

A New Record of Larval Host Plant, *Alysicarpus Monilifer* (Family: Fabaceae) of *Zizina otis* Fabricius, 1787 Butterfly from Tirunelveli, Tamil Nadu

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Abstract

This paper reports *Alysicarpus monilifer* (L.) DC (Fabaceae) as a new larval host plant for *Zizina otis* Fabricius, 1787 (Lycaenidae) from Tirunelveli, Tamil Nadu, India.

Keywords: *Alysicarpus monilifer*; Lesser grass blue; *Zizina Otis*; Lycaenidae; new host plant

Introduction

The larval host plant of butterflies is important for their survival and reproduction [17]. Butterflies lay their eggs on or near specific host plants, which serve as a source of food for the developing caterpillars [19]. Without its specific host plant, the butterfly caterpillar would not have the necessary nutrition to survive and develop into an adult butterfly. Additionally, certain butterfly species have specific requirements for their host plants, and may only lay eggs on one or a few specific plant species [7]. Butterflies that inhabit dry grasslands typically use a variety of host plants that are adapted to surviving in arid conditions. It is important to note that butterflies in dry grassland regions are also vulnerable to habitat loss or changes in the availability of their host plants due to human activities such as urbanization, agriculture, and overgrazing [15].

Documentation of larval host plants of butterflies is important for several reasons. The 'host plant' tag can help with the conservation of both the butterfly and the plant [11]. This information can be useful in identifying and protecting habitats that are important for these species and to manage them in a sustainable way. It can also aid in understanding how these insects will be affected by a changing climate and in developing strategies to support their survival [16].

India is known for its high diversity of butterflies, with over 1600 species, including 312 species of butterflies from the family Lycaenidae recorded in the country. The diversity of butterflies in India is influenced by the wide range of habitats that are present in the country. From wetlands, grasslands, and forests, to agricultural lands, each of these habitats supports a unique set of butterfly species [10]. The main documentation of larval host plants of butterflies from India was done by T. R. Bell (1909 - 1927). After this date, a significant amount of research on butterfly larval host plants has been carried out. Recently, a total of 834 plant species have been reported as butterfly larval host plants from the Western Ghats alone by Nitin et al. (2018).

Materials and Methods

The *Zizina otis* Fabricius butterfly was found opportunistically in 2017 at the Agasthyamalai Community Conservation Centre (ACCC). The caterpillars and plants were photographed with a Panasonic Lumix DMC-FZ40 Point & Shoot Camera and Canon 90d with a 100mm prime macro lens. The collected caterpillars were kept and maintained in plastic boxes at room temperature and fed with fresh leaves and seeds. The boxes were cleaned daily to avoid fungal attacks and ensure hygiene. A digital vernier caliper scale was used to measure the size of the larvae.

Results and Discussion

The Lesser Glass Blue (*Zizina otis* Fabricius, 1787) is a small butterfly from the subfamily Polyommatae and family Lycaenidae [9]. Collectively called “Grass Blues”, these butterflies are found throughout India. The Lesser Grass Blue is swift-flying and active with forewing lengths ranging between 8mm to 16mm. It prefers open, dry areas. It flies close to the ground and feeds on small flowers that grow at ground level. The male is a dull purplish-blue color on the upper surface of its body whilst the female is brown [10]. The underside is grey with a series of small dark spots on the fore- and hindwings. The caterpillar of this species is greenish with a cream-yellow line on the segmented body which is covered with tiny hairs (Figure 1. D).

Alysicarpus is a genus of flowering plants in the legume family, Fabaceae. It is distributed in tropical and subtropical regions of Africa, Asia, and Australia. There are 34 species of plants recorded from this genus and about 17 species from India. *Alysicarpus monilifer* is abundant in open grasslands and provides food and shelter for ants, beetles, lizards, snakes, geckoes, etc. This plant is also an important medicinal herb, has anti-inflammatory properties, and is used in treating stomach ache, fever, jaundice, leucoderma, diarrhea, skin diseases, kidney stones, and as an antidote to snakebite [6].

Alysicarpus monilifer (Figure 2) is a diffuse or prostrate, much-branched dryland herb, with branchlets with elongated, spreading, pilose hairs. Its leaves are broadly oblong or elliptic-oblong, the base is subcordate, and the apex is obtuse or rounded, mucronate, glabrous or sparsely hairy. Flowers are arranged in axillary racemes; with a pink to violet corolla [5]. The fruit pods are distinctly moniliform and the seed is ovoid. An important and interesting observation is that the caterpillar of the Lesser Grass Blue camouflages very well with the fruits of the *A. monilifer* plant.

S. No	Plant name	Family	Reference
1	<i>Amaranthus viridis</i>	Amaranthaceae	Wynter-Blyth 1957
2	<i>Alysicarpus vaginalis</i>	Fabaceae	Wynter-Blyth 1957; Kunte 2000; Robinson et al. 2010; Gamage, R 2013
3	<i>Desmodium heterophyllum</i>	Fabaceae	Kasambe, R 2016
4	<i>Desmodium triflorum</i>	Fabaceae	Nitin et al. (2018)
5	<i>Sesbania bispinosa</i>	Fabaceae	Wynter-Blyth 1957; Kunte 2000; Robinson et al. 2010
6	<i>Zornia diphylla</i>	Fabaceae	Bell 1918; Wynter-Blyth 1957
7	<i>Zornia gibbosa</i>	Fabaceae	Wynter-Blyth 1957; Kunte 2000; Robinson et al. 2010
8	<i>Zornia reticulata</i>	Fabaceae	Robinson et al. 2010
9	<i>Tribulus terrestris</i>	Zygophyllaceae	Robinson et al. 2010; Nitin, R., 2018
10	<i>Vicia sp.</i> ,	Fabaceae	Kehimkar, I 2008
11	<i>Mimosa pudica</i>	Mimosaceae	Mathew, G 2011

Table 1: Previously reported host plants of *Zizina otis*.

On the afternoon of 12th February 2017, while carrying out a butterfly transect at the Agasthyamalai Community Conservation Centre (ACCC), I came across a *Zizina otis* butterfly (Figure 1) laying eggs on *Alysicarpus monilifer*. I later observed the caterpillars on the same plant, eating the leaves. The earlier instar of the caterpillar was collected from the plant. It changed into a pupa on 4th March 2017, and emerged as an adult on 10th March 2017. It took seven days to change from pupa to adult stage. In the field, the pupa can be found under the leaf or branches of the plant. The eggs, caterpillars, and pupae were also observed in dry grasslands of Tharuvai, Moolakaraipatti, Koonthankulam, Rengarajapuram and, Panayankulam (Figure 3) in Tirunelveli district.

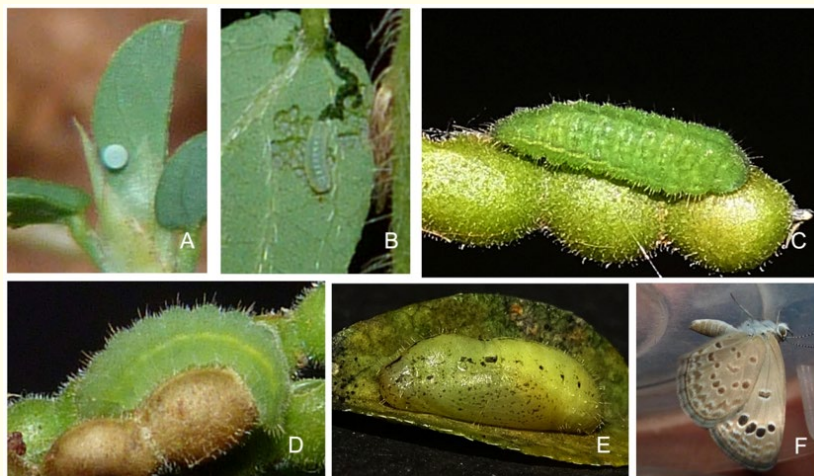


Figure 1: Life cycle of *Zizina otis* on *Alysicarpus monilifer*. A. Egg, B-D. Caterpillar, E. Pupa, F. Adult.



Figure 2: The larval host plant, *Alysicarpus monilifer*.

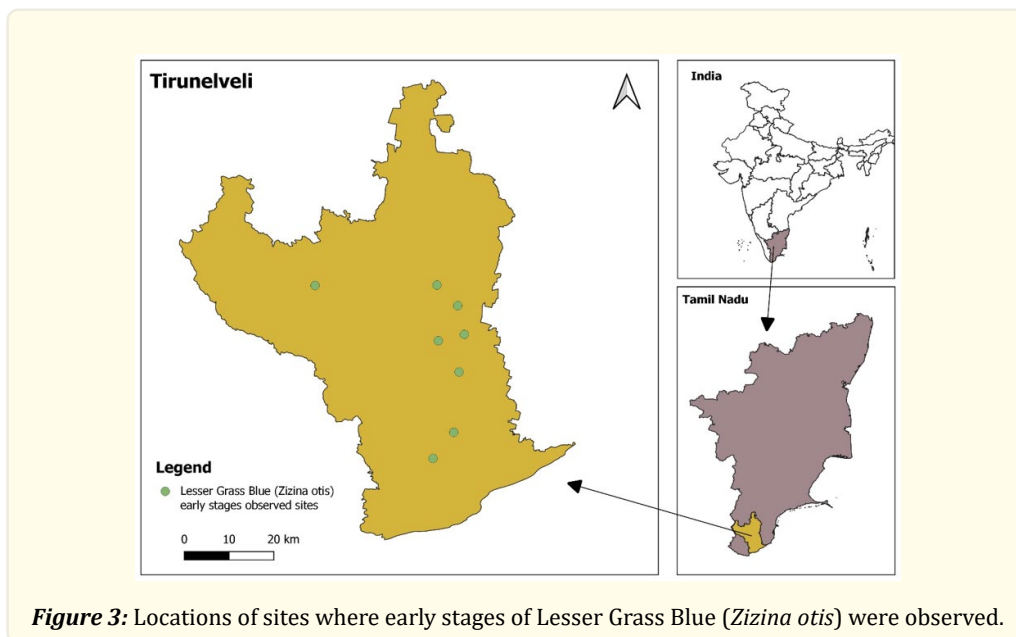


Figure 3: Locations of sites where early stages of Lesser Grass Blue (*Zizina otis*) were observed.

An egg and different stages of caterpillars of the Lesser Grass Blue were once again observed on a *A.monilifer* plant at the ACCC on 14 January 2023 at 14:30 hrs. I collected the three different stages of caterpillars in boxes to observe the life stages. The 1st caterpillar was the largest compared to the other two caterpillars. It pupated on 16 Jan 2023 and remained in a pupal state for seven days. The adult butterfly emerged on 21 January 2023. The 2nd caterpillar was 4.9mm long when it was collected and grew up to 8.4mm. It pupated on 22 January 2023 at a body length of 6.7mm. The 3rd caterpillar, collected on 18 January 2023, while collecting food plants for the previously collected caterpillar, was initially 4.8mm long, grew to 8mm and turned into a pupa on 25 January 2023. It emerged as an adult butterfly on 30 January 2023.

The butterfly places blue toroidal eggs singly on the leaves of the food plant. A small network of triangular white ribs covers the surface of each egg. Each egg is around 0.5 mm in diameter. The caterpillars resemble green slugs and have short, light-colored hairs. They have a narrow yellowish stripe running along either side of their bodies, a dark green stripe down the middle, and a green stripe along the back. The caterpillar holds its head tucked under the thorax. The head is usually hidden and either brown or black in color. With various black markings, the pupa can be dirty pink, pale green, or light-yellow in color. A cremaster and girdle are used to secure the pupa to a practical surface. The pupa measures between 6 and 8 mm in length.

An interesting feeding behavior of this caterpillar was observed while rearing.

The initial instars feed only on the soft surface layer of the leaves. After reaching the second/third instar stage, the caterpillar makes a hole in the fruit and feeds on the interior part of the fruit., While feeding, it keeps its head inside the fruit while the rest of the body is visible outside the fruit.

Conclusion

Earlier records of larval host plants do not include *A. monilifer*. The Lesser Grass Blue indicated its preference for *A.monilifer* even in the presence of previously recorded host plants. *A.monilifer* could therefore be a major host plant for *Zizina Otis*. More studies on the availability of host plants and the butterfly's preference are necessary to better understand the biology of *Zizina otis*.

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Conflict of interest

Author do not have any conflict of interest.

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