

PESTICIDAL POTENTIALITY OF PETKOLIN IN COMPARISON WITH OTHER CHLORINATED INSECTICIDES

SHAHID H. ASHRAFI, S.M. MURTUZA AND DILSHAD ASMATULLAH

Central Laboratories, Pakistan Council of Scientific and Industrial Research, Karachi

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Pesticidal action of Petkolin, a petroleum based chlorinated insecticide, has been studied by using topical application method against cockroaches and house flies. The LD_{50} was found to be in the range of 64 to 96 micrograms per cockroach and 8 to 20 micrograms per fly. Against mosquito larvae, LC_{50} was in the range of 5 to 8 p.p.m. and LC_{95} in the range of 8.5 to 15 p.p.m. Petkolin was more toxic than Makrolin against house flies and mosquito larvae, but less toxic against cockroaches.

Introduction

In continuation of earlier work on the pesticidal action of Makrolin by Ashrafi *et. al.*¹ a series of pesticidal products, obtained through the chlorination of indigenous and foreign petroleum cuts by Siddiqui and Qureshi,² have been tested to evaluate their insecticidal action. As a result of these co-operative studies it has been found that the chlorination of certain fractions of both indigenous and imported petroleum furnishes products which are toxic to insects. Out of these, the two products obtained through the chlorination of petroleum cuts in the boiling range of 35-155°C., and named as Petkolin-A and Petkolin-S, have been found more toxic to insects than others.

The insects used were cockroaches (*Periplaneta americana*), house flies (*Musca domestica*) and mosquito larvae (*Aedes aegypti*).

Materials and Methods

The topical application method³ has been used for testing the insecticides. The different concentrations ranging from 0.1 to 5% of Petkolin, Makrolin and DDT (Technical) were prepared in acetone. In case of cockroaches 10 μ l and for house flies 1.2 μ l of each concentration were applied topically. Cockroaches and house flies of known age were used and each experiment was run in triplicate. Thirty cockroaches and seventy five flies were exposed against each concentration. The percent mortalities were calculated by using Abbott's⁴ formula and LD_{50} , LC_{50} and LC_{95} values were calculated by probit analysis.

For testing the larvicidal action, 0.31 ml. of each concentration was used to spread a 10 μ thick film on the surface of water. The total quantity of water used was 1500 ml. in which 20

mosquito larvae of known age were released. A detailed account of the method has already been described by Ashrafi *et. al.*¹

Results

Cockroaches.—Mortalities obtained with different concentrations of Petkolin have been shown in Fig. 1. and calculated LD_{50} values along with those of Makrolin and DDT are given in Table 1.

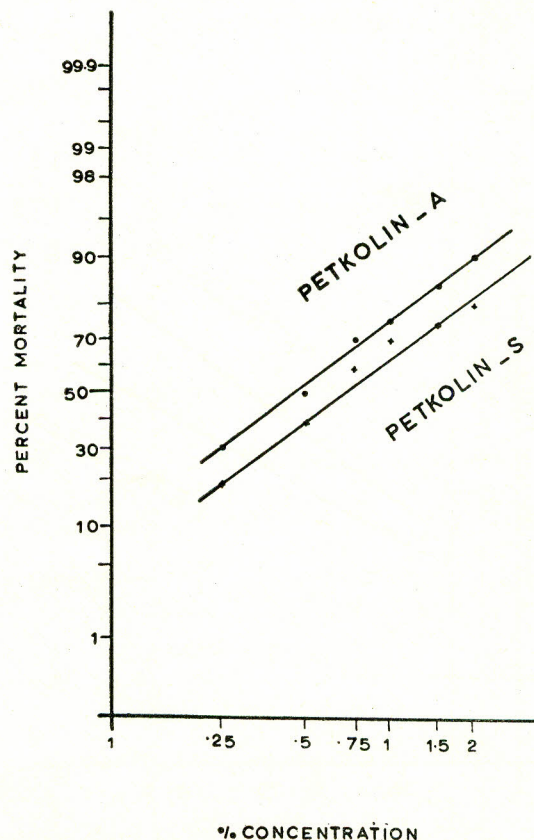


Fig. 1.—Showing the percent mortalities of cockroaches against percent concentration of Petkolin.

TABLE 1.—MEDIAN LETHAL DOSAGES OF VARIOUS CHLORINATED INSECTICIDES AGAINST COCKROACHES.

Insecticides	LD ₅₀ (μg/cockroach)
Makrolin	46
DDT	220
Petkolin-A	64
Petkolin-S	96

TABLE 2.—MEDIAN LETHAL DOSAGES OF VARIOUS CHLORINATED INSECTICIDES AGAINST HOUSE FLIES.

Insecticides	LD ₅₀ (μg/fly)
Makrolin	14.0
DDT	1.6
Petkolin-S	8.0
Petkolin-A	20.0

House Flies.—The percent mortalities of house flies due to the action of Petkolin are shown in Fig. 2 and comparative LD₅₀ values are given in Table 2.

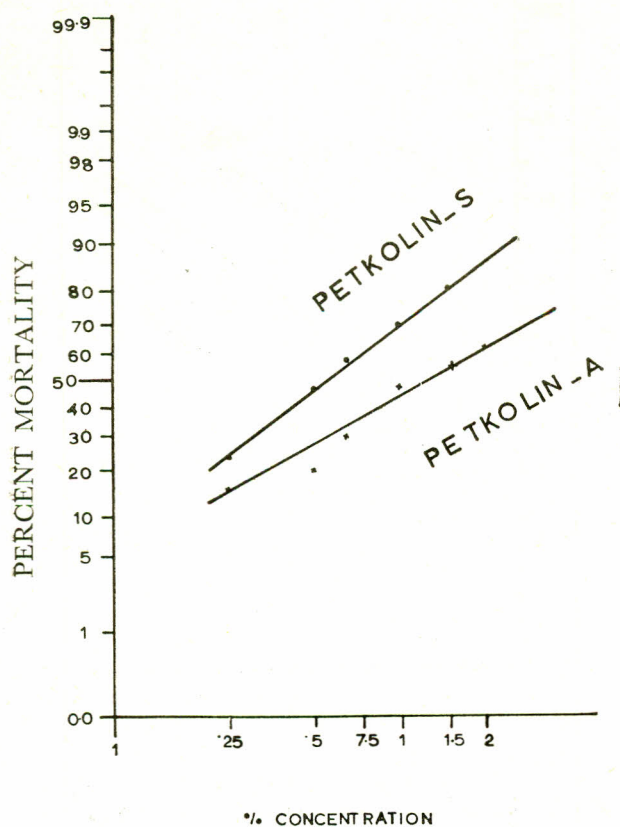


Fig. 2.—Showing the percent mortalities of house flies against percent concentration of Petkolin.

Mosquito Larvae.—The toxic effectiveness of Petkolin against mosquito larvae has been shown in Fig. 3, and calculated LC₅₀ and LC₉₅ values are presented in Table 3.

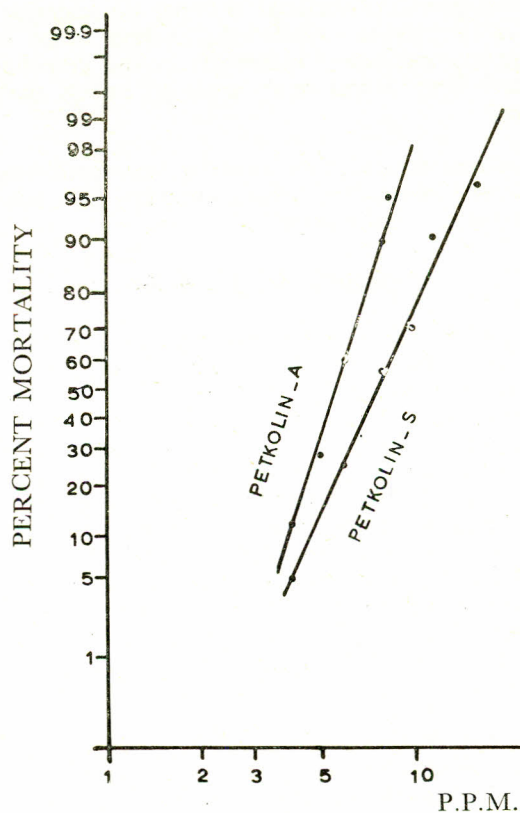


Fig. 3.—Showing the percent mortalities of mosquito larvae against percent concentration of Petkolin.

TABLE 3.—MEDIAN LETHAL CONCENTRATION OF VARIOUS CHLORINATED INSECTICIDES AGAINST MOSQUITO LARVAE.

Insecticides	LC ₅₀ (ppm.)	LC ₉₅ (ppm.)
Makrolin ..	7.0	13.0
DDT ..	4.0	15.0
Petkolin-A ..	5.6	8.5
Petkolin-S ..	8.0	15.0

Discussion

Petkolin-A and -S with LD₅₀ ranging from 64 to 96 µg/cockroach were found more toxic than DDT against cockroaches but less toxic than Makrolin, Heptachlor, Aldrin, and Chlordane whose LD₅₀ values¹ were found to be 46, 13, 18 and 25 micrograms per cockroach respectively. From the present investigation it can be concluded that in the decreasing order of effectiveness against cockroaches, the insecticides can be arranged in the following order, Heptachlor, Aldrin, Chlordane, Makrolin, Petkolin and DDT.

Petkolin-S with LD₅₀ 8 µg/fly was more toxic than Makrolin against house flies but less so than Aldrin, DDT, Heptachlor and Chlordane whose LD₅₀ values¹ were found to be 1.5, 1.6, 1.7 and 5.6 microgram per fly respectively. It is, therefore, inferred that the decreasing order of the insecticides in respect of their toxicity against house flies is Aldrin, DDT, Heptachlor, Chlordane, Petkolin-S and Makrolin.

The present investigation against mosquito larvae has shown that Petkolin-A with LC₅₀

5.6 ppm is more toxic than Petkolin-S and Makrolin, but less toxic than DDT, Heptachlor, Aldrin and Chlordane, whose LC₅₀ values¹ were 4.0, 0.2, 0.38 and 1.2 ppm respectively. Taking LC₉₅ into consideration, however, Petkolin-A with 8.5 ppm. was found more toxic than DDT and Makrolin which showed LC₉₅ at 15 and 13 ppm respectively. The decreasing order of toxicity against mosquito larvae at LC₉₅ level¹ was thus: Heptachlor (1.2 ppm.), Aldrin (1.6 ppm.), Chlordane (8 ppm.), Petkolin-A, DDT and Makrolin.

As a result of the present studies it may be stated in conclusion, that Petkolin is less toxic than Makrolin but more so than DDT against cockroaches. Against house flies Petkolin is more toxic than Makrolin and less than DDT. In case of mosquito larvae Petkolin is more toxic than Makrolin and DDT, and approximately as active as Chlordane.

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