

STUDIES ON THE POTENTIAL OF USING PREDATORY MITES ON THE MANAGEMENT OF COCONUT MITES (*Aceria guerreronis* Keifer) ON DIFFERENT VARIETIES/FORMS OF COCONUT

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INTRODUCTION

The coconut tree is justifiably called "The tree of Life" due to its multiple uses. Coconut is an important key plantation crop in Sri Lanka and mostly important in the daily diet of Sri Lanka people. The crop is prone to damage by a number of various pests. Among them, recently Coconut mites (*Aceria guerreronis* Keifer) cause severe economic losses to the coconut production in Sri Lanka by feeding tender nuts. For the control of this pest farmers apply 20ml of Monocrotophos to infested palm as trunk injection. Monocrotophos is a systemic insecticide that is carried in the vascular system and it is more effective and convenient to use in this situation but excess dosage of application cause serious health hazards as they can get into the kernel of nuts. Therefore the search for alternative control methods to suppress this pest is necessary. In this context, this study will focus to attempt a biological control method of coconut mites using predatory mites.

OBJECTIVES

- To assess the possible control of coconut mites using predatory mites.
- To made survey on the distribution of predatory mites on different coconut varieties.

MATERIALS & METHODS

Survey was conducted in different areas in Batticaloa district. Data on the number of predatory mites and infectious mites were recorded on different varieties of coconut palms such as Tall x Tall variety, Tall x Dwarf variety, Plus palm (Local variety), Thempli and Kevili types of coconut palms with two ages of nuts (3-4 and 8-9 months) and five immature nuts from each variety were drawn to assessed for mites infestation. Number of infectious mites in adult and nymph stages per 25mm² of perianth of the infested nut and number of predatory mites per nut were the parameter used in this study. Data for each variety of palms was recorded separately and the description was based on the different varieties. Analysis of variance (ANOVA) was used to analyse the data on number of infectious mites and predatory mites on different varieties of coconut palms. Using Duncan's Multiple Range Test (DMRT) further comparison was done to find the significance, if any between the treatments.

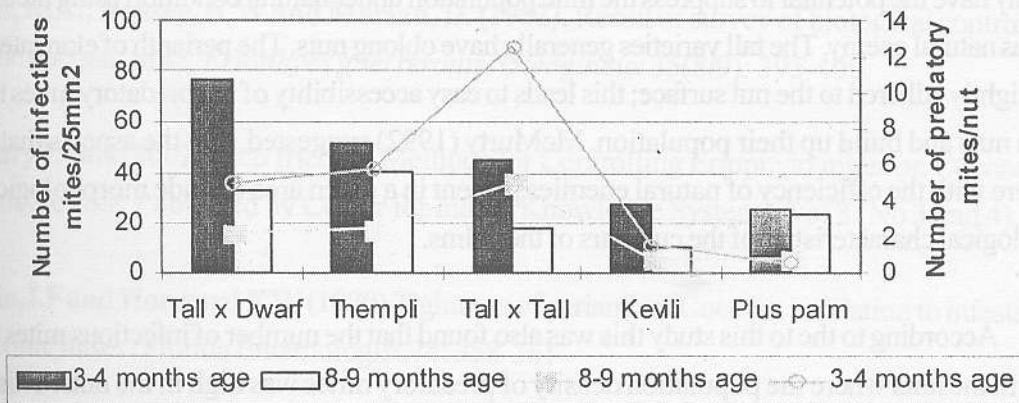
Results and discussion

Treatment	Mean number of Infectious mites on nuts at different ages (months)		Mean number of predatory mites on nuts at different ages (months)	
	3-4	8-9	3-4	8-9
Tall x Tall	45.600 ^{cb}	17.800 ^{hg}	12.600 ^a	5.000 ^b
Tall x Dwarf	77.200 ^a	32.600 ^{cd}	5.000 ^b	2.200 ^d
Plus Palm	25.200 ^{efg}	22.800 ^{fg}	0.600 ^d	0.800 ^d
Thempli	51.600 ^b	40.200 ^{cd}	5.800 ^b	2.400 ^d
Kevili	27.000 ^{ef}	10.600 ^h	1.600 ^d	0.800 ^d
Total number	226.600	124.000	25.600	11.2

Mean of five replicates

Mean of same letters do not differ significantly based on DMRT ($p < 0.05$).

Table 1: Number of infectious mites and predatory mites on the nuts of different varieties.



(Column chart – Predatory mites

Line chart – Infectious mites)

Fig 1: The relationship between number of infectious mites population and predatory mites population at different ages of button nuts.

The number of infectious mites/25mm² collected from Tall x Dwarf hybrid was significantly ($p < 0.05$) higher (77 infectious mites/25mm²) than the other varieties tested in this study. Coconut mites population was fairly high in Nuts at 3-4 months age of Thempli and Tall x Tall varieties. Nuts at 8-9 months age of Thempli and Kevili recorded the lower population of infectious mites, recorded 17 infectious mites/25mm² and 10 infectious mites/25mm² respectively. From the above study high population of infectious mites were present on nuts at 3-4 months age of Tall x Dwarf variety compare to the other varieties/types, suggest that the habitat of these varieties conducive for survival of infectious mites.

The population dynamics of predatory mites on different varieties/forms of coconut palms (Tall x Tall, Tall x Dwarf, Plus palm, Thempli and Kevili) at two ages (3-4 and 8-9 months) was studied to find out the possibilities in natural control using predatory mites on different varieties/types of coconut palms. Number of predatory mites in adult and nymph stages of infested nut was considered in this study. The results showed that the significant differences were observed among the varieties tested in this study. Number of predatory mites in nuts at 3-4 months age of Tall x Tall variety has significantly ($p < 0.05$) higher number (13 predatory mites/nut) of predatory mites compared to the other varieties. No significant difference was observed in number of predatory mites among the nuts at 3-4 months age of Thempli and Tall x Dwarf based on DMRT at $p = 0.05$. Nuts at 3-4 months age of Plus palm showed lower number of predatory mites than other varieties. Plus palm generally have more or less rounded nuts and perianth of button nut is tightly adhered to the nut surface. The tightness of perianth limits the accessibility of predatory mites to infest the nuts.

From this study, it was found that the nuts at 3-4 months age of Tall x Tall variety has higher predatory mites population and the population was lower in Plus palm at 3-4 months age. Tall x Tall may have the potential to suppress the mite population under natural condition using predatory mites as natural enemy. The tall varieties generally have oblong nuts. The perianth of elongated nut is not tightly adhered to the nut surface; this leads to easy accessibility of the predatory mites to the button nuts and build up their population. McMurty (1992) suggested, that the aspects that may interfere with the efficiency of natural enemies present in a given area include morphological or phenological characteristics of the cultivars of the palms.

According to the to this study this was also found that the number of infectious mites were lower in the nuts where the population density of predatory mites was high in the nuts. This was observed in Tall x Tall, Thempli and Tall x Dwarf varieties. Therefore it may be concluded that there are possibilities of suppressing infectious mites using predatory mites in some varieties under natural condition.

The studies conducted by Julia and Horward, (1990), observed that several species of natural enemies have been recorded in America and Africa but their regulatory effect on *Aceria guerreronis* was not adequately known. Therefore no studies have been undertaken in the past to utilize predators in a biological control programme. Although potential of using predatory mites to control coconut mites is there, it has not been properly exploited. This may be accomplished by mass culturing of predatory mites and release them against infectious mites.

CONCLUSION

From the descriptive study can suggest some varieties Thempli and Tall x Dwarf have higher population of predatory mites followed by Tall x Tall. These varieties have high potential in controlling infectious mites as assist the lodging of predatory mites to suppress the infectious mites population.

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