

Pest alert !!!

Invasive armoured scale, *Aulacaspis madiunensis* (Zehntner), ravaging Cycas plants in North Kerala

Cycas circinalis (Cycadaceae), commonly called as queen sago ('eendh' in Malayalam) is an endemic gymnosperm species restricted to Western Ghats and hills of southern peninsular, in the states of Kerala, Karnataka, Tamil Nadu and Maharashtra (Hill, 1995; Hill, 2003). In northern Kerala, traditionally, the seeds are used as food, while mature leaves are used for thatching and decorations. The pith extracted from the stem is of medicinal value. The palm is also utilized as ornamental plant in urban gardens. It is a Red Listed Endangered species (IUCN Red List: Varghese *et al.*, 2009) and any incidence of insect pests and diseases on the palm can result in the decline in its population. Recently, a severe infestation of the armoured scale insect, *Aulacaspis madiunensis* (Zehntner), has been recorded on the endemic cycad species, *Cycas circinalis* in the northern parts of Kerala, for the first time in India. This invasive pest poses a serious threat to the ecologically significant cycad palm.

Incidence of the armoured scale on the cycas palm was first observed in March, 2023 in different localities of Kozhikode district and the problem was brought to our notice by the Agricultural Officer of Thuneri krishibhavan. Subsequently, field surveys were conducted in different panchayats (Chekkiad, Thuneri, Vadakara, Mudavantheri, Valayam, Nadapuram, Purameri, Kunnumal and Eramala) to study the extend of infestation and damage. The survey revealed that over 260 trees were heavily infested by the scale insect in the region, with 90 per cent palms being more than 50 years old. Simultaneously, infestation of the scale insect on Cycas palm was also reported from Kannur district (Chokli, Tripangoottur, Panoor and Kunnothuparambu). Farmers and the people in the region raise serious concern over the large scale drying and death of the palms due to scale infestation.

Nature of damage and symptoms

The infestation of the scale insect begins from the base of the rachis and then spread on both the upper and lower surfaces of the leaflets, completely covering it with a crowded population of female and male scale insects. Later the infestation spread on megasporophyll and

the surface of the nuts. In severe cases, the scale insects gather on the stem covering the whole length of the tree. As a result of continuous sap sucking from the parenchyma tissues of different plant parts, the leaflets, nuts, and complete crown exhibit a dried appearance. In case of severe infestation, the whole crown will decay resulting in the death of the trees. The symptom is often mistaken for any disease caused by pathogen infection. However, on close examination, encrustation of the scale insects can be seen on the palm leaves, petiole, stem, rachis and nut surface (Joshi *et al.*, 2023).

Adult female scale insect is elongate to oval, pale yellow and lives under the circular or oval grayish white/waxy cover that is not attached to the adult body, hence the name armoured scale. The cover can be removed to reveal the scale insect hidden below. Males are elongate, parallel-sided, bright white coloured without any cover. Eggs are reddish yellow in colour which are present underside of the female body. On hatching, the crawlers (first instar nymphs) move out and actively search for new feeding sites. They then moult and the subsequent instars are sedentary begin to feed on plant sap. The armoured scale does not produce honeydew and lead to sooty mold development unlike soft scales.

As the scale insect has emerged as a threat to this endangered cycad palm, appropriate management measures are to be adopted to prevent further spread of this devastating pest and conserve North Kerala's invaluable cycad biodiversity.

Management strategy:

- Immediate phytosanitary measure to be adopted to deal with the severely infested palms include cutting and burning of the fronds, rachis and other parts showing encrustation of the scale
- The nymph and adult scale insect is protected by waxy covering. The contact insecticides will not be effective as the insecticides cannot penetrate the waxy covering. Hence timing of spray treatment should coincide with the crawler stage, where waxy covering is absent
- In the homesteads, crawlers can be managed by spraying horticultural mineral oils (2.5%) or neem oil emulsion (2%) or commercial botanical insecticides containing azadirachtin 5% (1 ml per lit) or azadirachtin 1% (3 ml per lit)
- In the gardens and commercial horticultural nurseries, the workers are to be instructed to periodically inspect the cycad palms and take necessary control measures in the initial stage of infestation to prevent further spread of this devastating pest. Systemic

insecticides like acetamiprid 20 SP (0.2 g/L), dinotefuran 20 SG (0.2 g/L), thiamethoxam 25 WG (0.2 g/L) or dimethoate 30 EC (2 ml/L) may be used to manage the scale, when the crawlers emerge.

An immediate, coordinated effort is crucial to halt this biological invasion and protect North Kerala's invaluable cycad biodiversity. Inspect your plants, be vigilant and act decisively against this unrelenting pest.

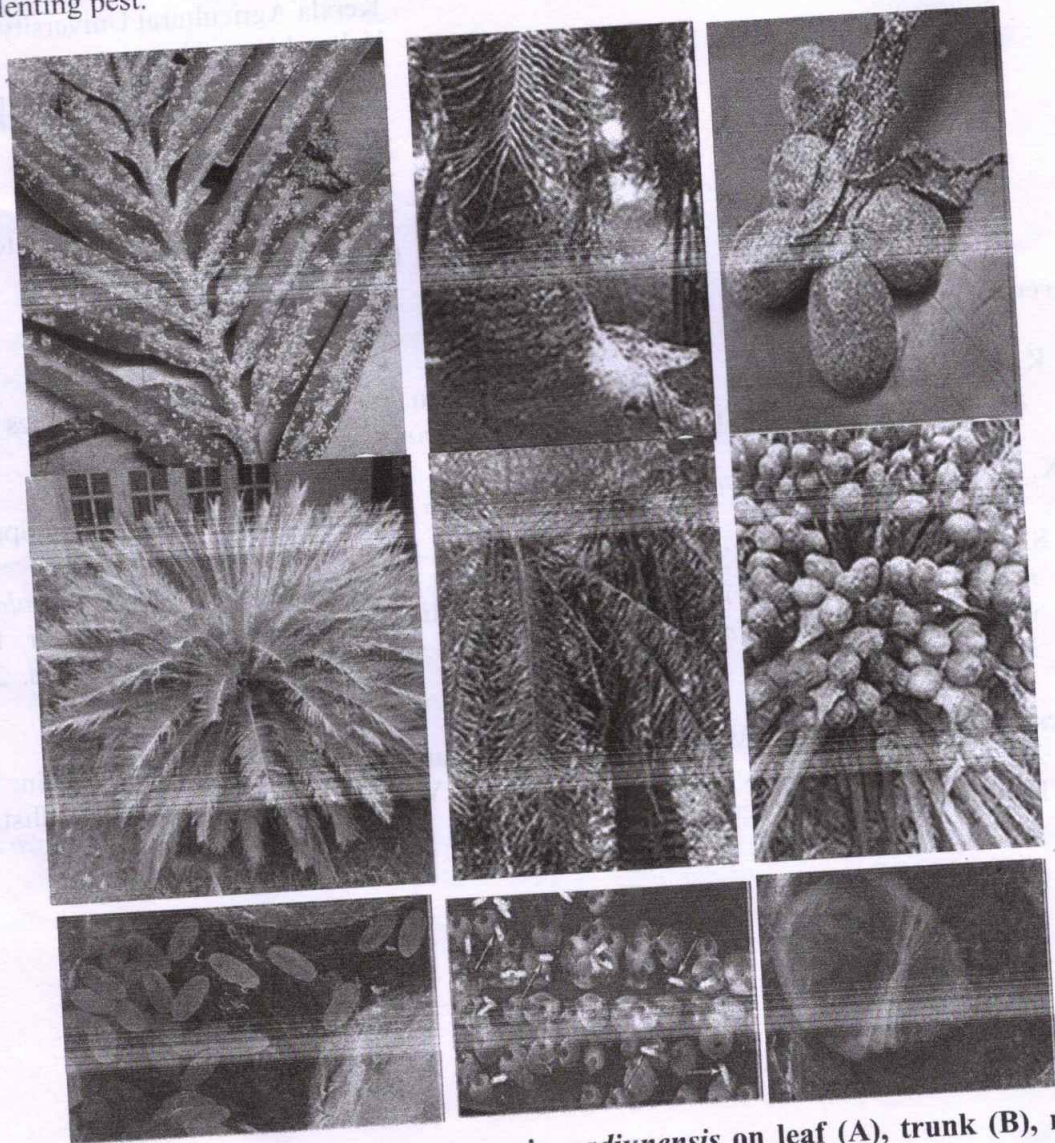


Fig. Encrustation of scale insect *Aulacaspis madiunensis* on leaf (A), trunk (B), nuts (C), early symptom on leaves: yellowing (D), drying and wilting of fronds (E), symptoms on nuts (F), Life stages of scale insect: eggs (G), female and male scale insect on leaf (H), adult female (I)

Acknowledgment

The scale species was identified by Dr. Sunil Joshi, Principal Scientist & Head, Division of Germplasm collection & Characterisation, ICAR-NBAIR, Hebbal, Bengaluru, Karnataka.

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Reference

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