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# Preliminary study of Cystic Echinococcosis in the Limpopo National Park area

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**SECOSUD II**

ITALIAN AGENCY  
FOR DEVELOPMENT  
COOPERATION  
Conservation and equitable use of biological diversity in the SADC region

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# Introduction: why in LPN

- There are many communities living in the park with their domestic animals;
- Water resources are limited so wild animals and people tend to share limited areas and this creates different wildlife/livestock/human interfaces;
- There is an official abattoir that represents an important starting point for doing such a study;
- No data on prevalence of Cystic Echinococcosis in the area exist.



Map of LNP area

# Introduction: what is...

- Zoonosis: is a disease that can be transmitted from animals to humans (directly or indirectly);
- Parasite: organism that lives on or in an organism host and gets its food from or at expense of its host (CDC definition);
- Cystic echinococcosis (CE) is a severe parasitic disease caused by the larval stage of the species complex of *Echinococcus granulosus sensu lato*;
- Is currently among the five most frequently parasitic zoonosis.



Adult of *Echinococcus*

# Introduction: what is...

The genetic diversity of *Echinococcus granulosus* s.l.

At least 5 are infective for Human

G1 = sheep strain

G2 = sheep strain Tasmania

G3 = buffalo strain

G4 = horse strain

G5 = cattle strain

G6 = camel strain

G7 = pork strain

G8 = deer strain (USA)

G9 = pork strain (variant)

G10 = deer strain (finno-scandinavian)

G? = lion strain (Africa)

**G1= sheep strain**

**G2= sheep strain Tasmania**

**G5=cattle strain**

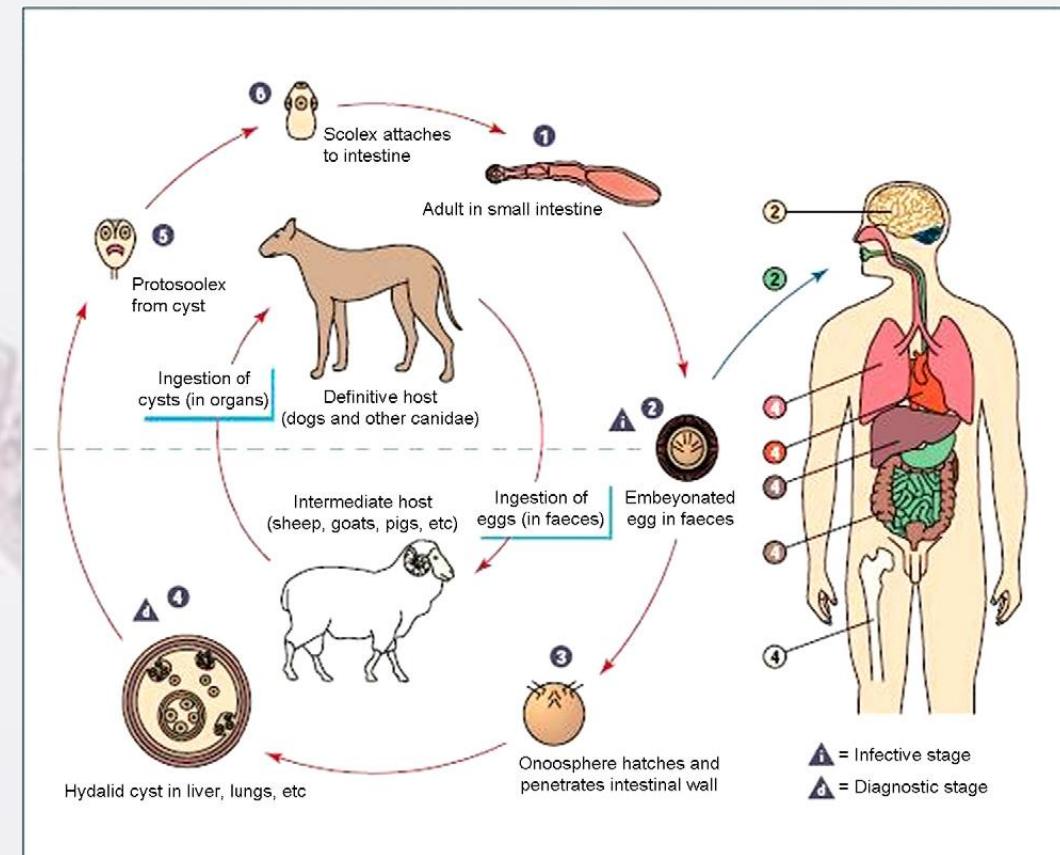
**G8=deer strain**

**G=9 pork strain(variant, Poland)**



# Introduction: life cycle

1. The adult cestode inhabits the small intestine of a carnivore (definitive host) and produces eggs containing infective oncospheres;
2. The intermediate host ingests eggs from environment example feeding or drinking. Larvae penetrates the intestine wall, and is carried in the circulatory system to various organs;
3. There, the cysts are formed, and can be seen macroscopically from 2 months post-infection, and can increase up to 10- 20 cm;
4. The cycle is completed when a carnivore ingests a protoscolex from organs with fertile cyst;
5. human is an 'aberrant' host.



Life cycle of *Echinococcus*

# Summing up

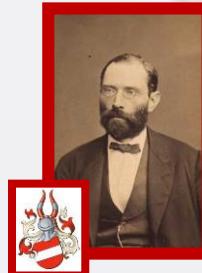
Definitive host becomes infected only by protoscolices, inside the cysts of affected organs



The intermediate hosts becomes infected only by ingesting eggs dropped by definitive host



**Control (eradication)**  
**Theoretically simple**



Harald Krabbe  
Copenhagen 1831 - 1917



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# But...



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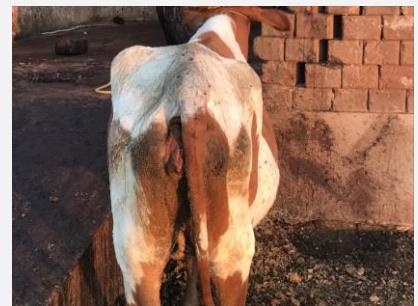
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# Materials and methods

- Ante-mortem clinical examination (data, BCS and clinical symptoms)



	Condition score 1 Backbone prominent Ribs very prominent Tail-head area recessed Skeletal body outline
	Condition score 2 Backbone visible Ribs very visible Tail-head area slightly recessed Body outline visible
	Condition score 3 Ribs visible fatless Ribs generally not visible Tail-head area not recessed Body outline almost smooth
	Condition score 4 Ribs barely visible Ribs well covered Tail-head area slightly lumpy Body outline rounded
	Condition score 5 Ribs almost no deposit Ribs well covered Tail-head area very lumpy Body outline hugging due to fat

- Post-mortem inspection phase

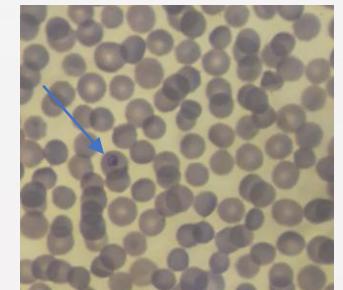


- Cysts founded classified according with appearance, location, size and numbers.

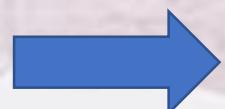


# Materials and methods

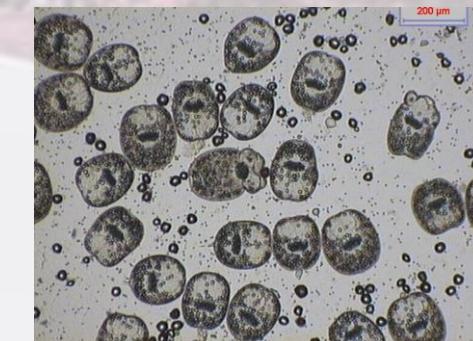
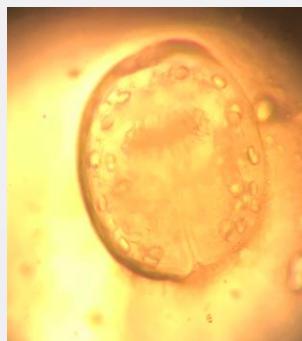
- Blood and stool samples are subjected to laboratory test



- Once identified, liquid and germinal membrane are sampled



- Microscopic evaluation of vitality. Samples are stored in 70% alcohol solution waiting for DNA extraction, for PCR to determine a genotype



# Our targets

Determine a prevalence of parasitosis



Evaluate which genotypes are present  
in the area



Analyze the impact of parasitic disease  
on health



Estimate the impact on production



Create a control plan

# Next steps

- Create a surveillance protocol for carnivores (domestic and wild) in LNP;
- Extend the activity in Kruger National Park area on wild carnivores and herbivores;
- Extend the activity to the domestic animals of the buffer zones of Kruger National Park;
- Disseminate scientific publications and working documents that can help local institutions to manage this problem;
- Create an education plan for local communities and technicians that work in abattoir;

Thanks for your attention!

