

**Semester II.**

# **Pharmacology**

## **Laboratory 6**

**Internal and external antiparasitics**

# Antparasitics

- 1. Pharmacognosis**
- 2. Pharmacodynamics**
- 3. Calculations for anthelmintic treatments**
- 4. Pharmaceutical technique**
- 5. Pharmacography**
- 6. Classification**

## 2. Pharmacodynamics

### The action of santonine and piperazine on pigs 'in vitro'

**Santonine** stimulates the motility of the worms, in order to cause paralysis in the next phase. Santonine acts on the parasite's neuro-muscular apparatus, producing paralysis. The action of santonine and its use will be discussed. Santonine is accompanied by a saline purgative. If the parasites are not evacuated they can recover by continuing their activity.

**Piperazine** acts on the neuro-muscular synapses by blocking them in the action of acetylcholine. It thus causes paralysis of the worms, and by the hydrolysis of adipate (it is given as piperazine adipate) in the intestine, it also has a slight stimulating effect of intestinal motility so that it does not need to be accompanied by purgative.

The experience can be done on the *Lumbricus terrestris*, which has the advantage that they can be easily kept alive for a longer period.

## **The toxic action of carbon tetrachloride**

The parasitic effect of carbon tetrachloride is discussed. At first, there are rapid movements of the parasite's contraction, and then paralysis.

## **The toxic action of contact insecticides based on DDT or HCH on insects**

The effect on the insects is monitored and discussed. Three phases of intoxication can be observed distinctly:

- the excitation phase
- phase of tetanus cramps
- the paralysis phase

It can be observed that the toxic effect of chlorinated contact insecticides is exerted on the central nervous system. Death occurs in the paralytic phase, by knocking down the insects.

## **The action of organophosphorus substances on insects**

A filter paper washer is spray-coated with Neguvon, then placed in a Petri dish. Insert a few insects and close the box.

Following the toxic effect of the organophosphorus substance on the insects, we find that at first a strong excitation phase appears, after which the paralysis and death of the insect settle.

The toxic effect is due to the blockage of acetylcholinesterase which has the role of hydrolyzing acetylcholine.

In the absence of the enzyme acetylcholine accumulates in the body of the insect, producing intoxication with the respective nervous manifestations

## Daminovici method for combating scabies in animals

It is based on the fact that Na hyposulphite in acidic medium decomposes slowly into sulfur and sulfur dioxide, both of which act efficiently on these parasites.

The reaction is as follows:  $S_2O_3Na_2 + 2HCl \rightarrow S + SO_2 + 2NaCl + H_2O$

For this purpose it is easily rubbed with a solution of 60% sodium hyposulfite at 40°C, the skin of the scabies. Allow to dry, the hyposulphite adhering as crystals on the surface of the body. It is then moistened with a warm 10% hydrochloric acid solution, after which SO<sub>2</sub> is slowly released which penetrates deep into the parasitic cavities. The animal does not wash, and after 3-5 days the treatment is repeated.

Chatin method in which an equal mixture of sodium hyposulphite and sodium bisulphite is made, to which an equal amount of water is added, forming a paste with which the animal is greased. The reaction is exothermic.

### 3. Calculations for anthelmintic treatments

The **florosil** requirement will be calculated for different lots of pigs (in number and weight), knowing that the substance is administered orally, in food, 3 times a day, for 2 days (in massive infestation 3 days), the amount administered pro dosage being 0.6 g per head in young pigs up to 40 kg and 0.8 g per head in those over 40 kg.

It will also calculate the amount of **basic copper** carbonate required for administration to different groups of sheep, knowing that the dose is 1 g per head in animals over 1 year, 0.75 g per head in weaned lambs and 0.5 g per lamb head to the untamed lambs. The administration is done 2 consecutive days once a day.

# 4. Pharmaceutical technique

## Helmerich ointment preparation

The composition of Helmerich ointment is:

Rp/

Sufur sublimatum depuratum 20.0

Natrium carbonicum 10.0

Axungia 70.0

M.f. ung.

D.S. ext.

The sulfur and the sodium carbonate are triturated in the mortar, gradually adding the pig fat and mixing until a good homogenization.

Helmerich ointment is used to fight the wound on delimited skin areas.

# 5. Pharmacography

**Rp./**

Carbonei tetrachlorati 30.0

D.S. int. to horse with naso-esofagian sonda

**Rp./**

Phenothiazini 10.0

Excipients Q.S.

Ut. f. boli

D.t.d.IV

S.int. 2x1/day to a pig with ascaridiosis

**Rp./**

Hexachloretani 60.0

Excipients Q.S.

Ut. f. boli VI

D.S. int. 3x1/day to calves in distomatosis

**Rp./**

Natrii fluorati 3.0

D.t.d. II

S.int. 1/day to pig with ascaridiosis

**Rp./**

Santonini 3.0

Calomelanos 2.0

Excipients Q.S

Ut.f.electuarium

D.S. int to pig in ascaridiosis

**Rp./**

Comp. Niclosamid 0,5

D.t.d IV

S. int 2x1/ day to dog in teniasis

**Rp./**

Tymoli 15.0

Decoct. Rad. Althaeae ad. 1000.0

M.D.S. int to horse then followed after 2 hours by a saline purgative

**Rp./**

Ol. Terebentinae 50.0

Ol. Ricini 350.0

M.D.S. int. to horse in teniasis

# 6. Classification

Antparazitary drugs		
Group	Type	Representatives
<b>Trematodosis</b>	Internal	Tetraclorura de carbon, Fasciosan ovin, Vitolin, Hexacloretan, Hetol, Hetolin, Diclorfen, Hezaclorfen, Rafoxanid (Ranide), Oxiclozanid (Zanyl), Niclofolan (Bilevon, Dertil), Clioanid, Bromsalicilanilid (Hilomid), Bitionol (Actamer, Bitin), Bitionaol S (Bitin S)
<b>Cestodosis</b>	internal	Arecolin, Bromarec, Arecolinacetarsol (Nemural), Filicine, Copper sulphate; Copper bazic carbonate, Niclosamid (Yomesan, Mansonil), Praziquantel (Droncit), Bunamidine (Scolaban, Buban) Cetovex, Terenol (Resorantel)
<b>Nemathodosis</b>	internal	Fenotiazine, Fenobent, Fenosar, Piperazine, Ascatrix, Fluorosilicate sodium, (Florosil), Thiabendazol, Cambendazole (Arcam, Bonham, Noviben) Parbendazole (Parbentec, Nilversol, Vurmix), Mebendazole (Telmin), Oxibendazole, Tetramisole (Nilvern, Citarin), Levamisole (Decaris, Nemisol), Pirantel tartat (Banminth, Exhelm), Morantel tartate ( Bovhelm, Ovihelm), Febendazol (Panacur), Ruelene, Febantel, Coumaphos (Asuntol, Baymix), Metriphonate (Neguvon, Dipterex), Diclorvos (Atgard, Equigard), Haloxon (Cevoxon, Galoxon)
<b>Sulphured</b>	External	Sulphure bioxide, hyposulphite, alkaline or carbonated. Powders or ointments
<b>Mineral</b>	External	Fenol, Creoline, Lizol, Creozot, Naftaline, Beta-naphtol
<b>Vegetal</b>	External	Piretrin A and B, Emulpan, Retenone
<b>Sinthetic</b>	External	Organochlorurates: D.D.T. – Detex, Detexan; H.C.H. – Heclotox, Lindatox, Entomoxan, Lindavet, Bromociclon
		Organophosphorics: Neguvon, Cumaphos, Asuntol, Fenthion, Tiguvon
		Carbamics: Sevin