ANALYSIS OF THE PEST CONTROL EFFECTIVENESS OF METHYLOBROMPHENVINFOS (PHOSPHATE (Z,E)-BROMO-1-(2,4-DICHLOROPHENYLO-VINYLO-DIMETHYL) IN THE HOUSES FOR CATTLE, POULTRY AND DOGS

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Introduction

Methylobromphenvinfos synthesized in Poland is a compound from the enolphosphate group. This compound is less toxic than its analogs bromphenvinfos and IPO-597 (phosphate 0,0-diethyl-0-1—(2,4-dichlorophenylo)-2,2-dibromvinyl) and chlorphenvinfos (Bakuniak et al., 1971; Sciesinski, 1977; Malinowski, 1978). Methylobromphenvinfos is characterized by low dermal toxicity, its absorption through skin is 27 – 75 fold lower than through the skin of the alimentary tract (Kolodziejczyk et al. 1977). The determination of acute dermal toxicity (LP50) of methylobromphenvinfos in our own investigations (Sciesinski 1981a) showed that it is revealed over the dose of 7.175 g/kg b.w. Methylobromphenvinfos showed slight irritating effect on the skin in pigs (Sciesinski 1981b).

The aim of the work was an analysis of parasiticidal effectiveness of commercial forms of methylobromphenvinfos (Polsep 20, Polsep 25 and Polsep aerosol) against flies in cattle sheds, against red spider mites in poultry houses and against fleas in kennels and boxes for dogs.

Material and methods

Commercial forms of preparations for disinsection of animal houses were supplied by the Institute of Organic Industry in Warsaw.

Methylobromphenvinfos and its commercial forms. Methylobromphenvinfos – chemical name for the active substance: phosphate (Z,E)-2-brom-1-(2,4 dichlorophenylo) vinyl-dimethyl. Commercial forms Polsep 20 liquid contains methylobromphenvinfos 20 a.s. (20%), emulgators and solvents (up to 100%), Polsep 25 liquid contains methylobromphenvinfos 25 a.s. (25%), cyclohexane (15%), emulgators (8%) and xylene (up to 100%) and Polsep aerosol contains methylbromphenvinfos 0.5 a.s. (0.5%), propylene glycol (6.0%), carrying substances and isopropanol (up to 100%).

Analysis of disinfecting effectiveness of commercial forms of ethylobromphenvinfos were carried out at the Agricultural Experimental Station of Warsaw Agricultural University Wilanow – Obory, poultry farm of the Division of Poultry Breeding of Warsaw Agricultural University and dog breeders in the area of the Warsaw province.

Aqueous solutions of Polsep 20 and Polsep 25 in the concentration of 0.2% were used in the poultry houses and 5% in the cattle houses. Commercial solutions were used in 4 poultry houses and the 5th comprised the control. A very numerous invasion of red spider mites (*Dermanyssus gallinae*) was observed in the poultry houses and a big number of flies (*Musca domestica*) in cattle sheds. In the poultry houses red spider mites were counted on 5 surfaces of 1 m² each (Table 1). In the poultry houses the working preparations were used on wooden and concrete walls twice at 14 day interval. The evaluation of the preparation effectiveness was performed after 1, 7, 14, 37 and 42 days after the preparations were applied (Table 1). In the cattle and calf sheds flies were counted on a specially chosen 5 wall surfaces and a mean number of those 5 surfaces was calculated. The working aqueous solution of 0.5% Polsep 20 was used twice at 7 day interval. The number if fleas were counted after 1, 7, 14, 37 and 42 days after the application of the preparation (Table 1). Methylobromphenvinfos in the form of aerosol solution (Polsep aerosol) was used twice at 14 day interval to spray kennels and dog boxes. The effectiveness of the preparation was determined by checking the presence of living fleas on 30 dogs 1, 7, 14, 37 and 42 days after the last spraying. The mean of parasites found on 30 dogs was calculated. In these calculations 100% comprised the number of fleas found on the back and flanks of dog before its spraying with Polsep aerosol (Table 1).

The evaluation of parasitofauna was based on the method presented by Mehlhorn et al. (1989).

Results

One day after using Polsep 20 and Polsep 25 in the 0.2% aqueous solution in poultry houses against the invasion of red spider mite there were no living parasites in the cracks of floors and walls. Parasites did not appear on birds and in poultry houses after 42 days (Table 1) and even after the further 12 months. In cattle and calf sheds the use of 0.5% Polsep 20 against the invasion of flies resulted in the fact that after 1, 7, 14 and 37 days insects did not stay long on the walls. After 42 days insects stay longer. Thus the effectiveness of the preparation was 90% (Table 1).

After using the aerosol form of methylobromphenvinfos – Polsep aerosol in the kennels and boxes for dogs which were invaded by fleas 50% effectiveness was observed after one day.

After 7, 14 and 37 days no living parasites were found on the dogs. After 42 days single parasites were noted on the dogs. Thus the effectiveness of the Iposep aerosol preparation was 75%.

Discussion

The performed experiments show that methylobromphenvinfos in the therapeutic forms: Polsep 20, Polsep 25 and Polsep aerosol applied against red spider mites in poultry, flies in cattle and fleas in dogs has good disinfestations qualities, controlling their insects.

Particularly effective were the aqueous solutions of 0.2% Polsep 20 and Polsep 25 against the invasion of *Dermanyssus gallinae* in poultry in which case already after one day since its application the effectiveness was 100% and reminded at that level until the end of the experiment. The investigations *in vitro* by Zlotorzycka et al. (1982) revealed red spider mite is the most susceptible to the low concentrations (0.01%) of Polsep 20 (methylobromphenvinfos) as it survived only one hour. Fleas survived the concentration 0.5% for 3 h. The effectiveness of 0.2% aqueous solution of Polsep 20 against flies in the cattle shed amounted to 100% and remained up to 37th day after the use of the preparation and then it showed a decrease (Table 1). Malinowski and Kroczynski (1981) observed that methylobromphenvinfos (Polsep in aerosol) is 100% effective against flies for 30 days. While using Polsep aerosol in the kennels and boxes for dogs invaded with fleas it was noted that for 37 days there were no fleas. After 42 days the effectiveness of the treatment was 75% (Table 1). The results obtained in our own earlier investigations on the disinfestative properties of methylobromphenvinfos were comparable (Sciesinski, 1999).

Conclusions

1. Sanitary forms of methylobromphenvinfos (Polsep 20, Polsep 25 and Polsep aerosol) are characterized by a high disinfestative effectiveness in the houses for cattle, poultry and dogs.
2. Especially high effectiveness (100%) of methylobromphenvinfos was observed in the case of red spider mite (*Dermanyssus gallinae*) in poultry.
3. Methylobromphenvinfos also possesses desinfestative properties in relation to fly (*Musca domestica*) and flea (*Ctenocephalides canis* and *C. felis*) in dogs.

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Table 1. The evaluation of the effectiveness of Polsep 20, Polsep 25 and Polsep aerosol against red spider mite (*Dermanyssus gallinae*), fly (Musca *domestica*) and flea (*Ctenocephalides canis* and *Ctenocephalides felis*) in houses for cattle, poultry and dogs

Lp.	Animals and parasites	Preparations used	Mean number of living parasites prior to treatment	Number of parasites and % of effectiveness after days									
				1		7		14		37		42	
				living	% effectiveness	living	% effectiveness	living	% effectiveness	living	% effectiveness	living	% effectiveness
1.	Poultry[1] Red spider mite	Polsep 20 sol. 0.2%	74	0	100	0	100	0	100	0	100	0	100
		Polsep 25 sol. 0.2%	80	0	100	0	100	0	100	0	100	0	100
2.	Cattle[1] Fly	Polsep 20sol. 0.2%	30	0	100	0	100	0	100	0	100	3	90
3.	Dogs[2] Flea	Polsep aerosol	20	10	50	0	100	0	100	0	100	5	75