

## Diagnosis of Poisoning Cases in Veterinary Medicine

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Diagnosis of animal poisoning is not easy; therefore, it should never be made in Hassel or quickly based on any symptoms. The conditions, elements, or sick are suspected of poisoning if not appropriately diagnosed. Attempts should be made to reach a confirmatory diagnosis. National diagnosis and effective control measures can only be adopted if a proper diagnosis is made. The first step is assessing the vital body function, mainly the respiratory and cardiovascular system functions. Once vital functions are stable, then go for further evaluation of poisoning.

Generally, diagnosis of the poisoning may be three types

1. Tentative
2. Presumptive
3. Confirmatory

These are based especially on history, physical examination, circumstantial evidence, pathological and laboratory observations, investigation, and analytical evidence.

### 1. History

It should be extracted from the owner or attendant.

Different aged species are being exposed to low-toxic agents that enter the body or mode of exposure by inhalation, ingestion, or dermal application.

Toxicity is directly proportionate to the amount of exposure and poisoning of animals, mostly happening accidentally or maliciously, the number of animals affected, and changes in the feed or animal attendant are recorded.

### 2. Physical examination and clinical evidence

Clinical examination includes temperature, pulse, respiration rate etc

- Hypothermia in OP poisoning
- Hyperthermia in OC and Belladonna
  - Bradycardia in barbiturates and mushroom poisoning.

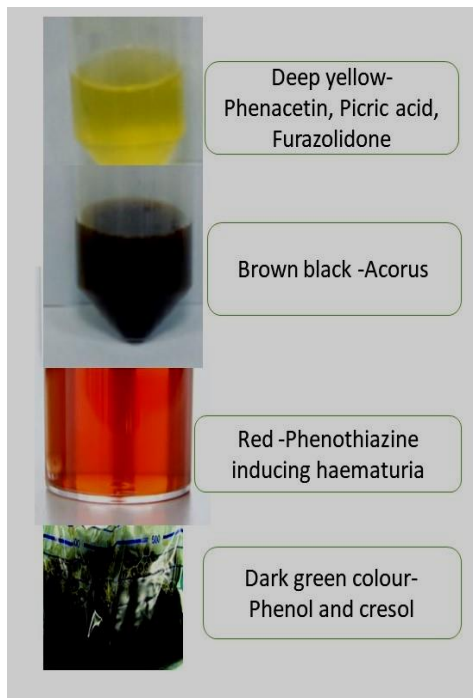
- Tachycardia in belladonna and cocaine poisoning
- respiratory rate increases in carbon monoxide, hydrogen cyanide and fluoroacetate
- respiratory decreases in narcotic analgesics, sedatives
- miosis in opium
- Mydriasis in belladonna
- Moist mouth drug with increased salivation and bronchial secretions in op poisoning.

**a. Smell of breath**

- Bitter almond in cyanide
- Garlic odor in Phosphorus and Arsenic

**b. Color of urine**

- Dark green color-Phenol and cresol
- Red -Phenothiazine or compound-inducing haematuria
- Brown black -Acorus
- Deep yellow -Phenacetin, Picric acid, Furazolidone
- other signs like diarrhoea, constipation, vomiting, abdominal pain, colic, CNS signs like ataxia, convulsions, paralysis, incoordination, death etc



Bright red conjunctival mucous membrane in Cyanide Poisoning



Brown muddy conjunctiva mucous membrane in Nitrate poisoning (Anilkumar et al, 2022)



### 3. Circumstantial evidence

It includes housing, feed, water and environment.

- Investigation of the owner regarding the change in the feed, feeding pattern, feed additives administration of a drug
- Pastures treatment with fertilizer or herbicide, pesticides on animals
- Painting of building animal access for baits, rodenticides, disinfectants
- Presence of any poisonous plants or this snakes on the premises may also be considered
- Any industrial effluence coming in contact with the pasture or water
- Check water for nitrates, arsenic, fluorine

### 4. Pathological evidence is based on gross and microscopic examination of tissue or organ by necropsy study.

Jaundice due to hepatic damage due to chloroform, plant toxins, mushrooms and drugs.

- Cyanotic mucus membrane due to carbon monoxide, nitrate and chlorate
- Bright red color blood and mucus membrane hydrogen cyanide poisoning

#### a. Odor of abdominal contents

- Bitter almond - Cyanide
- Rotten egg-Hydrogen sulphide
- Ammonia- Urea
- Rotten garlic -Selenium
- Garlic- Phosphorus
- Acetylene or Rotten fish odor- Zinc phosphide

#### b. Color of rumen contents

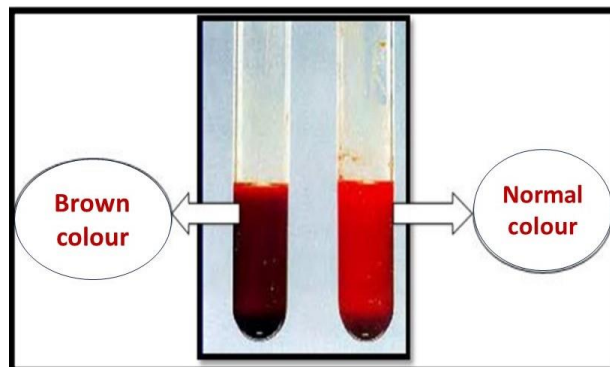
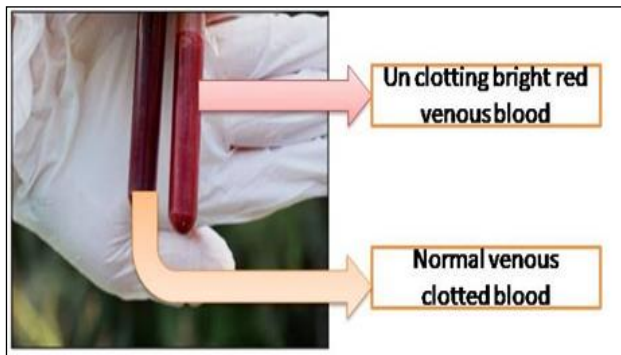
- Copper -greenish blue
- Chromium -yellow to orange or green
- Acid / alkali- black
- Greenish hemorrhagic lesion- clover poisoning



Diffuse hyperaemic and oedematous abomasum with multifocal to coalescing irregular pale white foci in Cyanide poisoning

**c. Colour of the blood and other characteristics**

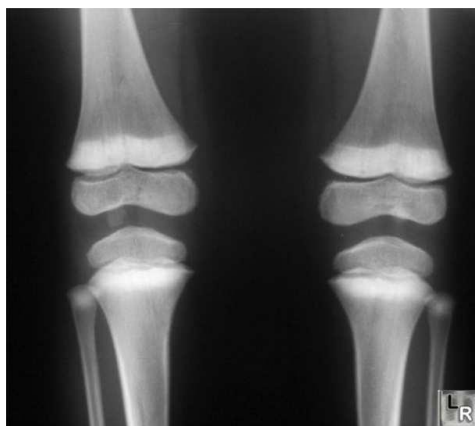
Nature of poison	Colour of the blood
Cyanide	Cherry red/ bright red
Hydrogen sulphate	Dark
Carbon monoxide	Pink
Nitrate	Brown
Arsenic	Brick red or Rose colour



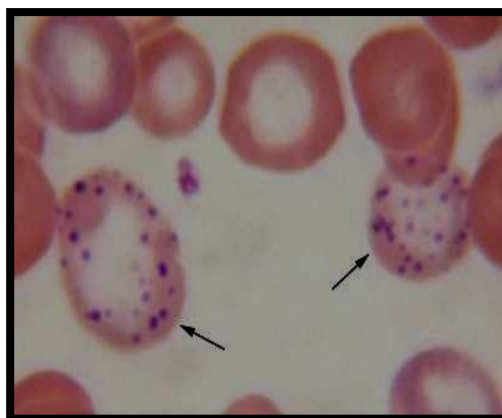
(Anilkumar, 2022)

**5. Laboratory investigation and analytical evidence:**

- Diagnosis of poisoning may be confirmed by routine biochemical test
- Laboratory test helps veterinary and to assess the level and dysfunction of various organ or system and also to what extent it gets damaged.



Lead poisoning osteoporosis

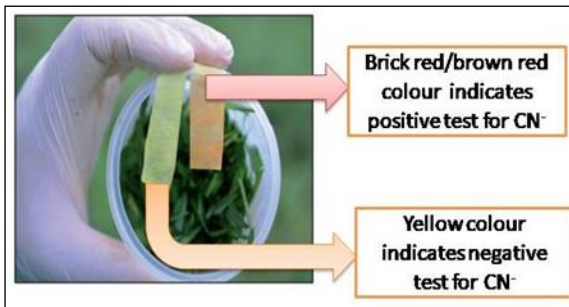


Lead poisoning presence of Basophilic striplings

- Confirmatory diagnosis depends on the qualitative and quantitative estimation of a significant amount of the toxic agent in the biological samples
- **Eg:** blood, faeces, vomitus, adipose tissue, hair or skin and environmental samples like food, feed, water, forage, baits chemicals, solvents, and pesticides.

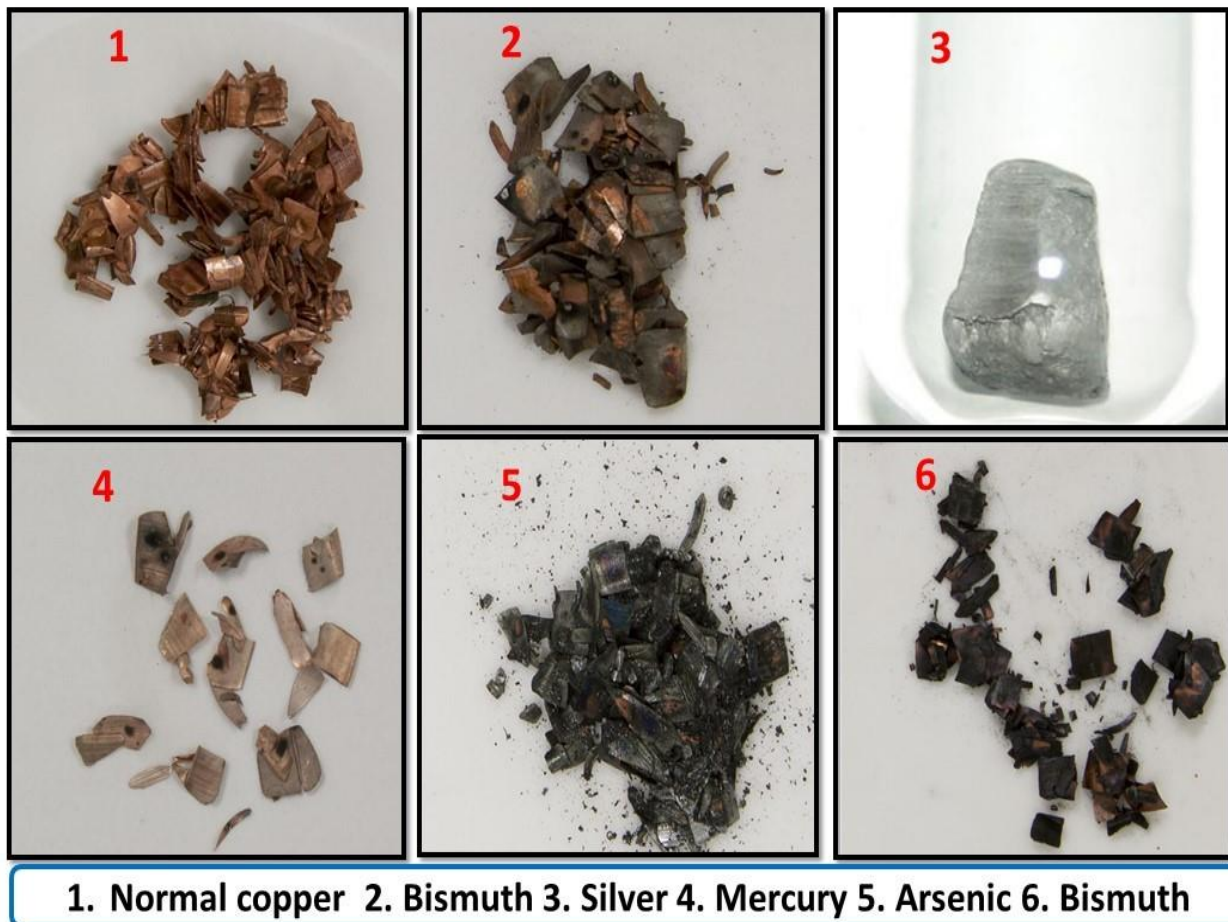






Diphenylamine blue test for nitrate

**Reinsch test test for heavy metals**



**1. Normal copper 2. Bismuth 3. Silver 4. Mercury 5. Arsenic 6. Bismuth**

**To sum up**

- Tentative diagnosis can be made based on dead animals' history, chemical examination, and necropsy findings.
- Presumptive diagnosis with history, chemical examination, necropsy findings, circumstantial evidence and positive response to antidotes.
- Confirmatory diagnosis based on qualitative and quantitative estimation of toxicant in the feed, water, rumen contents, blood and biological samples.

**References**

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 Anilkumar B Ambica Gadige and Ravikumar Yadala A Monograph on hydrogen cyanide (HCN) poisoning in farm animals *The Science worl*

