

# New Distribution Record of Palm Whitefly, *Aleurotrachelus atratus* Hempel in Kerala, India

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## Abstract

The exotic palm whitefly, *Aleurotrachelus atratus* Hempel was first field intercepted on coconut from Mandya and Mysuru, Karnataka, India during 2019. It was later reported from Tamil Nadu during 2021 from coconut. This technical note highlights on the new distribution record of *A. atratus* from Kannur, Kerala, India during 2022. Morphological features of *A. atratus* puparium were compared with that of the puparium of arecanut whitefly, *Aleurocanthus arecae* David and Manjunatha and the palm aphid, *Cerataphis brasiliensis* (Hempel). Co-occurrence of *A. atratus* with Bondar's nesting whitefly, *Paraleyrodes bondari* Peracchi was also reported on coconut. Conservation biological control using the predator, *Cybocephalus* sp. and the entomopathogenic fungus, *Aschersonia* sp. was emphasized. Being a non-native pest of Neotropical origin, sensitization campaign among the stakeholders is the need of the hour to halt its spread.

## Introduction

Exotic pests have been threatening biodiversity and upset the biotic balance in the newly introduced region. Initially population of such exotic pests outburst in the new environment due to the absence of potential natural enemies. In the post-liberalization era of enhanced trade and travel, such introductions have been quite common. Coconut palms have witnessed the introduction of at least four non-native whiteflies since 2016 attracting specific attention from different stakeholders to combat

such biosecurity risks. Strengthening quarantine at the strategic entry points of sea ports and air ports are therefore very crucial to arrest transboundary regression of invasive pests.

## Impact of exotic pests on coconut

Advent of the exotic coconut eriophyid mite (*Aceria guerreronis* Keifer) in 1998 and its documentation from Kochi, Kerala by ICAR-CPCRI was definitely a beginning of significant impact of alien invasive species in coconut farming. Concerted efforts by research organizations all over the coconut growing belts could effectively tackle the outbreak which spread across the country in no time. Similarly, the exotic rugose spiralling whitefly [RSW] (*Aleurodicus rugioperculatus* Martin) reported from Tamil Nadu and Kerala in 2016 is another example of potential setback faced by coconut farmers from all over the country during the initial phase of introduction. Weather factors and conservation biological control using the aphelinid parasitoid, *Encarsia guadeloupae* Viggiani, predators such as *Apertochrysa* sp., *Cybocephalus* sp. and coccinellids and *in situ* habitat conservation of sooty mould scavenger beetle, *Leiochrinis nilgiranus* Kaszab reduced the invasive potential of RSW significantly in all regions in a period of 5-6 months bringing down the pest intensity to <20%.

Subsequently two nesting whiteflies, *Paraleyrodes bondari* Peracchi and *Paraleyrodes mineilaccarino* were reported by ICAR-CPCRI during 2018. Relatively smaller than *A. rugioperculatus*, the impact of nesting whiteflies

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Fig 1. Palm whitefly pupae



Fig 2. Arecanut whitefly pupae



Fig 3. Palm aphid

was not well felt in coconut system and these nesting whiteflies co-existed with other non-native whiteflies in both coconut and guava ecosystems. Before the fire was doused, another exotic palm whitefly (*Aleurotrachelus atratus* Hempel) was reported from Mandya and Mysuru, Karnataka during 2019 (Selvaraj et al., 2019). Subsequently, *A. atratus* was reported from Tamil Nadu as well during 2021. Henceforth, in a period of four years, four exotic whiteflies of quarantine significance invaded coconut palms and reported from all coconut belts of the country. Though the exotic spiralling whitefly (*Aleurodicus dispersus* Russell) was reported on coconut in 1996, it remained as a minor pest and is still a less preferred host.

### Occurrence of palm whitefly from Kerala

Despite the prevalence of all exotic whiteflies on coconut from Kerala, the palm whitefly (*Aleurotrachelus atratus* Hempel) was not reported from Kerala so far. During the recent surveillance surveys (April, 2022) performed by ICAR-CPCRI to Kannur, Kerala, black puparium bordered by white waxy fringes could be observed on the lower leaflets (Fig 1). This black puparium differed from that of indigenous arecanut whitefly *Aleurocanthus arecae* David and Manjunatha by the absence of conspicuous dorsal spines which is very characteristic to that of *A. arecae*. The white wax fringes of *A. arecae* are restricted along the margin of the puparium and are quite rigid (Fig 2). On the contrary the white wax fringes of *A. atratus* are quite loose and are not only restricted along the margin of the pupae, but cover the back puparium body and obscure it. Even though the palm aphid, *Cerataphis brasiliensis* (Hempel) resembles palm whitefly, the aphids are 1 to 2 mm long, oval, slightly convex body that is dark brown and glossy with a peripheral fringe of white wax plates. A white distinctive transverse suture is also present in the middle of the dorsum which divides the body

(Fig 3). Based on the shape of the pupae, absence of dorsal spines, presence of loose white fringes almost covering the pupae as well as other distinct puparium features, the whitefly was identified as the palm whitefly, *Aleurotrachelus atratus* Hempel. This forms the first distribution record of the pest from Kannur, Kerala and recorded from the villages of Pulingome (12.29°N, 75.39° E) and Cherupuzha (12.28°N, 75.38° E). Out of the 50 palms observed in the villages, about 80% of palm leaflets were found infested by palm whitefly population coexisting with Bondar's nesting whitefly, *P. bondari*. The older leaflets had a greater number of colonies than the younger leaflets. The palm whiteflies, *A. atratus* were also recorded from ICAR-Central Plantation Crops Research Institute, Research Centre, Kidu, Karnataka (12.70°N, 75.57° E) during March, 2022 where they were found co-existing with areca whitefly, rugose spiralling whitefly and Bondar's nesting whitefly. The palm whiteflies were observed to infest coconut in hilly tracts (Kidu: 291m and Cherupuzha: 72 m above the MSL) having high humidity (Kidu: 87.4 % and Cherupuzha: 92.2 %). Though palm whiteflies are known to cause necrotic lesions on palm leaflets elsewhere in the world, such an extensive damage was not visualized on the infested palms.

### Diagnosis

The palm whiteflies lay elliptical, stalked eggs on the lower side of coconut leaflets, which turn black before eclosion. The nymphs possess eight prominent white spots on the dorsal surface, which later coalesce and partially cover the black body. The puparia are black in colour with marginal serrations, round lingula and sub-marginal fold is interrupted at vasiform orifice. Adults are longer than width, with white wings which are held roof like over the body (Fig 4). *A. atratus* has more genetic lineage with *Aleurotrachelus socialis* Bondar and forms a monophyletic sub-clade with solanum whitefly,



Fig 5. Grub of *Cybocephalus* sp.



Fig 6. *Aschersonia* sp. infecting palm whitefly



*Aleurotrachelustrachoides* Back (Josephrajumaret al., 2020).

### Damage symptoms

Palm whitefly was found to cause mild to moderate level of infestation (around 10%) on palm leaflets. No necrotic feeding lesions could be observed. The level of honey dew deposit and sooty mould encrustation was definitely low compared to that of RSW feeding damage mainly due to the smaller size of adult whiteflies. *A. atratus* was found feeding on older palm leaflets of juvenile palms of West Coast Tall, Chowghat Orange Dwarf, Chowghat Green Dwarf and Gangobondam in the surveyed regions of Kannur district(Kerala) and Kidu (Karnataka).

### Natural enemies

Occurrence of the predator, *Cybocephalus* sp. (Fig 5) and natural infection by the entomopathogenic fungus, *Aschersoniasp.* (Fig 6) were observed on the palm leaflets infested by palm whitefly. At Kidu, *Aschersoniasp.* infected nearly 42.28 per cent *A. atratus* colonies. These natural bioagents are found effective in the bio-suppression of the pest and arrested the pest population escalation beyond action threshold in the region warranting no specific intervention. In the presence of natural bioagents on the infested palm leaflets arresting the pest population to explode, conservation biological control is suggested at this point of time.

However, close scrutiny on the population dynamics of palm whitefly is very important for timely intervention. Till that period, conservation biological control would be advised with a pesticide holiday approach. Systematic surveillance surveys and awareness campaign are very important to sensitize

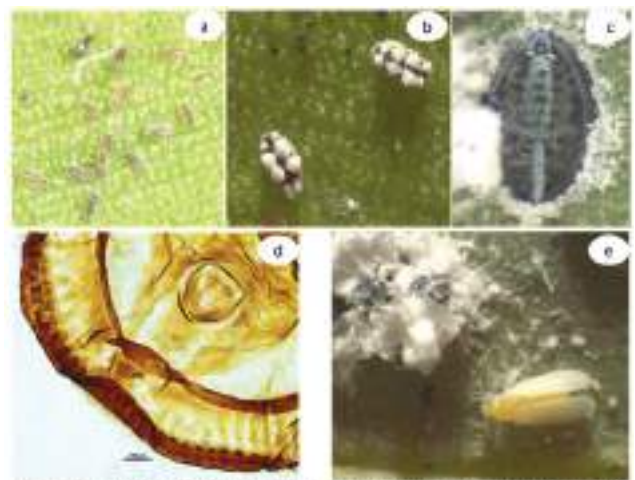


Fig 4. a) Stalked eggs b) Nymphs with eight white spots c) Pupa d) Nasiform orifice with round lingula e) Adult palm whitefly

the stakeholders through the State Department of Agriculture. Strengthening quarantine is the need of the hour to arrest the entry of exotic pests in to the country as several potential invasive pests are waiting at the doorsteps including coconut leaf beetle (*Brontisपालongissima*Gestro) and false coconut scale (*Aspidiotus rigidus* Reyne).

### References

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