



# ***Integrated Control of Liver Flukes of Cattle Using Botanical Extracts and Biocontrol Agents***

(PRJ-0109-2016)

***University of kwaZulu-Natal -***

***Quarter 2 2016*** (April 2016 till June 2016)

## **Project goals**

### **Goal 1 - Survey farms to get a measure of infestation levels**

#### ***Achievements***

##### **Suspended Research Goal**

This goal has not be undertaken.

#### ***Non-achievements / underperformance***

Research has not be undertaken on this goal.

#### ***Reasons for non-achievements / underperformance***

This is a major project in its own right. We do not have the budget, the transport or the postgraduate student to undertake this aspects of the overall fluke research picture, at this stage.

#### ***Planned remedies for non-achievements / underperformance***

If adequate funding, and suitable postgraduate students become available, then this could be considered and undertaken.

**Goal 2 - Screen for drug and multi-drug resistance in the two primary flukes found in South African animals. Get the samples from livers at abattoirs and from the faeces of animals in the field. Test the animals of commercial and small scale farmers.**

#### ***Achievements***

#### ***Non-achievements / underperformance***

### **Suspended Research Goal**

This goal has not be undertaken.

Research has not be undertaken on this goal.

#### ***Reasons for non-achievements / underperformance***

This is a major project in its own right. We do not have the budget, the transport or the postgraduate student to undertake this aspects of the overall fluke research picture, at this stage

#### ***Planned remedies for non-achievements / underperformance***

If adequate funding, and suitable postgraduate students become available, then this could be considered and undertaken.

### **Goal 3 - Develop storage protocols for flukes at various life stages**

#### ***Achievements***

- We are looking for vets that can collaborate with this in this regard securing a reliable supply of a reliable contaminated livers from the abattoirs, and faecal samples from infected animals.

- We have been developing techniques for the ongoing production of a large population of the intermediate host (aquatic snails).

#### ***Non-achievements / underperformance***

We are still contacting vets regarding the collabrations

#### ***Reasons for non-achievements / underperformance***

There are relatively few vets working on this topic in KwaZulu-Natal.

#### ***Planned remedies for non-achievements / underperformance***

We are still contacting vets regarding the collabrations

### **Goal 4 - Initiate primary screening in vitro of plant extracts on flukes.**

#### ***Achievements***

Eight plants were collected, dried and grounded into a powder ready to extract

Working on the remaining plants

#### ***Non-achievements / underperformance***

Prepare the extract of the plants by methanol solvent

Screening in vitro on adult or eggs from faecal sample and liver samples

Chose the best three plant by different doses

Test them on animal

***Reasons for non-achievements / underperformance***

The student started late due to visa issues. Her focus was start reading about the project, and securing a checklist of appropriate plants from which to extract the potential active ingredients.

***Planned remedies for non-achievements / underperformance***

Ordering of chemicals and securing of samples resources

**Goal 5 - Initiate screening for biocontrol agents in infested pastures, to kill: a) the eggs in faeces; b) the miracidia in the faeces; c) the cercaria and metacercaria stages - In vitro (in microtitre plate wells) and In vivo trials (in pots)**

***Achievements***

Prepering the speace in the labrotory for the *Bacillus* culture

***Non-achievements / underperformance***

- Once we secure the source of the fluke stages, this research goal will progress with screening of the *Bacillus* antagonist library, and any potential fungi control agents

***Reasons for non-achievements / underperformance***

Securing of chemicals that the student needs for the elective extractions

***Planned remedies for non-achievements / underperformance***

- Work plan will continue versus time frame

**Goal 6 - a. Isolate and screen for biocontrol agents that kill the alternate host, the snails in pot trials.**

## **Achievements**

Work is in progress to build a culture library of *Bacillus* species and develop techniques for maintaining a population of snails as well as to breed them in the large quantities required for a broad screening trial.

## **Non-achievements / underperformance**

Efforts to source breeding populations of the target snails from nature (Eastern Cape and Pietermaritzburg area) have failed perhaps due to either change of environment or likely due to seasonal weather conditions being inhospitable for these snail species. However, a source of aquatic snails that are prevalent in tropical aquariums and are amenable to producing a large population has been sourced. Cultivation of this species should be relatively easy and offers a source of material for the initial screening of snail antagonists.

## **Reasons for non-achievements / underperformance**

Screening for most antagonists requires large populations of suitable snails, and is therefore predisposed on successful breeding and maintenance of target snail populations.

## **Planned remedies for non-achievements / underperformance**

Work is also going on modification of four hydroponics concrete tanks situated at the Controlled Environment Research Unit (CERU) located on the Pietermaritzburg Agriculture campus of the University of KwaZulu-Natal.

Thereafter, once a suitable population of liver fluke host snails are obtained, research would commence on the cultivation and testing of antagonists against the target snail species, and these protocols can be refining.

## **Income and expenditure statement**

Income and expenditure statement	<a href="#">Book2.xlsx</a>
Unnecessary spending during period	No

# Popular Report

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## Additional documentation

[Re project report.docx](#)

## Statement

Levy funds were applied only for the purposes stated in the contract	Yes
Levy funds were applied in an appropriate and accountable manner	Yes
Sufficient management and internal control systems were in place to adequately control the project and accurately account for the project expenditure	Yes
The information provided in the report is correct	Yes