Journal of the Andaman Science Association Vol. 30 (2): 116-127 (2025)
ISSN 0970-4183, Printed in India

Poaceae taxa offered as Larval Food Influences Fecundity of Andaman Long branded Bushbrown, *Mycalesis visala andamana* Moore in an island ecosystem

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Abstract

Grass species viz. *Digitaria sanguinalis* (L.) Scop. (Poaceae) has been recorded here for the first time as new host plants for larvae of Andaman Long branded Bush brown butterfly, *Mycalesis visala andamana* (Lepidoptera: Nymphalidae) in the tropical ecosystem of Andaman and Nicobar Islands, India. Its impact on host species and conservation status are assessed. The grass species appear to be most susceptible to damage by the larvae, feeding on the leaves of the plant and affecting its growth. Larvae damage the leaves of grass host species which is native to the Andaman and Nicobar Islands.

Key words: *Poaceae; Mycalesis; Lepidoptera; Nymphalidae; Digitaria.*

Introduction

Grasses belongs to most economically important plant family, Poaceae, adapted to diverse environments and well recognized as natural resource for essential food, forage, building materials, fuel etc. worldwide. It is known to offer larval food for Lepidoptera: Nymphalidae butterfly. (Davidson & Aitken, 1890; de Nicéville & Manders, 1899; Bell, 1909; Green, 1910; Ormiston, 1924; Woodhouse, 1949; Dassanayake, 1994; Igarashi & Fukuda, 1997; Veenakumari *et al.,* 1997, 2008; Braby, 2000; Sourakov & Emmel, 2001; van der Poorten & van der Poorten, 2012; Naik, & Mustak, 2015; Robinson *et al.,* 2023). Other group of plants also recorded as larval host plants for Lepidopteran butterflies (Purti *et al.,* 2022, 2023a,b, 2024a,b, 2025). The family Poaceae is found throughout the India including ANI and comprises *ca.* 1506 species under 266 genera (Kellogg *et al.,* 2020). ANI is one of the hotspots of biodiversity where the family Poaceae stands first having *ca.* 197 species under 80 genera (Singh & Ranjan, 2021; Singh *et al.,* 2021). ANI has unique grassland which occurs on low hill sides of Teressa, Bompoka, Nancowry and Kamorta and in the central part of Trinket. Lowland grasslands are restricted to Great Nicobar Islands mainly on the inland riverbanks. Except for notable exceptions like *Oryza sativa* there is no report on Poaceae as a larval host plant from India. *Digitaria sanguinalis* (L.) Scop. of Poaceae family is recorded here as new host for Long branded Bushbrown butterfly, *M. v. andamana* Moore (Lepidoptera: Nymphalidae) from ANI, India for the first time. In ANI the genus *Digitaria* is represented by only nine species and distributed throughout the Islands. During field study found that *D. sanguinalis* feed by larvae of long branded Bushbrown butterfly, *M. v. andamana from grassland area of South Andaman*. Developmental stages of life history traits (egg, larvae, pupa) of this endemic butterfly were observed on this grass and described here in great detail.

The order Lepidoptera, which comprises of butterflies and moths, is one of the most well-known and popular insect orders. Linnaeus coined the term Lepidoptera in 1735, which means "scaly-winged" insects and the order is distinguished by the presence of pigment-bearing scales dense broad scales on their wings. These scales are flattened, modified hairs that give butterflies and moths their unique colour patterns. About 160 million years ago it appeared on the evolutionary scene and they were last to appear almost parallel to angiosperms. Lepidoptera

has a diverse and remarkable set of characteristics that distinguishes it as a distinct and highly specialized group among insect orders. Lepidoptera reproduce sexually and are holometabolic. Lepidopterans have four life history stages: egg, larva or caterpillar, pupa or chrysalis and imago or adult, all of which differ not only in morphology but also in habits as well (Sidhu, 2023). The order Lepidoptera comprises of five super families namely Hesperiidae, Papilionoidea, Pieridae, Lycaenidae and Nymphalidae. *The genus Mycalesis belongs to family* Nymphalidae and is distributed in Africa, Australia, India and central parts of Asia. Globally, there are approximately more than 100 species (Goonesekera *et al.,* 2013) of which 20 are found in India (Anonymous, 2023). Various workers have documented larval host plant for the butterfly belonging to *Mycalesis* spp. (Kasambe, 2018; Kunte, 2000; Kalesh & Prakash, 2015; Jayasinghe *et al.,* 2021; Robinson *et al.,* 2023). *M. v. andamana is an endemic butterfly found in the Andaman group of Islands of ANI.* This investigation aimed to record the herbaceous grass host plants and detail the life history traits (morphology of the egg, larva and pupa stage) of *M. v. andamana* and assess its impact on herbaceous grass host species.

Material and Methods

Observed live plant and butterfly specimens through eight field trips to localities where natural populations occur (Manglutan, North Wandoor, Wimberlygunj, Bakultala, Karmatang, Laxmipur) during 2017-2023. Eggs and larvae of *M. v. andamana* were collected from the infested grass, *D. sanguinalis*. Field surveys were conducted to quantify the impact of *M. v. andamana* herbivory naturally occurring plants in type localities (Fig.1). All the collected voucher specimens of grass and *M. v. andamana* have been deposited in the herbarium of BSI, ANRC (PBL). GPS (Garmin Montana 680) coordinates of the localities of wild population were recorded. *M. v. andamana* eggs along with the host plants were placed in a separate sterile labeled plastic box. The droppings of the larva were cleaned periodically and fresh young leaves of the host plants were replaced. The larval stages of *M. v. andamana* were monitored daily, documented and photographed under a stereomicroscope (Olympus SZ 61) at the ANRC, BSI.

Result

Taxonomic Notes on Poaceae host plants

Digitaria Haller (Poaceae)

Digitaria sanguinalis (L.) Scop., Fl. Carniol., ed 2, 1: 52. (1771)

Distinguishing features: It is recognized by tufted decumbent, hollow weak stem sparsely spreading. It spreads 1 m or more, rooting from the lower nodes. The sheaths are pubescent and shorter than the internodes. The leaf blades are flat, soft and pubescent 5–10 mm in width. Inflorescence consisting of 4–9 erect or spreading, digitate racemes at the apex of the stem. Spikelets in pairs, *ca.* 3 mm long.

Distribution / Locality selected for in-situ observations: The native range is Medit. to Central Asia and Malesia. In India it is distributed throughout the country. In ANI, its population recorded in the grassland area and the area of Andaman group of islands: Manglutan, North Wandoor, Wimberlygunj, North & Middle Andaman: Bakultala, Karmatang, Laxmipur were found to be infested by Andaman Long branded Bushbrown butterfly (Fig. 1).

Habitat: Grassland and lawns, roadside, along footpaths, field, trails, disturbed areas, degraded areas.

Conservation status: The plant is commonly distributed and its status is not evaluated. During present field surveys found that some of the natural populations are under great threat due to developmental activities like construction works, development of agricultural field etc. Due to anthropogenic pressure, it is assessed here as under threat in these Islands.

Notes on the pest species of *Digitaria sanguinalis* (L.) Scop. (Fig.1-3).

***Mycalesis visala andamana* (Moore, 1892) (Lepidoptera: Nymphalidae)**

Morphology and Description

M. v. andamana Andaman Long branded Bushbrown butterfly is a sub species endemic to the Andaman Islands (Chandra & Rajan 2004; Veenakumari *et al.,*

2008, Varshney & Smetack 2015; Singh, 2022). These butterflies are brown in colour with eyespots on the underside of their wings and are mostly found in shade. The upper surface is dark brown with one white centre spot on the forewing. The under surface is light brown with a white transverse band in the middle of the wings. The forewing shows two ocelli and the hind wing with 7 ocelli. The wingspan ranges from 25–35 mm.

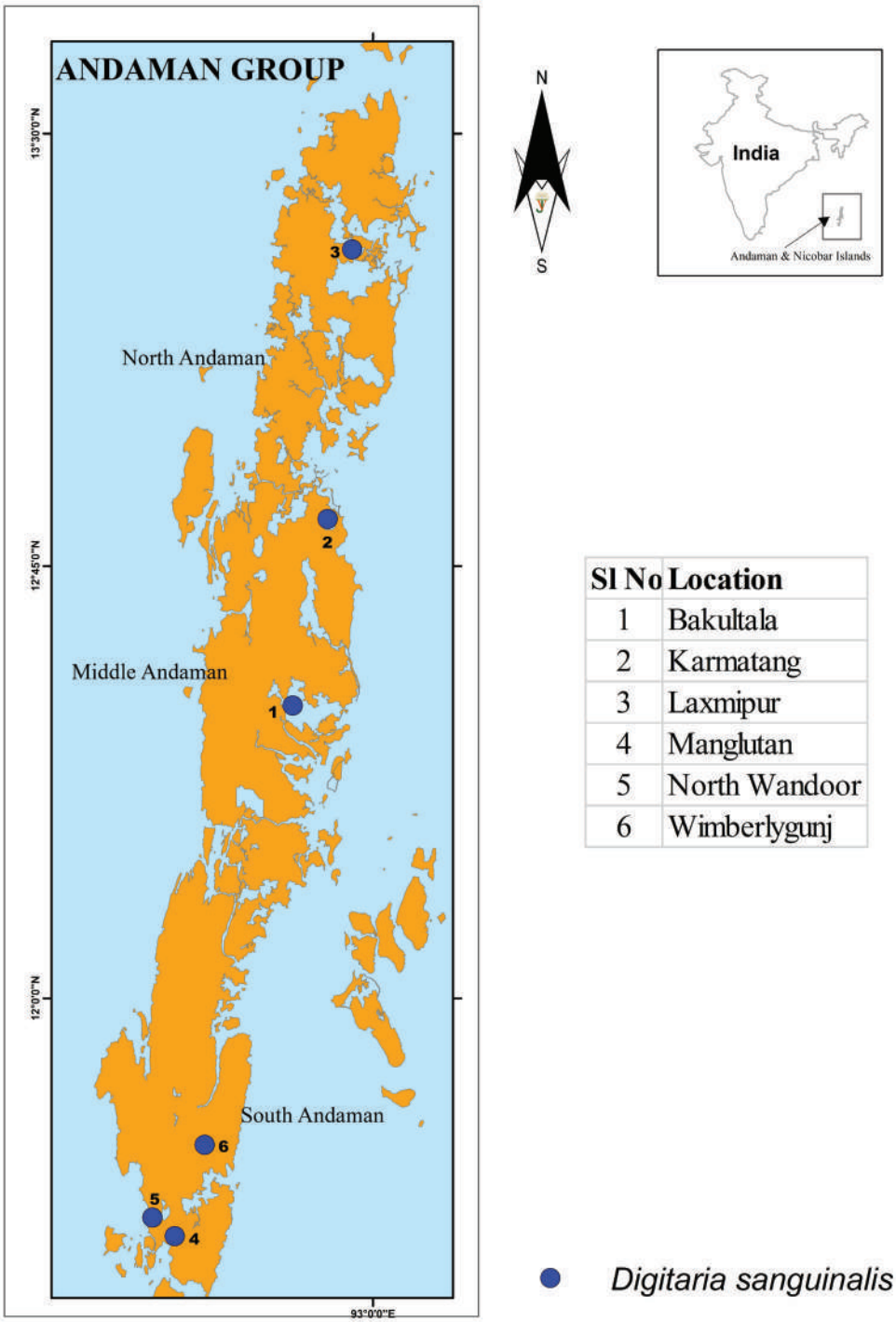

Figure 1. Distribution and study localities of Digitaria sanguinalis (L.) Scop. in the present study

Description of immature stages / Life history traits of Andaman long branded Bushbrown.

Egg: The female butterfly lays egg singly on the underside of the leaf lamina. The egg is spherical in shape and white in colour. It takes 3-4 days for the egg to hatch the caterpillar immediately feeds on the egg shell after emergence.

1st instar stage: The caterpillar has a thin whitish cylindrical body with an initial body length of about 3.5 mm. Its body is covered with moderately long setae over the dorso-lateral rows. At the tail end a pair of backward-pointing processes can be found. The head is blackish-brown colour with numerous seate, further a pair of short and round horns with few lateral protuberances. Since leaf is its diet, the 1st instar caterpillar acquires a strong greenish undertone. During its growth, the last two to three segments at the posterior end turn red in colour as it grows. It takes 3.5-4 days with a body length of about 6.5mm to molt into 2nd instar.

2nd instar stage: The rounded horns of the head become pointed and the two anal processes elongates and thus appears pronounced in the 2nd instar. Few lateral conical projections on the head capsule shortens and turns whitish in colour. Its body colour turns pale yellow in colour with a green undertone. The body and the head have numerous minute tubercles, single seta originates from each of the tubercles. This stage lasts for 2.5-3 days with body length ranging 10-11 mm to molt into 3rd instar.

3rd instar stage: In this stage the caterpillar almost resembles the earlier instar stage. The head capsule is brown in colour while the cephalic horns and the basal areas around the mouth parts turns pale brown in colour. This stage lasts for 3-4 days with a body length of ranging 16-17 mm to molt into 4th instar.

4th instar stage: In this stage the instar closely resembles the previous instar initially with no apparent changes in any features. As the growth proceeds the base of the body turns either to pale yellowish green or pale brown with lateral obscure and oblique stripes. Small reddish specks are observed over these stripes leading to the abdominal segments. This stage lasts for 4-4.5 days with body length ranging 24-28 mm to molt into 5th instar.

5th instar stage: This is the last and final instar stage. Brown or yellow or green caterpillars are seen in this stage. The cephalic horns turn to orange colour at the tip while the oblique stripes over the body segments become broader and more prominent. The red specks in the previous stage now turn black and larger. The red coloration on the dorsum of the posterior segments has completely disappears. This stage lasts for 7-9 days with a maximum body of about 38-39 mm and thus entering into pre-pupa stage.

Pre-pupa Stage: The body length gradually shrinks and turns green in colour. Consequently, the caterpillar locates a suitable site on the underside of the leaf blade or on a stem to spin a silk pad. Later it secures itself through its claspers situated at its anal end and assumes upside-down pre-pupatory pose.

Pupa: A day after the pre-pupal stage the pupa appears somewhat angular, smooth and green in colour. Small black speck dotting was observed on the wing pad and ventral side of the abdomen as well. Small and obscure yellowish spots can be observed on the dorso-ventral pairs on the abdominal segments 2-6. The length of the pupae was measured to be 16-17 mm. after 5-5.5 days of hibernation the pupae appear to be blackish-brown in colour with tinge of green. On the forewing and wing pads ringed-spots were observed. On the 6th day adult butterfly emerges and ready to commence the next chapter of its life cycle.

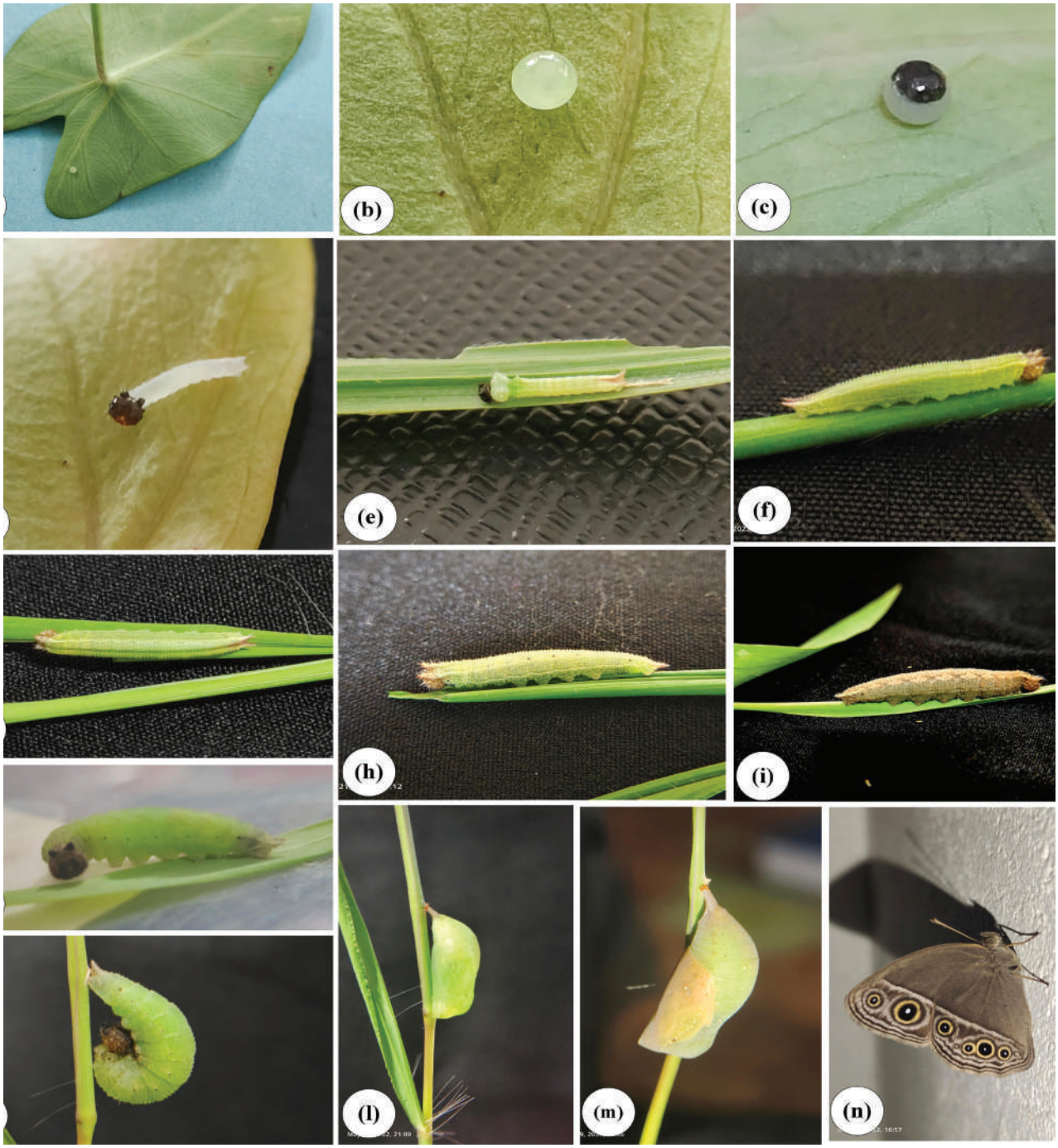

Figure 2. Life history traits of *Mycalesis visala andamana;* (a). eggs laid on underside of leaf lamina of *Colocasia esculenta*; (b). close up view of egg; (c). view of egg before hatching of larva; (d-e). first instar larva; (f). second instar larva; (g). third instar larva; (h). fourth instar larva feeding on the leaf of *Digitaria sanguinalis*; (i). fifth instar larva; (j-k). pre pupa; (l). pup; (m). view of pupa before hatching; (n). adult butterfly

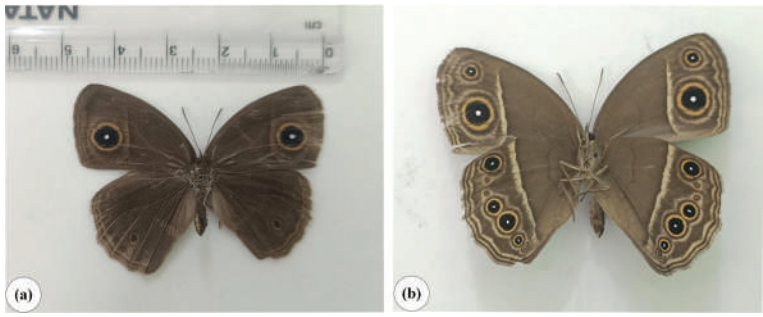

Figure 3. Wing Morphology of *Mycalesis visala andamana;* (a). upperside; (b). underside

Impacts of Mycalesis visala andamana on Host Plants

The larvae of *M. v andamana* devour the upper middle portions of the leaf lamina of the grass with its head pointing towards the base of the leaf. It proceeds satisfying its appetite from the leaf margin towards the mid rib on either side of the leaf. Further, the larvae proceed downwards to the base of the leaf. In order to avoid predation, the larvae were seen frequently transferring itself to the adjacent leaf. Since, the host plant is abundantly available its impact is very less.

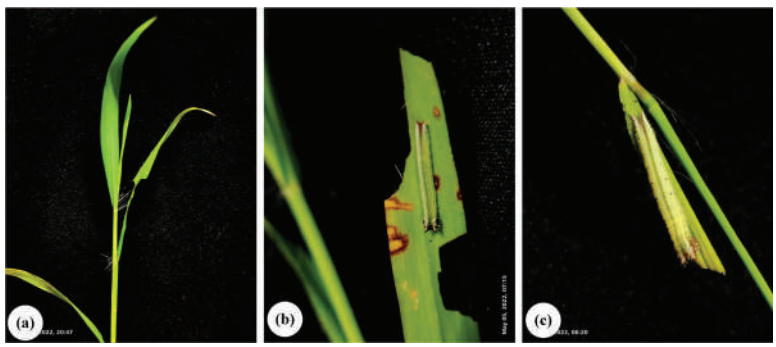

Figure 4. Damage to grass caused by *Mycalesis visala andamana* herbivory: (a-c). leaves of Digitaria sanguinalis infected with larvae

Discussion

Recent studies revealed that the insect herbivory pose a grave threat to various group of plant population in the ANI (Purti *et al.,* 2022, 2023a, b, 2024a,b, 2025). For the first time *D. sanguinalis* is reported here as new host for Andaman Long branded Bushbrown butterfly, *Mycalesis visala andamana* Moore (Lepidoptera: Nymphalidae) from ANI, India. It is a common grass found as weed throughout the islands and offered as larval food influences fecundity of *M. visala andamana*. This butterfly is shade loving and is observed mostly in the early morning and in the evening hours in the grassland in search of nectar and host. It was observed that the habitat of *D. sanguinalis is* under severe pressure of anthropogenic activities such as used as grazing sites of cattles, land used for developmental works. In the gardening activities regular trimming of grasses is one of the causes of destruction of the population. Moreover, even the some of the gardens are also being replaced by concrete floors as a result of which the plant habitat is lost. Its natural population is declining day by day throughout the islands. It was observed during the field study that the female butterfly laid egg on the adjacent leaf for its larval host plant. It may be due to heavy ovipositing pressure or to get or to get rid of predators. The female butterfly laid on the underside of the leaf lamina of *Colocasia esculenta* which was adjacent to its larval host plant *D. sanguinalis*. Later on, after the emergence from the egg the larvae migrated to its larval host plant and continued its life cycle. Such behaviour of the larvae is of great significance for the survival of their

offsprings. It also keeps them protected from the predator during their early stages of development. Various grass species recorded as host plant for *Mycalesis* spp. is given in Table 1.5.

Table 1.5: Taxa of the family Poaceae recorded for *Mycalesis* spp.

S. No	Larval host plant	Butterfly	Country where reported	References
1	*Axonopus compressus* (Sw.) P. Beauv.	*Mycalesis perseus* (Fabricius, 1775)	Philippines	Robinson *et al.,* 2023
		Mycalesis mineus (Linnaeus, 1758)	India	Naik & Mustak 2015
2	*Bambusa* spp.	*Mycalesis rama* (Moore, 1892)	Sri Lanka	Robinson *et al.,* 2023
3	*Brachiaria mutica* (Forssk.) Stapf	*Mycalesis zonata* Matsumura, 1909	Taiwan	Robinson *et al*., 2023
4	*Cyrtococcum trigonum* (Retz.) A. Camus	*Mycalesis oculus* Marshall, 1880	India	Kasambe 2018
5	*Digitaria ciliaris* (Retz.) Koeler	*Mycalesis perseus* (Fabricius, 1775)	Japan	Robinson *et al.,* 2023
6	*Digitaria mollicoma* (Kunth) Henrard	*Mycalesis janardana* Moore, 1857	Indonesia	Robinson *et al.,* 2023
7	*Digitaria radicosa* (J. Presl) Miq.	*Mycalesis igoleta* C. & R. Felder, 1863	Philippines	Robinson *et al.,* 2023
8	*Digitaria sanguinalis* (L.) Scop.	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
		Mycalesis visala andamana (Moore, 1892)	India (Andaman Islands)	**Present study**
9	*Digitaria violascens* Link	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
10	*Eleusine indica* (L.) Gaertn.	*Mycalesis mineus* (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023
11	*Imperata cylindrica* (L.) Raeusch.	*Mycalesis francisca formosana* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis horsfieldi (Moore, 1892)	Indonesia	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	Indonesia	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	Japan	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	Java	Robinson *et al.,* 2023
12	*Imperata* spp.	*Mycalesis sirius* (Fabricius, 1775)	Australia	Robinson *et al.,* 2023
		Mycalesis terminus (Fabricius, 1775)	Australia	Robinson *et al.,* 2023
13	*Isachne globosa* (Thunb.) Kuntze	*Mycalesis gotama nanda* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis sangaica mara Fruhstorfer, 1908	Taiwan	Robinson *et al.,*2023
		Mycalesis zonata Matsumura, 1909	Taiwan	Robinson *et al.,* 2023
14	*Ischaemum timorense* Kunth	*Mycalesis patnia patnia* Moore, 1857	Sri Lanka	Jayasinghe *et al.,* 2021.
15	*Kaempferia rotunda* L.	*Mycalesis maianeas* Hewitson, 1864	West Malaysia	Robinson *et al.,* 2023
16	*Leersia hexandra* Sw.	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama nanda Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis mineus (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023

17	*Lophatherum gracile* Brongn.	*Mycalesis mineus* (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023
18	*Microstegium ciliatum* (Trin.) A. Camus	*Mycalesis mineus* (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023
19	*Miscanthus floridulus* (Labill.) Warb. ex K. Schum. & Lauterb.	*Mycalesis gotama nanda* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis sangaica mara Fruhstorfer,1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis zonata Matsumura, 1909	Taiwan	Robinson *et al.,* 2023
20	*Miscanthus sinensis* Andersson	*Mycalesis francisca formosana* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama Moore, 1857	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama nanda Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis zonata Matsumura, 1909	Taiwan	Robinson *et al.,* 2023
		Mycalesis sangaica mara Fruhstorfer, 1908.	Taiwan	Robinson *et al.,* 2023
21	*Oplismenus compositus* (L.) P. Beauv.	*Mycalesis anaxias* Hewitson, 1862	India	Kasambe 2018
		Mycalesis anaxias anaxias Hewitson, 1862	India	(Kunte 2000)
		Mycalesis junonia Butler, 1868	India	(Kalesh & Prakash 2015)
		Mycalesis oculus Marshall, 1880	India	(Kalesh & Prakash 2015)
		Mycalesis perseus tabitha (Fabricius, 1793)	India	(Kunte 2000)
		Mycalesis francisca formosana Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama Moore, 1857	Japan	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	Philippines	Robinson *et al.,* 2023
		Mycalesis subdita (Moore, 1890)	India	Kasambe 2018
		Mycalesis patnia Moore, 1857	India	Kasambe 2018
		Mycalesis perseus (Fabricius, 1775)	India	Kasambe 2018
		Mycalesis ita C. & R. Felder, 1863	Philippines	Robinson *et al.,* 2023
		Mycalesis oculus Marshall, 1880	India	Kasambe 2018
22	*Oplismenus compositus* var. *patens* (Honda) Ohwi	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama nanda Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
23	*Oplismenus hirtellus japonicus* (Steud.) U. Scholz.	*Mycalesis gotama nanda* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
24	*Oplismenus* spp.	*Mycalesis gotama* Moore, 1857	Japan	Robinson *et al.,* 2023

25	*Oplismenus undulatifolius* (Ard.) P. Beauv.	*Mycalesis francisca formosana* Fruhstorfer, 1908	Taiwan	Robinson *et al.,*2023
		Mycalesis sangaica mara Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis zonata Matsumura, 1909	Taiwan	Robinson *et al.,* 2023
26	*Oplismenus japonicus* (Steud.) Honda	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
27	*Oryza sativa* L.	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al*., 2023
		Mycalesis perseus tabitha (Fabricius, 1793)	India	(Robinson *et al.,*2010)
		Mycalesis visala andamana (Moore, [1892])	India (Andaman Islands)	(Veenakumari *et al.,* 2008)
		Mycalesis horsfieldii (Moore, [1892])	Indonesia	Robinson *et al.,* 2023
		Mycalesis mineus (Linnaeus, 1758)	West Malaysia	Robinson *et al.,* 2023
		Mycalesis nr. *Lorna* Grose-Smith	New Guinea	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	India	Robinson *et al.,* 2023
		Mycalesis terminus (Fabricius, 1775)	New Guinea	Robinson *et al.,* 2023
		Mycalesis visala Moore, [1858]	India (Andaman Islands)	Robinson *et al.,* 2023
		Mycalesis perseus (Fabricius, 1775)	India	Kasambe 2018
28	*Oryza* spp.	*Mycalesis gotama* Moore, 1857	Japan	Robinson *et al.,* 2023
		Mycalesis patiana Eliot, 1969	India	Robinson *et al.,* 2023
		Mycalesis perseus tabitha (Fabricius, 1793)	India	(Kunte 2000)
		Mycalesis perseus (Fabricius, 1775)	India	Kasambe 2018
29	*Paspalum conjugatum* P.J. Bergius	*Mycalesis gotama* Moore, 1857	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama nanda Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
30	*Pennisetum alopecuroides* (L.) Spreng.	*Mycalesis sangaica mara* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
31	*Pennisetum purpureum* Schumach.	*Mycalesis sangaica mara* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
32	*Phyllostachys nigra* (Lodd. ex Lindl.) Munro	*Mycalesis gotama* Moore, 1857	Ryukyu Islands	Robinson *et al.,* 2023
33	*Poa annua* L.	*Mycalesis gotama* Moore, 1857	Ryukyu Islands	Robinson *et al.,* 2023
		Mycalesis hyperanthus Bethune-Baker, 1908	Afrotropical	Robinson *et al.,* 2023
34	*Pogonatherum crinitum* (Thunb.) Kunth	*Mycalesis mineus* (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023
35	*Polytrias indica* (Houtt.) Veldkamp.	*Mycalesis oculus* Marshall, 1880	India	Kasambe 2018
36	*Saccharum officinarum* L.	*Mycalesis horsfieldi* (Moore, 1892)	Indonesia	Robinson *et al.,* 2023
		Mycalesis mineus (Linnaeus, 1758)	Phillippines	Robinson *et al.,* 2023

37	*Sasa* spp.	*Mycalesis anaxioides* Marshall & de Nicéville, 1883	West Malaysia	Robinson *et al.,* 2023
38	*Setaria barbata* (Lam.) Kunth	*Mycalesis mineus polydecta* (Cramer, [1777])	India	(Kalesh & Prakash 2015)
		Mycalesis mineus (Linnaeus, 1758)	India	Kasambe 2018
39	*Setaria palmifolia* (J. Koenig) Stapf	*Mycalesis francisca formosana* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis gotama nanda Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis sangaica mara Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023
		Mycalesis zonata Matsumura, 1909	Taiwan	Robinson *et al.,* 2023
40	*Thysanolaena maxima* (Roxb.) Kuntze	*Mycalesis mineus* (Linnaeus, 1758)	Hong Kong	Robinson *et al.,* 2023
41	*Zizania latifolia* (Griseb.) Hance ex F. Muell.	*Mycalesis gotama nanda* Fruhstorfer, 1908	Taiwan	Robinson *et al.,* 2023

Conclusions

The present study provides the base information necessary to formulate conservation management programs for butterflies as well as host plant in India. The author documented the developmental stages of life history (egg, larvae, pupa) of an endemic butterfly, *M. visala andamana* and assessed its impact on host plant, *D. sanguinalis* in great detail. As India is assemblage of diversified phytogeographical region, further field studies are required to identify other larval food plants belonging to Indian Poaceae used in the natural population in different climatic conditions and habitats.

Acknowledgements

The authors are grateful to the Director, Botanical Survey of India, Kolkata for constant support. Authors are thankful to the Department of Environment and Forests, Andaman and Nicobar Islands for giving necessary permission and providing logistic support during the field studies. The authors are thankful to Dr. Debasis Bhattacharya, Editor-in-Chief, Journal of Andaman Science Association and anonymous reviewers for critical comments and suggestions that helped to improve the manuscript. The authors are thankful to scientists and staff of Botanical Survey of India, Andaman and Nicobar Regional Centre (PBL), who have always shown readiness for help.

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Received : 1st July, 2025 Accepted : 19th October, 2025