

**INFESTATION AND DAMAGE SEVERITY OF COCONUT MITE,
ACERIA GUERRERONIS KEIFER AT DIFFERENT LOCATIONS OF
BARISHAL DISTRICT IN BANGLADESH**

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Coconut (*Cocos nucifera* Beccari) is the main source of cash income for farmers in the coastal belt/southern region in Bangladesh. The coconut palm and its fruit are regarded as the most important plant to human being around the world. Approximately 100 million coconuts are produced in the country in an area about 35 thousand hectares. South and southwestern parts of the country contributes 80% of total coconut production (BBS, 2009). The yield of coconut is about 21 nuts per plant per year which is very low, compared to those of other coconut-growing countries (Keifer, 1965). This poor yield is due to lack of high-yielding varieties, inadequate nourishment, insect pests and diseases as well as management practices. At least 750 insect pests of coconut have been recorded from around the world (Lever 1969). These pests attack the leaves, stems, flowers, nuts and roots of the coconut plant. In the Caribbean over 26 major pests have been recorded in coconut orchard of which two species are mite, 15 species are insect and three species are rodent (Krantz *et. al.* 1978). Recently, coconut palms are found to suffer from the attack of mite in Bangladesh. Coconut eriophyid mite is microscopic, slender, vermiform organism and creamy white in color. Although the mites are small measuring 200-250 Å (microns) in length and 36-52 Å (microns) in breadth, they can cause severe damage to palm and fruits. These minute arthropods cannot be seen with the naked eye. Massive colonies of the mites and individual mites can be detected with a 10 x hand lens. At this magnification, the colonies appear as vague silvery patches. Individual coconut mites appear small even when viewed under standard stereo microscopes. Like typical eriophyid mites, they are elongate body, worm like appearance have two pairs of legs, instead of four pairs as is typical of most mites. They are white and translucent. Mite injures the tender portion of young nuts and suck sap from the nut. The injury ultimately leads to warring and longitudinal fissures on the nut surface. Due to their extensive feeding on young buds resulted in reduction in size followed by immature bud drop. Considering the importance of coconut and the potentiality of this mite to cause damage, the present study was undertaken to study pest status of coconut mite at different locations of Barishal district.

Study locations and observation of pest status: The study was conducted at 10 coconut plantations at in Patuakhali district from February to May 2019 and February to May 2020. In February to May 2019 first year first investigative pest

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status was conducted in Patuakhali sador, Lebukhali, Mahipur, Kuakata, Pakhimara, Kalapara, Subidkhali, Mirzagong, Dumki, Galachipa. Similarly, second year second investigative pest status from February to May 2020 in same plantations places were conducted in Patuakhali District. The studies were made with the emphasis on the documentation of damage potential and incidence of the promising pests. The places were selected randomly for recording observations and data on eriophyid mite infestation (%) and intensity of eriophyid mite infestation. Pest status of coconut mite was done by visual observation of scoring method as prescribed by Muralidharan *et al.* (2001) and Girisha (2005). Three coconut plants were selected from each place for collecting sample coconuts. In each plant five matured bunches of coconut from selected three plants were observed to record the infested coconut due to coconut eriophyid mite infestation. Similarly, in the month of February-May every year, total number of harvested coconuts and number of infested coconuts were recorded for calculated per cent infestation. Data recoded on different parameters were processed for statistical analysis. Mean comparisons for treatment parameters were compared using Duncan's Multiple Range Test (DMRT). Average values of mite infestation were worked out every pest status. Later the observations subjected to (ANOVAs) during statistical analysis Panse and Sukhatme (1985).

Incidence and severity of fruit damage caused by *A. guerreronis* were assessed on three randomly selected plants per plantation by classifying all coconut fruits on each plant on the basis of the extent of characteristic *A. guerreronis* damage visible on fruit surfaces. Amongst the harvested coconuts, the infested coconuts were also graded on the basis of visual scoring method given by Murlidharan *et al.*, (2001). Coconut fruits were grouped into three grades – based on the percentage of fruit surface damaged by *A. guerreronis*.

Grade	Surface damage
Free	No symptoms of coconut mite
Grade I	1-25% of coconut surface damage by coconut mite
Grade II	26-50% of coconut surface damage by coconut mite
Grade III	Above 50% of coconut surface damage by coconut mite

Infestation rate of coconut mite *A. gurrerronis* at different locations of Patuakhal in Bangladesh

The infestation of coconut due to coconut eriophyid mites on the basis of per cent coconut infestation ranged between 71.49 - 90.26%, during 2018 - 2019. The highest per cent infested coconuts observed at Patuakhali Sador (90.26%) which was followed by Mirzagonj (89.88%), Kalapara (89.02%), Kuakata (87.98%), Galachipa (87.84%), Dumki (87.65%) at Lebukhali. During the year 2019, coconut infestation due to coconut eriophyid mites on the basis of per cent coconuts infestation ranged between 87.85 - 91.39%. The maximum per cent coconuts

infestation level observed at Lebukhali (91.39%) which was followed by Subidkhali (90.95%), Galachipa (90.27%), Kalapara (89.91%), Kuakata (89.62%), Mirzagong (89.23%), Pakhimara (88.58%), Patuakhali Sador (87.97%), Dumki (87.92%) and the lowest at Mahipur (87.85%). The pooled mean of both years data was presented in Table 1 on pest status of coconuts infestation due to coconut eriophyid mite in different places of Patuakhali district. The infestation of coconut eriophyid mite based on per cent coconuts infestation. The maximum per cent infested coconut observed (90.34%) at Mirzagong which was followed by Subidkhali (89.52%), Kalapara (89.47%), Patuakhali Sador (89.12%), Koakata (88.80%), Mahipur (86.76%), Pakhimara (83.48 %), Dumki (82.65%), Galachipa (81.61%) and the lowest (81.44%) at Lebukhali. The variations in the range of infestation may be due to changing environmental condition as well as biotic stresses. Desai *et al.* (2009) also observed that the intensity of infestation of coconut mite and scale index was low in Ratnagiri and Raigadh districts.

Table 1. Infestation rate of coconut mite *A. guerreronis* at different locations of Patuakhali in Bangladesh during 2018, 2019 and pooled

Location	Year 2018			Year 2019			Pooled infestation
	Total count	Infestation (%)	Damage grade	Total count	Infestation (%)	Damage grade	
Patuakhali Sador	195	90.26	Grade-III	241	87.97	Grade-III	89.12
Lebukhali	235	71.49	Grade-III	244	91.39	Grade-III	81.44
Pakhimara	282	78.37	Grade-III	219	88.58	Grade-III	83.48
Kalapara	255	89.02	Grade-III	218	89.91	Grade-III	89.47
Mahipur	251	85.66	Grade-III	214	87.85	Grade-III	86.76
Kuakata	233	87.98	Grade-III	260	89.62	Grade-III	88.80
Subidkhali	299	87.63	Grade-III	221	90.95	Grade-III	89.52
Mirzagong	257	89.88	Grade-III	250	89.23	Grade-III	90.34
Dumki	243	87.65	Grade-III	240	87.92	Grade-III	82.65
Galachipa	255	87.84	Grade-III	226	90.27	Grade-III	81.61

Coconut eriophyid mite, *Aceria guerreronis* Keifer is one of the potential invasive pests of coconut in Bangladesh. Coconuts are rarely grown on large plantation in Bangladesh except for few in the coastal areas. They are mainly grown in the homestead in almost all parts of the country. Infestation of eriophyid mites on coconut occurred at all places of Patuakhali districts in Bangladesh and was found to have started much earlier at Pakhimara compare to other locations in the Patuakhali districts. The infestation of eriophyid mites on the basis of per cent coconut infestation was more at Mirzagong which was followed by Subidkhali, Kalapara, Patuakhali Sador, Koakata, Mahipur, Pakhimara, Dumki, Galachipa and the lowest Lebukhali.

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