

Biology of *Tonica zizyphi* Stainton on Jujube (*Ziziphus mauritiana* Lamk.)

S K Verma

Central Arid Zone Research Institute, Jodhpur - 342 003 India

Abstract Biology of *Tonica zizyphi* has been reported on jujube (*Ziziphus mauritiana*) under arid conditions of western Rajasthan. With 2-3 days of incubation period, 10-16 days of larval period and 5-8 days of pupal period, the life cycle was completed in 19 to 32 days (average 25 days). An unidentified disease caused mortality in 13 to 42% of larvae and 37 to 65% of pupae.

Key words *Tonica zizyphi*, Jujube, *Ziziphus mauritiana*, Biology.

The citrus leaf roller, *Tonica zizyphi* Staint. (Oecophoridae : Lepidoptera) has been observed as a minor foliar pest of young as well as old plants of jujube (*Ziziphus mauritiana* Lamk.) in the arid region of western Rajasthan. The pest is earlier recorded to feed on various citrus plants like orange and lemon, curry leaf plant *Murraya koenigii* (Lefroy 1909) and also *bael*, *Aegle marmelos* (Gupta 1954). Although it is mentioned as a pest of jujube (Nayar *et al.* 1976), there appears to be no report on the biology of this pest on jujube. Therefore, field and laboratory studies were undertaken on the biology of this pest on jujube under arid conditions of western Rajasthan at the Central Arid Zone Research Institute, Jodhpur.

Materials and Methods

Observations were taken on the intensity and damage of foliage of jujube plants by the leaf roller. Infested leaves were brought to the laboratory for the rearing of the pest to study and record biology. Rearing was done in 15 cm culture Petri plates lined with moist blotting paper. If required, fresh jujube leaves replenished in some lots. Emergent adults were kept in 500 mL battery jars covered with muslin cloth and were provided with 5% glucose solution in cotton swabs padded into 5 cm culture Petri plates placed in the bottom of battery jars. For oviposition, small twigs of jujube were kept immersed in narrow mouthed 30 mL bottles containing plain water.

Results and Discussion

Characteristics of the pest

Eggs : Round, yellowish white, somewhat compressed, laid singly on the undersurface of the leaves. Under field conditions the eggs were found

on leaves borne on branches prostrate and near to the ground.

Larvae : Brown unspotted head, body pale green translucent, with foliar ingestions clearly visible dorsally. There were no spots on head or on body up to II instar. In the III stage larvae, two dorso-lateral brownish lines running along the body developed. Gupta (1954) recorded only one brownish line. In some cases, the IV stage larvae may be spotted black on head and along the entire length of the body. Larvae in later stages were very active. In laboratory, such larvae show agile wriggling movements resulting in quick shift of positions for about 5 to 7.5 cm by a single stimulus of touch. Full grown larva was 1.2 to 1.3 cm in length. Fletcher (1914) mentioned the length of caterpillar to be only 0.8 cm whereas Gupta (1954) recorded the length to be about 1.2 cm.

Pupae : Newly formed pupa was initially creamy yellow in colour. A light brown hue developed dorsally on the I abdominal segment after about 5 hours of pupal molt and it gradually spread, first towards the abdomen. Then the pupa became pale whitish ventrally with smoky streaks along the leg aspects but dorsally smoky streaks were more conspicuous. Finally, the pupa was 5 to 7 mm long with maximum width of 1.5 mm, slender, and chocolate brown in colour.

Adults : Adults were small delicate moths, 0.9 cm in body length, wings folded roof like on the body and the wing processes looked like terminal hooks pointing outwards. Antennae were carried over the back posteriorly along the length of the body. Ventrally the abdomen had silvery smoky white scales.

Damage : *T. zizyphi* is a very minor pest (Fletcher 1914) and is only sometimes serious pest of citrus