Short Communication

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EFFECTIVENESS OF SOME BOTANICAL EXTRACTS ON WHEAT APHIDS

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ABSTRACT

The effect of six different botanical extracts- Orange peel *(Citrus sinensis*); Bitter goard (*Momordica dioica*); Garlic (*Allium vineale*); Mari gold; Hot pepper (*Capsicum frutescens*) and Tobacco (*Nicotiana tabacum*) extract on wheat aphid was assessed in field at Adaptive Research Farm, Gujranwala. Wheat aphids were deliberately exposed to the above botanical extracts and then the number of live and dead aphids was counted in meter square ring on tagged spikelet's. The botanical extracts showed varying effect on aphid population. Application of Orange Peel extract (T1) inflicted consistently the maximum level of aphid mortality (65.69%) followed by Garlic (57.91%), Tobacco (57.90%).

Key words. Wheat aphid; Botanical extract; Pakistan

INTRODUCTION

Plant protection plays an important role in addition to good seed, fertile soil, irrigation water and fertilizer management for maximum production. In spite of development of various modern synthetic insecticides, heavy losses of crop and stored grain are recorded by the attack of pests and diseases. In recent years, the use of pesticides, particularly of insecticides, has become very common. Excessive and indiscriminate use of these toxicants has unlimited hazards for human beings and every naturally growing population (Iqbal *et al*., 2007). The vegetable crops and other edible parts of plants are directly exposed to the applied pesticides and are usually consumed before the plant system is able to get rid of pesticide residues or the latter is diluted to the non-toxic level (Iqbal *et al*., 2009). Fumigation, spraying and dusting of pesticide liberate a fair volume of harmful vapors in the atmosphere and consequently create a certain degree of atmospheric pollution (Dheeraj *et al*., 2006). However, some chemicals have posed some serious problems to health and environmental safety, because of their high toxicity and prolonged persistence (Kulkarni and Joshi, 1998) but the culture of Pakistani people is to consume the fresh vegetables that having the residues across maximum residue limit (MRL) (Mansoor *et. al*., 2005). Extracts from plant origin containing insecticidal properties are indigenously available and are considered comparatively safe for environment & public health. It has been reported that over 2000 plant species belonging to about 170 natural families are known to have insecticidal properties (Feistein, 1952). Thus the present study aimed to assess the use of some botanical extracts like orange peel, garlic crush, bitter goard peel, Mari gold, hot pepper and tobacco for the control of aphid in wheat crop in the area of Adaptive Research Farm, Gujranwala.

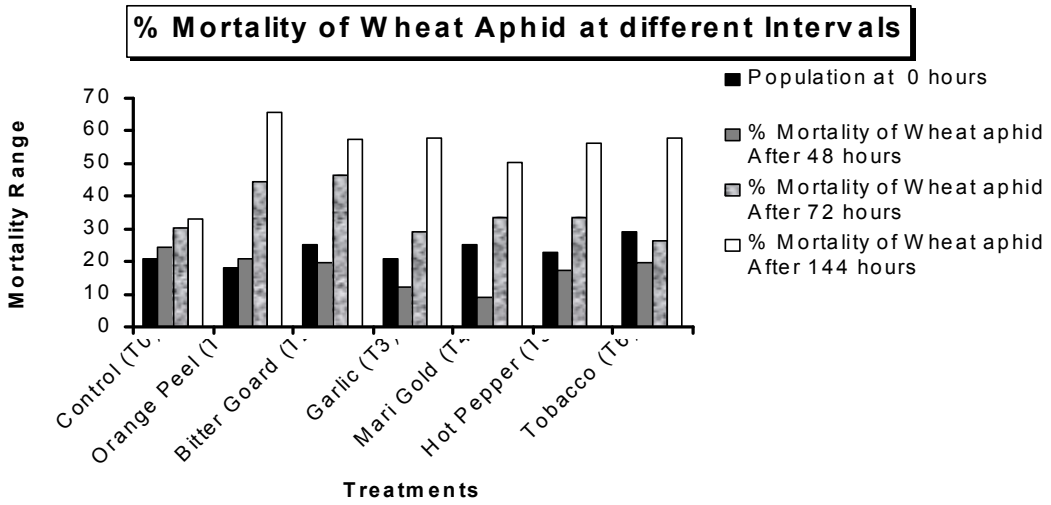
MATERIALS AND METHODS

The research trial was conducted under CRD with three replications and seven treatments having 24x45 sq. ft. area. These treatments included orange peel (T_1), bitter goard peel (T_2), garlic crush (T_3), Mari gold (T_4), hot pepper (T_5), tobacco (T_6) and control plot (T_0). The experiment was conducted at Adaptive Research Farm, Gujranwala during the year of Rabi-2009. The extract was formulated by grinding of 200 gram of raw material such as orange peel, garlic, bitter goard, mari gold, hot pepper, tobacco in one liter of water separately. These extracts were filtered with whattman flute filter paper and stored separately in glass bottles. Before spraying 50 ml of extract was added to 2 liter of water in spray machine for calibration of botanicals extracts. The aphid infested plot was selected in the area of A. R. Farm, so that the population of aphid was collected. After that the formulated extract was sprayed on wheat crop in the month of March against the infestation of aphid at earing stage of wheat crop. The plants selected in one meter square ring, aphid population was counted, after this tags were fixed on different spike-lets of wheat crop in the ring. Observations were recorded after 48, 72 and 144 hours of spray and compare with 0 hours plot. The percentage mortality of aphid with respect to pre-treatment data was calculated by formula given by (Abbott *et al*., 1925 and Flemming *et al.,* 1985).

RESULTS AND DISCUSSION

The effect of different botanical extract orange peel (T_1), bitter gourd peel (T_2), garlic crush (T_3), Mari gold (T_4), hot pepper (T_5), tobacco (T6) and control plot (T_0) on mortality of wheat aphid is shown in Figure 1. It is apparent that application of orange peel extracts before (0 hours) and after 48, 72 and 144 hours showed 20.65%,

44.28% and 65.69% mortality of aphid population, respectively. Whereas Mari gold extract was least effective for wheat aphid control. These results showed significant effect reported by (Dheeraj *et. al*., 2006).



Many scientists have developed ways of making their own extracts (sprays) from plant such as garlic, hot pepper, marigolds and many others. These are low in cost locally available and have proved to be very effective for the control of insect pests. Orange peel spray showed better result as compared to other plant extract against aphid because it contained sulphur and polyphenolic compounds (Gaby, 1996). Similar results of botanicals were reported by Bhathal *et. al*., (1994), Pandey *et. al*., (1987) Singh and Singh (1995). From the present study it may be concluded that the application of plant extracts (Orange peel, Bitter gourd, Hot pepper, Garlic, Mari gold) on wheat crop reduced the aphid population. These results regarding mortality of aphid are in accordance with the work reported by Srivastava. *et. al*. (2003). The scale up studies are required to understand the mechanism(s) of solvent extracted from vegetables and fruits and used against aphid which will be helpful in replacing the pesticides harmful to the environment and the human beings.

REFERENCES

Abbott, W. S. (1925). A method of computing the effectiveness of an insecticide. J. Eco. Ent. 8:165-267.

Bhathal, S. S., D. Singh and R. S. Dhillon (1994). Insecticidal activity of Ageratum conyzoides Linnaeus against L. erysimi Kalt. Journal of Insect Science 7: 35-36.

Dheeraj M., A. K. Shukla, A. K. Dixit and K. Singh (2006). Insecticidal activity of vegetable oils against Mustard aphid, *Lipaphis erysimi* Kalt under field condition. J. Oleo Sci., 55 (5):227-231.

Feistein L. (1952). Insecticides from Plants Insect, year Book of Agriculture, U.S. D.A Washington, 222-229.

Flemming R. and A. Ratnakaran (1985). Evaluating Single Treatment data using Abbot's Formula with Reference to Insecticides. J. Eco. Entomol. 78:1179-1181.

Iqbal M. F., U. Maqbool, M. R. Asi and S. Aslam (2007). Determination of Pesticide residues in brinjal fruit at supervised trial. J. Anim. Plant Sci. 17(1-2):21-23.

Iqbal M. F., U. Maqbool, I. Perveez, M. Farooq and M. R. Asi (2009). Monitoring of insecticide residues in brinjal collected from market of Noshera Virkan, Pakistan. J. Anim. Plant Sci. 19(2):90-93.

Gaby S. (1996). Natural Pest and Disease Control published by Magraf Verlag, PO Box 105 97985 Weikersheim, Germany.

Kulkarni N. and K. C. Joshi (1998). Botanical pesticides as future alternatives to chemical in forests insect management *SAIC Newsletter* (8)1-3.

Mansoor H., M. Farooq, M. Sagheer, M. F. Iqbal and M. Tariq (2005). Residual persistence of Chlorpyrifos, Imidachloprid & Acephate in Brinjal fruit. Pakistan Entomol. 27(1):53-55.

Pandey N. D., Y. P. Singh and R. A. Tripathi (1987). Effect of certain plant extract against L. erysimi Kalt. Under lab condition. Indian J. of Ento. 49: 238-242.

Srivastava A. and G. Sanjay (2003). Evaluation of botanicals for mustard aphid, Lipaphis erysimi (Kalt.) control in Brassica Himachal J. Agric. Res. 29(1&2): 116-118.

Singh, H. and Z. Singh (1995). New records of insect-pests of rapeseed- mustard. Indian J. Agri.Sci. 53(9):970.