

COMPARISON BETWEEN SPRAYING AND WASHING METHOD OF REDUCTION RATIOS ON ANIMAL ECTOPARASITES BY USING DIAZINON 60% EC UNDER FIELD CONDITIONS IN FARM ANIMALS

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The present work was done to study evaluation of spraying and washing method of reduction ratios on animal ectoparasites by using Diazinon 60% EC under field conditions in farm animals. Results showed that the mean mortality percentage to lice on buffaloes were 55.38 and 70.43% from treatment with Diazinon 60% EC spraying and washing method at 1ml/liter water after 45 days respectively. The mean mortality percentage to ticks on cattle 40.63 and 62.03%, from treatment with Diazinon 60% EC spraying and washing method at 1ml/liter water after 45 days from respectively. Finally, the washing method was the best produced high toxicity followed by spraying method for the control of animal parasites control may be due to it gives more space exposure to a pesticide against the pest.

Keywords: Spraying method, animal ectoparasites, farm animals, Diazinon 60% EC, ticks, contact method

INTRODUCTION

Arthropod ectoparasites have a major impact on husbandry, productivity and welfare of domestic animals (Colebrook and Wall, 2004). These obligate parasites live, feed and shelter on or just beneath the surface of their host's epidermis, hair or feathers (Marshall, 1981).

Ticks are economically the most important pests of cattle and other domestic species in tropical and subtropical countries. They are the vectors of a number of pathogenic microorganisms including protozoans (babesiosis, theileriosis), rickettsiae (anaplasmosis, ehrlichiosis, typhus), viruses (e.g., Kyasanur Forest Disease reported from Karnataka State of India; Crimean-Congo Hemorrhagic Fever reported time and again from Pakistan), bacteria (e.g., Pasteurella, Brucella, Listeria, Staphylococcus) and spirochaetes (Barnett, 1961; Jongejan and Uilenberg, 2004). The only food for the ticks is blood. They are voracious blood suckers; loss of blood for their rapid development impoverishes the hosts. In heavy infestation cattle must have more feed merely to meet the demands of the parasites; the growth of young animals is retarded, and they may remain thin, weak and stunted. In dairy cows, milk production is greatly reduced. Ticks belonging to genus *Ixodes* and *Ornithodoros lahorensis* are associated with tick paralysis which is a specific type of intoxication, resulting from the injection of a toxin by certain instars of ticks usually the adult females but sometimes by nymphs. Sweating sickness is a disease of cattle and other domestic species which occurs in South, Central and East Africa. It is associated with infestation by *Hyalomma truncatum* and has all characteristics of toxicosis (Barnett, 1961).

Although, economic losses due to ticks are mainly due to the diseases which they transmit (Garcia, 2003), financial losses associated with nagging irritation and depreciation of the value of skins and hides (upto 20-30%) are also significant (Biswas, 2003). In severely tick infested young cattle, sometimes ticks have been found in the oral cavity as well as in the stomach. They reach here as a result of constant licking induced by irritation. The present treatise attempts to review some of the pragmatic tick control measures in dairy cattle and buffaloes. Ghosh *et al.* (2007) have reviewed upcoming and future strategies of tick control. Similarly, Jongejan and Uilenberg (1994). Skin diseases caused by lice, ticks and mange mites, are among the major diseases of cattle causing serious economic loss to the farmer, the tanning industry and the country as a whole. Skin diseases cause mortality, decreased production and reproduction, and downgrading and rejection of skins. Bekele (2002) inventory of pesticides used to control ectoparasites of farm animal Information was gathered through questionnaires and verbal interviews. A total of 22 veterinary drug stores, 14 farms and 8 veterinary clinics were visited. A total of 28 different pesticides were encountered in veterinary drug stores, with synthetic pyrethroids (50%) being predominant. On the farms and veterinary clinics, 19 different pesticides were encountered, with organophosphates (42.1%) being the most widely used. The most popular method of application of pesticides was dipping. The result of this survey suggests there is need to subject the most widely used pesticides to systematic in vivo and in vitro assays, in order to avoid possible development of resistance by ectoparasites to these pesticides.

MATERIALS AND METHODS

The present study was conducted in the farm animals of the Faculty of Agriculture, Assiut University, during 2009-2010 years. This farm consisted of about five feddans, including the buildings of animal- sheds and animal food storages. This farm contains buffaloes, cattle and sheep. The present work was done to study evaluation of washing and spraying method of Reduction ratios on animal ectoparasites (buffaloes lice & cattle ticks) by using Diazinon 60% EC under field conditions in farm animals.

Animal was virtually divided into three groups. The infested group was isolated in special places to prevent spreading of the infestation and divided into equal subgroups; first group was treated with Diazinon 60% EC spray, at concentration of 1ml/ liter respectively. The second group was treated as a Diazinon 60% EC washing in the farm. The third group was untreated as a control agent of ectoparasites in the farm. Treatments were compared with the control group; the results were taken after 1, 3, 5, 7, 10, 15, 20, 30 and 45 days.

Data were analyzed using analyses of variance (MSTAT-C 1988) and means were separated using the least significant differences method (LSD) at 5% probability level (Steel and Torrie, 1984), only when a significant "F" test was obtained. The percentage of reduction was calculated by Henderson and Tilton (1955). All percent mortality data were arcsin transformed to suit the analysis.

RESULTS

Diazinon 60% EC spraying and washing methods at 1ml/liter caused an initial kill of 39.13% and 56.52% in control of buffalo parasites and 37.61% and 50.45% in control of cattle ones, after 24 hrs. The activity of the product increased gradually to attain 78.57% and 86.36% after 7 days with spraying and washing method in buffaloes parasites, also 68% after 5 days with spraying method and 80.56% after 7 days with washing method in cattle parasites, after so the activity of the product decreased gradually to attain 59.73%, 77.85%; 34.43% and 65.58% after 20 days, respectively. However after 45 days the percentage of

mortality reduced to be 31.21%, 43.31%; 16.78% and 43.92% for animal parasites, respectively (Table 1 and figure 1). In general, washing method was the best produced high toxicity, followed by spraying method for the control of animal parasites control.

DISCUSSION

Application of acaricides (agents used to kill ticks and mites) is the most widely used method of tick control in dairy farming. Control of ticks with acaricides may be directed against the free living stages of ticks in the environment or against the parasitic stages on host. Acaricides can be applied by dipping, washes, spraying, pour-on, spot-on or by injections. Insecticide ear tags are commercially available in some countries for the control of horn flies, face flies and spinose ear ticks. Dipping is an expensive operation but is desirable when a large number of cattle are to be treated or when a tick eradication programme is in place.

The frequency of dipping depends upon the species of the tick infesting the cattle. In the case of *Boophilus microplus*, dipping every 21 day is recommended to break the life cycle because 18 days is the least time from the dropping off of an engorged female to time when larvae can be ready for infestation, and the dip gives protection for three days (Hungerford, 1990). The construction of a dipping tank varies according to the kind and number of animals required to be dipped. In tropical and sub-tropical countries, it is preferable to cover the tank with a roof, as it will avoid excessive concentration of the insecticides by evaporation or dilution by rain. The following precautions should be observed while dipping animals for tick control and treatment (Ruprah, 1985).

Wounds must be attended to thoroughly before resorting to dipping, otherwise dipping causes discomfort to animals and toxicity may occur. Avoid dipping on cloudy, rainy, windy or cold days.

The animals to be dipped should not be thirsty.

Animals that are fatigued due to any reason should not be dipped.

Table 1: Reduction ratios on animal ectoparasites by using washing and spraying method with Diazinon 60% EC at (1ml/L) under field conditions in farm animals, Faculty of Agriculture, Assiut University during, 2009-2010.

Days	Mean \pm SE (%)			
	Buffalo lice		Cattle ticks	
	Spraying method	Contact (washing) method	Spraying method	Contact (washing) method
1	39.13 \pm 1.28 no	56.52 \pm 1.28 h-j	37.61 \pm 0.93 op	50.45 \pm 1.62 lm
3	51.16 \pm 1.37 k-m	67.44 \pm 1.37 f	54.55 \pm 1.78 i-l	63.64 \pm 1.78 fg
5	64.44 \pm 1.31 gh	77.78 \pm 1.31 cd	68.00 \pm 1.21 f	73.27 \pm 1.75 e
7	78.57 \pm 1.15 c	86.36 \pm 1.15 ab	58.33 \pm 1.63 hi	80.56 \pm 1.63 c
10	74.51 \pm 1.15 de	88.24 \pm 1.16 a	49.04 \pm 1.76 m	85.15 \pm 1.75 ab
15	64.48 \pm 1.16 f	84.21 \pm 1.16 b	40.00 \pm 1.68 no	74.29 \pm 1.68 de
20	59.73 \pm 1.19 gh	77.85 \pm 1.19 cd	34.43 \pm 2.21 pq	65.58 \pm 1.45 f
25	51.02 \pm 1.20 k-m	67.35 \pm 1.20 f	26.77 \pm 1.39 r	52.75 \pm 1.39 j-m
30	39.56 \pm 1.32 no	55.23 \pm 1.32 h-k	20.83 \pm 1.23 s	41.67 \pm 1.23 no
45	31.21 \pm 1.13 q	43.31 \pm 1.72 n	16.78 \pm 1.14 t	32.91 \pm 1.74 q
Mean	55.38 c	70.43 a	40.63 d	62.03 b

-Means followed by the same letter are insignificantly different

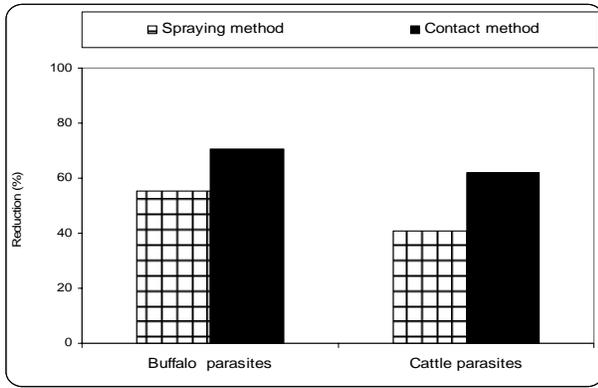


Figure 1: Reduction ratios on animal ectoparasites by using Contact (washing) and spraying Diazinon 60% EC using 1ml/L under field conditions in farm-animals, Faculty of Agriculture, Assiut University during, 2009-2010.

To the extent possible, avoid contamination of the dipping tank with organic matter (e.g. dung) as it lowers the concentration of insecticides in the dip.

The animals must actually swim in the tank and have one or two dips of their heads in the acaricidal solution. For this purpose, two attendants with forked blunt sticks should direct the operation.

Let the animals drain properly before they are sent out to the fields, otherwise the insecticide will cause pollution of feed, fodder, or other items coming in contact with insecticides. Design the dipping area with a good drain back to the dipping bath.

The concentration of the dip should be very carefully adjusted and may be same as recommended for the spray but in no case higher than that.

Weak animals less than three months old should not be subjected to dipping.

Human safety against insecticides is of paramount importance.

While handling any acaricide, avoid repeated or prolonged contacts with skin and inhalation of dust and mist. Wear clean clothing and wash hands and face before eating or smoking. Keep the antidote (generally atropine sulphate injection @ 0.2-2 mg/kg) ready for use in the case of acaricide poisoning. Recommended drug withdrawal period should be observed. The dimension of the dipping tank should be decided according to the number and type of dairy animals of the farm.

A plunge-dipping tank should have a pucca, cemented, impervious, non-slippery internal lining. The entrance and exit should have convenient slopes. It should be filled in such a way that the animals are in a position to swim a few feet on their way. Barnett (1961) recommends that cattle should pass through the dip in their age groups and not as mixtures of large and small animals. According to this author, one of the difficulties of treating buffaloes for ectoparasites is their propensity of frequent immersion in wallows, which washes off the acaricide.

It has been suggested that the small wallows could be used, in which a suitable concentration of acaricide could be incorporated, thus acting as a voluntary dip for buffaloes. Incorrect or poor application of even a highly effective acaricide can result in less than satisfactory control and may contribute to the development of acaricidal resistance. This is because of reduction in the concentration of acaricide with the passing of each cattle through the dip tank and addition of organic matter in the form of dung and urine into the dipping solution. Concentration also reduces as the time elapses.

One way to address the problem of falling concentration of acaricide is to use 'head count system' which has been practiced in some parts of Africa. With this system, replenishments of acaricide concentration are made not based on volume of wash used but on number of heads of cattle dipped (Mathewson, 1984). For small number of animals (say 10-25), spraying with a bucket-pump hand sprayer is more economical. In order to effectively control ticks, it is necessary that every part of the body be sprayed and not only the hair

but the skin be moistened (Kinsey, 1993).

For farmers maintaining a very small number (say 1-6) of cattle/buffaloes, plastic spray bottles commonly used by barbers in hair cutting and by women in ironing clothes can be used. Two mL of Ecofleece TM (Prix, Pharma) or Cyprin TM 20EC (Pameer, Pharma) can be added to 2L of water and sprayed on the tick infested body areas of cattle and buffalo with the help of spray bottle at interval of 5-7 days in summer months. Delta - 25 TM solution (Selmore, Pharma) is a proprietary preparation containing 2.5% deltamethrin. The recommended dilution of this preparation for tick control is 2mL/L of water. As per the personal perspective of the principal scribe of this treatise, this method is extremely economical, effective and environment friendly.

CONCLUSION

The washing method was the best produced high toxicity followed by spraying method for the control of animal parasites control may be due to it gives more space exposure to a pesticide against the pest.

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