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Incidence of red Pierrot, *Talicauda nyseus nyseus* (Lycaenidae) on the green mother of millions, *Bryophyllum pinnatum* (Crassulaceae)

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Abstract

The present observations of incidence of *T. nyseus* on *Bryophyllum pinnatum* (Fam: Crassulaceae) was observed at a home garden in Bengaluru and reveal that the Red Pierrot has successfully established in home gardens in Bengaluru, reported to be source site for populations establishing in North India. Four generations of *T. nyseus* has been observed in the same plant during 2015-16. Percent damage in the entire plant and percent damage of individual leaves of total leaf area/leaf were recorded based on visual observation of the foliar damage. The mining pattern was initially blisters transforming into blotches as the larvae gradually increased in size.

Keywords: *Talicauda nyseus*, *Bryophyllum pinnatum*, Bengaluru

1. Introduction

Members of the family Lycaenidae show diverse trophic strategies involving herbivory, and carnivory. The larvae of the red Pierrot, *Talicauda nyseus nyseus* (Lycaenidae) are adapted to a special type of environment of leaf mining. There are 8 species in the genus *Talicauda* with oriental distribution viz., *annamitica*, *assamica*, *buruana*, *clitophon*, *khasiana*, *macbethi*, *metana* and *nyseus*. The species *T. nyseus* is represented by two subspecies in India, *Talicauda nyseus nyseus* Guérin-Méneville, 1843 – Indian Red Pierrot and *Talicauda nyseus khasiana* Swinhoe, 1893 – Khasi Red Pierrot. The host range of the monophagous larvae includes, succulent rockery plants, *Bryophyllum calycinum* and *Kalanchoe kirkii* (David and Ananthakrishnan, 2004) [2]. *K. laciniata*. Karunaratne *et al.* (2002) [3]. Reported an association between *T. nyseus* and the lichen *Leproloma sipmanianum* its larvae can feed on the lichen. *T. nyseus* is distributed from India and Sri Lanka to Burma, Thailand and South Vietnam. This is a forest edge species, found at altitudes up to about 2000m, but is most commonly met with in hill forest habitats between 300-800m above sea level (<http://www.learnaboutbutterflies.com/India%20-%20Talicauda%20nyseus.htm>). It is known to occur in South India throughout the year and it is abundant during March –May and September-December. Its initial colonization in the lower western Himalayas has suggested it to be an indicator of the changing environment (Singh, 2005) [7]. Its distribution is reported from different locations in South India (Kunte, 2000) [4]; Kerala (Skaria *et al.*, 1997) [8] and extending its range north of the country, Dehradun (Singh 2005) [7]; Delhi (Smetacek 2009) [9]; Kumaon Himalaya (Smetacek 2011) [10]; and Himachal Pradesh (Mahendroo, 2013) [5]. Bais (2015) [1] reported the predation of *T. nyseus* by the Indian Yellow Wasp (*Polistes hebraeus* Fabr.).

The present observations of incidence of *T. nyseus* on *Bryophyllum pinnatum* (Fam: Crassulaceae) was observed at a home garden in Bengaluru (N13.014783, E: 77. 607111) (Fig 1 & 2). The present observations reveal that the Red Pierrot has successfully established in home gardens in Bengaluru, reported to be source site for populations establishing in North India (Singh, 2005) [7]. Although four generations (two summer and two monsoon) of *T. nyseus* has been observed in the same plant during 2015-16, data pertaining to the incidence of the second (monsoon 2015) and fourth generation (monsoon 2016) of the butterfly is reported. Percent damage of the leaves (technically phylloclades) in the entire plant and percent damage of individual leaves of total leaf area/leaf were recorded based on visual observation of the foliar damage. Leaf mines were observed in mature leaves only. The larva mines into the thick fleshy leaf and feeds on the parenchymatous tissue depositing a trail of frass which accumulates

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as granules when dried. The mining pattern was initially blisters (Fig 3) transforming into blotches as the larvae gradually increased in size. The frass pattern was initially single and accumulated to show a distributed pattern (Fig 4) as the larvae pupated. The leaf becomes pale and in most cases droops and drops from plant. Pupae (Fig 5) were observed anchored to the rims of the plant pot or on the leaves. Three pupae (one dorsal and two ventral) anchoring a single leaf was observed in the second set. Pupation on leaf was observed on less damaged leaves and its site was away from mines and spined cocoons are strategies to protect themselves from predation. Newly emerged adult at pupation site is seen in Fig 6. During the first set of observation (Fig. 7) of the total 30 leaves, only 13 large leaves with mines were counted with a maximum record of 70% damage in terms of leaf area of individual leaves of the 43% damaged leaves. Of the 54% damaged leaves (29 damaged of total 54 leaves counted) highest damage of 90% in terms of leaf area was recorded in the second set (Fig 8).

B. pinnatum like most crassulacean plants is a morphologically simple plant with succulent, cylindrical leaves and a smooth stem, characteristics that have probably evolved primarily as an adaptation to a xerophytic habit. However, an additional selective force for a reduction in plant structural complexity may have come from the insect community itself, as a simpler plant structure has been proposed to lead to a reduction in insect herbivory (Moran 1980) [6] unlike architecturally complex plants potentially having more niches and providing enemy-free space, and therefore expected to support a greater number of insect species (Moran 1980; Strong *et al.* 1984) [6, 11].



Fig 1: *Bryophyllum pinnatum* plant with *T. nyseus* larval mines



Fig 2: Plantlets along the margin of a mature leaf



Fig 3: First instar larvae mining



Fig 4: Larval frass



Fig 5: Pupae



Fig 6: Newly emerged adult *T. nyseus* (exuvia seen)

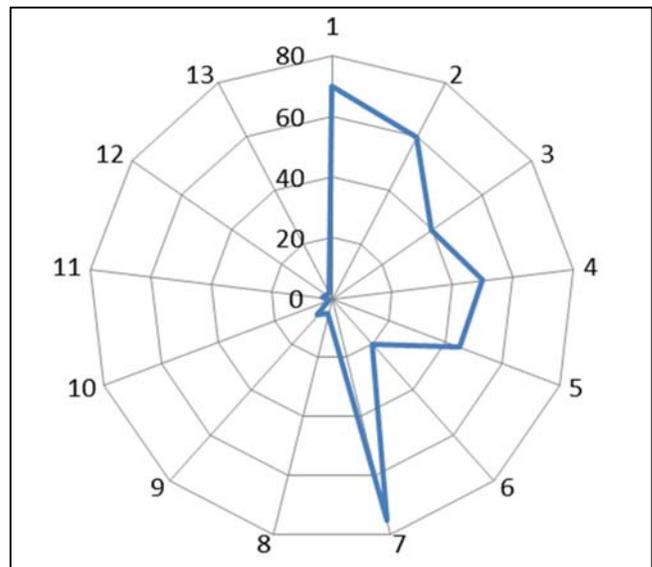


Fig 7: Percent damage caused by larval mining (Generation 2)

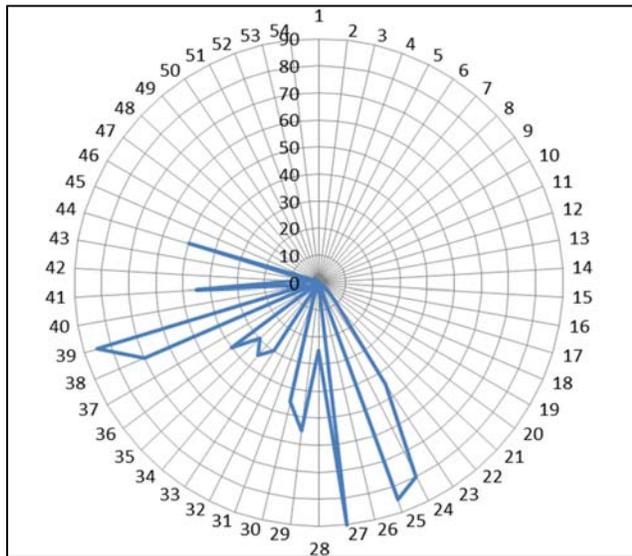


Fig 8: Percent damage caused by larval mining (Generation 4)

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