

Analysis of the use and effectiveness of ethno-botanical practices of livestock keepers in Cholistan, Pakistan, with particular focus on anthelmintic treatments

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Outline

1. Introduction
2. Study objectives
3. Materials & Methods
4. Time plan
5. Possible outcomes

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1. Introduction

1. Helminthiasis is a major threat for livestock, causing hurdle in the development of profitable livestock industry (Khan *et al.* 1989; Sajid *et al.* 1999)
2. Prevalence of helminthes in ruminants varies 25-92% in different areas of Pakistan (Iqbal *et al.* 1993; Raza *et al.* 2007)
3. It constitute an immense problem for pastoral livestock keepers in Cholistan, Pakistan

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4. Synthetic anthelmintics use for the control of helminthiasis have following problems
 - Side effects
 - Resistance development
 - Chemical residues in products and dung
 - Toxicity problems
 - High costs
 - Non-availability in remote areas.
5. Revived interest in exploiting the potential of medicinal plants

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2. Study Objectives

- No record of helminth species of Cholistan → Poor livestock keeper are spending a lot of money for the treatment of unknown helminthes
- Cheap ethno-botanical remedies are used in Cholistan, but their effectiveness against helminthes is unknown
- There will be minimum economic losses due to low production or death of animals by helminthes and cheaper or even free of cost treatment by using ethno-botanicals. This will improve the life of poor Cholistani people and will a step towards prosperity.

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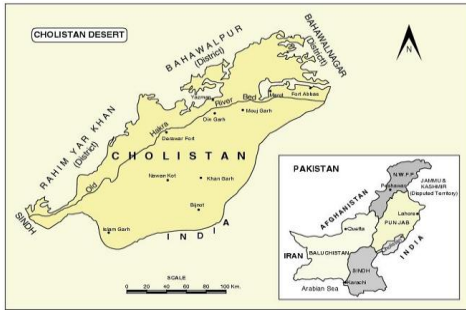
3. Materials & Methods: Study area

- Cholistan (16,000 sq. km.) spreads across 3 districts of Punjab viz; Bahawalpur, Bahawalnagar and RY Khan
- Temperature 6 - 50 °C
- Rainfall 128-175 mm/yr
- Ground water mostly brackish, 25-90 m deep
- Human population 0.16 million
- Livestock population 1.6 million

Livestock husbandry is very important for communities; traditionally, wealth assessment is based on the number of livestock



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Life of Cholistan People



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Cholistani goat



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Cholistani sheep



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- 3.1. Baseline survey for the documentation of medicinal plants (completed)
- 3.2. Survey in the herds of sheep & goats to determine the prevalence of helminthes (completed)
- 3.3. Scientific validation of documented medicinal plants



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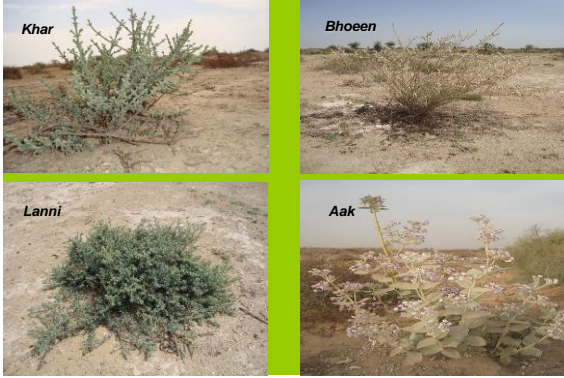
3.1 Baseline survey for the documentation of medicinal plants

- Interviewed 100 stockholders/ farmers and 20 local healers
- Areas/ villages/ Tobas
 - 1. 80, 82, 83, 84-D B (Survey completed)
 - 2. 144, 145, 147-DB (Survey completed)
 - 3. Mir Garh (288, 289, 290-HR) (Survey completed)
 - 4. Tobas Jam Ser, Mir Ser (Survey completed)
 - 5. Islam Garh & Darawar Fort (Survey completed)

• Documented medicinal plants has been collected & identified.

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Some Medicinal Plants of Cholistan



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3.2 Prevalence of helminthes

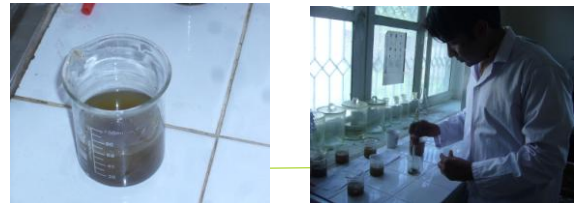
- Systematic collection of 500 faecal samples of each sheep & goat from the previously visited 5 areas (villages/tobas)
- Microscopic examination by using direct and indirect techniques (floatation technique)
- Identification of helminthes eggs/larvae



Faecal Collection



Faecal Examination



Faecal Examination



Results of Helminthes survey

Overall helminthes prevalence 76.8%

- **Goat** 77%
 Nematode 39.6%
 Trematode 6.6%
 Cestode 2.3%
 Protozoa 2%
 Mix infection 26.3%
- **Sheep** 76.6%
 Nematode 46%
 Trematode 6%
 Cestode 3.3%
 Protozoa 0.6%
 Mix infection 20.6%

Age-wise prevalence of helminthiasis

Percentage (%) of infected animals

Species	Suckling	Young	Adult	Overall
Goat	87.0	79.0	70.5	77.0
Sheep	85.4	79.0	72.1	76.6
Total	86.3	79.0	71.4	76.8

Oesophagostomum radiatum



Trichuris ovis



Trichostrongylus axei



Sex-wise prevalence of helminthiasis

Percentage (%) of infected animals

Species	Male	Female
Goat	77.4	76.9
Sheep	69.1	79.5
Total	73.3	78.2

Haemonchus contortus



Trichostrongylus spp



Nematodirus spp



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3.3 Evaluation of anthelmintic activity

- Collection of 5 most promising medicinal plants recommended in base-line survey (frequency of mentions, and mentioned effectiveness)
- Methanol extract preparation by putting dried powdered plant in methanol
- Evaluation of anthelmintic activity of the plants

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1. Egg hatch test

- Mix different concentrations of methanol plant extract with helminthes eggs in 24-flat-bottomed micro-titre plate
- Less egg hatch → plant effective

2. Larval development test

- Add different concentrations of methanol plant extract with helminthes larvae in test tube
- More larvae dead → plant effective

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4. Time plan

Activity	Time needed	Details
Preparation <input checked="" type="checkbox"/>	2 ½ months	Literature collection, secondary data collection
GPS training <input checked="" type="checkbox"/>	15 days	GPS training, University of Kassel, Germany (April 2010)
Field work ongoing <input checked="" type="checkbox"/>	8 months (2010/11)	Base-line survey, collection of plants and prevalence of helminthes
Laboratory work	8 months (on going)	Preparation of plant extracts and in vitro evaluation.
Data evaluation and publication	1 year (2012)	Statistical analyses of data, evaluation, publications and thesis write up

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5. Possible Outcomes

- Specific local plants can be utilized appropriately for the treatment of helminthes in small ruminants, helping the local population to save money on chemical drugs and avoid the residue problem
- Scientifically proven ethno-veterinary knowledge enables local people to collect and market effective plants; at the same time the insight into its value helps in preserving the natural flora of Cholistan

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