What´s new in the phylogeny of *Arvicanthis* (in Eastern Africa)?

Josef Bryja, Tatiana Aghová, Yonas Meheretu, Radim Šumbera and others

Comparative phylogeography of Zambezian region in Southeastern Africa using small mammals as a model

Institute of Vertebrate Biology Academy of Sciences of the Czech Republic

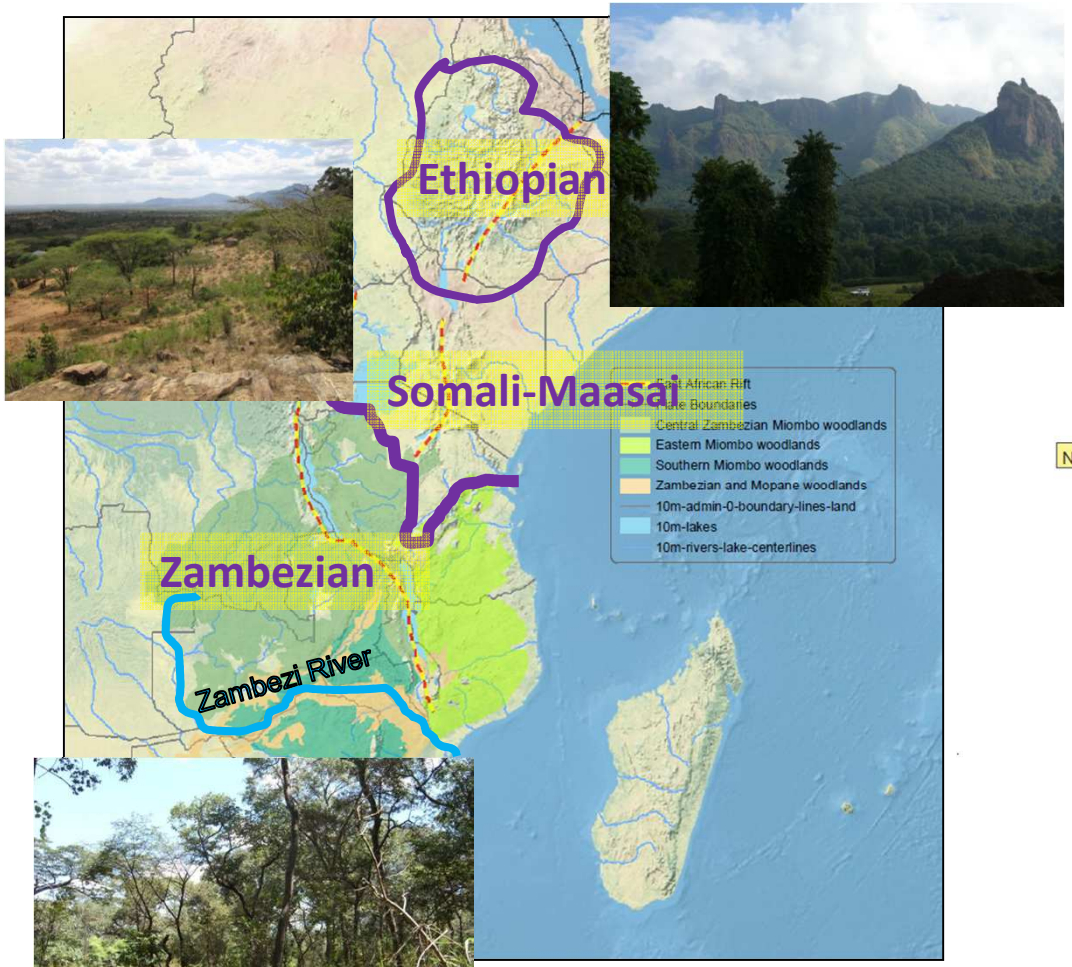
University of South Bohemia, České Budějovice, Czech Republic

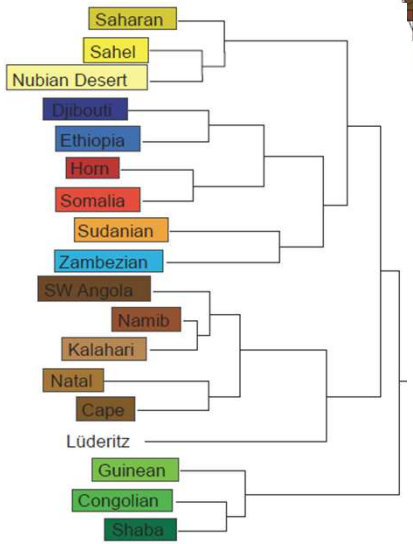
2010-2014

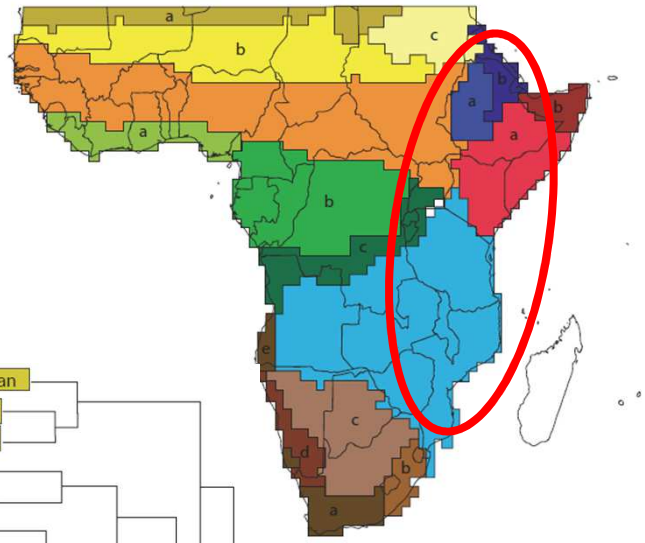
GAČR
GRANTOVÁ AGENTURA ČESKÉ REPUBLIKY

- the use of phylogeographic approaches (in rodents) for understanding the distribution and evolution of biodiversity in understudied areas of Eastern Africa

Focussed on three understudied biogeographical regions

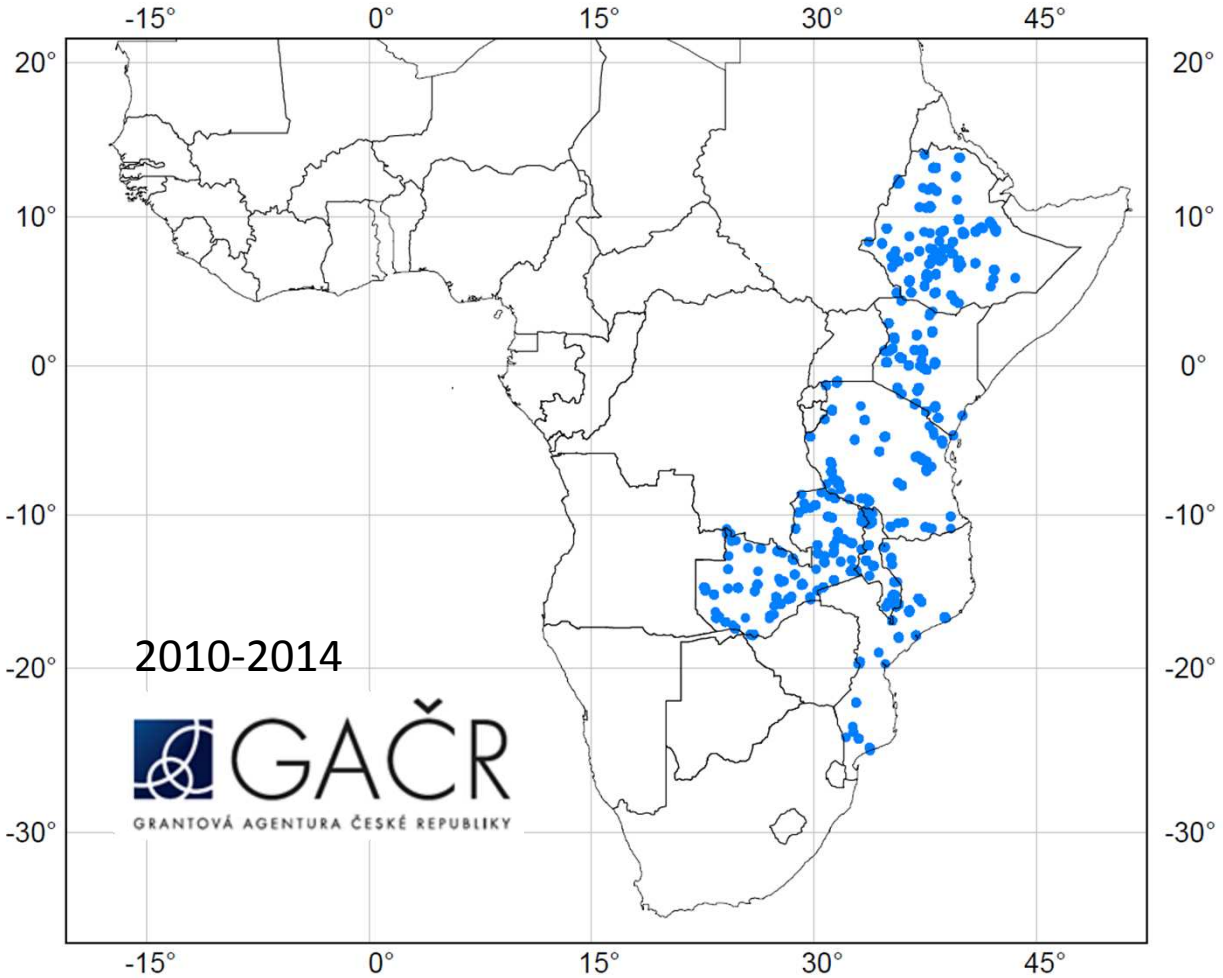






Linder et al. 2012

Comparative phylogeography of Zambezian region in Southeastern Africa using small mammals as a model



- cca 6500 individuals, fresh samples for DNA analysis (DNA barcoding)

Main results of the project

- rodents as models for **biodiversity** studies – *interspecific* (biogeography, phylogeny, taxonomy) and *intraspecific* (phylogeography) levels – *Saccostomus*, *Grammomys*, *Aethomys*, *Nannomys*, *Gerbilliscus*, etc.

- rodents as hosts of important **pathogens** (host-parasite coevolution) – especially Praomyini vs. arena- and hantaviruses

Y. Meheretu

T. Aghová

What about *Arvicanthis* ?

(potential model for Somali-Maasai phylogeography?)

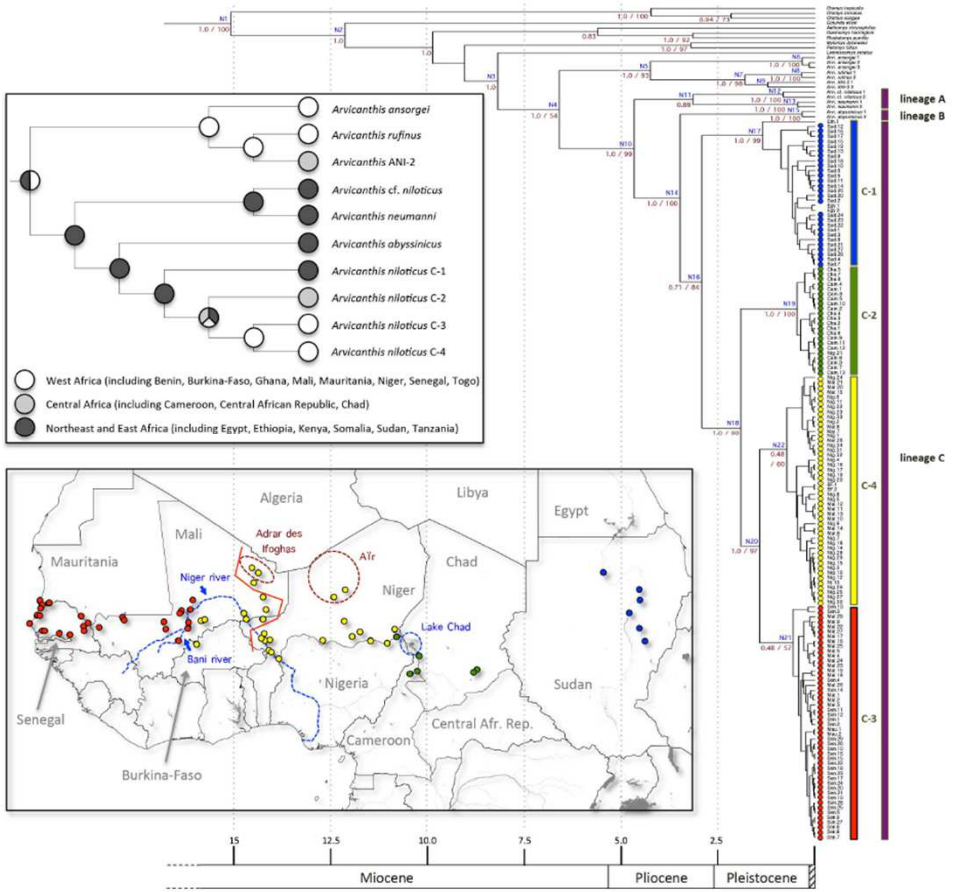
OPEN ACCESS Freely available online

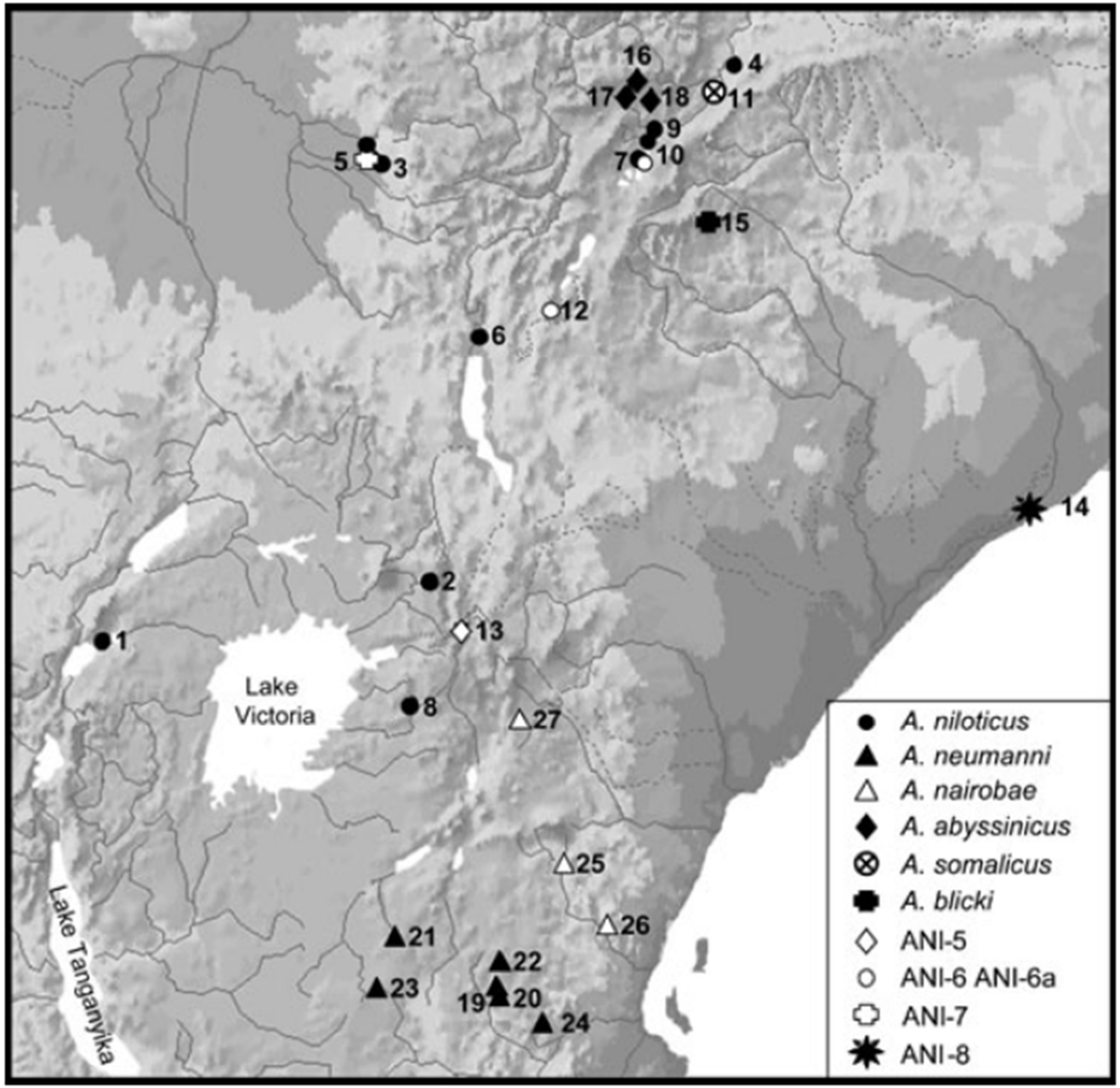
PLOS | ONE

Mitochondrial and Nuclear Genes-Based Phylogeography of *Arvicanthis niloticus* (Murinae) and Sub-Saharan Open Habitats Pleistocene History

Gauthier Dobigny[1,2], Caroline Tatard[3], Philippe Gauthier[1], Khalilou Ba[4], Jean-Marc Duplantier[1], Laurent Granjon[1,4], Gael J. Kergoat[3]*

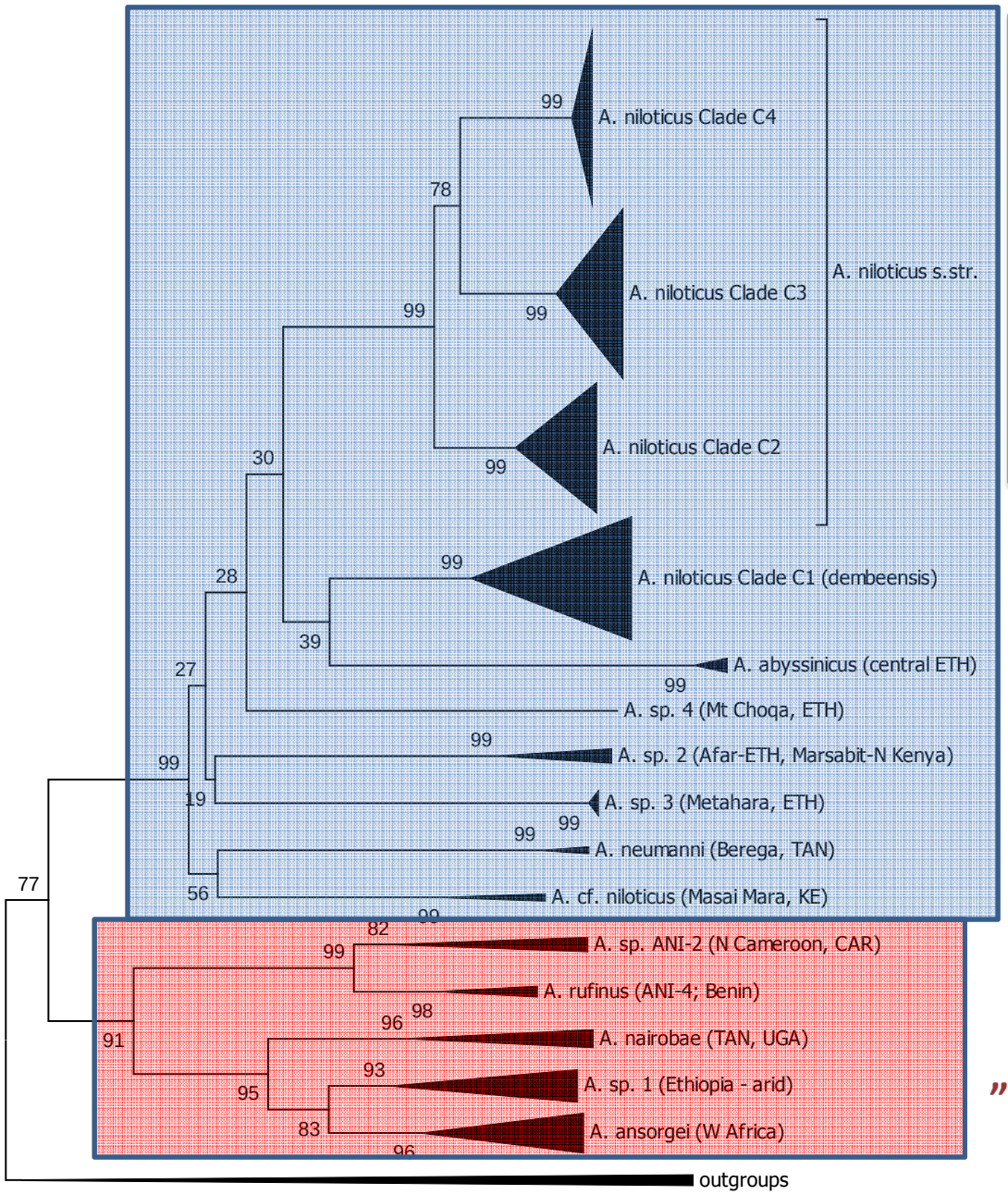
1 IRD, CBGP (IRD, Inra, CIRAD, Montpellier SupAgro), Campus de Baillarguet, Montferrier-sur-Lez, France, **2** Centre Régional Agrhymet, Rive Droite, Niamey, Niger, **3** Inra, CBGP (IRD, Inra, CIRAD, Montpellier SupAgro), Campus de Baillarguet, Montferrier-sur-Lez, France, **4** IRD, CBGP (IRD, Inra, CIRAD, Montpellier SupAgro), Dakar, Senegal

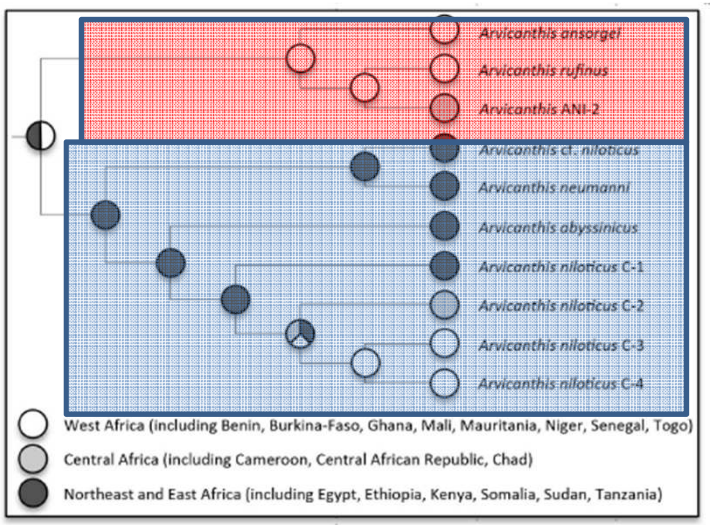




High karyotypic diversity in Africa, but limited number of sequence data

Castiglia et al. 2006



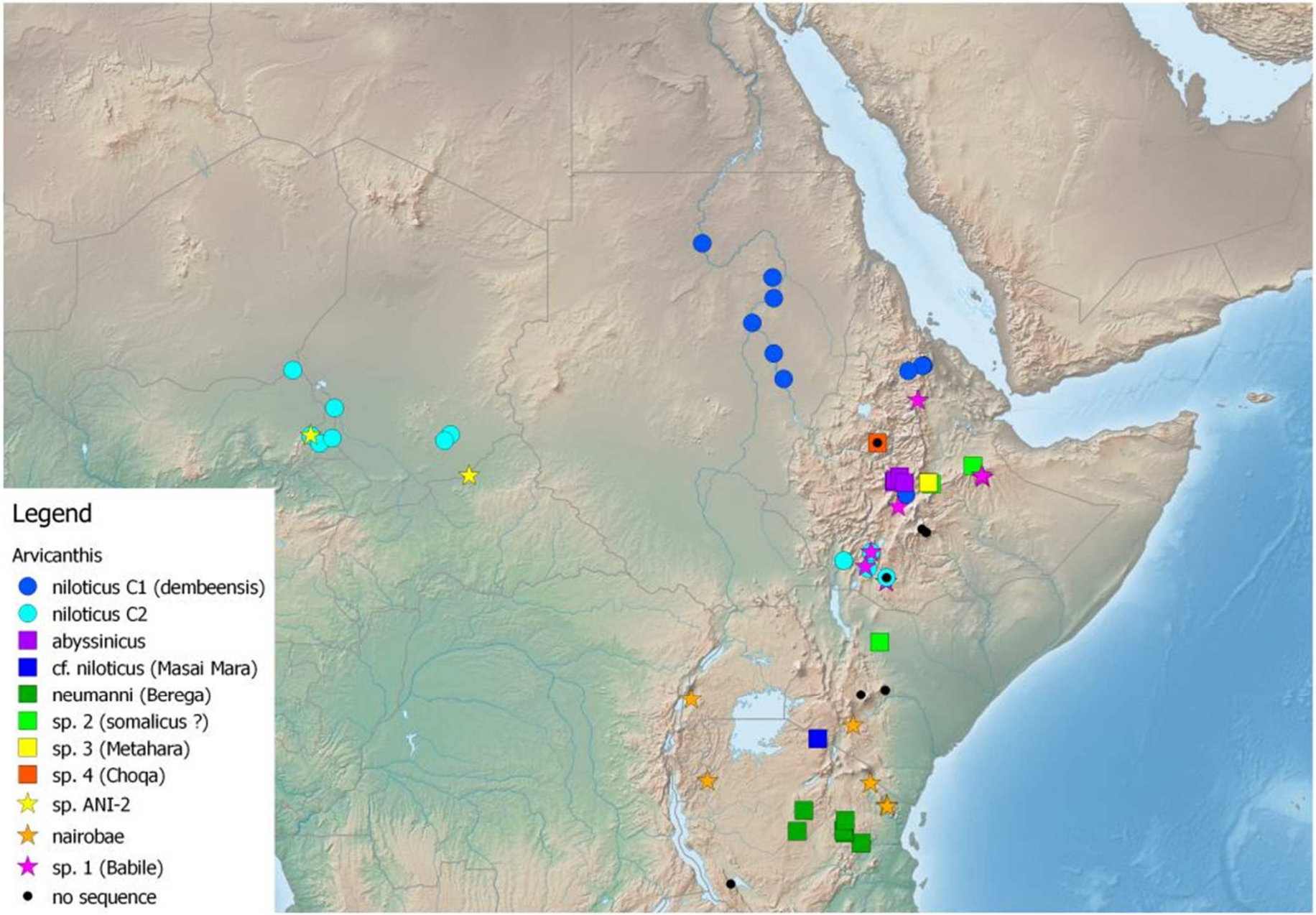


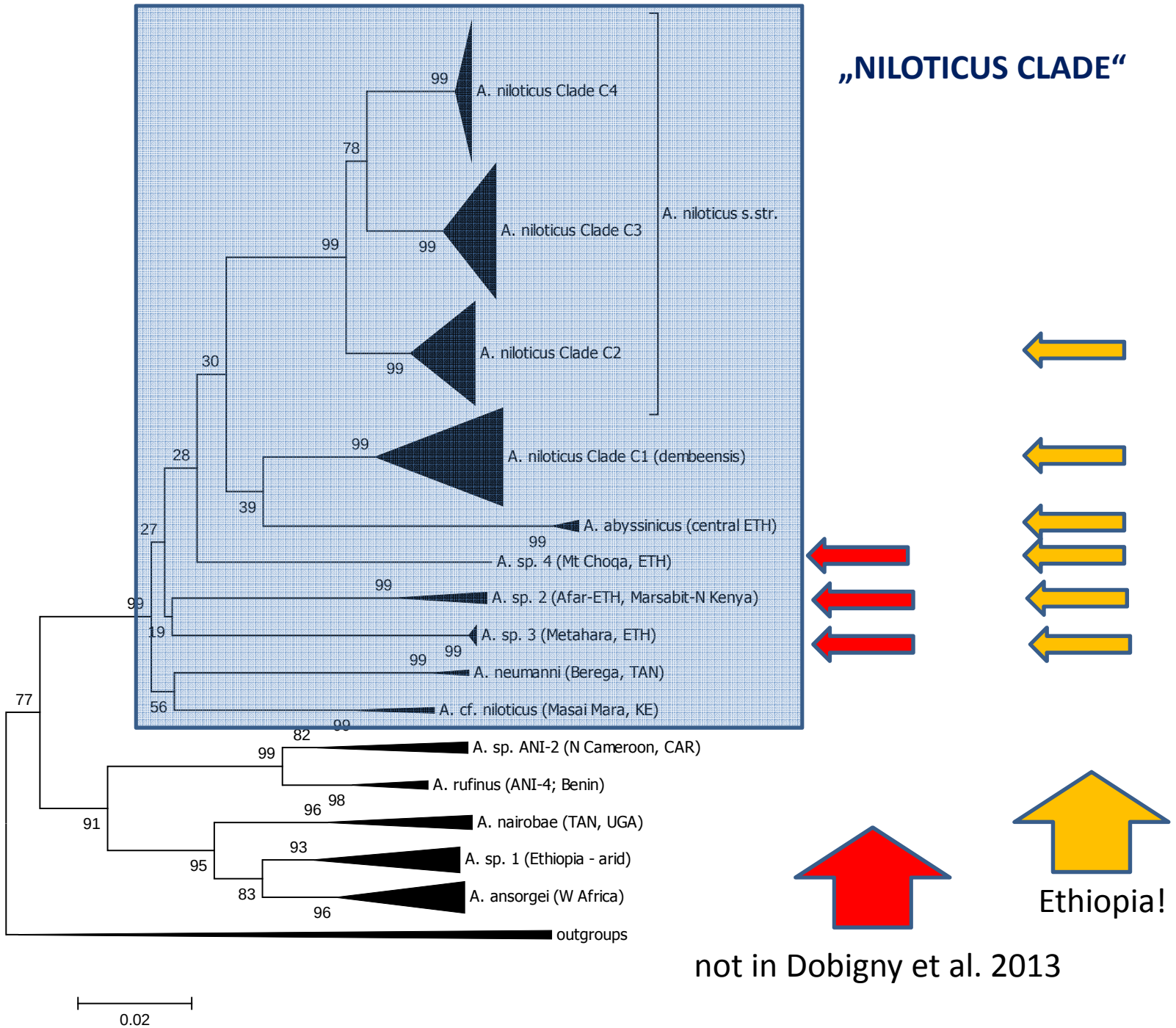
Dobigny et al. 2013
(also Ducroz et al. 1998, etc.)

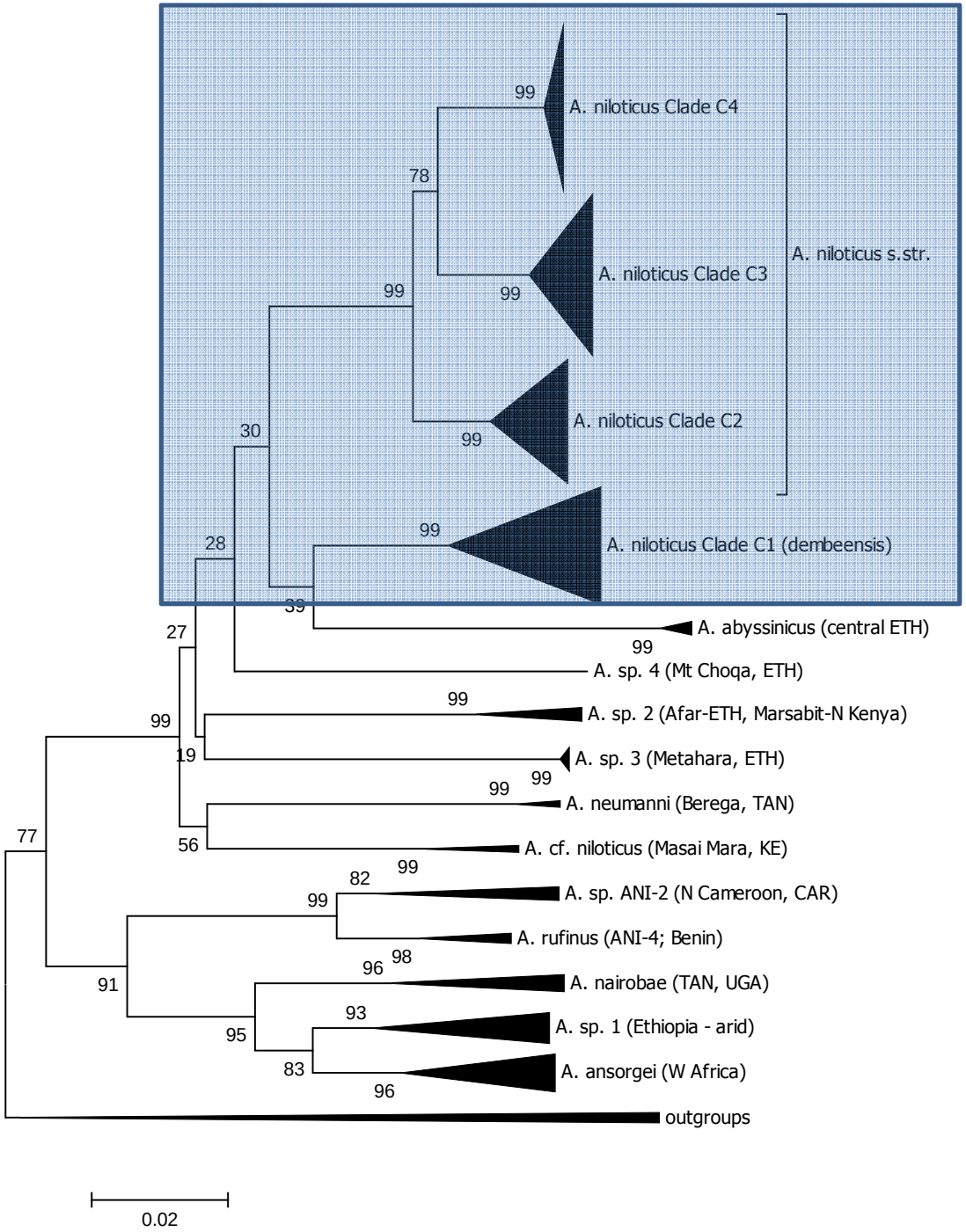
„NILOTICUS CLADE“

CYTOCHROME B

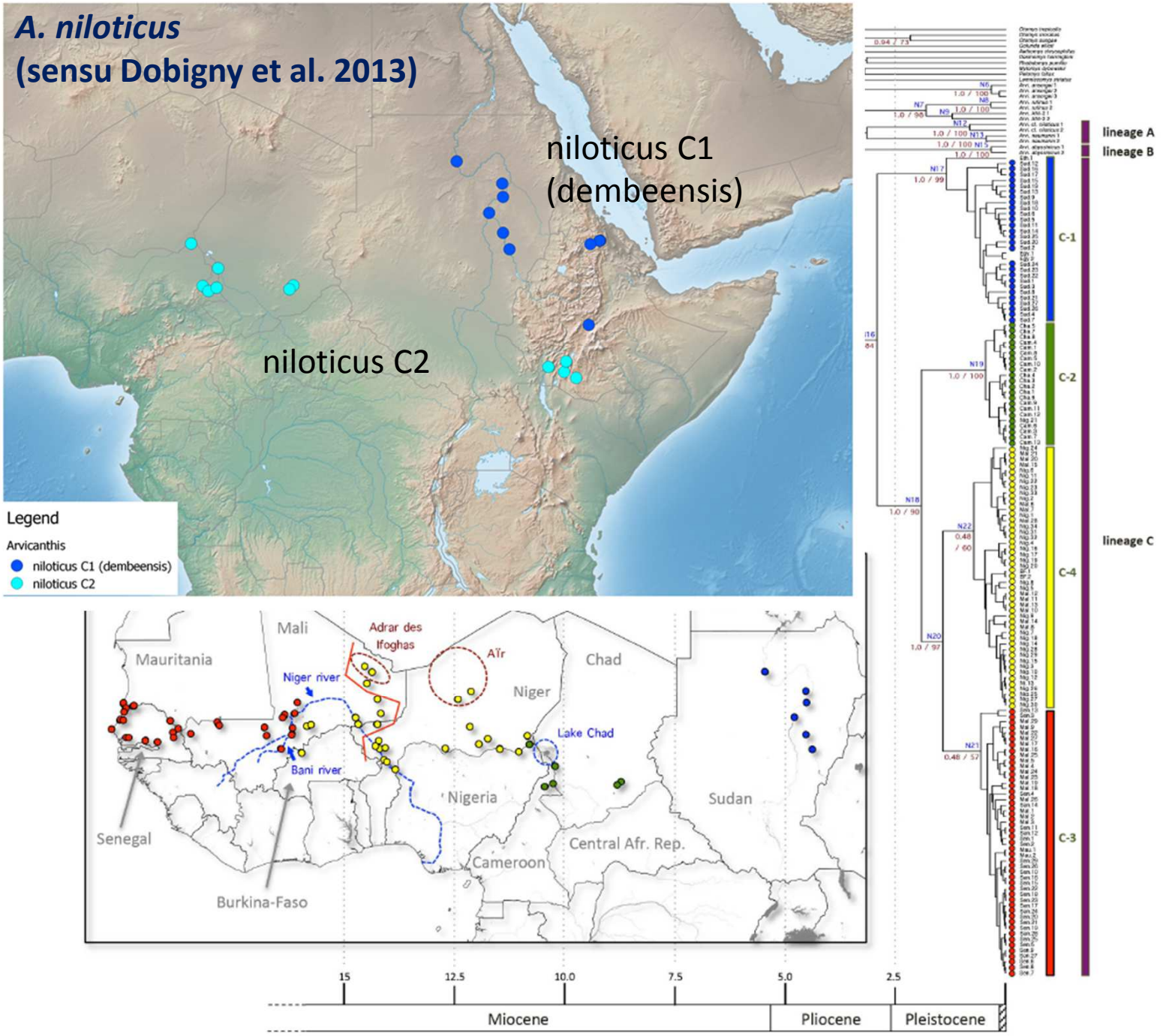
„ANSORGEI CLADE“


Legend
Arvicanthis
niloticus C1 (dembeensis)
niloticus C2
abyssinicus
cf. niloticus (Masai Mara)
neumanni (Berega)
sp. 2 (somalicus ?)
sp. 3 (Metahara)
sp. 4 (Choqa)
sp. ANI-2
nairobae
sp. 1 (Babile)
no sequence

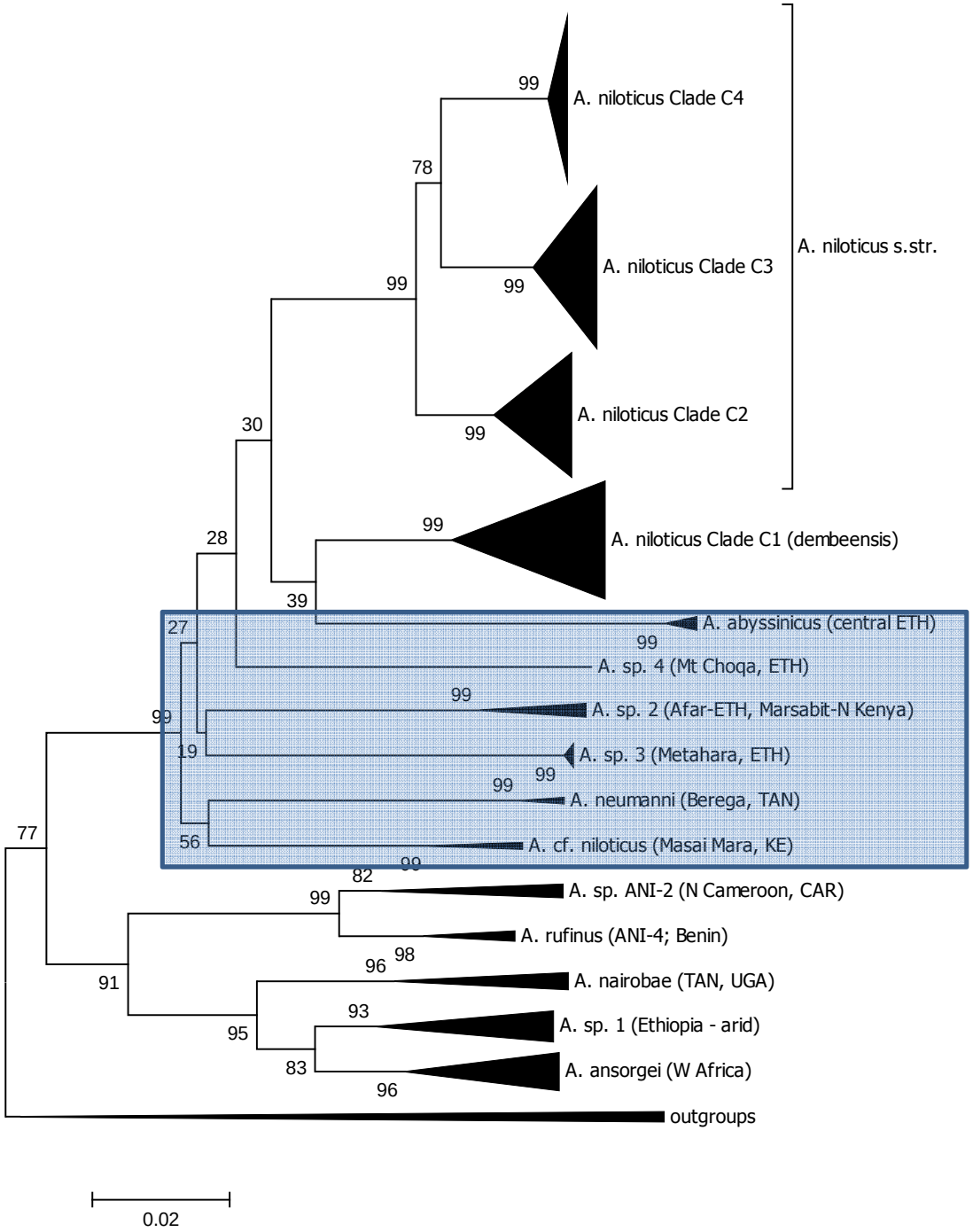

„NILOTICUS CLADE“
A. niloticus Clade C4
A. niloticus Clade C3
A. niloticus Clade C2
A. niloticus s.str.
A. niloticus Clade C1 (dembeensis)
A. abyssinicus (central ETH)
A. sp. 4 (Mt Choqa, ETH)
A. sp. 2 (Afar-ETH, Marsabit-N Kenya)
A. sp. 3 (Metahara, ETH)
A. neumanni (Berega, TAN)
A. cf. niloticus (Masai Mara, KE)
A. sp. ANI-2 (N Cameroon, CAR)
A. rufinus (ANI-4; Benin)
A. nairobae (TAN, UGA)
A. sp. 1 (Ethiopia - arid)
A. ansorgei (W Africa)
outgroups
0.02
Ethiopia!
not in Dobigny et al. 2013

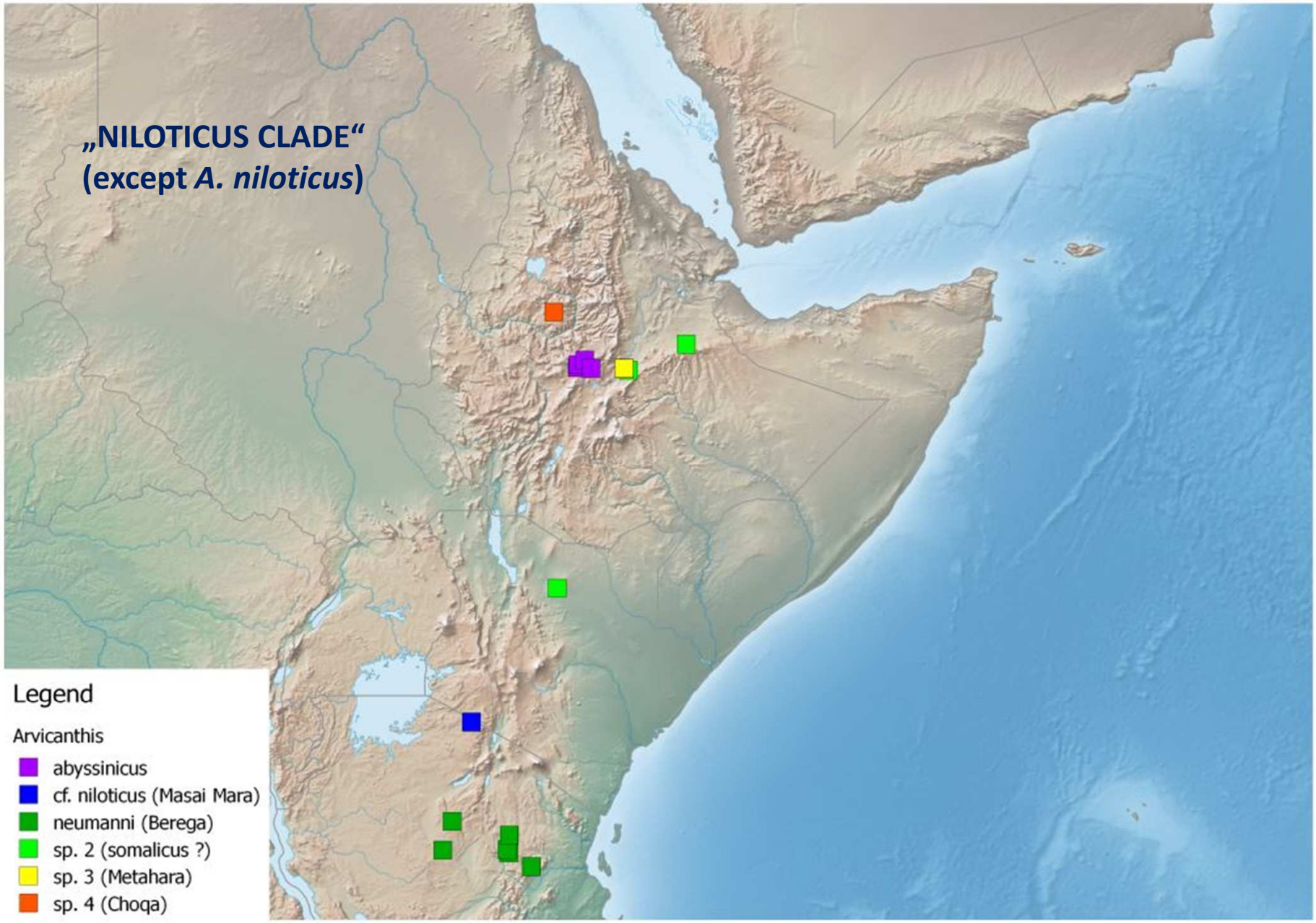


A. niloticus
(sensu Dobigny et al. 2013)


A. niloticus
(sensu Dobigny et al. 2013)
niloticus C1
(dembeensis)
niloticus C2
Legend
Arvicanthis
niloticus C1 (dembeensis)
niloticus C2
Mauritania
Mali
Adrar des
Ifoghas
AÏr
Chad
Niger
Niger river
Lake Chad
Bani river
Nigeria
Sudan
Senegal
Burkina-Faso
Cameroon
Central Afr. Rep.
lineage A
lineage B
lineage C
C-1
C-2
C-3
C-4
15
12.5
10.0
7.5
5.0
2.5
Miocene
Pliocene
Pleistocene

„NILOTICUS CLADE“
(except *A. niloticus*)

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(except A. niloticus)
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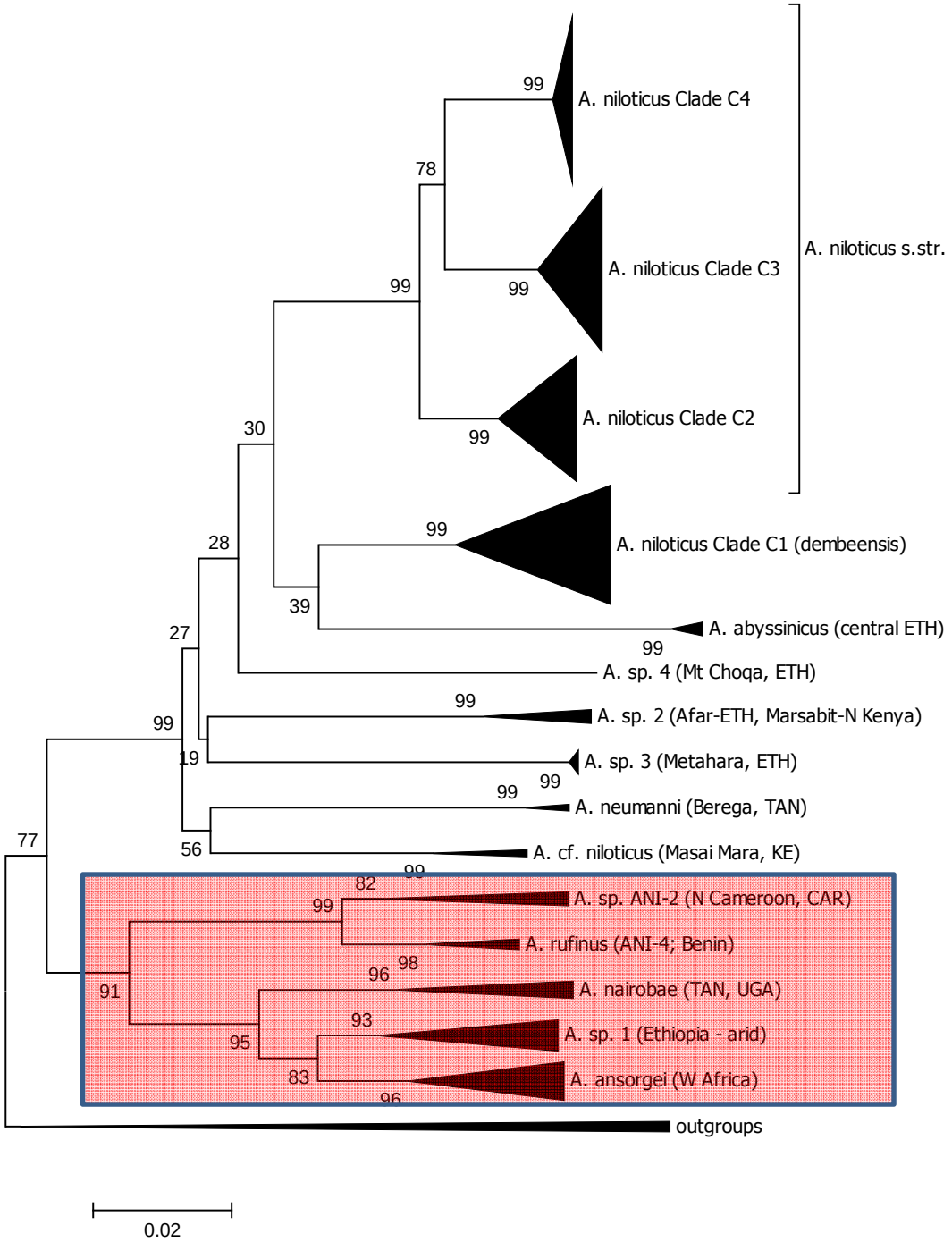
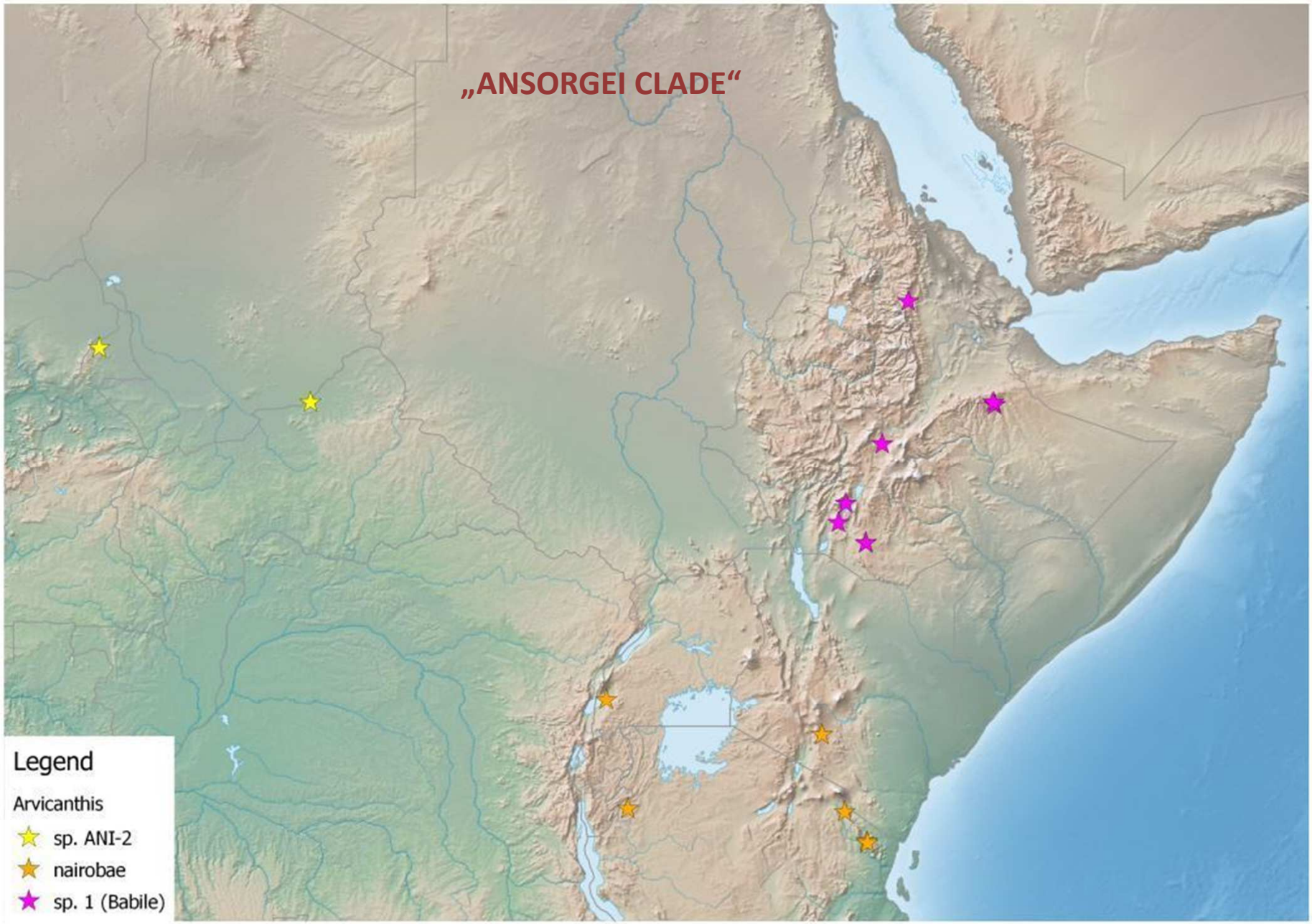


„ANSORGEI CLADE“

not in Dobigny et al. 2013

Ethiopia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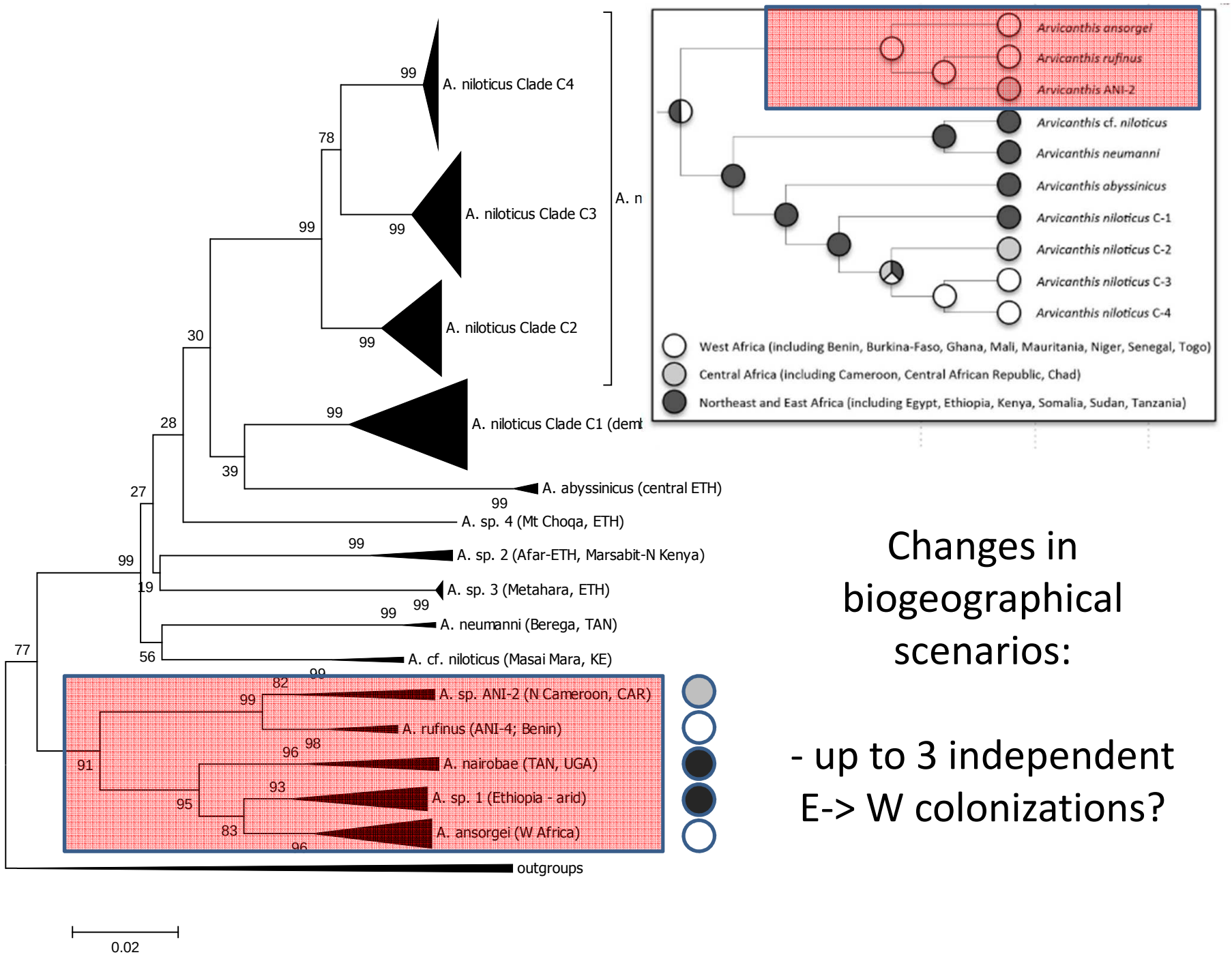
nairobae
sp. 1 (Babile)



Changes in biogeographical scenarios:

- up to 3 independent E-> W colonizations?

What next ...

- completing cyt b genotyping of remaining material (especially Kenya and Ethiopia)
- nuclear markers
- species delimitation + morphological analysis = taxonomic revision
- the use of selected „species“ of *Arvicanthis* in comparative phylogeography of Sudanian savanna and Somali-Maasai savanna