# 144 Anthelmintics

ca. Diethylcarbamazine is also used in the treatment of toxocariasis (visceral larva migrans). For discussions of these infections and their treatment, see under Choice of Anthelmintic, p.134, and under the individual headings below.

Diethylcarbamazine is usually given orally as the citrate.

In the treatment of lymphatic filariasis the recommended dose of diethylcarbamazine citrate is 6 mg/kg daily in 3 divided doses for 3 weeks, given in an initial dosage of 1 mg/kg daily and then gradually increased to 6 mg/kg daily over 3 days to reduce the incidence and severity of hypersensitivity reactions due to the destruction of microfilariae. However, adverse effects of diethylcarbamazine may be reduced, without loss of efficacy, by giving a single dose of 6 mg/kg at weekly or monthly intervals. In areas where lymphatic filariasis is endemic, mass treatment campaigns can reduce the intensity of transmission and incidence of disease. Diethylcarbamazine may also be used in the form of medicated salt to control lymphatic filariasis. For further details, see below.

In the treatment of loiasis diethylcarbamazine citrate 6 mg/kg daily in 3 divided doses for 2 to 4 weeks has been given. In heavy infections rapid killing of microfilariae can cause severe adverse effects including encephalitis and treatment should start with very small doses, increasing gradually over 4 days. A corticosteroid has been given concurrently. In the prophylaxis of loiasis, a dose of 300 mg weekly is recommended by WHO.

In the treatment of toxocariasis diethylcarbamazine citrate 9 mg/kg daily in 3 divided doses for 21 days has been given. Diethylcarbamazine is considered by some to be the treatment of choice while others do not recommend its use due to higher rates of severe adverse effects.

Administration. Diethylcarbamazine was first used as the chloride, but was subsequently produced as the dihydrogen citrate which contains only half its weight as base. In reporting doses it was therefore important to indicate whether they referred to a specific salt or to the base; unless otherwise stated, it could generally be assumed that the dose referred to the citrate.1

1. WHO. Lymphatic filariasis: fourth report of the WHO expert committee on filariasis. WHO Tech Rep Ser 702 1984. Available at: http://libdoc.who.int/trs/WHO\_TRS\_702.pdf (accessed

Loiasis. Diethylcarbamazine is the main drug used in the management of loiasis (p.137).

## References.

- 1. Nutman TB, et al. Loa loa infection in temporary residents of endemic regions; recognition of a hyperresponsive syndrome with characteristic clinical manifestations. J Infect Dis 1986;
- Nutman TB, et al. Diethylcarbamazine prophylaxis for human loiasis: results of a double-blind study. N Engl J Med 1988; 319: 752–6.
- 3. Nutman TB, Ottesen EA, Diethylcarbamazine and human loiasis. N Engl J Med 1989; 320: 320.
- 4. Klion AD, et al. Effectiveness of diethylcarbamazine in treating loiasis acquired by expatriate visitors to endemic regions: long-term follow-up. *J Infect Dis* 1994; **169**: 604–10.

Lymphatic filariasis. Diethylcarbamazine is used in the management of lymphatic filariasis (p.137). In endemic areas mass treatment of the entire population (excluding neonates, pregnant women, and debilitated individuals) can reduce the intensity of transmission and the incidence of disease. In countries where there is no co-endemic loiasis or onchocerciasis, the Global Programme to Eliminate Lymphatic Filariasis launched by WHO together with other international agencies, advocates a single dose of diethylcarbamazine citrate 6 mg/kg with a single dose of albendazole 400 mg, given once each year for at least 5 years. If diethylcarbamazine-medicated salt is to be employed then intake of salt needs to be on a daily basis for 6 to 12 months.

## **Preparations**

**BP 2008:** Diethylcarbamazine Tablets; **USP 31:** Diethylcarbamazine Citrate Tablets

**Proprietary Preparations** (details are given in Part 3)

Fr.: Notezine; Gr.: Hetrazan†; Notezine; India: Banocide; Hetrazan; Thai.:

Multi-ingredient: India: Helmazan†; Unicarbazan.

#### Disophenol

Disofenol. 2,6-Diiodo-4-nitrophenol.  $C_6H_3I_2NO_3 = 390.9.$ CAS — 305-85-1.

#### **Profile**

Disophenol is an anthelmintic used in veterinary medicine.

#### Doramectin (BAN, USAN, rINN)

Doramectina; Doramectine; Doramectinum; Doramektiini; Doramektin; UK-67994.

Дорамектин

CAS - 117704-25-3 ATC Vet - QP54AA03

Doramectin is an avermectin anthelmintic used in veterinary medicine for nematode infections. It is also used as a systemic veterinary ectoparasiticide.

# **Embelia**

Vidang.

Виданга

CAS — 550-24-3 (embelic acid)

(embelic acid)

Embelia consists of the dried fruits of Embelia ribes and E. robusta ( = E. tsjeriamcottam) (Myrsinaceae), containing about 2.5% of embelic acid (embelin). It has been used in India and other Asian countries for the expulsion of tapeworms.

## **Preparations**

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: India: Happy'tizer.

## **Eprinomectin** (USAN, rINN)

Eprinomectina: Éprinomectine: Eprinomectinum: Eprinomektiini: Eprinomektin; MK-397. A mixture of eprinomectin component B<sub>Ia</sub> and eprinomectin component B<sub>Ib</sub>.

# Эприномектин

CAS — 159628-36-1 (eprinomectin); 123997-26-2 (eprinomectin); 133305-88-1 (component  $\mathrm{B}_{1a}$ ); 133305-89-2 (component B<sub>1b</sub>).

ATC Vet - OP54AA04

#### Pharmacopoeias. In US.

 $\begin{array}{lll} \textbf{USP 31} & \text{(Eprinomectin)}. \ Eprinomectin \ is \ a \ mixture \ of \ component \\ B_{1a} & (C_{50}H_{75}NO_{14}=914.1) & and & component \\ B_{1b} & (C_{49}H_{75}NO_{14}=900.1). \ It \ contains \ not \ less \ than \ 90\% \ of \ component \\ \end{array}$ nent B<sub>1a</sub> and not less than 95% of components B<sub>1a</sub> and B<sub>1b</sub>, calculated on the anhydrous, solvent-free, and antoxidant-free basis. Antoxidants may be added. A white to off-white powder. Insoluble in cold water. Store in airtight containers at 2° to 8°.

### Profile

Eprinomectin is an avermectin anthelmintic used in veterinary medicine for nematode infections. It is also used as a systemic veterinary ectoparasiticide.

### **Epsiprantel** (BAN, rINN)

BRL-38705; Epsipranteeli; Epsiprantelum. 2-Cyclohexylcarbonyl-1,2,3,4,6,7,8,12b-octahydropyrazino[2,1-a][2]benzazepin-4-one. Эпсипрантел

 $C_{20}H_{26}N_2O_2 = 326.4.$ CAS — 98123-83-2. ATC Vet — QP52AA04.

Epsiprantel is an anthelmintic closely related to praziquantel. It is used in veterinary medicine.

# Febantel (BAN, USAN, rINN)

Bay-h-5757; Bay-Vh-5757; Febanteeli; Fébantel; Febantelum. 2'-[2,3-Bis(methoxycarbonyl)guanidino]-5'-phenylthio-2-methoxyacetanilide; Dimethyl {2-[2-(2-methoxyacetamido)-4-(phenylthio)phenyl]imidocarbonyl}dicarbamate.

Фебантел

 $C_{20}H_{22}N_4O_6S = 446.5.$  CAS - 58306-30-2.ATC Vet — QP52AC05.

Pharmacopoeias. In Eur. (see p.vii) for veterinary use only. Ph. Eur. 6.2 (Febantel for Veterinary Use; Febantel BP(Vet) 2008). A white or almost white, crystalline powder. It exhibits polymorphism. Practically insoluble in water; slightly soluble in dehydrated alcohol: soluble in acetone.

## **Profile**

Febantel is an anthelmintic used in veterinary medicine for the treatment of nematode infections of the gastrointestinal tract and lungs and in tapeworm infections.