

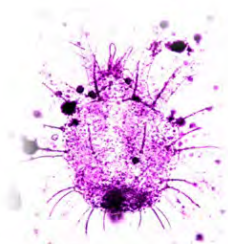
# BugS R ALL

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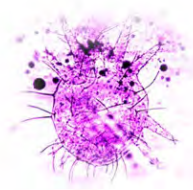
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## MITE

### Life cycle of Red Palm Mite, *Raoiella indica*, Hirst (Acari: Tenuipalpidae) on coconut leaves

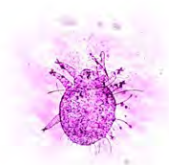


Adult (Dorsally Mounted)

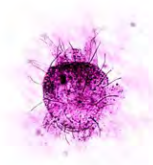


Adult (Ventrally mounted)

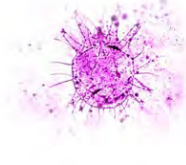
IUCN Red List:  
Not Assessed



Larva



Protonymph



Deutonymph

#### *Raoiella indica* life stages: Larva to adult

#### Arachnida

[Class of Joint-legged arthropod]

#### Trombidiformes

[Order of Mites]

#### Tenuipalpidae

[Family of Mites]

#### *Raoiella indica*

[Red Palm Mite]

Species described by  
Hirst in 1924

The red palm mite, *Raoiella indica* Hirst, is a pest of several ornamental and fruit producing palm species in West Bengal, India. This mite becomes serious pest in leaves of Coconut trees (*Cocos nucifera*). The infested leaves show chlorosis with several yellow spots on it, which eventually coalesces to form yellow patch. Subsequently, the infested leaves wither. Apart from this host, this mite attacks several other plants viz, Palm tree, Banana, beans etc. It is a serious pest of the fruits (coconuts) of the coconut palm in many countries in the tropics of the Eastern and Western hemispheres. It is distributed in India, Philippines, Mauritius, Reunion, Malaysia, Israel and Egypt, Trinidad and Tobago, Guadeloupe, and Saint Martin (Gupta 2005); Kane et al.,

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**Table 1. The duration of different developmental stages (in days) of *Raoiella indica* at 30°C and 70% RH**

Stage	Duration (days)		
	Mean ± S.E	% mortality	Range
Egg	6.5 ±0.31	Nil	5-8
Larva	7.1 0.60	23%	4-10
Protonymph	6.6 0.34	7%	5-8
Deutonymph	8.2 0.91	Nil	2 -3
Egg – adult	28.9 ±1.98	Nil	18-36

#### Global Distribution:

Egypt, India, Iran, Israel, Mauritius, Oman, Pakistan, Philippines, Réunion, Saudi Arabia, Sri Lanka, Sudan, Thailand, United Arab Emirates, Guadeloupe, Puerto Rico, Saint Martin, Trinidad and Tobago, Haiti and Jamaica

2005; Etienne and Fletchmann, 2006). Since coconut tree is a good deal of importance in different aspects, the life cycle of *R. indica* on leaves of coconut was carried out.

## Methods

Adult mites were isolated from laboratory stock culture of *R. indica*, maintained on excised leaf discs (3 cm<sup>2</sup>) and were placed on a water saturated cotton swab in a Petridish (3" diameter). Leaf discs were made with fresh leaf of *C. nucifera* without mite infestation. The cotton bed was kept wet by soaking with water twice daily so that the discs remained fresh. Mass culture of *R. indica* was set up under controlled condition in the laboratory at 30°C and 70% R.H (relative humidity) maintained in a BOD (Biological Oxygen Demand) incubator. All the Petridishes were kept in BOD incubator at the constant temperature and humidity.

To determine the duration of life stages, 20 freshly laid eggs were placed in 20 separate petridishes and observations were recorded at 24 hours interval under stereo-binocular microscope. The time development of different stages from egg to adult was recorded. The data pertaining to different life stages were taken from those cases when the complete life cycle could reach and also the percentage of mortality at different stages were recorded. Similarly, for computation and statistical analysis of the data, only those cases where life cycle was completed was used. The data was subjected to statistical analysis which was done by SPSS 10.0 for windows.

## Results

Eggs required an average of 28.9 days to develop into adults. Fifteen of the 20 eggs

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observed (70%) became adult. Mortality at the larval and protonymph stages was 23% and 7% respectively. There was no mortality at the deutonymph stage. Duration of egg stage was approximately 6.5 days, followed by larval 7.1, protonymphal and deutonymphal stages each accounting for 6.6 and 8.2 days, respectively (Table 1). Quiescent protonymphal and resting deutonymphal stages were also observed, each one with duration of approximately 1 day.

## Discussion

Since, no studies have been made earlier by others on life-cycle of this mite on leaves of *C. nucifera*, from India, the results obtained in the present study could not be compared with those of other workers. But few reports are available on the life cycle of *R. indica* in other hosts from other parts of the world. According to Vasquez et al. (2015), *R. indica* was able to complete immature development only on coconut, *Adonidia merrillii*, *Ptychosperma macarthurii*, *H. psittacorum* and *A. purpurata* at 29°C and 60% RH. Duration of the immature phase (egg-adult) ranged between 21.5 days on coconut to 34.1 days on *A. purpurata*. In the present study *R. indica* completed its life cycle (egg-adult) in 28.9 days at 30°C temperature and 70% RH. It may be due to the fact that the biology and growth of plant mites depend on the availability of temperature, RH and food, and these factors decide their life-cycle pattern, their abundance and population fluctuations in different seasons (Podder, 2016).

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