AMPHIBIAN DIVERSITY SURVEY AND CONSERVATION ASSESSMENT IN THE LAKE TUMBA WETLAND LANDSCAPE OF THE CONGO BASIN, EQUATEUR PROVINCE, DEMOCRATIC REPUBLIC OF CONGO

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INTRODUCTION

• Publications on Amphibians from DR Congo show that Amphibians form an important component of the biological diversity
• Only few studies were done in the Congo Basin
• No study on the amphibian diversity in the Lake Tumba Wetland Landscape (RAMSAR wetland)
• Surveys are needed to improve the knowledge of the amphibian diversity in the Congo Basin.

BACKGROUND

1) first step: writing a pre-proposal

2) second step: study visit to the RMCA for:
   - Refreshing course in collections management
   - Study visit to the museum collections
   - Documenting the amphibians by Intranet, and literature.

3) third step: full proposal for surveying the amphibian diversity in the Lake Tumba Wetland Landscape.
JUSTIFICATION

Why studying amphibians in the Congo Basin?

- Amphibians are important components of the biological diversity in tropical areas
- Amphibians play a role as bioindicators of the environment quality [global decline: more sensitive to change in moisture]
- The Congo Basin is among the least studied areas in the world, at least for Amphibians
- Capacities for studying amphibians are available at national and international levels
LEVEL OF EXPLORATIONS

- the RMCA registers 128,326 adult specimens from Congo R.D. representing 200 species.
- Eastern regions (Ituri, Kivu, Tanganika): 72.5%
- Southern regions (Bas Congo, Lukaya, Kwango, Kasai, Katanga): 20.7%
- Central regions (Equateur (*), Mai Ndombe, Tshopo): 6.5%
- Northern regions (Ubangi, Uele): 0.3%.

(*) includes the Lake Tumba Wetland landscape (the target study area of the project).
THE RESEARCH GOAL

- Improve the knowledge of the Congo Basin’s amphibian fauna by:
  - documenting the taxonomical variability (in space) and change (in time)
  - with a geographical limitation to: the Lake Tumba Wetland Landscape
THE STUDY SITE

Lake Tumba Wetland Landscape
(18°00’ E -0°37’S, ~ 430m alt.)

encompassing:
(1) Lake Tumba
(2300 km²)
(2) Surrounding Tropical Rainforest
(3) Esobe, savannah-like habitat
Habitats: lake, rivers, forest and wet area
Esobe lands
Savannah, Dry savannah (Esobe), water inundated lands (Libeke)
OBJECTIVES

Overall objective: improve the knowledge of amphibian diversity in the Congo Basin.

>>> Specific objectives
- establish the amphibian faunal list at Lake Tumba Wetland Landscape
- collect specimens for taxonomic study allowing the identification of taxa and description of new taxa
- collect data on amphibian biology and ecology necessary to suggest appropriate conservation measures to decision-makers.
MATERIAL AND METHODS

**Material:** permits, logistics, and research equipment

**Methodology**
- specimen collecting (field)
- habitat data collecting (field)
- specimen processing (field-laboratory)
- specimen data collecting (laboratory)
- specimen determination (laboratory)
- analysis (laboratory)
Methodology: specimen collecting

1) Site scanning method: Opportunistic surveys on different stations of the three important habitats: the lake’s shores, the surrounding forest and the Esobe lands.

- Day work: visually locating individuals in all possible places and caught by hand
- Night work: acoustically detecting and locating individuals with a head lamp and laser pointer. After recording the calls the specimen recorded must be caught.
Methodology: specimen collecting

1) Site scanning method: Opportunistic surveys on different stations of the three important habitats: the lake’s shores, the surrounding forest and the Esobe lands.

2) Linear transects: placed perpendicularly to habitats border and marked at 100m intervals. Each transect point will be the basis of a thorough search for specimens.
Methodology: specimen processing

- specimens are kept alive in numbered plastic bags
- Field data: date, time, site, locality (GPS), and position in habitat, weather conditions: $T^\circ$, rH.
- Documenting coloration (digital camera)
- Smoothly killed by Orajel
- Photographed once again (in standard positions), weighed, and tagged with a field number.
- DNA sample: dissection of tissue from liver or thigh; placed into a labelled plastic vial in 95% ethanol
- fixation in buffered 10% formalin and transfer into 70% ethanol for permanent storage.
Methodology: specimen data collecting

a) Morphology of specimen
   - Measurements: length of head, body and limbs, eye dimensions
   - Description: coloration, tubercles, skin folds, granulations, webbing, tympanum, pupil form, sex, age…

b) Study of calls
   - selecting sounds for analysis
   - audiographic characteristics: number of calls, duration etc.

c) Study of digital photographs
   - pattern description
Methodology: specimen determination

Taxonomic data analysis
- Attribution of specimens to (unnamed) taxon groups
- Giving species names by using determination keys or expertise from specialists
- Using additional information from DNA analysis for the identification of species
Methodology: habitat data

- Vegetation type, height and canopy coverage.
- Uniformity and habitat size
- Type, intensity of and distance to anthropogenic activities: cultivation, tree cutting, settlement, logging, roads, fishing, and pollution
EXPECTED RESULTS

- Amphibian faunal list(s) for the Lake Tumba Wetland landscape
- Good museum collection specimens for further taxonomic study
- Determination keys for species involved
- Comparison of species composition by habitat
- Data on amphibian biology and ecology
- (evaluation of the impact of human activities on species)
- (bottleneck analysis [for decision-makers]: in order to define appropriate conservation measures)
TIES TO BIODIVERSITY AND ENVIRONMENTAL ISSUES.

• Amphibian species richness of the Lake Tumba Wetland Landscape
• Amphibian are bioindicators of the environment requirements
• Capacity building for appropriate measures for protecting the site and its biodiversity.
CAPACITY BUILDING AND INTERNATIONAL COLLABORATION

• Training opportunities for Congolese biologists: on the field, at the RMCA and at the Centre Antivenimeux (CAV) of Kinshasa.
• Boostering ongoing conservation efforts in the region
• Collaboration with scientists from: RMCA, UTEP and McMUCR
LINKS TO DECISION AND POLICY MAKERS

• Local level: local communities and CBOs
• National level: Institut Congolais pour la Conservation de la Nature, (ICCN) and the Ministry of Environment, Conservation of Nature and Tourism
BUDGET ESTIMATES

Covering all expenses: material, subsistence, per diem, permits, training, travels, etc.

- Starting budget requested from UNESCO (Phase 1, one station one team): US$5500
- Phases 2,3,4 (three years full project): US$102500.
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THANK YOU

Hyperolius sp.