

BIOLOGY OF *UDASPES FOLUS* CRAM.
(LEPIDOPTERA: HESPERIIDAE),
THE LEAF ROLLER PEST OF TURMERIC AND GINGER

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ABSTRACT

Biology of *Udaspes folus* Cram. the leaf roller pest of turmeric and ginger was studied under laboratory conditions. The average duration from egg to adult was 28.6 days in ginger and 25.1 days in turmeric. Longevity of adults was 4 days in males and 6.7 days in females. The maximum number of eggs laid was 50. The collateral hosts of the pest are also listed.

INTRODUCTION

AMONG the various insect pests infesting ginger (*Zingiber officinale* Roscoe) and turmeric (*Curcuma longa* Linn. and *Curcuma aromatica* Salisb.), the skipper butterfly *Udaspes folus* Cram. (Lepidoptera: HesperIIDae) is an important foliage pest. Lefroy (1909) reported it as a rarely abundant or injurious pest of turmeric and ginger that is widespread over the plains. Fletcher (1914) recorded this as a scarce insect, but occasionally as a serious pest of ginger, turmeric, and probably wild lilies. Pillai (1927) reported that ginger has only a few insect pests. In south India, the Hesperiid *U. folus* Cram. sometimes seriously damages the ginger leaves. Ayyar (1940) reported this as a specific pest of turmeric and arrow root *Curcuma angustifolia* Roxb. Kershaw (as quoted by Fletcher, 1914) noted *Alpinia nutans* Roscoe as a food plant of this pest in Hong Kong. We have recorded this pest infesting other zingiberaceous hosts as *Elettaria cardamomum*, *Aframomum melegueta*, and *Hedychium* sp., besides *C. longa* and *Z. officinale*, and very recently on mango ginger *Curcuma amada* in our Institute farm. Very little information is available on the biology of this pest and hence this study.

MATERIAL AND METHODS

The studies were initiated with butterflies collected from the fields of CPCRI, Kasaragod.

They were reared in cages (28 cm height and 28 cm diameter) containing turmeric/ginger plants and kept in the laboratory (temperature 26-35°C and relative humidity 41-100%). The butterflies were fed with diluted honeys. The hatching of eggs laid in the potted plant was observed daily. Newly hatched caterpillars were separated and reared individually in petridishes containing fresh turmeric and ginger leaves for studying the moulting and duration of different larval instars. Longevity and fecundity of adult butterflies were studied by caging them individually and in pairs.

RESULTS

The eggs are laid singly on the lower surfaces of leaves. Freshly laid eggs are pale brown in colour with a pinkish tinge and are nearly spherical in shape with a broader base. They firmly adhere to the lamina (Fig. 1). During the course of development, the colour of egg changes to dull white with a black dot at the distal end. The incubation period was 3.7 days in turmeric (range 3-4 days) and 4.1 days in ginger (range 4-5 days).

There were five larval instars. In turmeric, the total duration of caterpillar phase ranged from 12-21 days (average 15.1 days), while in ginger the larval period was completed in 13-25 days (average 17.9 days). The durations of different instars, when reared on turmeric and ginger, are given in Table I.

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TABLE I
Life-history of *Udaspes folus Cram.* on turmeric and ginger

Crops	Incubation period (days)		Larval instars (days)										Pupal period (days)		Average duration from egg to adult		
	Range	Average	1	2	3	4	5	Total	Range	Average	Range	Average	Range	Average			
Turmeric	3-4	3.7	2-2	2.0	2-4	2.5	2-4	3.1	2-5	2.6	4-6	4.9	12-21	15.1	6-7	6.3	25.1
Ginger	4-5	4.1	2-6	3.4	3-5	3.8	3-4	3.1	3-7	4.9	13-25	17.9	6-7	6.6	6-7	6.6	28.6

The newly hatched caterpillar is 4 mm long and 1 mm broad. A thin black ring is present on the dorsal side of the prothorax in the first instar caterpillar. The first instar caterpillars are olive green in colour with a black head. Even from the first instar onwards they are very active and feed voraciously. The anterior part of the prothorax is narrower in all the stages of the caterpillar. The fully grown caterpillar is 36 mm long and 4.5 mm broad (Fig. 2). It is dark green in colour. On the day before moulting, the prothorax of the caterpillar enlarges and becomes pale in colour. An orange red spot appears on the ventral surface of prothorax, but this disappears with the moulting.

Before the final moulting, the larva stops feeding and the body gets shortened. There is a prepupal phase which lasts for a day. The prepupa attaches itself to the rolled leaf by a thread-like process arising from the posterior end. The pupal period lasts for 6.3 days (range 6-7 days) in turmeric and 6.6 days (range 6-7 days) in ginger. The pupa, measuring 32 mm long and 4.5 mm broad, is light green in colour and has a beak-like anterior end and a tapering posterior end (Fig. 3). It is naked and is attached to the leaf surface by an anal pad and a girdle inside the rolled leaf. After further development the pupa becomes brownish black in colour, the same colour as of the developing adult butterfly inside.

The adult is an active butterfly possessing brownish black wings with eight white spots of different sizes in the fore wing and one large spot in the hind wing. It has a body length of 23 mm and breadth of 5 mm. It is completely covered with scales (Fig. 4). The wing has an expanse of 20 × 45 mm.

The longevity of males is 4.0 days (range 3-5 days) and of females is 6.7 days (range 5-11 days). Egg laying was noticed only on leaves of potted turmeric plants kept in bigger cages, but not in smaller ones. The butterflies laid a maximum of 50 eggs each during a period of eight days. A preoviposition period of three days was observed in all cases.

The caterpillars are voracious feeders. They remain inside rolls on the lower surfaces of leaves. Newly hatched larvae cut the leaf margins and feed on the lamina leaving the midribs and a portion of lamina on the sides



FIG. 1
Turmeric plant infested by *U. folus* caterpillars.

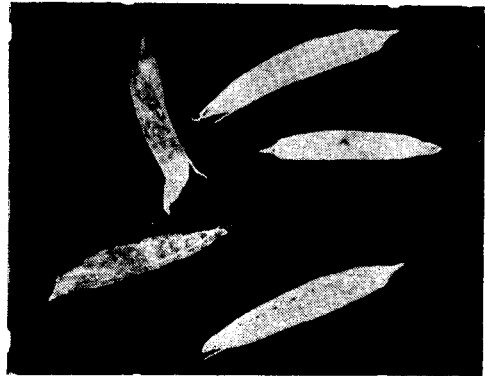


FIG. 3
U. folus pupa



FIG. 2
U. folus caterpillar

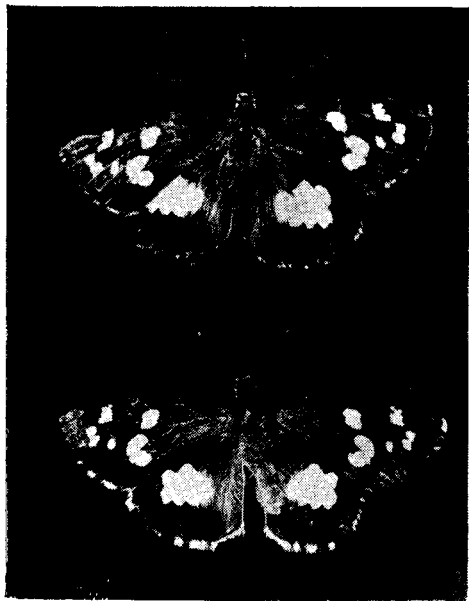


FIG. 4
U. folus — adult butterflies

of the midrib. In ginger, they web the leaf margins together by means of silken threads and form a tubular case. When one leaf is eaten up, the caterpillars migrate to another one. The caterpillars prefer middle-aged leaves.

The pest was present in abundance at Kasaragod during August-October. The larva collected from the field during December pupated and remained in that stage for long period till early March. But when the pupae were mildly pressed between fingers, the adults emerged from them within five days. This indicates the possibility of a pupal hibernation during the off-season.

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