

TICK RESISTANCE TO DIAZINON: A CASE REPORT

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SUMMARY

A case of a heavy tick infestation of dogs in a private kennel that resisted treatment with diazinon is reported. Application is by the conventional acaricidal tick dips and subsequent acaricidal spraying of the premises on three consecutive occasions which yielded no result. However a change of drug from diazinon to cypermethrin for dips and spraying the premises on a single exposure controlled the ticks. It was thus considered that resistance of ticks to common pesticides have serious implications for tick control and for the safety of the environment.

KEY WORDS: Tick, Resistance, Diazinon, Cypermethrin, Dips

INTRODUCTION

Pesticide resistance is one of the major environmental challenges emanating from the very wide explosion in the pesticide usage in recent times. Diazinon is one of the major acaricides used in veterinary medicine to control tick infestation.

Kenneth (1990) asserted that some pesticide lead to the development of resistance more quickly than others, the organochloride insecticide being notoriously bad in this respect. Usually the more persistent the poison and the more rapid the life cycle of the insect or acarine, the greater is the risk of developing resistance. In the field conditions, the influx of non-exposed migrants dilutes the in breeding of resistant organism, so that isolated populations are often found to develop resistance quickly (Kenneth 1990).

The development of resistance have several consequences for mankind. At

best, leads to the need to apply more pesticide to achieve the same level of control as hitherto, with correspondingly greater risk to the environment and higher cost of control. At worst, it endangers our agricultural productivity and public health in face of devastating pests. The case in question poses a serious concern to the veterinarian as such drug failure continues to elicit doubts of competence form client. Diazinon is still the commonest pesticide on veterinary shelf.

The aim of this report is to document a case of resistance of the tick *Rhipicephalus sanguineus* to diazinon and offer a possible alternative of cypermethrin.

CASE HISTORY

A case was reported to a veterinary clinic in Ado-Ekiti of a heavy tick infestation in a private kennel of six dogs. Physical examination of the kennel and house premises revealed massive infestation of the walls and crevices with *Rhipicephalus*

sanguineus ticks. The ticks were identified as *Rhipicephalus sanguineus* using the methods of Morel(1989) and Fox and Syke (1985).

Tick dips and the spraying were done at 1ml/liter and 2mls/liter of water respectively, using diazinon(Diazintol from Animal care Nigeria Limited.) of 162mg/ml concentration as recommended by the manufacturer. The treatment resulted in about 20% reduction of tick load (about 10 ticks per 5 square cm body surface as against 50 ticks before treatment). The treatment was repeated twice with double the initial dosage at three week intervals without an appreciable response. After two weeks, a change of drug to cypermethrin(Best cypermetrin from African Agro product Ltd) using a 10% emulsion at the manufacturers recommendation of 1% final dilution in water for dips and spraying of the premises successfully controlled the ticks infestation.

DISCUSSION

The tick population in question may have become resistant to diazinon. Certain American population of this species of ticks are reported to have developed resistance to insecticides (Micheal Dryden 1998). The development of resistance to this drug will be a source of serious concern for the practice since diazinon is still the commonest pesticide on veterinary shelf. It will also serve to alert the environmentalists of the possible contamination of the biosphere with

diazinon due to possible overdose sequel to this resistance. Lewis and Sawicki (1971) demonstrated an enzyme in extract made from a diazinon resistant strain of housefly with low classical esterase activity. This enzyme acted as a "phosphates" splitting diazinon to give de-ethyl diazinon and diethyl phosphorothioic acid. Enzymes of this form in the *Rhipicephalus sanguineus* may be responsible for this resistance observed in the case in question.

In conclusion this report has established resistance of *Rhipicephalus sanguineus* to diazinon and demonstrated that in such resistant population, cypermethrin could be a useful alternative.

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