



Summary of 10 Years biodiversity capacity building in Kisangani, RD Congo

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Biodiversity studies on African vertebrates faunas



Scientific perspective

- ✓ Species discovery, taxonomy, barcoding
- ✓ Phylogeny, phylogeography, population genetics

Societal relevance

- ✓ Species **conservation**
- ✓ Impact of **past** environmental changes
- ✓ **Inventory** of pest species, disease carriers, ...



Why so few data from the Congo Basin ?



- **3.7 million km²**
- **Globally: 2nd largest rainforest**
- **Congo River:**
 - 4,700 km long (2nd in Africa)
 - 41,800 m³/s flow (2de worldwide)
- **Poorly known biodiversity**
(old studies)
- **Unique fauna & flora that is threatened** (deforestation, unregulated hunting & fishing, & climate change)

Why so few data from the Congo Basin ?



- Most collections >50 year old
- In **Belgian musea** (RBINS, RMCA-Tervuren) & the Botanical Garden (Meise)



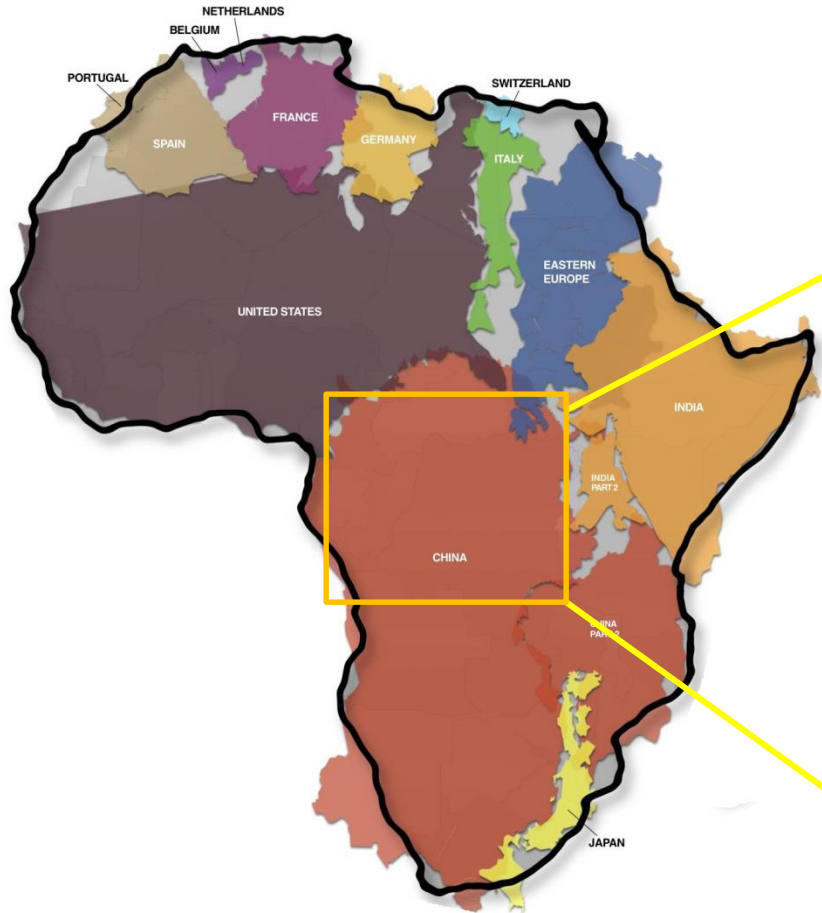
Why so few data from the Congo Basin ?



- Since independence: political instability since ~ 1990
- Weakened institutions/ universities
- Unreliable infrastructure
Transportation: air, land & water
Services: electricity, water, internet,



Why so few data from the Congo Basin ?



**!!! Enormous distances !!!
Absence of reliable roads,
bridges, boats &
administrative obstacles**





New opportunities since 2010



- 50 years independence of DRC
- International year of Biodiversity

Congolese-Belgian partnership (UNIKIS- RMCA - RBINS & NBG)

Objective: Increase local capacity for biodiversity research in DRC

- ✓ Development of local expertise
- ✓ Development of local reference collections
- ✓ Local infrastructure
 - a) Research facilities
 - b) Management and study of collections
 - c) Expertise to formulate advise/reporting for local authorities



New opportunities since 2010



- 50 years independence of DRC
- International year of Biodiversity

Congolese-Belgian partnership (UNIKIS- RMCA - RBINS & NBG)

Different types of projects:

- ✓ Joint field campaigns (2009, **2010**, 2011, 2012, 2013 & 2014)
- ✓ Jointly carried out research projects
- ✓ Development of grant schemes to follow up research activities
- ✓ Accompanying young researchers > MSc & PhD theses
- ✓ Initiating activities that translate knowledge in user friendly tools for sustainable development





1. Expedition Congo 2010



- **35 Congolese scientists**, UKINIS, UNILU, UNIKIN
- **32 Belgian en expat scientists** (BE, NL, ENG, FR, DU, IT, ZAfr & VS)
- **15 media 'people'** (vrt, rtbf, written press, photo journalists, ...)

- **Kitchen team (9), mechanics (8), crew of 3 ships and 7 large pirogues**

In total >120 participants

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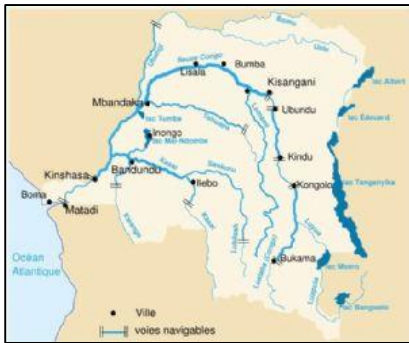




1. Expedition Congo 2010



Traject ~ 1000 km



Transport

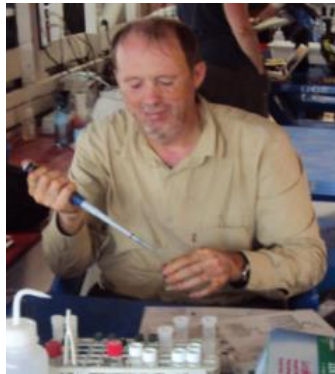
- two wooden boats \pm 35 meter length for scientists
- one 'push' boat with raft to carry containers for the media team
- 7 pirogues with outboard engines
- 4 motorcycles

Working outdoors and sleeping in tents





1. Expedition Congo 2010



Taxonomy:

Contribute to biodiversity inventory of the region (outside protected areas):

Conservation Biology

Identification of biodiversity hotspots that may be earmarked for conservation

Ecology

Study of role of Congo basin in global CO₂ cycle
Traces of pollution from Northern hemisphere?

Geography

Development of new navigation maps for the Congo River

Antropology

Study of early human settlements in Congo Basin via excavations (charcoal)

Linguistics

Local vocabulary ~ biodiversity and use of natural resources



1. Expedition Congo 2010



Developing local expertise

- **Collaboration with local scientists**, techniques, documentation of samples ...
- **Development of joint research projects** between Northern hemisphere scientists and local scientists
- Creation of **specimen collections** for the new Biodiversity Centre in Kisangani (CSB)



1. Expedition Congo 2010



1. Expedition Congo 2010



1. Expedition Congo 2010





1. Expedition Congo 2010

Informing the local population





1. Expedition Congo 2010



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Articles

Chawana R., Alagaili A., Patzke N., Spoeter M.A., Mohammed O.B., Kaswera C., Gilissen E., Bennett N.C., Ihunwo A.O., Manger P.R. (2014) Microbats appear to have adult hippocampal neurogenesis, but post-capture stress causes a rapid decline in the number of neurons expressing doublecortin. *Neuroscience* 277 (2014) 724-733. [View Abstract](#)

Van den Broeck D., Lücking R., Ertz D. (2014) The foliicolous lichen biota of the Democratic Republic of the Congo with the description of six new species. *The lichenologist* 46(2): 141-158. [View abstract](#)

Portillo F., and Greenbaum E. (2014) At the edge of a species boundary: A new and relatively young species of *Leptopelis* (Anura: Arthroleptidae) from the Itombwe Plateau, Democratic Republic of the Congo. *Herpetologica* 70: 100-119.

Multiple authors (2014) Specimen collection: An essential tool. www.sciencemag.org May 23, 2014. [View letter](#)

Laudoisot A., Dadi Falay, Amundala N., Dudu Akaibe, Gouy de Bellocq J., Van Houtte N., Breno M., Verheyen E., Wilschut L., Parola P., Raoult D., Socolovschi C. (2014) Rats, fleas and public health in Kisangani. *American Journal of Tropical Medicine and Hygiene*, online January 20, 2014; doi: 10.4269/ajtmh.13-0216. [View Abstract](#)

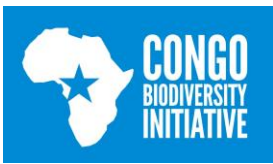
- 50 publications
- 10 PhD theses
- >15 master theses

- Thousands of samples

image.png

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2. Creation of a Research Institution in Kisangani (CSB)

- ✓ Construction of a building
- ✓ Purchase of equipment for laboratories & fieldwork
- ✓ Installation of conservatories for collections
- ✓ Introduction of computers and internet on campus
- ✓ Hiring personnel
- ✓ Developing a structure for the organisation: direction, departments
- ✓ Developing a Strategic plan, mission statement, website
- ✓ Introducing of 'new' concepts

'Annual reports'
External funding

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2. Creation of a Research Institution in Kisangani (CSB)

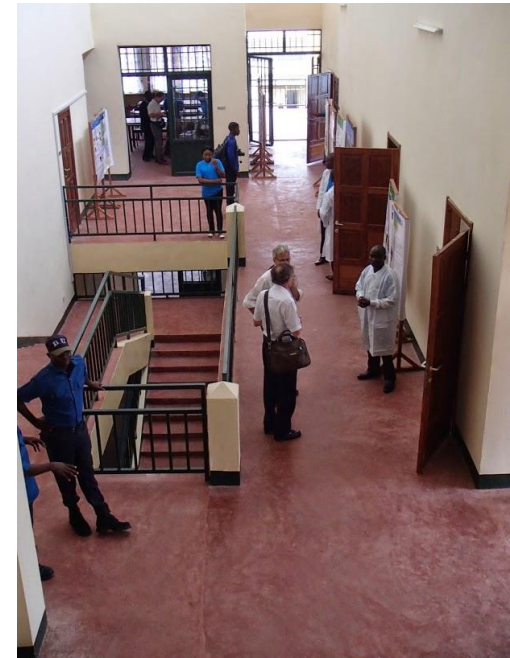


Inaugurated in June 2014

Appointment of “Provincial
representations of the CSB”
(2015)



Earmarked for funding by
Worldbank 2016-2021
(\$700,000/yr)



2. Creation of a Research Institution in Kisangani (CSB)



Missions of the CSB

1. facilitate and attract projects on biodiversity in the Congo Basin;
2. expand partnerships (DRC / international) that will benefit CBS and DR Congo;
3. capitalize gains resulting from these activities : collections , joint publications



2. Creation of a Research Institution in Kisangani (CSB)



Surface: 2300 m²
27 scientists & 5 technicians

Ground floor: 6 collection rooms,
meeting room, 4 offices, 1 storage
room & 8 toilets.

- 1st floor:** library, 8 labs, 5 offices,
meeting room & 4 toilets.
- 2nd floor:** 5 offices, server room
(airco).
- A zoological museum**



3. Organisation of International meetings in Kisangani (CSB)



“1st International Conference of the Conservation of Biodiversity of the Congo Basin”



(June 2014)



4. Research fellowships

CEBioS, SO1.2.3.

**Cooperation with the University of Kisangani
for the taxonomic study
and the monitoring of lowland forests**

Activities

- 1. Annually three research stays of up to 3 months in Belgian institutions** since 2008
- 2. Financial support for specific individual needs** in relation to the research projects (local expenses, field work, small equipment).

Deliverables

- 1. Finalisation of locally started PhD research projects** with external experts as co-promoters of the submitted/defended theses.
- 2. Scientific publications** during these trajectories, each candidate will try to publish up at least one publication in international journals prior to their thesis defence.

4. Research fellowships

CEBioS, SO1.2.3.

**Cooperation with the University of Kisangani
for the taxonomic study
and the monitoring of lowland forests**

Seven PhD theses defended so far:



Guy Crispin Gembu Tungaluna

Peuplement et dynamique alimentaire des Chiroptères frugivores (Mammalia) de la Reserve Forestière de Yoko (Province Orientale, RD Congo) - Année académique 2011-2012, Promoteur : Dudu Akaibe (Unikis) Co-Promoteur : Erik Verheyen (IRScNB)



Nicaise Amundala Drazo

Ecologie des populations des Rongeurs (Rodentia, Mammalia) dans une perspective de gestion des espèces nuisibles aux cultures dans la région de Kisangani (R.D. Congo) - Année académique 2012-2013, Promoteur : Dudu Akaibe (UNIKIS) Co-promoteur : Herwig Leirs (UA)



4. Research fellowships

CEBioS, SO1.2.3.

**Cooperation with the University of Kisangani
for the taxonomic study
and the monitoring of lowland forests**

Consolate Kaswera

Impact des activités anthropiques sur la densité et la distribution de *Petrodromus tetradactylus tordayi* THOMAS, 1910 (Macroscelididae, Mammalia) Dans la Région De Kisangani (Province Orientale, RD Congo) - Année académique 2012-2013, Promoteur : Dudu Akaibe M. (UNIKIS), Co-Promoteurs: Emmanuel Gilissen (MRAC) & Erik Verheyen (IRSN)



Jean-Claude Mukinzi Itoka

Biodiversité et écologie des musaraignes (Soricomorpha, Mammalia) de la réserve forestière de Yoko et des milieux perturbés environnants (Ubundu, RD Congo) - Année Académique : 2013-2014, Promoteur : Dudu Akaibe (UNIKIS), Co-Promoteur: Herwig Leirs (UA)



4. Research fellowships

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Célestin Mizani Danadu

Problématique de *Synodontis* cuvier, 1816 (Siluriformes, Mochokidae) dans le bassin du fleuve Congo: Systematique et ecologie (RD Congo) Année Académique: 2013 – 2014, Promoteur: Jos Snoeks (KULeuven, MRAC), Co-Promoteur: Ulyel Ali-Patho (UNIKIS)



Sylvestre gambalemoke Mbalitini

Phylogéographie et biodiversité des musaraignes (Soricomorpha, Crocidurinae) en cuvette congolaise (Kisangani, RDC) - Année Académique 2013-2014, Promoteur : Dudu Akaibe (UNIKIS), Co-Promoteur: Erik Verheyen (IRScNB)



4. Research fellowships

CEBioS, SO1.2.3.

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Frank Bapeamoni Andemwana

Biodiversité et densité des nids des oiseaux dans un dispositif permanent a Yoko (Ubundu, RDC) -Année académique 2014-2015, Promoteur : Dieudonné Upoki Agenong'a (UNIKIS), Co-Promoteur : Michel Louette (MRAC)



4. Research fellowships

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for the taxonomic study
and the monitoring of lowland forests**

Ongoing PhD studies



Falay Dadi Sadiki

Zoonoses et biodiversité dans la région de Kisangani.

Promoter: Dr. Jan Jacobs (ITM) co-Promoter Nestor Dauly Ngbonda (UNIKIS)



Casimir Nebesse Mololo

La filière de la viande de brousse dans la province Orientale,

Promoter Dudu Akaibe, co-promoter Erik Verheyen (IRSNB)



Prescot Musaba Mololo

Les chiroptères dans la région de Kisangani, diversité et zoonoses, Promoteur Gembu Crispin Tungaluna (UNIKIS), co promoteurs Erik Verheyen & Vic Van Caeckenberge (UA)



Steve Ngoy Luhembwe

Le role des ticks comme vecteurs de zoonoses chez les rongeurs
Promoter Gembu Crispin Tungaluna (UNIKIS), co promoteurs Erik Verheyen & Anne Laudisoit (UA, CIFOR)

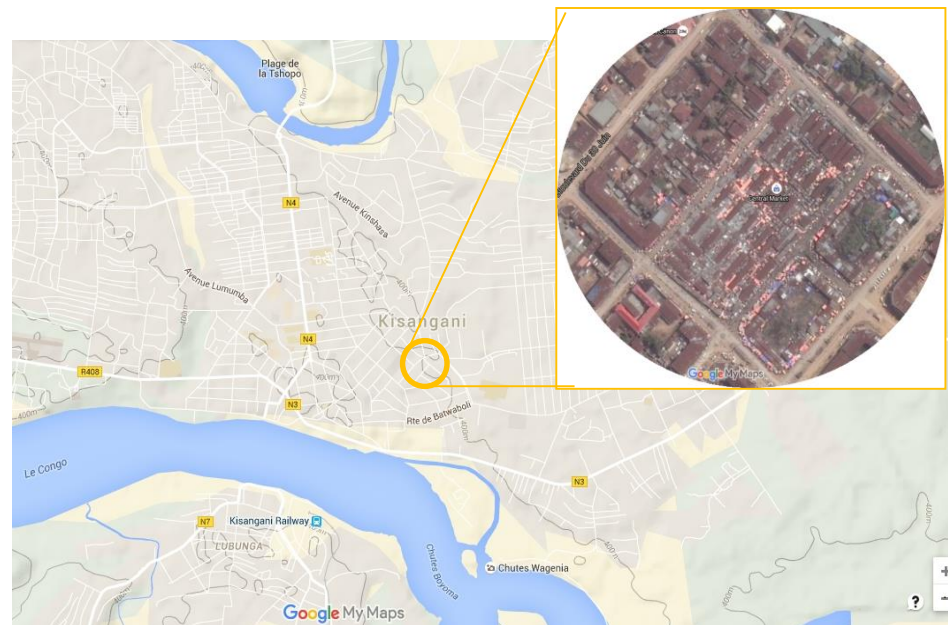
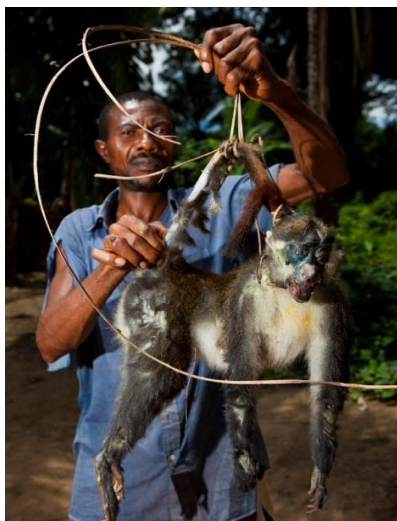


4. Other field campaigns with local teams

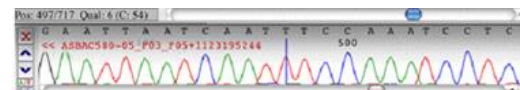
CEBioS, SO1.2.3.

Cooperation with the University of Kisangani
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Bushmeat trade in Kisangani region



Bushmeat trade in region around Kisangani & in Kisangani city: impact on biodiversity & traject from hunter to consumer

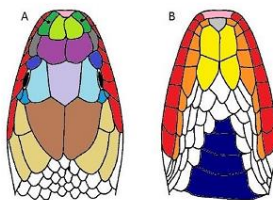
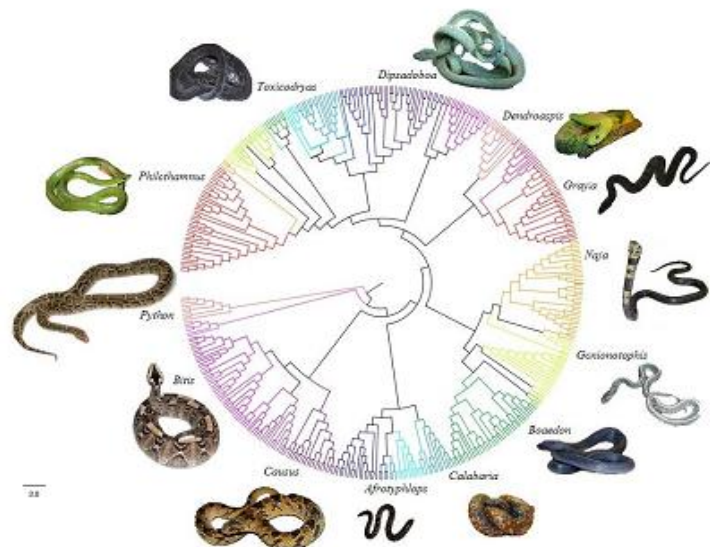


4. Other field campaigns with local teams

CEBioS, SO1.2.3.

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and the monitoring of lowland forests

Biodiversity inventories



Barcoding snakes: full species inventory
& assessment of society impact



4. Other field campaigns with local teams

CEBioS, SO1.2.3.

Cooperation with the University of Kisangani
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and the monitoring of lowland forests

Biodiversity inventories



Synodontis contractus



Hydrocynus forskahlii



Tetraodon miurus



Xenomystus nigri



Synodontis acanthomias



Tylochromis labrodon



Synodontis caudalis



Synodontis alberti



Synodontis nummifer



Synodontis pleurops

Africa
TERVUREN



Barcoding fishes: full species inventory & assessment of society impact (sustainable fisheries)

13 ordines: Clupeiformes, Cypriniformes, Cyprinodontiformes, Gonorynchiformes, Lepidosireniformes, Osteoglossiformes, Perciformes, Polypteriformes, Siluriformes, Synbranchiformes, Syngnathiformes, Tetraodontiformes

5. Local project

VLIR CUI-UNIKIS

Apport de la biodiversité à la formation et la sécurité alimentaire dans le Bassin Nord-est Congo (Kisangani, RDC):
Project 2: biodiversity



General objective.

to strengthen the academic capacity of the institution in the fields of biodiversity.

Specific objectives

Improve knowledge (taxonomic , ecological), socio- economic and nutritional importance of animal and plant biodiversity

4. Local project

VLIR CUI-UNIKIS

Apport de la biodiversité à la formation et la sécurité alimentaire dans le Bassin Nord-est Congo (Kisangani, RDC):
Project 2: biodiversity



Hippolyte Nshimba Seya

Coordonateur local du projet biodiversité botanique



Dudu Akaibe Migumiru

Coordonateur local du projet biodiversité zoologie



4. Local project

VLIR CUI-UNIKIS

Apport de la biodiversité à la formation et la sécurité alimentaire dans le Bassin Nord-est Congo (Kisangani, RDC):
Project 2: biodiversity



Bushmeat impact, zoonoses & economy

4. Local project

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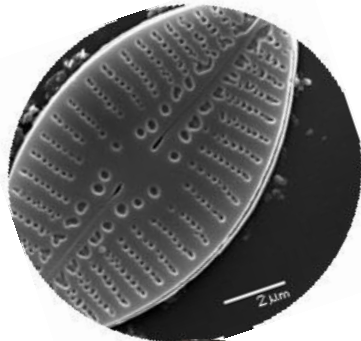


Bushmeat replacement, pisciculture, culture of fungi

4. Local project

VLIR CUI-UNIKIS

Apport de la biodiversité à la formation et la sécurité alimentaire dans le Bassin Nord-est Congo (Kisangani, RDC):
Project 2: biodiversity



Taxonomic inventory
of algae & fungi



Taxonomic inventory
of vertebrates

4. Local project

VLIR CUI-UNIKIS

Apport de la biodiversité à la formation et la sécurité alimentaire dans le Bassin Nord-est Congo (Kisangani, RDC):
Project 2: biodiversity



Dessimination biodiversity info to stakeholders





<http://www.congobiodiv.org>

https://www.researchgate.net/profile/Erik_Verheyen/contributions

Acknowledgements



Consortium Congo2010

Coordination



Hilde Keunen (RMCA)



Dudu Akaibe (UNIKIS)

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THANK YOU
FOR YOUR ATTENTION

