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Cover: Whale Shark *Rhincodon typus* and Reef - made with poster colours. © P. Kritika.



New prey record of giant ladybird beetle *Anisolemnia dilatata* (Fabricius) (Coccinellidae: Coleoptera) feeding on Som Plant Aphid *Aiceona* sp.

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Ladybird beetles are also commonly called lady bugs and coccinellids. Around 6,000 species under 360 genera are classified in two subfamilies and 30 tribes worldwide (Slipinski 2007).

The giant ladybird beetle *Anisolemnia dilatata* (Fabricius) is a specialist predator of woolly aphids of bamboo plants and sugarcane, and endemic to southern Asia and Asia-Pacific regions (Agarwala & Majumder 2016). Fabricius (1755) named this species as *Coccinella dilatata*, later Mulsant (1850) described this species as *Caria dilatata* but widely used name of this species is *Anisolemnia dilatata* which was given by Korschefsky (1932). Iablokoff-Khnzorian (1986) transferred the species into the genus *Megalocaria* but the name *Anisolemnia* was kept as its type species (Poorani 2002).

The genus *Aiceona* Takahashi (1921) belongs to the subfamily Aiceoninae of the family Aphididae. The genus occurs in eastern, southern, & southeastern Asia, including China, India, Nepal, Malaysia, Thailand, and Japan; associated mostly with Lauraceae (Takahashi 1960). Earlier, the subfamily Anoeciinae was composed of two tribes: Aiceonini and Anoeciini (Ghosh 1988), however, Remaudière & Remaudière (1997) elevated the

tribe Aiceonini to the subfamily Aiceoninae that contains only one genus *Aiceona* Takahashi, 1921 in which 18 species are assigned under two subgenera, *Aiceona* Takahashi 1921 (17 species) and *Subaiceona* Remaudière & Remaudière, 1997 (1 species) (Remaudière & Remaudière 1997; Zhang & Qiao 1998; Qiao & Zhang 2002). In India, the subfamily Aiceoninae contains only one genus *Aiceona* of which eight species are recorded on about 10 species of plants belonging to five families: Araliaceae, Lauraceae, Malvaceae, Menispermaceae, Poaceae and Scrophulariaceae (Singh & Singh 2016).

During fortnightly visits (extending from April 2017 to March 2018) to the Som *Persea bombycina* Kost plantations at the farm of Uttar Banga Krishi Viswavidyalaya (North Bengal Agriculture University), Pundibari, Cooch Behar (89.3980°E & 26.3405°N, altitude 43 m), the aphid, *Aiceona* sp. was found to have significant presence and inflict serious damage to the Som plantations by feeding. The Cooch Behar District (West Bengal) adjoining Assam enjoys identical ecological conditions (Eastern Himalayan Zone) like northeastern India and very congenial for mugaculture. Muga Silkworm *Antheraea assamensis* Helfer is reared on two primary host plants, Som and Soalu *Litsea*

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Image 1. Giant lady predator on Som Plant Aphid.

a—Adult beetle in natural habitus in som aphid colony | b—Heavy population of aphid on leaves with black mould | c—Egg cluster of Giant Ladybird Beetle close to a high density colony of *Aiceona* sp. © Biwash Gurung.

monopetala Roxb under outdoor conditions.

The aphid is yellowish-green in colour, larger in size (Table 1) and colonizes the Som plants particularly during new flush. Both nymphs and adults infest the tender buds, apical shoots, and lower surface of leaves. Due to sucking of plant sap from the tender parts of the plant the growth is arrested and curling and reduction in size of the leaves takes place. In case of severe infestation

black sooty mold develops on the honeydew secreted by the aphids (Image 1b). The aphid colony can be easily spotted out due to the association of different types of ants.

The population of aphid was counted from 10 cm apical twig /new flush selecting 10 plants at random and observing five twigs per plant at fortnightly interval during 2017–18. The aphid population throughout the

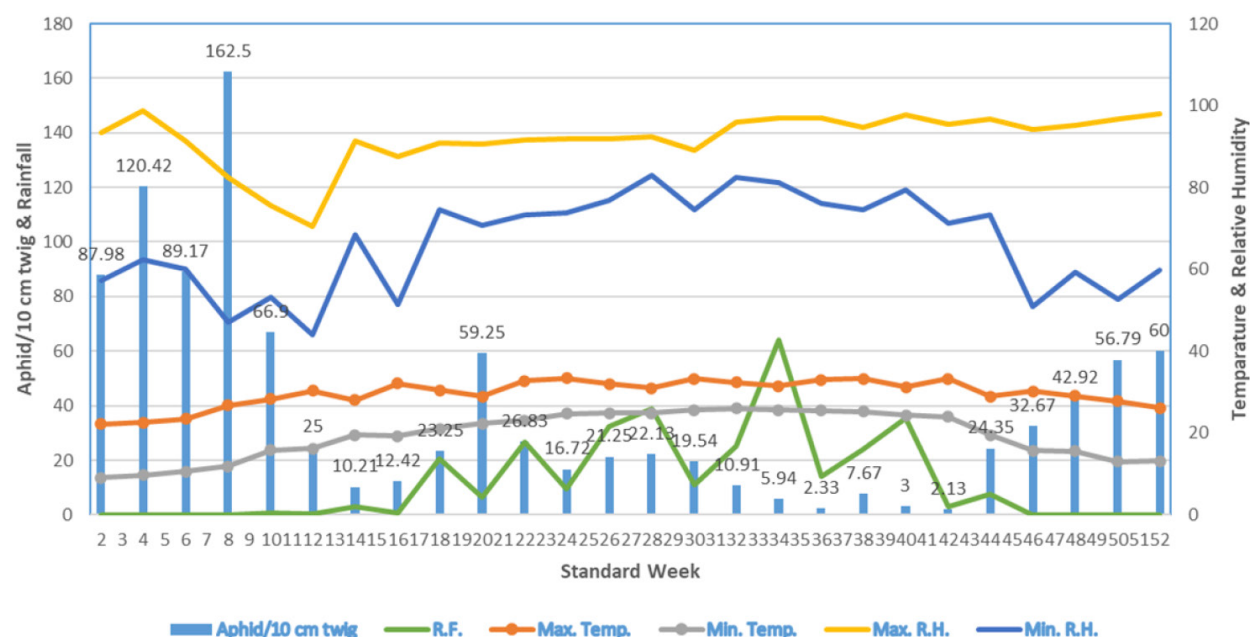


Figure 1. Field population fluctuation of som aphid, *Aiceona* sp. with respect to meteorological parameters.

Table 1. Body weight of different life-stages of *Aiceona* sp. feeding on *P. bombycina*.

Life stages of <i>Aiceona</i> sp.	Body weight* (mg)
First instar nymph	0.2167 ± 0.0747
Second instar nymph	0.5267 ± 0.1143
Third instar nymph	0.9500 ± 0.1167
Fourth instar nymph	1.2967 ± 0.0928
Adult female	1.6267 ± 0.1143

*Mean of 30 observations.

Table 2. Correlation of meteorological parameters with infestation of *Aiceona* sp.

Pest	Meteorological Parameters				
	Max. Temp.	Min. Temp.	Max. R.H.	Min. R.H.	R.F.
Aphid	-0.793**	-0.801**	-0.196	-0.576**	-0.479*

* Significant at 5% level ($r = \pm 0.388$) | ** Significant at 1% level ($r = \pm 0.496$)
 Max. Temp.-Maximum Temperature; Min. Temp.- Minimum Temperature; Max. R.H.-Maximum Relative Humidity; Min. R.H.- Minimum Relative Humidity; R.F.- Rainfall.

study period was correlated with the meteorological parameters collected from the agro-meteorology unit, Uttar Banga Krishi Viswavidyalaya, Pundibari, West Bengal. The population of the aphid persists throughout the year but there has been a noticeable upsurge in population with the advent of winter season and reached the peak level in the spring season, i.e., February end (Figure 1). But the population decreased with the rise of atmospheric temperature soon and maintained at a low to moderate level throughout the summer and rainy season. The population was again found increasing with lowering of temperature during winter season. Significant negative correlation coefficients were found to exist between the aphid population and the maximum and minimum temperature ('r' values -0.793 & -0.801, respectively) (Table 2). Significant negative associations were also established between aphid infestation and minimum relative humidity and rainfall ('r' values -0.576

& -0.479, respectively).

During the time of heavy infestation of aphid on Som, particularly during the spring season from February to April, a significant population of the giant ladybird beetle, *Anisolemnia dilatata* (F.) (Coccinellidae: Coleoptera) were observed associated with the aphid colony. All the life stages of the coccinellid including the egg clusters could be recorded on the high-density colony of the aphid *Aiceona* sp. (Image 1). The adult beetles were collected from the field and reared under laboratory conditions on the aphid for confirmation of its status as a predator on the Som plant aphid (Image 2).

As per the available literature the giant ladybird predator can prey on *Astegopteryx minuta* (Van der Goot), *A. bambusae* (Takahashi), *Ceratovacuna silvestrii* (Takahashi), *Pyrolachnus pyri* (Buckton), *Pseudoregma bucktoni* Ghosh, Pal & Raychaudhuri (Agarwala & Ghosh

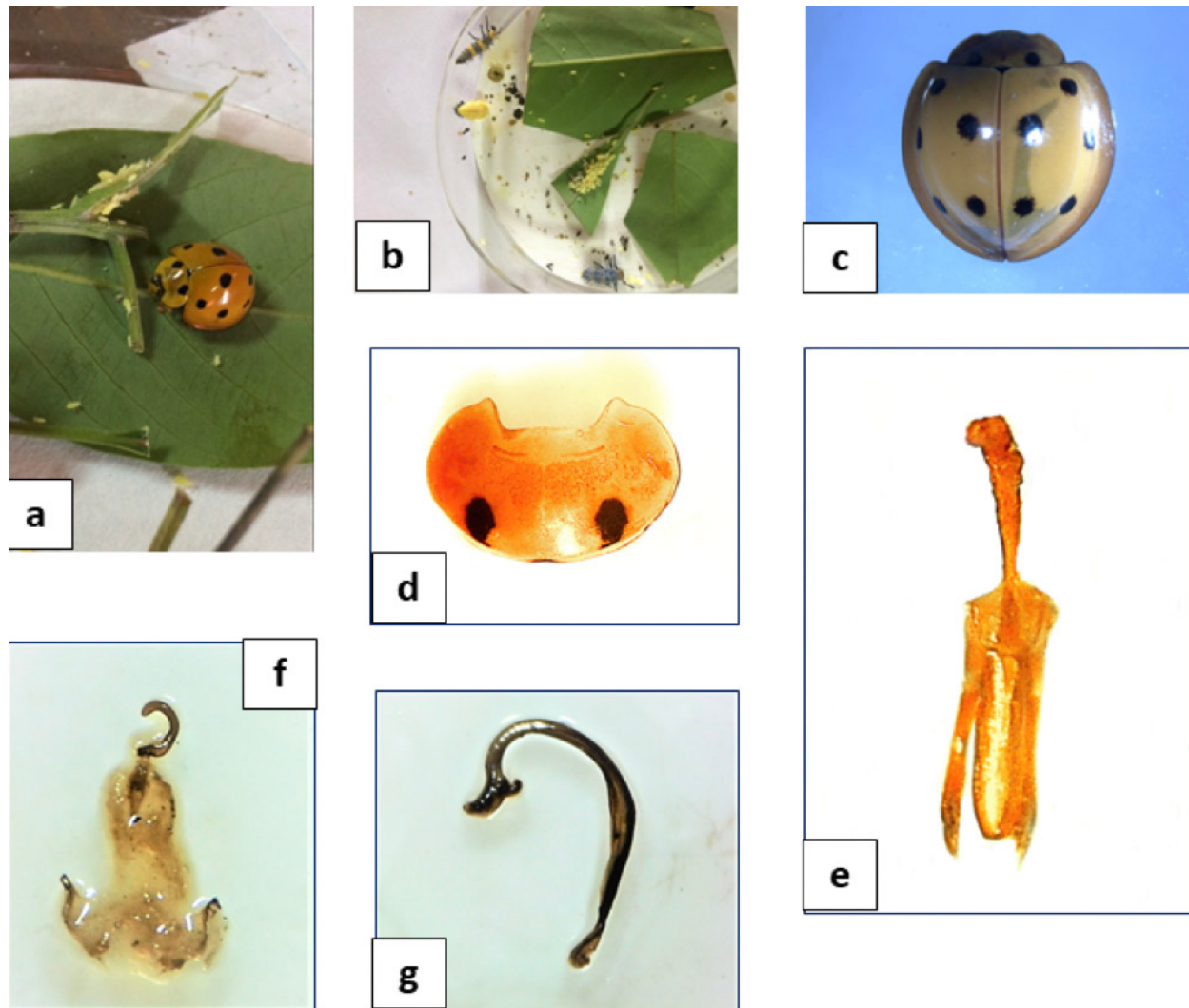


Image 2. Laboratory study of giant ladybird predator, *Anisolemnia dilatata* (F.).

a—Adult beetle reared on som aphid in laboratory | b—Grub & pupa of Giant Ladybird predator | c—Microscopic dorsal view of adult beetle | d—Pronotum of *Anisolemnia dilatata* | e—Male genitalia | f—Female genitalia | g—Siphus. © Ponnusamy Natarajan.

1988). Giant ladybeetle *A. dilatata* feeds voraciously on woolly aphids infesting various bamboo species like *Ceratovacuna silvestrii* (Takahashi), *Ceratovacuna indica* (Ghosh, Pal & Raychaudhury) and *Pseudoregma bucktoni* (Takahashi) in northeastern India (Agarwala et al. 1984). Great predatory potential of *A. dilatata* against sugarcane woolly aphid *Ceratovacuna lanigera* Zehntner has been established under laboratory conditions (Kumar & Pal 2019). Giant ladybird beetles are unique among ladybird predators due to their large size and prey specialization. These beetles mostly appear under high prey density which can occur in case of woolly aphids infesting bamboos and sugarcanes. During the present investigation severe infestation of Som plant aphid with larger body size served as a good host (prey) for the

Giant ladybird beetle and this is a new prey record for the coccinellid *Anisolemnia dilatata* (F.).

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