

Project report on my practice done in Cameroon from 20. April to 18. July 2016

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Since school I wanted to study biology. Microbiology was my preferred subject. But during studies I noticed that my main interest changed to parasitology. Therefore I wanted to learn as much as possible about these fascinating organisms.

It came that I attended a seminar of PD Dr Alfons Renz about Cameroon, the parasites there, the field work, culture and the projects.

This solidified my wish and after conversations with Alfons, we started to consider which project I could focus on during a practical in Cameroon. We came to the conclusion to follow-up the results of Freya Zettl, who was in Cameroon in 2015. She had observed the movement of microfilariae in Agar agar as a skin-similar medium.

So my topic was to study microfilariae of the genus *Onchocerca* with regard to their movements in different environments. Like in solutions of agar and galantine with different concentrations. In such semi-solid media, the movement of microfilariae is similar to their suspected migrations in their normal habitat, the cutis of the cattle-skin.

This was really handy, because there was already a basic on which I could set up my project. My main objects were microfilariae of the species *Onchocerca ochengi*. These parasites are very common in Cameroon and easy to get from the nearby slaughterhouse.

The idea was to create a medium as similar as possible to their natural habitat, the bovine



Fig. 1: L3 of *O. ochengi* in 0,05% Agar



Fig. 2: Microfilaria of *O. ochengi* in 0,05% Agar.

or human skin. Further projects should address issues like how they react in combination with bovine, or human blood serum, the microfilaricide drug Ivermectin, vitamin D, electric impulses, or other stimuli.

After developing a frame concept of my project I prepared myself for this journey. This was the first time I went outside of Europe, so I was a bit nervous and excited. But in the same time I was full of confidence and anticipation.

After two long flights from Stuttgart to Istanbul and further to Yaoundé, the capital city of Cameroon I was grateful to Dr. Albert Eisenbarth who came with me. He helped to break the initial linguistic barrier, which was eliminated after two to three weeks in Cameroon.

After a day in Yaoundé we took the train overnight further to Ngaoundéré. Arrived there, a cab brought us to the research compound which is near to the centre of the town. The compound includes a main building (with a bathroom, bedrooms, kitchen and living room), a laboratory, a repository and a really big garden

In this station, there are four lab workers, a cook, gardener, night watch and a dog. Working there was designed very pleasant, because I could work in the lab every time I wanted and I could concentrate myself fully on my project.



Fig 3: My usual work place with camera setup and laptop.



Fig 4: Examination of a cattle for Onchocerca nodules.

In the lab I worked together mainly with two experienced assistants, David Ekale and Jeremie Jembo. David showed me how to distinguish the microfilariae – there are at least three different *Onchocerca* species that live in the cattle skin - and Jeremie brought me every morning fresh skin tissue samples with *Onchocerca* nodules and microfilariae from the slaughter house.

The aim of my project was to observe the movements, direction and orientation of the microfilariae regarding to some kind of stimuli, like vitamin D, Ivermectin and electricity as same as in a skin similar environment.

For this I created a Y-formed shape, made out of cut cover slides. I fixed the pieces of the

cover slides with some UV-glue on a slide and let the endings open or closed with the same glue. So I could fill up those forms with medium, put the microfilariae in the centre and set the stimuli on the three (or less) endings of the y-shaped system.

The second step proved to be the hardest one, because here I had to find the ideal medium for the microfilariae. For this I tried various concentrations of Agar and gelatine. It turned out, that gelatine in a concentration of 2 g per 10 ml distilled water is the best environment for microfilariae to move easily in a snake-like manner. This is lower than the concentration of gelatine in ballistic gels, which were developed to mimic the human skin (1,25 g per 10 ml): In such medium, the movements of microfilariae looked like in thick water.

Unfortunately I couldn't set stimuli on the microfilariae, so I just designed a shape for a good observation of moving microfilariae and found an ideal medium in which they easily move. In the videos, the movement is well documented and one can imagine, that a directed movement would be more than only possible.

So next step should be to set the stimuli, like an electric field, vitamin D, Ivermectin, various pH-values, heat and other stimuli and observe the movement of the microfilariae and answer the question if the various species of *Onchocerca* react different to the stimuli.

I did not only work in the lab, but I also helped in the field with the projects of the „Programme Onchocercoses“ with the cattle herd. On a paddock near the river Vina du Sud, about 15 km to the South of the town, stand about 60 Zebu-cattle, which are followed-up in parasitological studies in collaboration with the project's partner institute – the Institut de Recherches Agronomiques pour le Developement (IRAD). These cattle are naturally exposed to local transmission and are regularly examined for the acquisition of *Onchocerca* nodules. To study the dynamics of this transmission, we did fly-catches during the afternoon, evening and early night. Supplementary I helped with collecting *Simulium* vector-larvae at their breeding sites in different local streams.

This work was much fun, not only because of the unbelievable fascinating and beautiful landscape of the Adamawa plateau.

This practical in Cameroon was an important enrichment to my study of biology and my whole life. Because I worked together with so many experienced Cameroonian workers from IRAD and from the Univ. of Tübingen's lab, I got so many impressive and deep insights to the whole work which is necessary for such a big programme, which is the „Programme Onchocercoses“ . And all these workers were so kind and helpful, so my work was really much fun and smoothly went off the hand.

Also I got a deep impression of the culture and history of Cameroon and the opinions of the Cameroonians to their living conditions and the whole world as well.

So I'm very grateful to Dr Renz for giving me such a great chance. And a great praise to Dr Albert Eisenbarth and Archile Paguem for their help, as well as to all the other workers of our lab and the IRAD, which tried to answer all my eternal questions about work and the everyday life in Cameroon.