

Assessing the threat of Chytrid Fungus Batrachochytrium dendrobatidis on Amphibians in the Albertine Rift, East Africa

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Introduction

-Albertine Rift in East Africa is an area rich in biodiversity, and the area is home to over 145 species of amphibian, accounting to 23% of all amphibians in Africa. The area is vulnerable to habitat loss, making the Albertine Rift a high priority region for conservation. Previous studies found that the fungus Batrachochytrium dendrobatidis (Bd), responsible for

- Other than natural and anthropogenic spread of Bdtesa Poorly environmental factors such as temperature and cottes. may influence the presence of Bd is the him influence. Therefore it is likely that circulate thange will affect he distribution and thence of Bd in the face.

Purpose

-Main purpose to document the distribution and prevalence of amphibian Bd in the Albertine rift, in both current and proposed protected areas, and determine whether the presence of Bd correlates with Chytridiomycosis -Predict the effect of climate change on the distribution and prevalence of Bd, using distribution models to predict future habitat suitability in the Albertine Rift.

-This is important in order to conserve the rich diversity of species in the area. No research on the distribution of Bd in the area had been carried out previously.

Materials and Methods

- Amphibians of 17 genera across 14 families swabbed using BBL 1/8" diameter sterile rayon tipped culture swabs 4-5 times each on the underside of the hind feet, abdomen, thighs and forefeet.

Sampled across 39 sites within the Albertine Rift. -

- Tissue samples from dead animals from museum collections were also taken. Samples were used for histological examination and tested using the Polymerase Chain Reaction (PCR) for Bd.

-Overall, 199 of the 1018(19.5%) samples collected altogether within the Albertine Rift tested positive for Bd using the PCR method.

-Of the 17 genera, individuals representing 10 genera tested positive for the presence of Bd and those representing the remaining 7 genera tested negative for Bd.

-Amphibians of the genus Afrixalus and Leptopelis had the highest prevalence of Bd.

- Optimum maximum temperature for the warmest month of the year for the probability of Bd presence is 10 - 21°C, with rapid decrease in probability of occurrence above 22°C.

-Significant increase in Bd occurrence in the study area increases with an increase in mean annual precipitation when all other environmental parameters are unchanged

-Probability of Bd presence decreases rapidly when annual rainfall reaches 1500mm

Conclusions

-Large reduction in Bd prevalence between historic samples since 1925 and samples collected in the Albertine Rift region

-Histopathological examination has found that Bd infection does not result in morbidity in all cases

-Some amphibian species sampled such as the American Bullfrog and the African Clawed Frog are less susceptible to Bd infection and therefore these species likely act as carriers of the disease -With the exception of two specimens (*Ptychadena* and *Hyperolius*), the majority of Bd positive specimens did not develop Chytridiomycosis despite infection with Bd

Future Research

-Tadpoles have been shown to act as a host for Bd in the environment, and tadpoles could be tested for the presence of Bd in mouthparts

- Aquatic parameters such as proximity to drainage and vegetation parameters during the wet and dry seasons could be tested to enhance the climatic models

References

Seimon, A., Ayebare, S., Sekisambu, R., et. al., 2015. Assessing the Threat of Amphibian Chytrid Fungus in the Albertine Rift: Past, Present and Future, PLoS ONE, 10 (12)