

Parthenium hysterophorus Toxicity

Course Title : Toxicopathology
Course No. : VPP-609



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INTRODUCTION

- ❑ Parthenium hysterophorus is commonly known as congress grass or carrot grass.
- ❑ It belongs to Asteraceae family
- ❑ It is an invasive plant species that disturbs cultivated areas, roadside vegetation, gardens etc. P. hysterophorus is considered as one of the worst weeds responsible for causing health problems in animals and humans



INTRODUCTION

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- Contact with the plant causes dermatitis and respiratory malfunction in humans, and dermatitis in cattle and domestic animals.
- It also is responsible for bitter milk disease in livestock when their fodder is polluted with *Parthenium* leaves.
- The main substance responsible is parthenin, which is dangerously toxic. Contact with this plant cause dermatitis and respiratory malfunction in humans, dermatitis in cattle and domestic animals due to the presence of toxin parthenin.
- It is a sesquiterpene lactone.
- It is a photodynamic substance causing primary photosensitization.
- Diarrhoea followed by cutaneous lesions characterised by itching etc.

Mechanism of Toxicity

- ▶ The major sesquiterpene lactone of Parthenium weed, i.e. Parthenin is a photodynamic substance. Hence as seen with other photodynamic agents ingestion of Parthenium weed results in primary photosensitization causing liver pathology and skin reaction.

Signs of poisoning

Signs that an animal has been poisoned vary a lot and are confusing but may include:

Animals become sick suddenly or die suddenly without looking sick.

Very unusual behaviour (p.250).

Photosensitisation (p.163).

Animals cannot see, and walk into things.



Diarrhoea which is severe and starts suddenly, or vomiting.

Very severe and sudden pain in the abdomen - colic (p.217).

Bloat (p.215).

May lose consciousness

Distressed breathing.

Much saliva comes from the mouth.

Walks very unsteadily, uncoordinated, convulsions and collapse.

Symptoms-

- Erythematous eruptions over much of the body.
- Alopecia and depigmentation of neck and shoulders.
- Oedema around eyelids and facial muscles.
- Diarrhoea followed by cutaneous lesions characterised by itching, erythematous eruption on the tip and base of the ear, neck sides of thorax, abdomen, knee joint and brisket region.

PM lesions included

- ▶ Ulceration of muzzle, dental pads, tongue and palate
- ▶ Necrosis and severe congestion of liver and gastrointestinal tract
- ▶ Distended gallbladder and gelatinous changes in the hilus of kidneys.
- ▶ Punch out ulceration on the oesophagus and abomasol folds.
- ▶ Ulceration throughout abdomen and fundic region and oedema of lungs.

Histopathological studies:-

- Revealed severe degenerative change in liver and kidney
- These symptoms are included in the toxicity which has been called "partheniosis"

DIAGNOSIS

There no specific method of conformation of Pathenium toxicity. Yet Pathenium toxicity may be diagnosed based on:

1. History of grazing in fodder fields heavily infected with the weed
2. Appearance of dermatitis lesions.

Reference

1 <https://www.ncbi.nlm.nih.gov/pubmed/16033401/>

2Ajmal M, Rao RAK, Ahmad R, Khan MA (2006) Adsorption studies on Parthenium hysterophorous weed: removal and recovery of Cd(II) from wastewater. J Haz Mat B 135:242-248



THANKS