

INFESTATION PATTERN OF *MACROSIPHUM ROSAE* AND *TETRANYCHUS* SP. IN ROSE PLANTS (*ROSA HYBRIDA*) CULTIVATED IN PROTECTED AND OPEN CULTIVATION IN KATHMANDU DISTRICT.

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Abstract

A study was carried out from January to December 2005 in four different sites of Kathmandu district. Infestation pattern of mite and aphid was observed in different canopy levels (top, middle and bottom) of rose plant. Top part of the plant showed highest aphid infestation followed by middle part and bottom part showed little or no infestation. Similar trend was observed in case of mite, with highest distribution in top, middle part and relatively low in bottom part. *Macrosiphum rosae* and *Tetranychus* sp. were found to be the dominant pests infesting rose plants in open and protected conditions respectively.

Key words: Rose, mites, aphids, infestation, canopy level, Kathmandu.

Introduction

Rose is one of the floriculture products grown throughout the year in different agro climatic condition ranging from temperate to tropical regions of Nepal. Roses are used not only for planting in the garden but also as cut flowers for table decoration and for making bouquets. Aside from ornamental perspectives rose as a flower has occupied an important position in Nepalese society from religious point of view. Current level of commercial production of roses is confined to small Nurseries. Roses of different species are cultivated in some rural and urban area for cash income. Generally roses are attacked by numerous kinds of pests and diseases, from the common observance the most prevalent among arthropod pests are mites, aphids, thrips, borers, scales etc. The major concerned diseases are downy mildew, powdery mildew and rose rust.

When thirty cultivars of rose were screened against mite *Tetranychus urticae* Koch, rose cultivar Rajhans was found to be most promising recording the population of mites while rose cultivar Arjun recorded the maximum number of mites (Hole and Salunkhe, 2005). Mite sucks sap from leaves, flower buds and flower resulting in discoloration of flowers, appearance of silvery patches and drying in affected plant parts (McCaffery *et al.*, 1989)

Aphids damage their host plants directly through sucking their saps and also indirectly acting as a vector for plant viruses (Chakrabarti, 2005). Rose colored aphid (*Macrosiphum rosae*) and *Rhodobium* sp. were reported in the rose plants of Nepal (Sharma, 2000). Discolorations of leaves, stunted growth and gall formation are some symptoms of aphid infestation. However, there are more than 177 species of aphids under 77 genera have been described from Nepal so far (Thapa, 2000) but these specific impacts on rose plants have underestimated in floriculture business.

Study Sites

The study was carried out from January to December 2005 in four selected rose cultivation sites in Kathmandu district. Rose plants cultivated in four nurseries: two protected (poly-house) and two openly cultivated sites were selected. Amar Nursery and Dr. Zakir Husain Rose Garden are openly cultivated rose fields located in Naikaap and Kirtipur respectively. Protected nurseries included the Standard Nursery (TSN), Bansbari, and Fresh Flower Nursery (FFN), in Chalnakhel VDC of Kirtipur.

Materials and Methods

Arthropods and insect pests were collected from both protected and open fields by hand picking the large specimens, brushing the affected plant parts in Petri dish and by using insect sweeping net. To study the population density of mite, six rose plants were chosen from each cultivation site. Samples of leaves were taken from each site. Samples of leaves were taken at three canopies of plant top (young leaves), middle (mature leaves) and bottom (old leaves). Three leaves were plucked from each canopy and collected in individually labeled vials. Specimens like aphids, which occurs in clusters were collected by using soft brush and also by knockdown process. All the collected specimens were preserved in 70% alcohol with few drops of glycerin added in it to avoid evaporation of preservatives and counted either with naked eye or under stereo binocular microscope in lab. All sorted specimens were numbered and kept in well-labeled separate vials. Adult insects were killed, by putting them in the killing jar containing cotton soaked in carbon tetrachloride.

Collected specimens were identified upto species level at National Agricultural Research Council (NARC), Khumaltar, Natural History Museum, Swoyambhu, Kathmandu and the Central Department of Zoology, Tribhuvan University (CDZ/TU), Kirtipur consulting experts and using literatures (Borror and DeLong, 1971; Gupta, 1985; Sharma, 2000).

Results and Discussion

Distribution of mites and aphids in different canopy height of the rose plants of all selected study sites were analyzed. It was observed the highest incidence of aphid population was on the top most part of the plant 1.02 (59.54%), while in the middle part it was 0.69 (40.28%) and in the lowest part 0.003 (0.175%). Distribution pattern of mite population also exhibited the same trends with aphids. Mites were highest in number in the top most part of the rose plant 1.3 (59.91%) following middle 0.77 (35.48%) and the bottom 0.1 (4.61%) were reported (Figure 1).

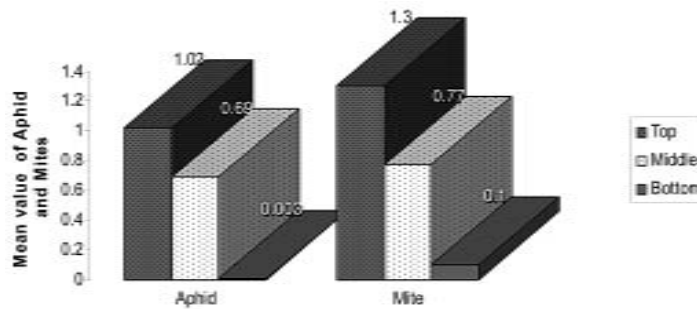


Figure 1. Mite and Aphid Populations at Different Canopy Heights of Rose Plants

A similar study of mite infestation but on cotton plant was done by (Butter *et al.*, 1997). The study concluded that majority of the mites occupy the fifth to tenth main stem leaves below the apical plant terminals and by late season they move in the plant terminal. The study also revealed that in the protected conditions red spider mite *Tetranychus* sp. was in dominant number (Figure 2) and in open cultivation rose colored aphid *Macrosiphum rosae* was in dominant number (Figure 3). *Macrosiphum rosae* are the dominant pests of the multiflorous rose and flower bed roses of various cultivars (Jaskiewicz, 2006). In Australia spider mites are the most important pests in protected conditions (Edge 1988).

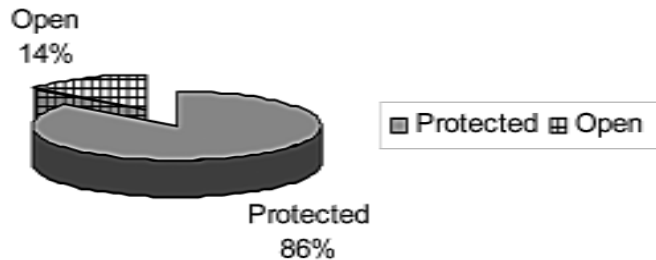


Figure 2. Relative Distribution of Mites in different types of Nurseries in year 2005

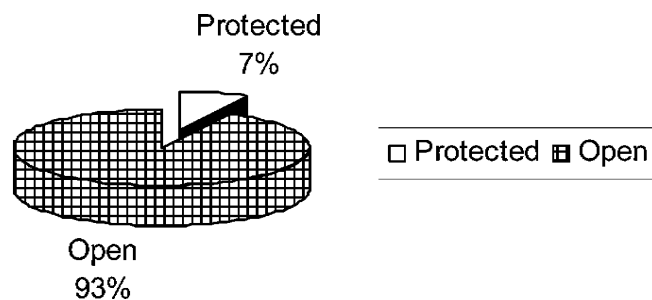


Figure 3. Relative Distribution of Aphids in different type of Nurseries in year 2005

Conclusion

Mites and aphids were found highest in top and middle part of rose plant. It was concluded that both mite and aphid prefers to attack young plant parts. It was also found that *Macrosiphum rosae* was dominant pest in open cultivation and *Tetranychus* sp. was dominant pest in protected cultivation.

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