Resource dynamics and fitness strategy: *Anisolemnia dilatata*'s (Coleoptera: Coccinellidae) response to clumped woolly aphid patches on bamboo

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Unlike majority of generalist predators of soft-body phytophagous insects, the giant ladybeetle predator, *Anisolemnia dilatata* (Fabricius), is a specialist predator of woolly aphids of bamboo plants in parts of tropical Asia. This predator has a long development time and reproductive duration. This study investigated through a field-cum-laboratory approach how a predator optimizes its reproductive and generational timing in bamboo habitats with patchy resources of woolly aphids. Results revealed that the giant ladybeetle females produced 69.20% of total eggs in the high prey density phase (mean ± SEM: 52.52 ± 9.65 aphids/leaf), comprising an average of 11 weeks out of the prey population cycle of 38 weeks. However, gravid females initiated egg-laying at a minimum average prey density of 16.35 aphids/leaf. Females chose narrow and thin parts of bamboo plants for depositing egg batches at a minimum distance of 21.05 cm and a maximum of 46.95 cm from the nearest aphid colony. Such behaviour is unique in aphidophagous predators directed at avoiding egg predation from actively growing conspecific or heterospecific larvae that continue to feed aphids after cessation of egg-laying in the declining phase of the population when prey resources become scarce.

Keywords: Egg-laying window, giant ladybeetle predator, patch quality assessment, woolly aphid population.

distribution, influencing the colonization pattern of aphids that form aggregated colonies[7]. Insects (herbivores and carnivores) dependent on such plant resources are usually specialists showing a preference for feeding on only a few related plant species occurring in similar landscapes[8].

Bambusa blacooa Roxb, *Bambusa nutans* Wall, *Bambusa tulda* Roxb, *B. vulgaris* (Schrand. Ex Wendl.) and *Dendrocalamus* spp. are the most common among 40 odd species of bamboo that occur in abundance in northeastern, central and southern parts of India, and foothills and subtropical Himalayas of Nepal, Myanmar, Bhutan, China and Taiwan. Bamboo grooves form a dense canopy and are perfect hosts of several woolly aphid species[9] that attract predators and parasitoids. Large aggregated colonies of woolly aphids are the preferred prey of the giant ladybeetle *Anisolemnia dilatata* (Fabricius), one of the two large-sized ladybeetle predators specializing in foraging bamboo habitats[10]. The other species is *Synonycha grandis* (Thunberg), which is recorded feeding woolly aphids alongside *A. dilatata* in bamboo plants in Karnataka and Manipur in India[5]. High larval voracity and high reproductive potential over a longer reproductive duration by females make these beetle specialist predators of woolly aphids of bamboo habitats[10]. In the area of this study in Tripura, northeastern India, *S. grandis* has not been recorded[4,10].

It is well demonstrated that larvae of ladybeetle predators