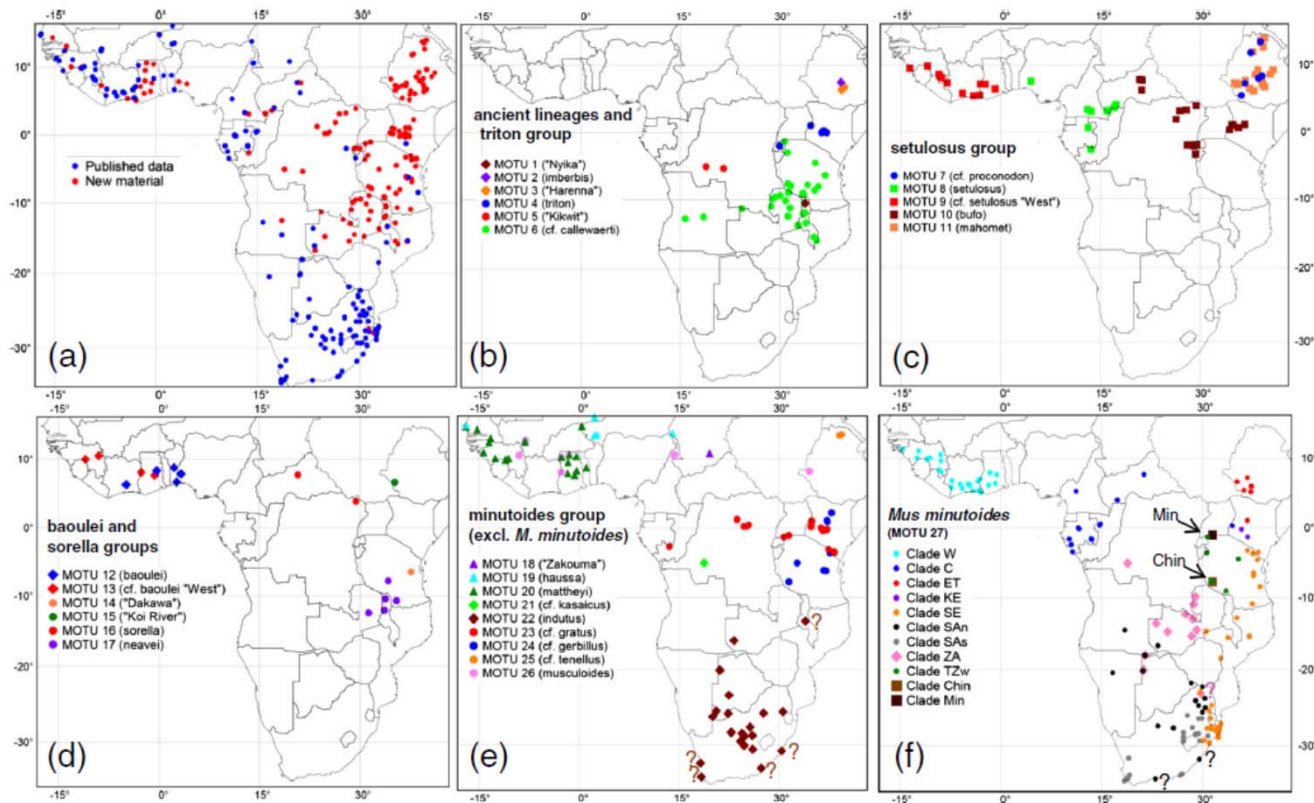


RESEARCH ARTICLE

Open Access

Pan-African phylogeny of *Mus* (subgenus *Nannomys*) reveals one of the most successful mammal radiations in Africa

Josef Bryja^{1,2,13*}, Ondřej Mikula^{1,3}, Radim Šumbera⁴, Yonas Meheretu⁵, Tatiana Aghová^{1,2}, Leonid A Lavrenchenko⁶, Vladimír Mazoch⁴, Nicholas Oguge⁷, Judith S Mbau⁸, Kiros Welegerima⁵, Nicaise Amundala⁹, Marc Colyn¹⁰, Herwig Leirs¹¹ and Erik Verheyen^{11,12}

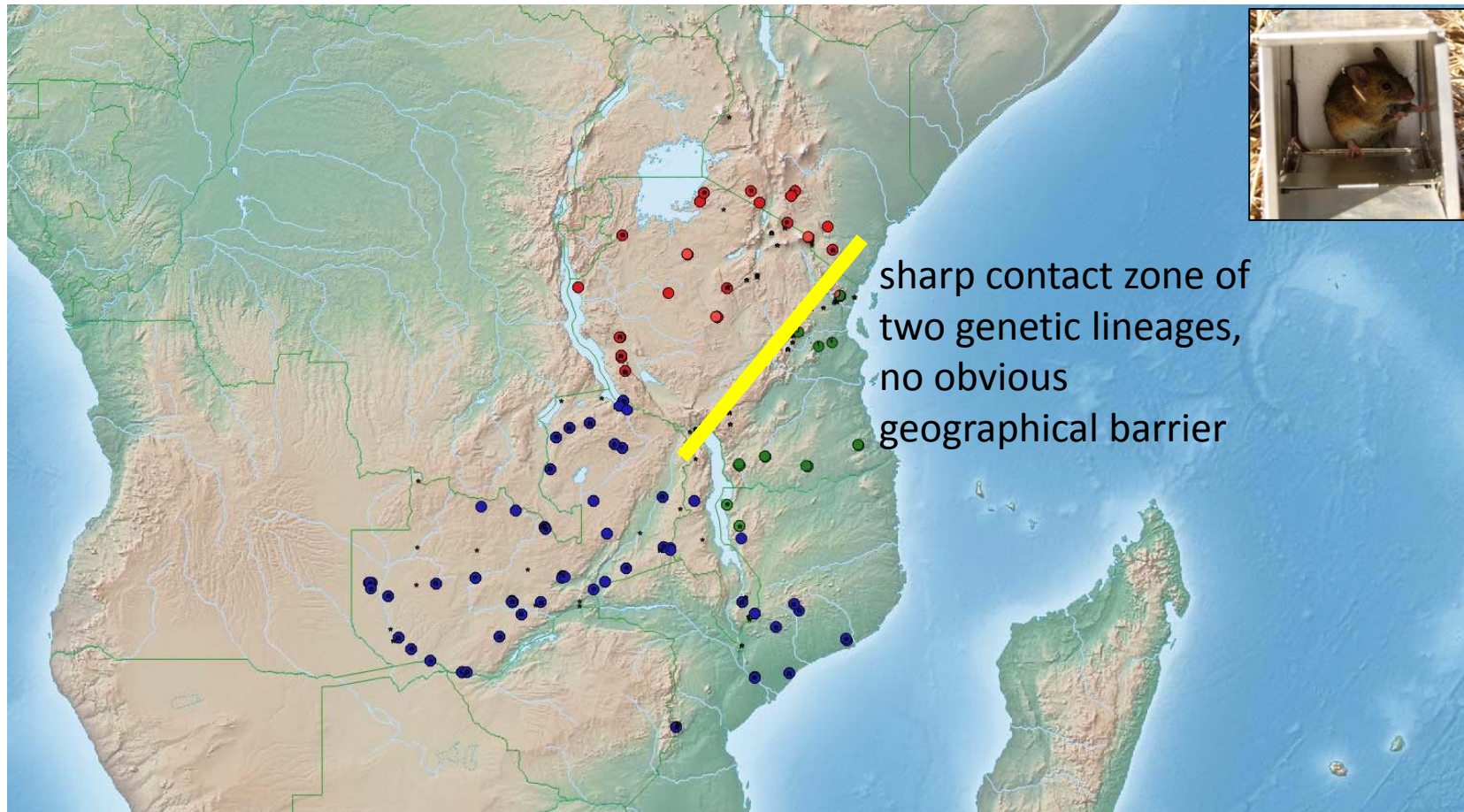


Evolution of rodents and their parasites in open habitats of East Africa

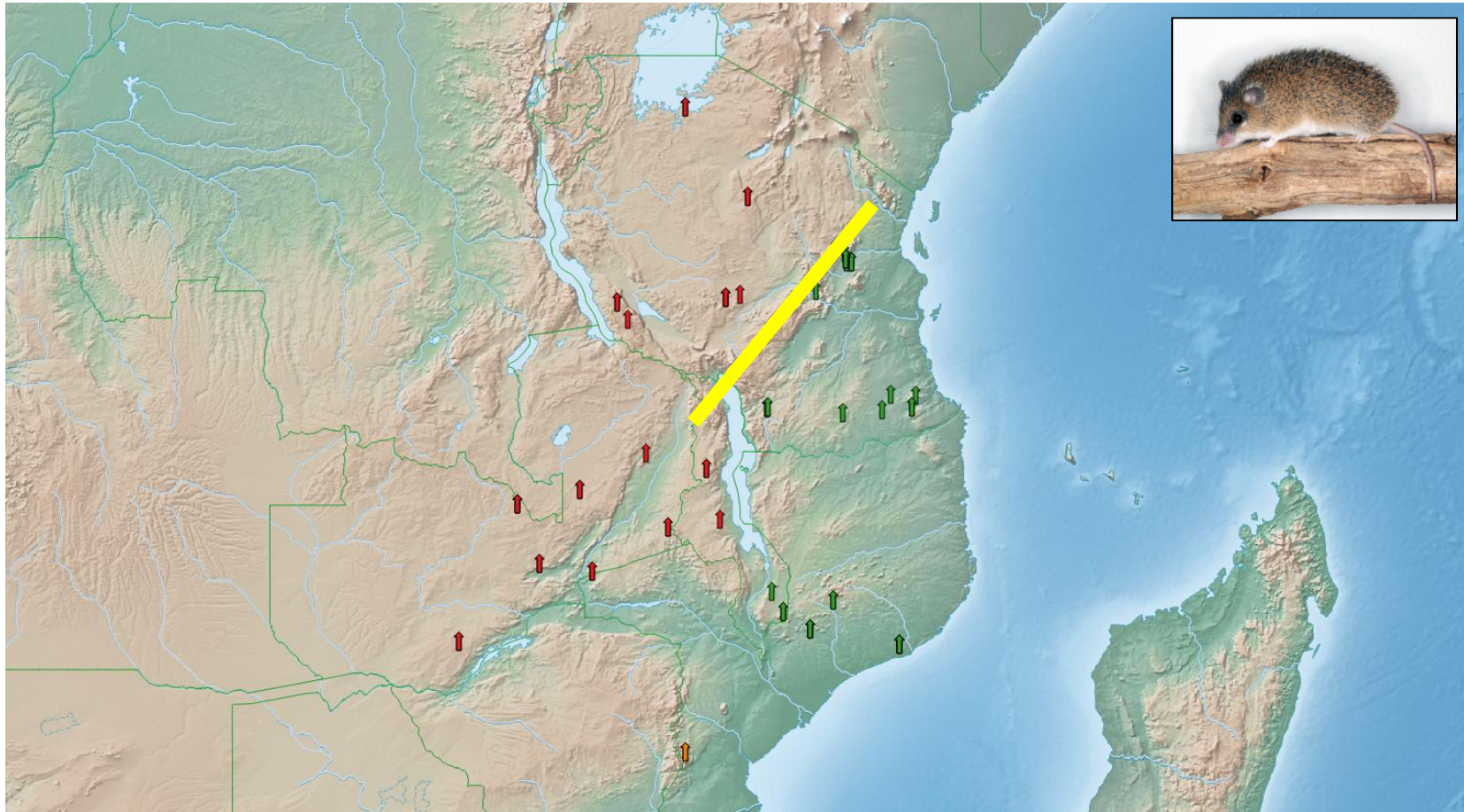
Czech Science Foundation 2015-2017

Project no. 15-20229S

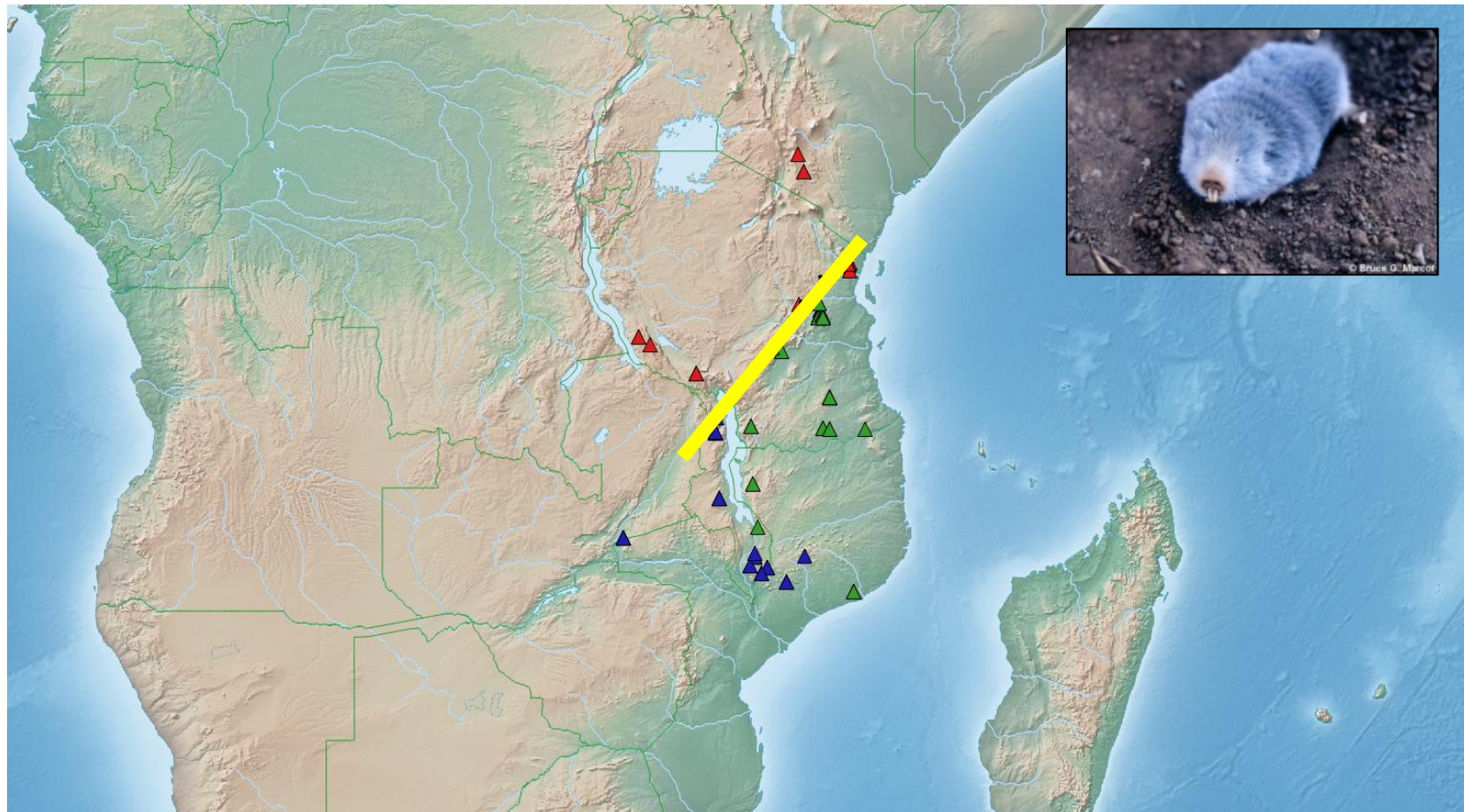
Mastomys natalensis



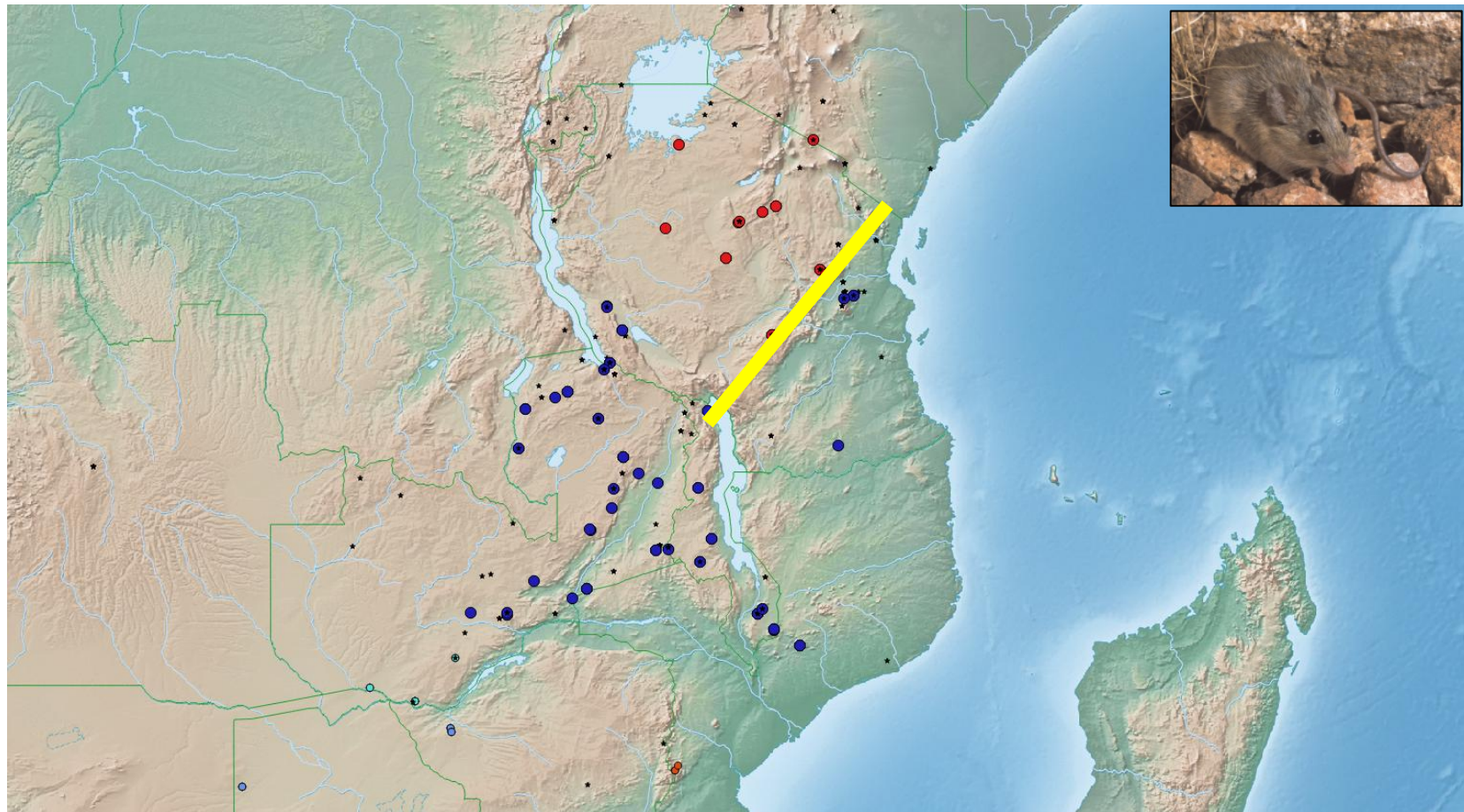
Acomys spinossissimus group



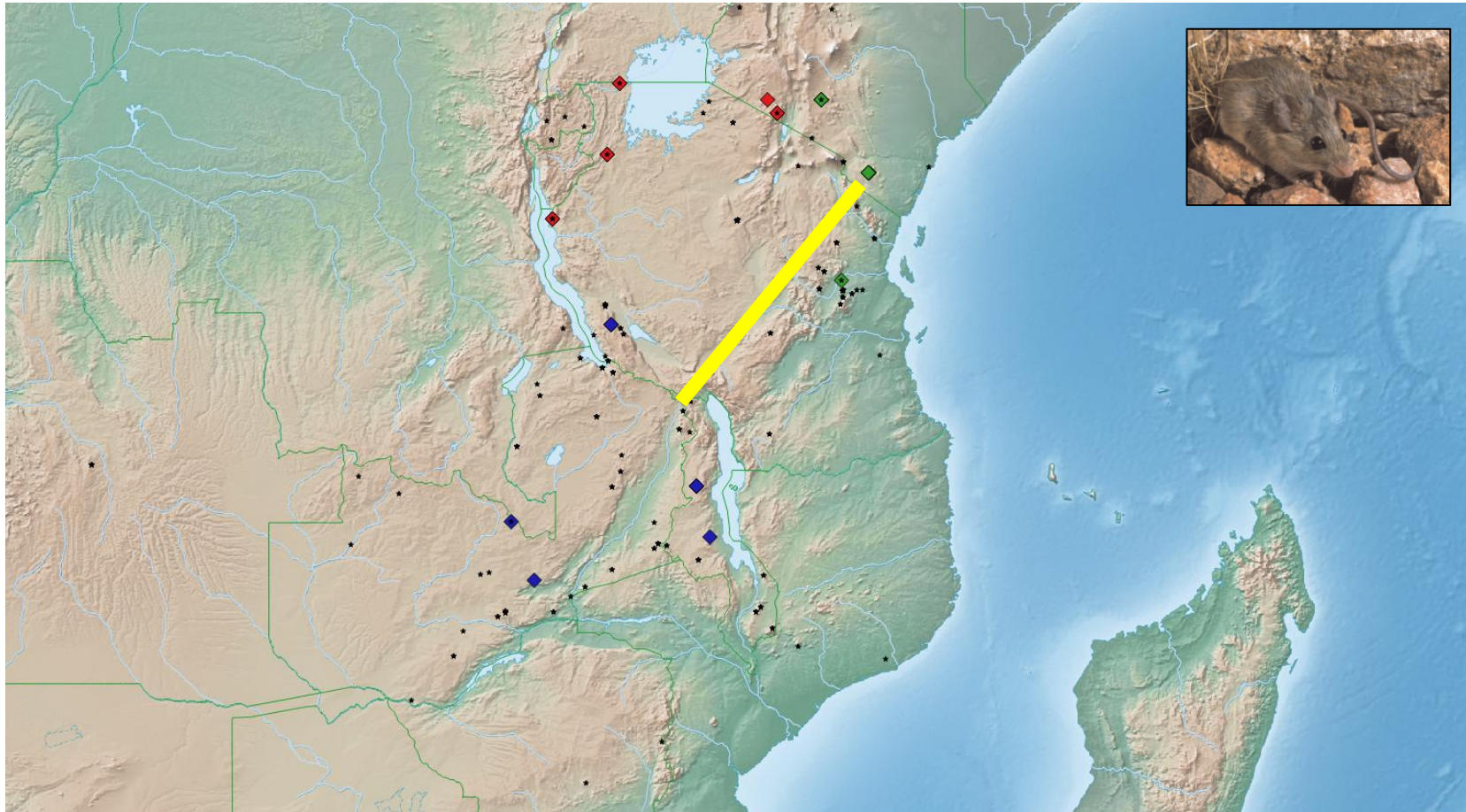
Heliophobius mole-rats



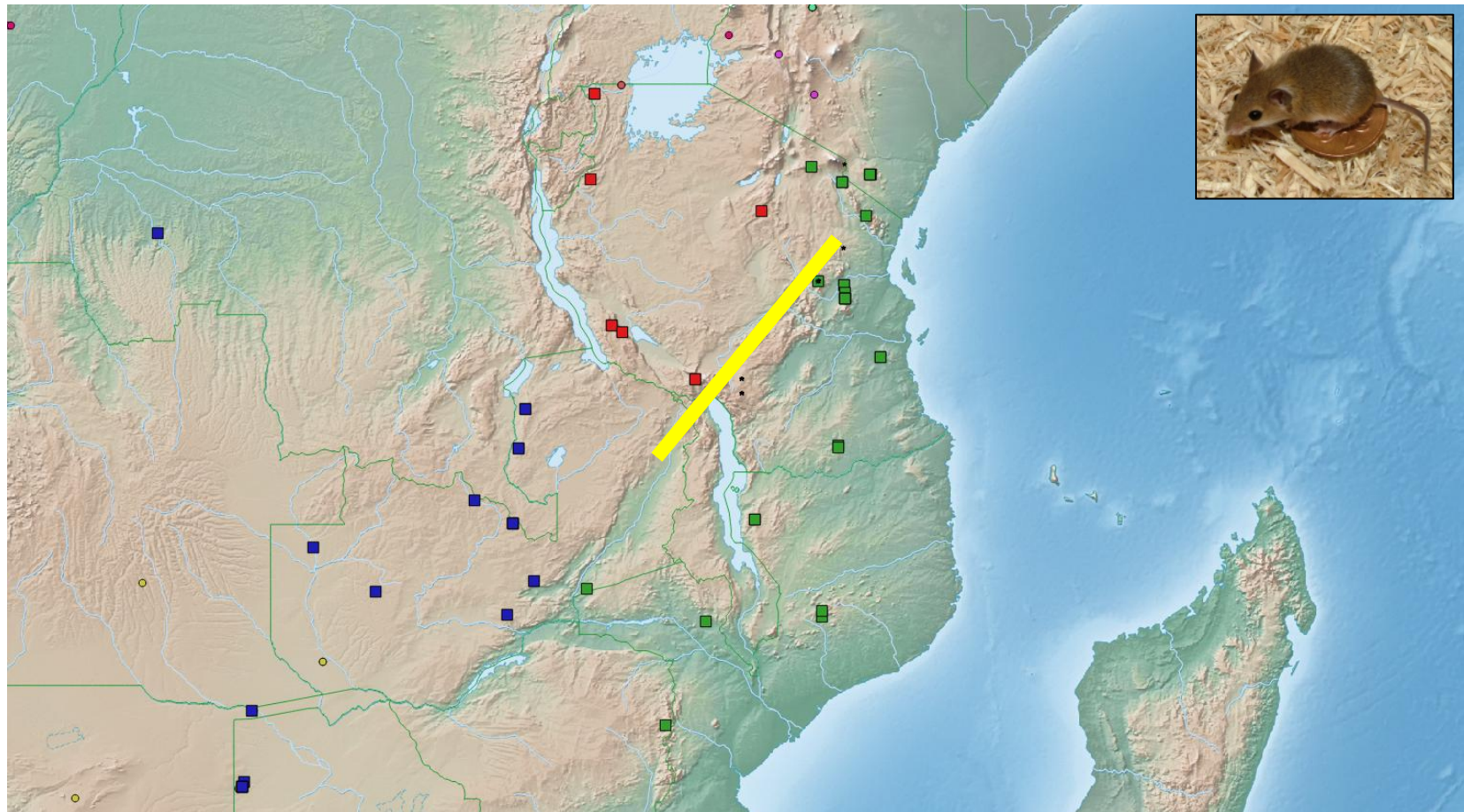
Aethomys chrysophilus



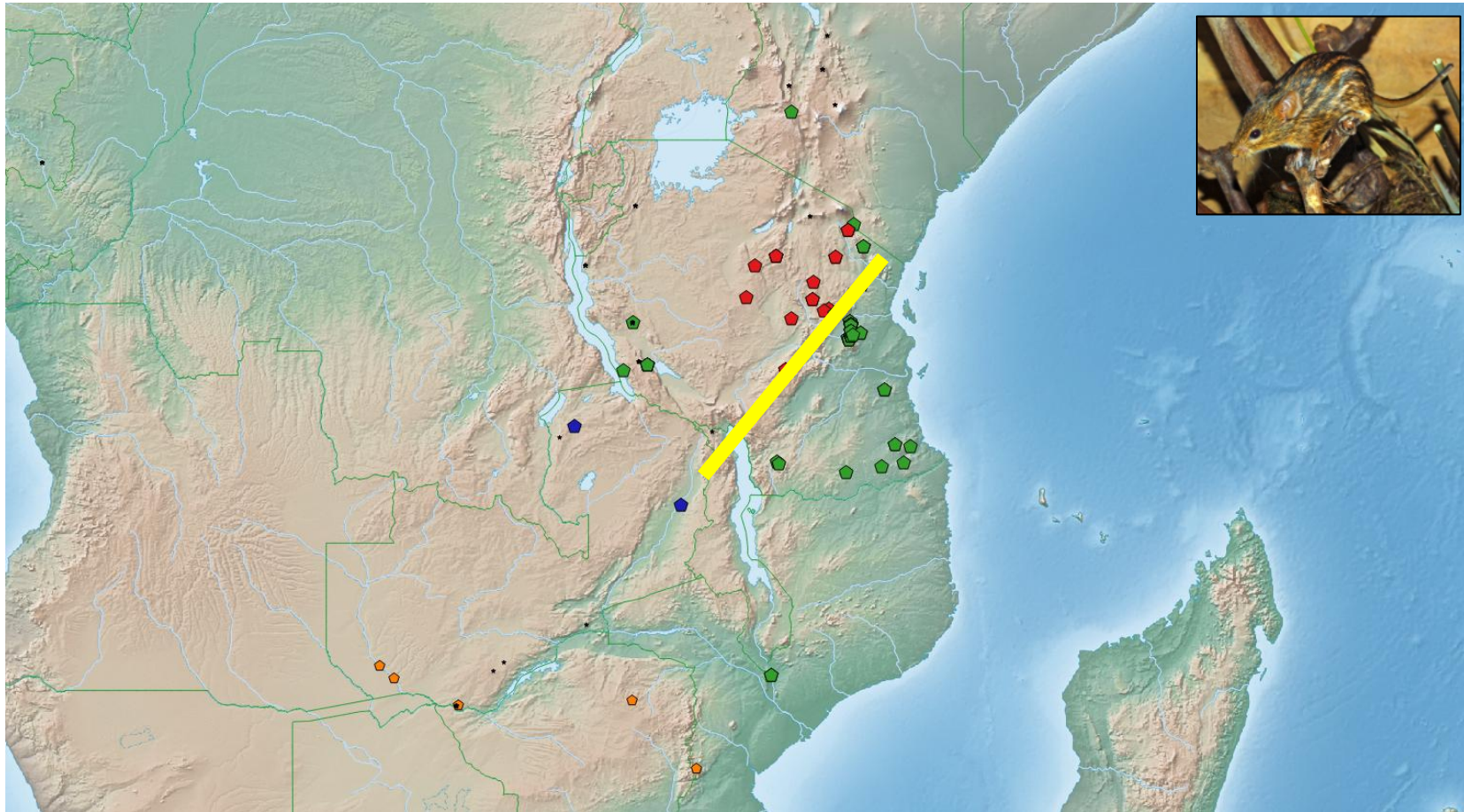
Aethomys kaiseri



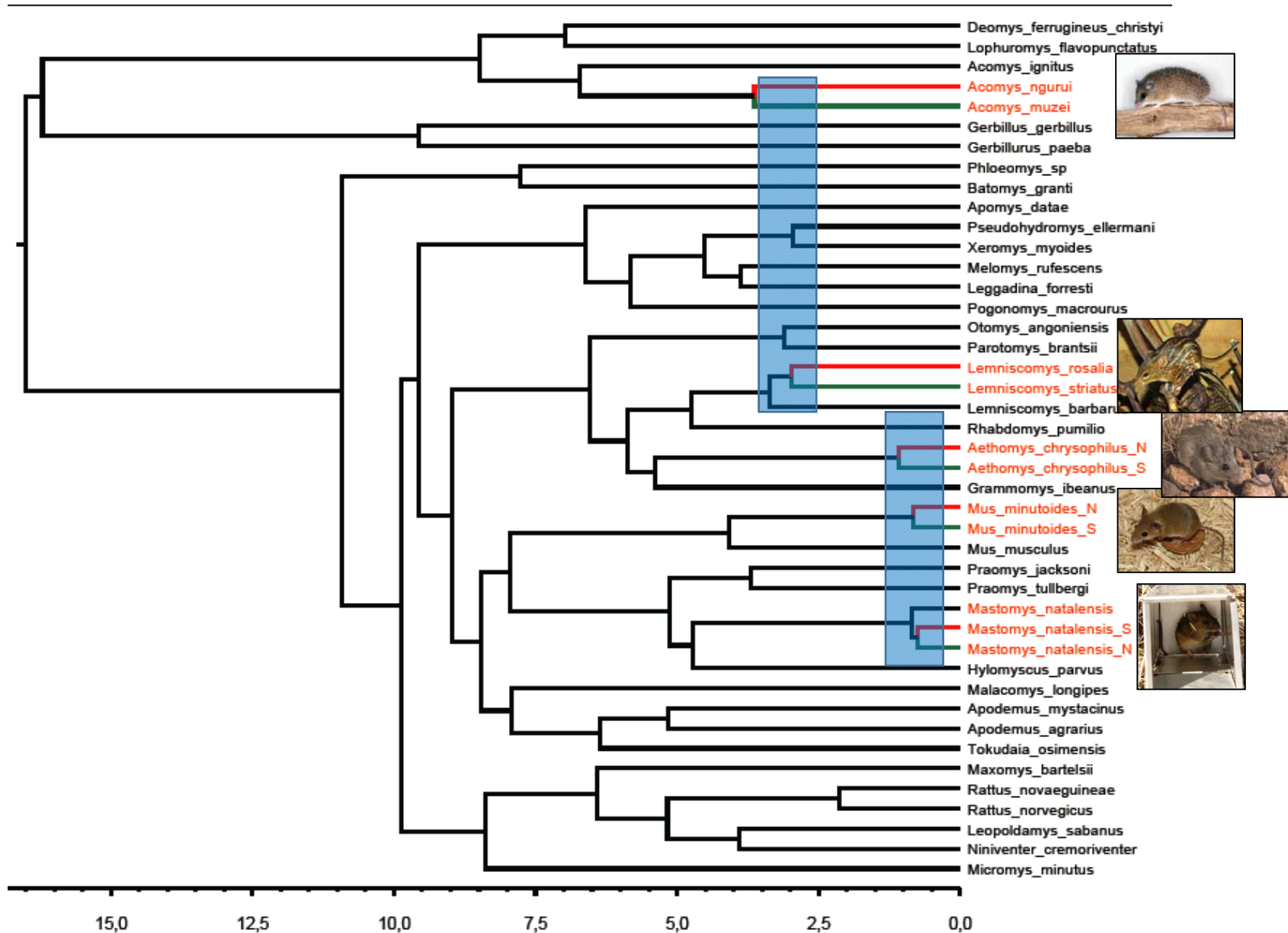
Mus minutoides



Lemniscomys zebra/rosalia

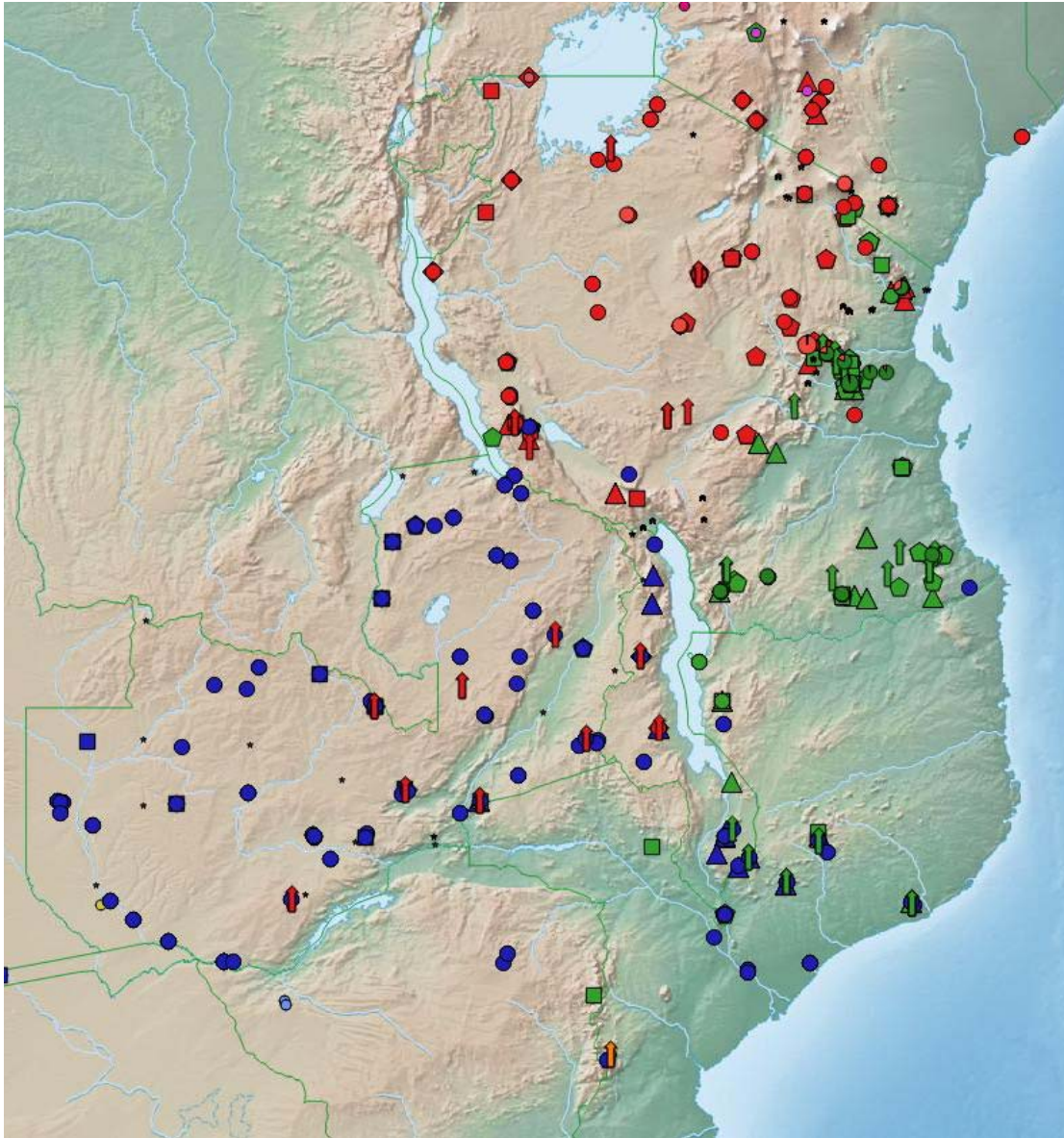


Same geographic pattern, different divergence times



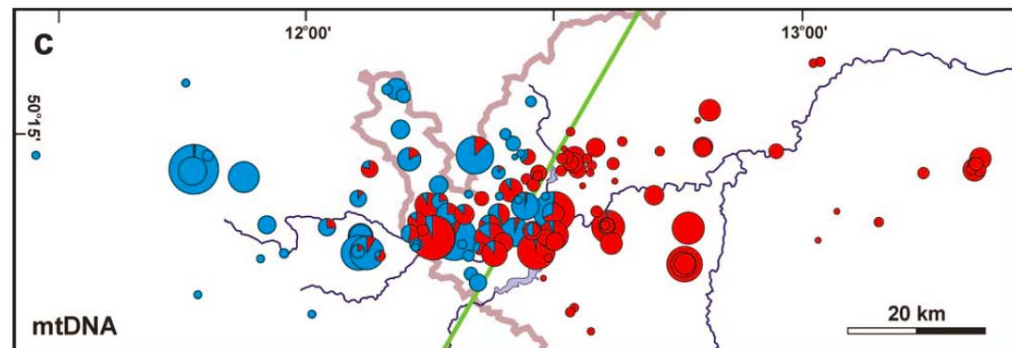
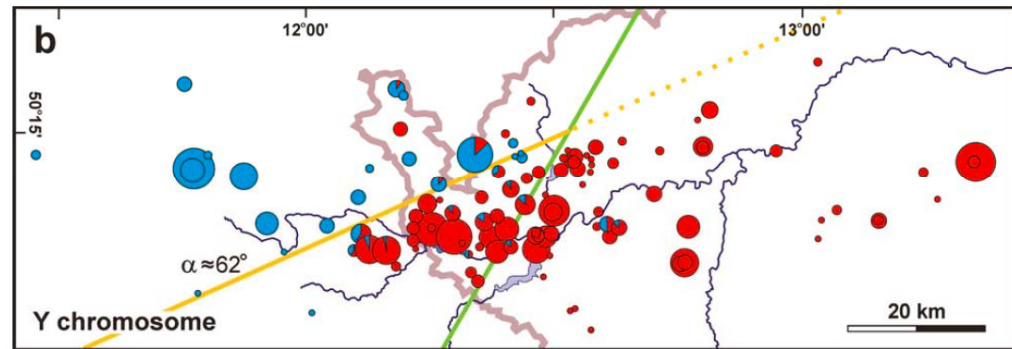
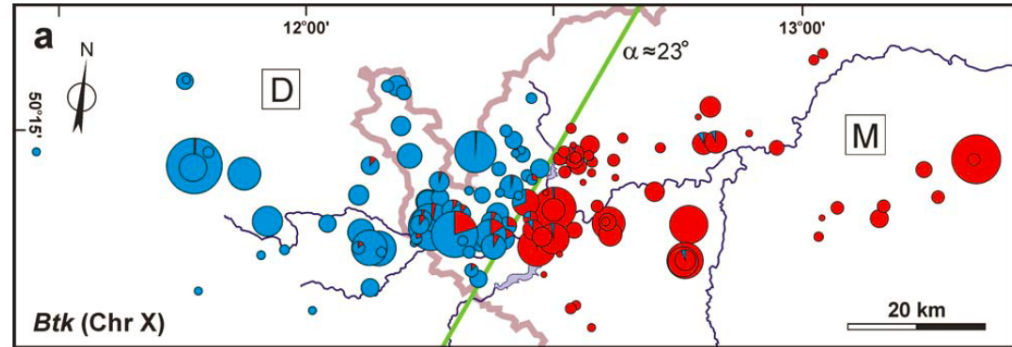
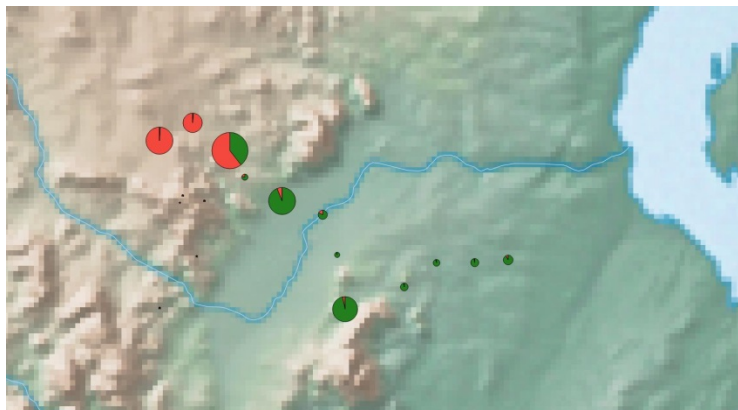
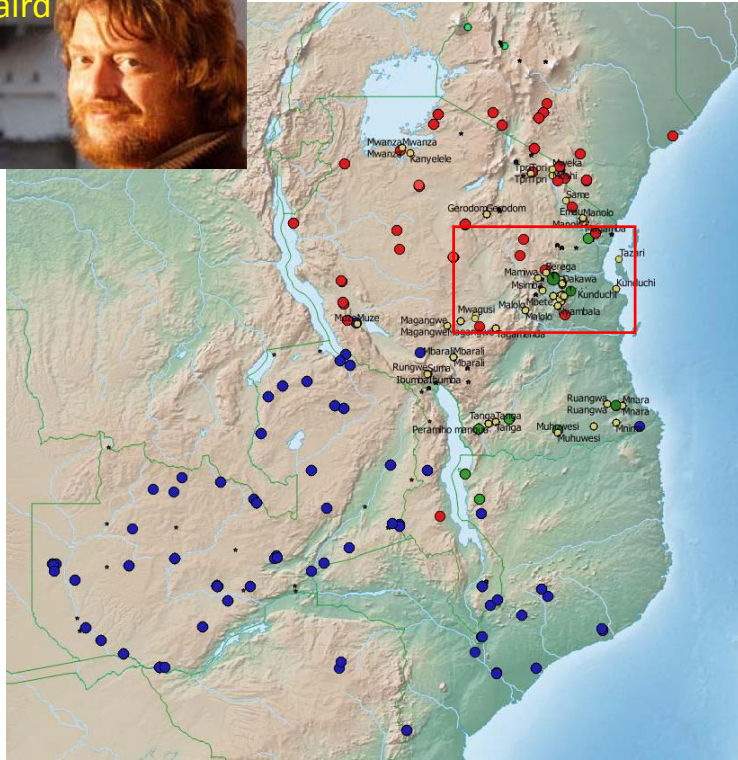
2.5-3 Mya 0.5-1 Mya

(1) How long-term *evolution of forest-savanna mosaic* has shaped diversity of small mammals?

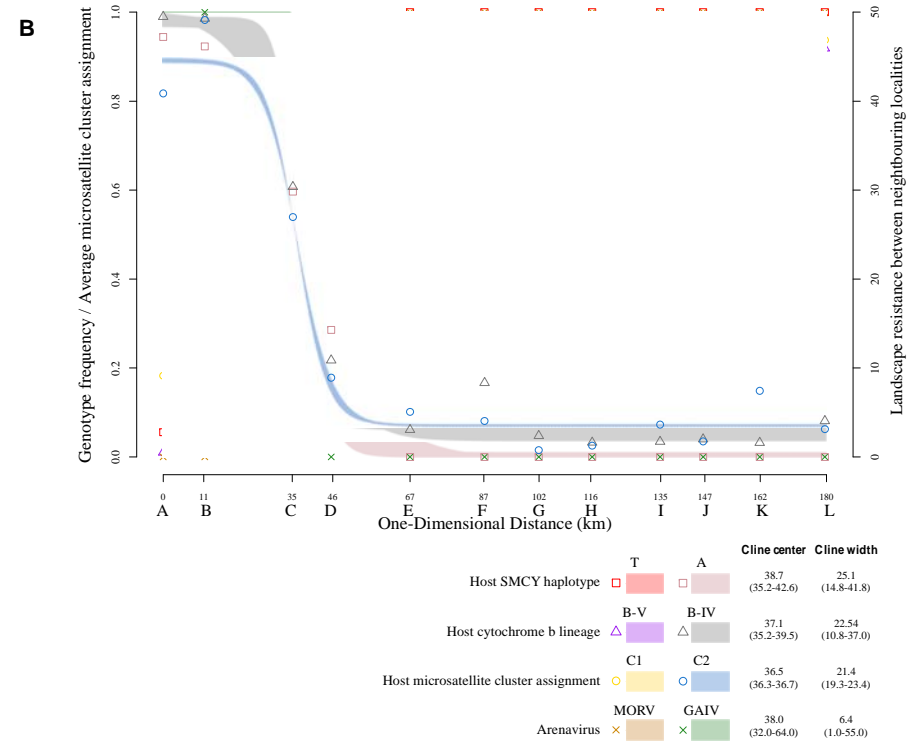
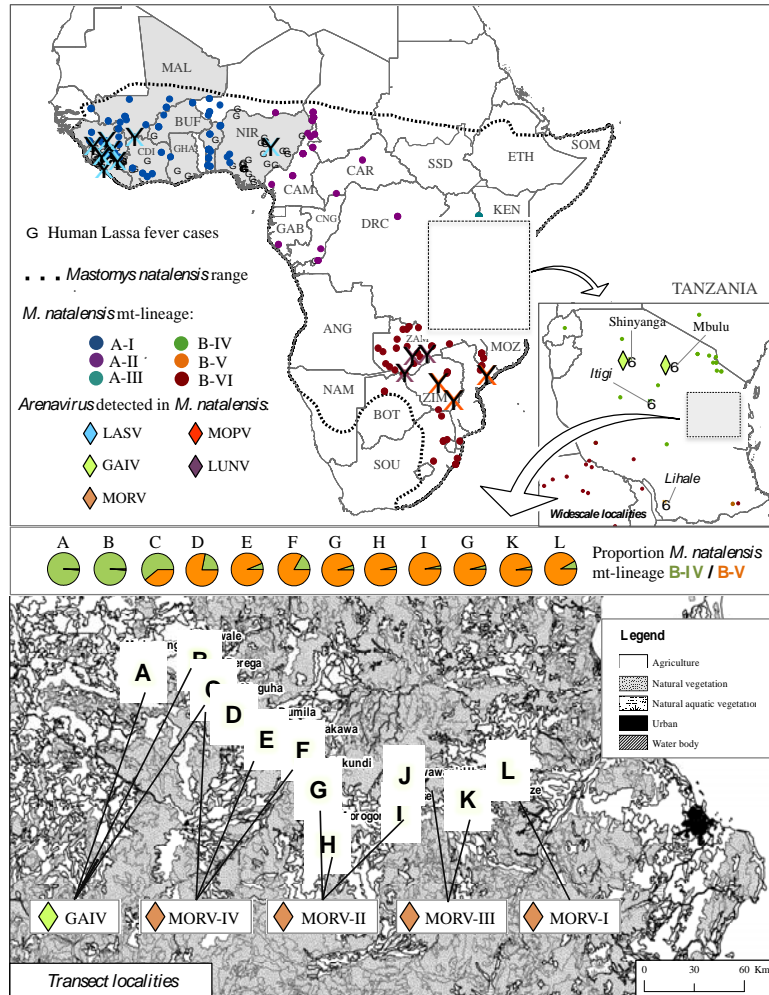


- detailed sampling in main biogeographical zones in **Tanzania** (+ other available data) – spatial distribution of genetic lineages
- **ecological niche modelling** – identification of environmental variables
- **comparative (community) phylogeography** – dating of divergence, hypothesis testing, etc.

(2) How genetically divergent rodents evolve on the contact zones?



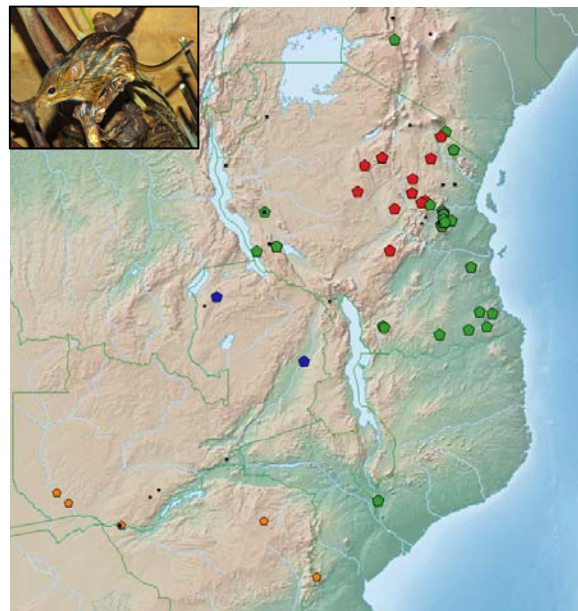
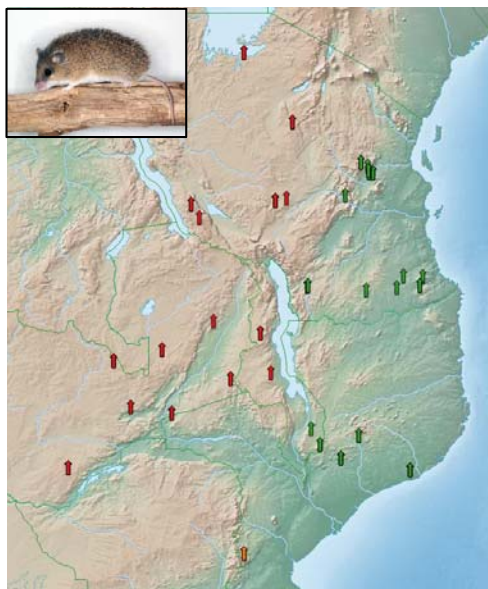
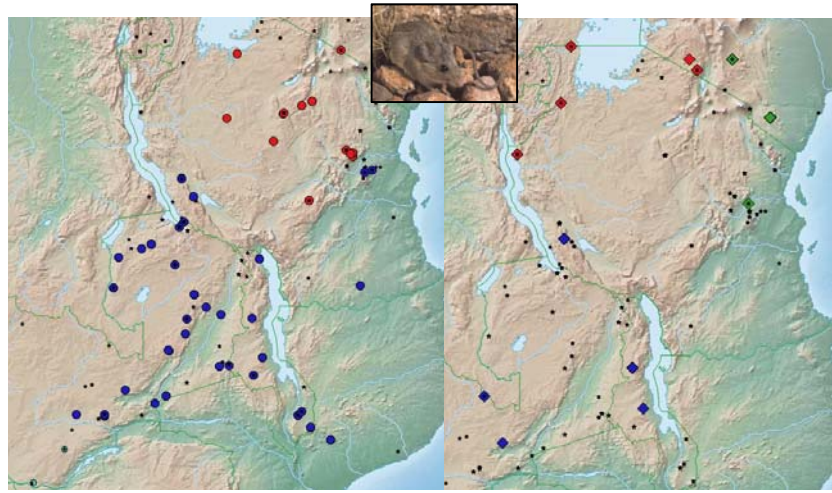
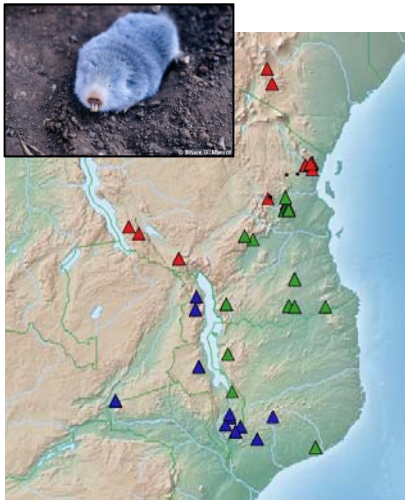
Many similarities with house mouse hybrid zone



microsatellites, Y-chromosom, mtDNA

Gryseels et al., submitted

Species delimitations (analyses of reproductive barriers, taxonomic revisions)



(3) Evolution of parasites in the contact zone of differentiated hosts?

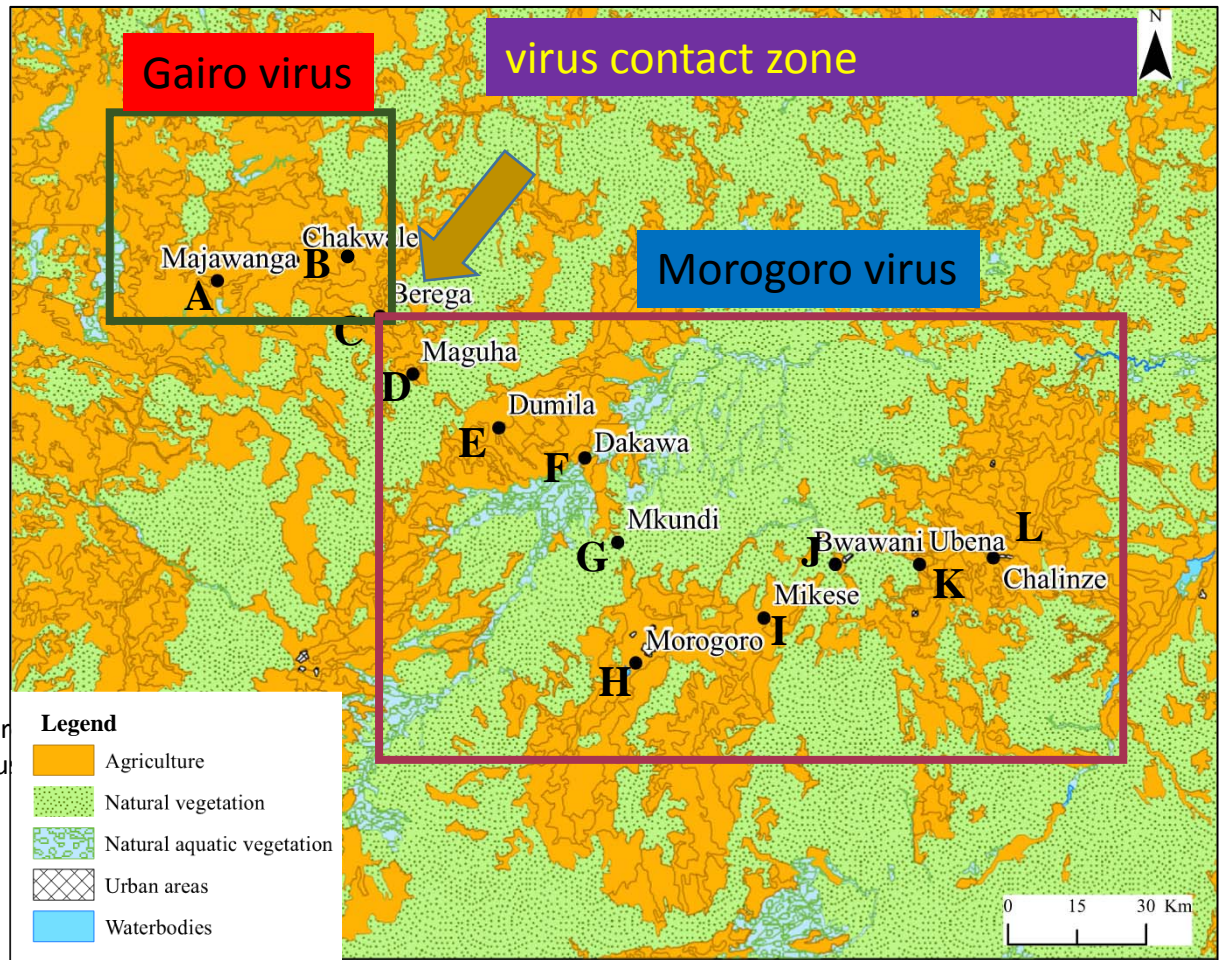
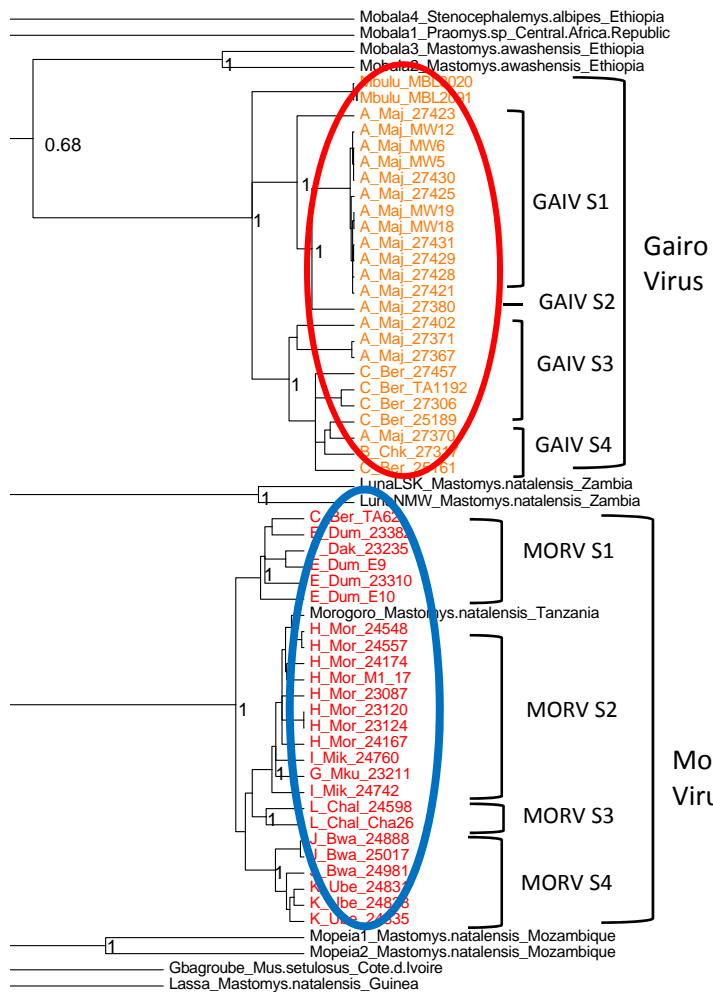
- arenaviruses
- *Pneumocystis*



J. Göüy de Bellocq

Arenavirus phylogeography

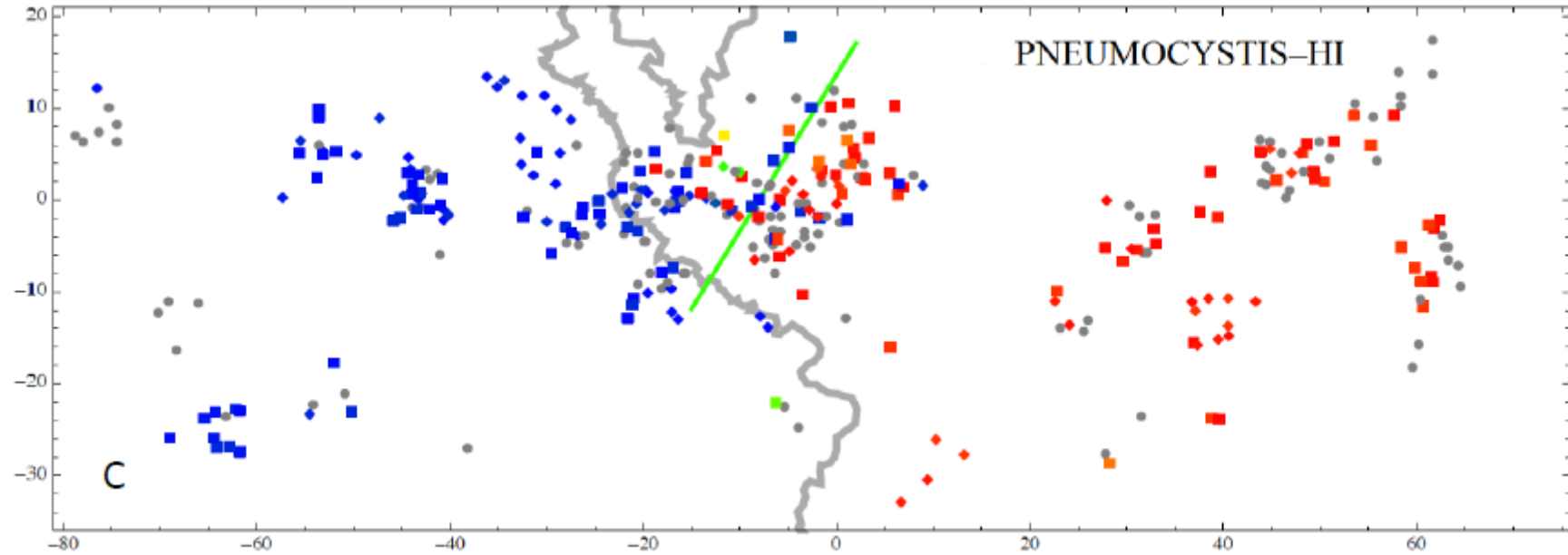
(sisters to Lassa virus – non pathogenic to human)



ons/site

Gryseels et al., submitted

Pneumocystis



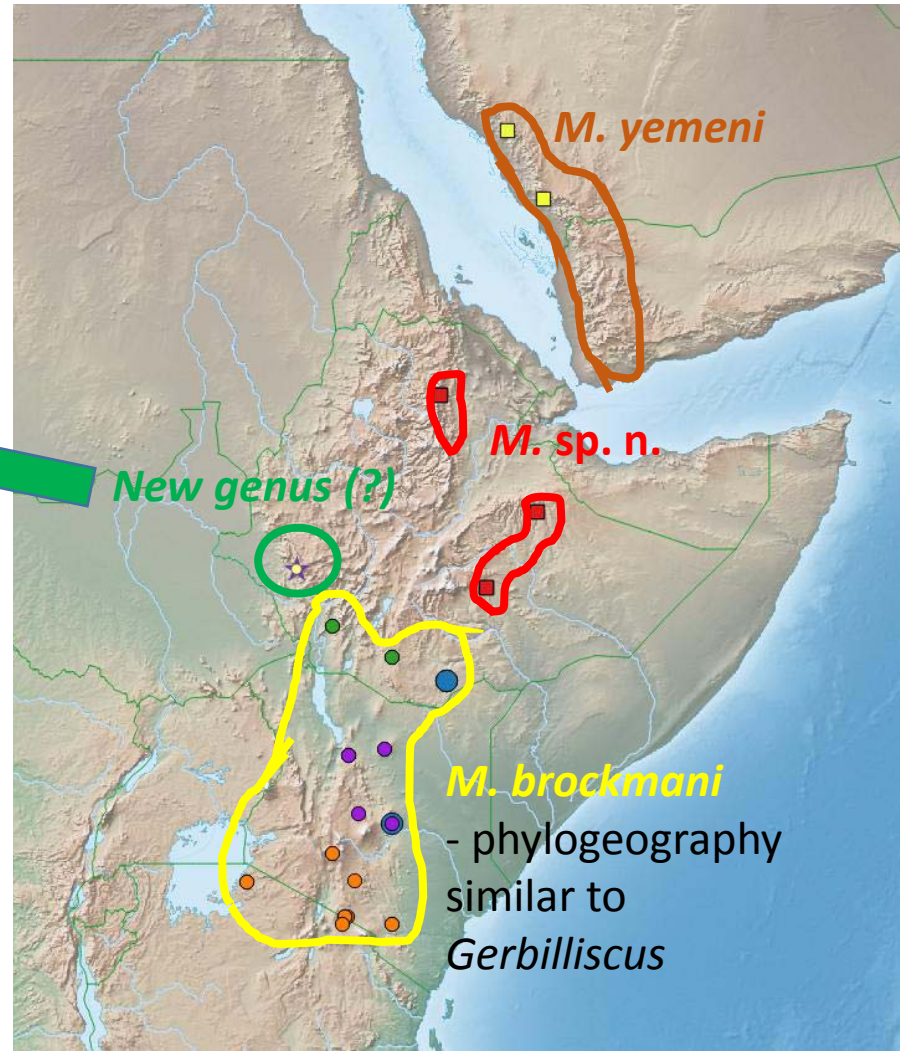
- subspecies-specific lineages in HMHZ – is this general pattern?
- which parts of *Pneumocystis* genome introgress better than others; is the pattern concordant in different hosts
- exome sequencing of *Pneumocystis* in both *Mus musculus* and *Mastomys natalensis* hybrid zones – bait design and NGS

Few additional news from
Eastern Africa

(if there is still time ...)

Myomyscus

- gather typical *Praomys*-like rodents (partly arboricolous), which are not true „*Praomys*“
- currently four species:
- *M. verreauxi* – South Africa („type species“)
- *M. brockmani* (= *Myomys fumatus*) – East Africa
- *M. yemeni* – Yemen, Saudi Arabia
- *M. angolensis* – Angola (no genetic data)
- formerly also *Praomys daltoni/derooi* or *Stenocephalemys albipes* – both as *Myomys*



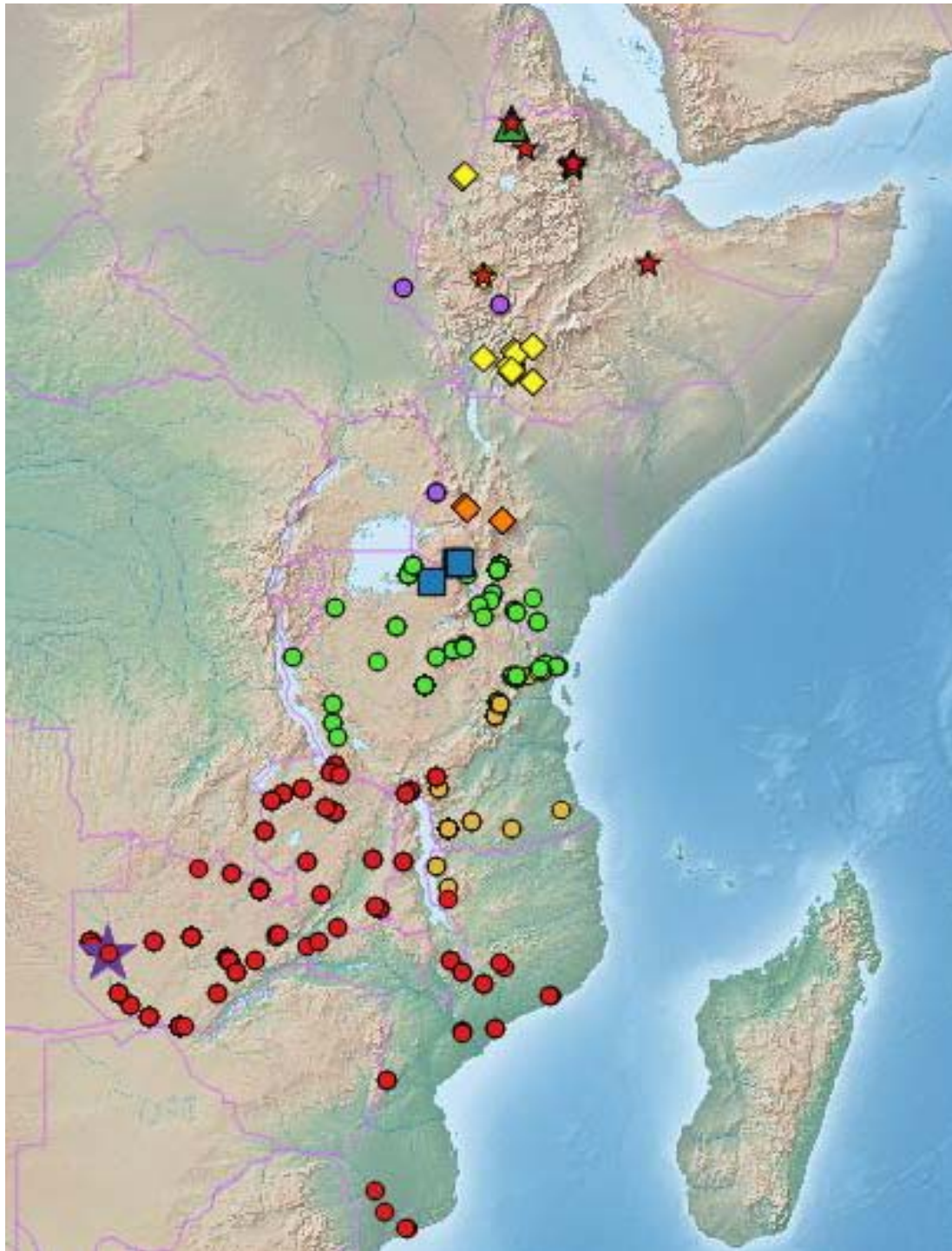
NHN 2001-070 cytochrome b (cytb) gene partial cds mitochondrial

cytb gene partial cds mitochondrial gene for mitochondrial product

omyscus should have different genus name

Mastomys

- probably the most important rodent genus for human in Africa (abundant, agricultural pest, diseases)
- while intensively studied in some parts of Africa (e.g. western Africa or Tanzania), in other regions even basic data (i.e. distribution of species) are missing
- 1671 *Mastomys* collected in Eastern Africa in last six years



- ▲ kollmannspergeri
- ★ awashensis
- ☆ coucha
- ◆ erythroleucus_C
- ◆ erythroleucus_D
- natalensis_AIII
- natalensis_BIV
- natalensis_BV
- natalensis_BVI
- pernanus

Mastomys
in Eastern Africa

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J. Těšíková



M. McDonough



T. Aghová



R. Šumbera and V. Mazoch



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J. Mbau



O. Mikula

and many others ...