

**Life history of the dark glass blue butterfly  
*Virachola isocrates* (Lepidoptera: Rhopalocera:  
Lycaenidae) in the Eastern Ghats of Southern  
Andhra Pradesh – India**

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**Abstract:**

*The life history of the dark grass blue Virachola isocrates in Southern Andhra Pradesh was studied on the basis of searches. The morphology of adults, eggs, larvae, and pupae was observed. Besides the population index of v. isocrates on pomegranate plant fruit was discussed. This butterfly normally requires a tropical to the subtropical environment but sometimes ranges into sheltered, hot temperate areas. The results showed that V. isocrates preferred to oviposit and attack along the middle region of the fruit. The growth from egg to adult was 19 - 26 days with four larval instar stages. Biological studies include morphometric measurements of different stages from egg to adult, incubation period, duration period of larval instars (first to fourth), pre-pupal and pupal stage, and adult longevity (male and female) were studied. The incubation period varies from 2 to 3 days ( $8.0 \pm 0.38$  days). Larval period varies from 12 to 17 days ( $17 \pm$*

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*1.10) days. Pupal period ranges from 05 to 06 days (05.45 ± 0.32 days). Adult longevity of male and female was 03-06; 04-08 days respectively.*

**Key words:** *Virachola isocrates*, *Punica grantum*, Life history, Instars.

## **INTRODUCTION:**

Butterflies are the most abundant group of insects on the earth which belong to the insect order Lepidoptera under phylum Arthropoda and are recognizable among the general public and science due to their beautiful colours and graceful flight. Butterflies are found in every part of the world wherever the flowering plants are existing and even in very high-altitude, Hills, mountains covered with perpetual snow and glaciers. Butterflies are one of the best-studied groups not only geographical subspecies but even varieties, races, seasonal and sexual forms have been named and described from different regions of the world.

*V. isocrates* was a species of lycaenid or blue butterfly found in Asia. Its common names include common guava blue, pomegranate butterfly, and anar butterfly. It was a pest of pomegranates in India (Kumawat, 2001).

A small butterfly that belongs to a group of very similar species that ranges through much of the Eastern Ghats. The area of blue coloration on the wing upper sides of the females was usually stable. In India the exact status of several species of butterflies are not clearly known and where there was accelerated distribution of forests and other natural areas giving to urbanization (Singh, S.B & Singh, H.M. 2001, Venkata Ramana, 2011). The flight is weak and fluttery. The butterflies fly near the ground and both sexes usually remain near their host plants. During the mornings, the males are

often seen to slowly fly around the host plants looking for newly emerged females with which to mate. On very hot days the butterflies are attracted to water or moist patches at the edges of waterholes along creek beds, where they will sip from the water's edge or directly from the damp patch. These butterflies are normally not timid and are easily approached with care.



**Fig: 1. Photographs of the sequential stages in the life history stages of *Viricola isocrates***

**ADULT:**

It was a light green tail less blue. The underside has numerous dark spots are two that are joined and in the males the upper side of the wings was dull purplish blue, in the female it was brown with blue bases. Strongly found in the moist deciduous, semi-evergreen and evergreen forests, but only in open areas.

## **OVIPOSITION HOST PLANTS:**

This butterfly was active in late monsoon and winter, but it occurs in probably throughout the year flying close to shrubs and small trees and settles often. They are univalent lays eggs singly on the underside of young *Punica granatum* leaves and fruits. They lay eggs during 10 00-15 00hr.

## **LIFE HISTORY:**

The Eggs are laid singly on tender leaves, stalks, and flower buds. The eggs are disc shaped and greenish with a blue tinge. The eggs are incubated at room temperature of about 29°C hatched in about 3-4 days. The hatched larva feed on the egg shell.

**Instar I:** The caterpillar was Dark brown, short and stout, covered with short hairs. It was semi-circle with a flat bottom and curved on the dorsal side. This stage lasts for 2-3 days.

**Instar II:** This stage lasted 3-4 days, it measures around 0.91 ( $\pm 0.05$ ) mm. It was light green with a mid-dorsal line. The head was black in colour.

**Instar III:** This stage lasted for 3 to 4 days. It reached a length of 1.23 mm and a width of 1.00 to 1.10mm. The larva was green in colour, has greenish brown hairy with the mid-dorsal line.

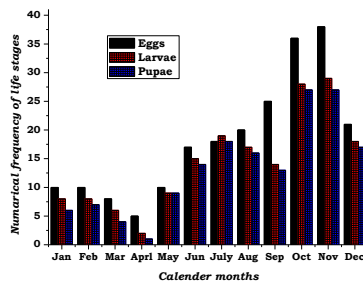
**Instar IV:** This stage lasted for 3 to 4 days and grows to a length of 1.66 mm and 1.23 – 2.00 mm in width. It was lemon yellow to green in colour with clear segments. A prominent dark spot was seen at the posterior end.

**Pre-pupal stage:** This stage lasted for 01-02 days. At this stage, the larva stops feeding get shortened in length.

**Pupal stage:** This stage lasted for 05-06 days; humped portion could be seen in the middle region, the abdomen was broader than the anterior part. It was dark green with black spots and a posterior region having black spots.

## POPULATION INDEX:

The numerical frequency of the natural occurrence of the life stages - eggs, larvae and pupae on the host plants are given in figure- 1. All the stages could be spotted out during January to March which corresponds post monsoon in the study locality. However, there was a higher frequency of occurrence of the life stages during October to November which corresponds with the post monsoon season (Graph: 1).



**Graph: 1.** Numerical frequency of the natural occurrence of the life stages – eggs, larvae, and pupae

## DISTRIBUTION:

It occurs throughout India, Pakistan, Afghanistan, Nepal, Bhutan and Sri Lanka. It has migration tendencies, which are occasionally witnessed in India, heading in a southerly direction. This was supported by the adult morphology, which was uniform across India, and also the rest of the Eastern Ghats where the butterfly also occurs. No mass migrations have ever been reported from Eastern Ghats of Southern India.

## **FIELD OBSERVATIONS OF BUTTERFLY BEHAVIOR:**

The Dark glass blue butterfly was one of the most widely distributed lycaenids in the world with its occurrence spanning in India, Africa, Asia, and Australia. Due to its utilization of pomegranate species as host plants, it was considered as a pest of pomegranate crops in certain places. This butterfly can be found in the various wasteland and plains of Southern Andhra Pradesh, where its local host plants, pomegranate species are growing. Typically the adults were observed round the year and are found flying in the vicinity of its host plants, visiting flowers, and puddling on wet grounds. The adults are strong flyers with a jerky and rapid flight.

### **Flight period in the Eastern Ghats:**

It was possible to find these flying butterflies throughout the year depending on the area and whether its food plants are in flower and also areas, this butterfly was largely dependent on the rainy periods. In the southern areas of native vegetation, it was more common during the spring, while in the urban garden it can be found during the warmer months. They are capable of completing a brood within about 4-5 weeks in southern areas. In the cold areas the butterflies normally overwinter as pupae.

### **Habitat:**

Found wherever its food plants occur, which are common and widespread occurring in most habitats. It was observed to be an efficient flier. It flew fast with rapid wing beats. It could cover long distances in a single flight. It moved about in bushes searching for nectar. Both sexes used to bask with their wings half open. It was often found setting on the walls on the verandahs of buildings in the university campus.

## CONCLUSION:

As the caterpillar was a fruit borer and the egg was preferably laid on the fruit rather than on the stem and leaves by the females so that the larvae could enter the fruit soon after hatching. The lower middle region of the fruit selected as the site of the oviposition could be for the protection of the fruit from direct exposure to the predators. The middle region of the fruit could be the preferred site for larval penetration due to the reason that the fruit starts ripening from the middle portion. The existence of an interval of 02-03 days between oviposition and first instar larva penetration was significant to put in practice the control measures. Karuppuchamy et al., (1998), Kumawat, (2001) recorded the total larval period of 22.8 days on pomegranate in Tamil Nadu. The total larval period recorded on Guava in Jammu plains was of 15 to 23 days. In this study area, life cycle (from egg to adult) was completed in 19 – 26 days at laboratory conditions. The population index determined from the searches of 50 *Punica granatum* plants show that the eggs, larvae, and pupae are present throughout the year with a higher frequency during September to November and January to February was in line with the prediction of Karuppuchamy (1998) that the tropical or subtropical butterflies breed throughout the year with a better performance in a certain period of the year. Assuming a lifespan of 3 – 6 days for the adults (Opler and Krizek, 1984), 10 -11 broods yearly for *Virachola Isocrates* was a reasonable estimate.

Sexual dimorphism was seen in adults. Females are larger in size than males in wing expanse. Females pale violet-brown with an ochreous spot on the forewings. Males are deep violet blue. The underside was pale buff with darker brown scalloped bands and white vertical lines. Average body length of an adult male was  $13 \pm 0.4$  mm and female measured  $16 \pm 0.52$

mm. Average width including a wingspan of an adult male was  $23.0 \pm 0.50$  mm and longevity were  $10 \pm 0.16$  days whereas, of the female butterfly was  $36.0 \pm 0.3$ mm with a longevity of  $15.64 \pm 0.24$  days. The total lifecycle of 19 to 26 days suggests that the butterfly can complete about 10-11 generations during the fruiting season prior to the harvesting period in January-February. Although the loss inflicted by *V. isocrates* to *Punica granatum* has not reached an economic threshold, but the recent trends of its infestation suggest that there was the need to work on the impact of this insect on *Punica granatum* industry.

#### **ACKNOWLEDGEMENT:**

The Corresponding author Dr. S.P. Venkata Ramana, Assistant Professor, Department of Zoology, Yogi Vemana University greatly acknowledge to UGC, New Delhi for financial support through a major research project and Sincere thanks to A.P forest department for giving permission to periodical survey in the field areas.

#### **REFERENCES:**

1. Kumawat K. C., S. S. Jheeba and A. K. Soni. (2001). Eco-friendly management of anar butterfly, *Virachola isocrates* (Fabricius). *Advances in Horticulture and Forestry*. 8:1, 32 – 38.
2. Karuppuchamy, P., Balasubramaniam, G. & Babu, P.C.S. (1998). The biology of pomegranate fruit borer, *Deudorix isocrates*. *The Madras Agricultural Journal*, 5/6: 252-256.



3. Kehimkar, I. 2008. The book of Indian Butterflies. Bombay natural history society, Oxford University press, Oxford, New York. 260.
4. Kunte, K. 2000. Butterflies of Peninsular India. University Press, Hyderabad, 170-172.
5. Owen, D.F. 1971. Tropical Butterflies. Clarendon Press. 324.
6. Opler, P.A., and G.O. Krizek. 1984. Butterflies: East of the Great Plains. The John Hopkins University Press. 76 – 80.
7. Venkata Ramana, S.P. 2011. The Flying jewels – Butterflies. Sri Venkateswara publications, Kadapa. A. P. 56 – 74.
8. Singh, S.B. & Singh, H.M. (2001) Biology of *Deudorix isocrates* on its potential host- Aonla (*Emblica officinalis*). Indian Journal of Entomology, 63 (1): 19-25.