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The Phenological Records on *Eresus Cinnabarinus* (Olivier, 1789) (Araneae: Eresidae)

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Abstract: In this study, maturing periods, hatching and bringing out eggs of *Eresus cinnabarinus* investigated. *Eresus cinnabarinus* is one of member of the palearctic that poisonous for people compared with the others. The laboratory investigations showed that the period of ovulation and hatching out of cocoon was at the middle of June and August, respectively. Sub-adult individuals were lived two months and become adult after 16-18 months. In the observation, 382 individuals hatched out of the cocoon and fed by *Drosophila* sp.

Key words: Spider, *Eresus cinnabarinus*, eresidae, phenology

INTRODUCTION

Spiders can live in various ecosystems and can adapt different surroundings. Today, the spiders has become as effective predatory of insects and arthropods that live in agricultural ecosystems.

Johannesen and Veith (2001) reported that *Eresus cinnabarinus* has two different color formation and it is widespread in Denmark and Germany. The researchers found out that this species has different spreading characteristic in middle and north Europe.

Eresus cinnabarinus has reported as the one of the most endangered species of spiders by Lundberg (1994).

Distribution of *Eresus cinnabarinus* in Turkey is Southeast Anatolia, East Anatolia, the coastline of the Mediterranean and Central Anatolia (Karol, 1967).

Today, the roles of biological controls of spiders have known and it is necessary to improve the knowledge on economy. In addition, this spider has much understood roles of biological control, therefore some monophagous or stenophagous spider that provides ecologic balance (Clausen, 1986). In order to utilize any spider as bio-control agent, the phenology of this spider needs to be work out with detail. On the other hand, there are no available data on the phenological characteristics of *Eresus cinnabarinus*.

Under these circumstances, the main goal of this research is to determine the phenology of *Eresus cinnabarinus*.

MATERIALS AND METHODS

This study was carried out on the climate rooms of University of Gaziantep, between 09.06.2003-04.05.2004;

specimens were selected by using translucent glasses and fed by *Drosophila* that grown in incubator.

Trio-ocular stereo microscopy and Fine Pix S 602 zoom digital camera used to take the photographs in varies stages of specimens.

In the field studies, three specimens were collected from different habitats. 1 ♀ Yağcılar district of Manisa province on 19.06.2003, 1 ♀ 3 km east of Ufacik village of Burc district of Gaziantep province on 18.05.2002, 1 ♀ 1 km east of Kaleboynu district of Gaziantep province on 22.06.2002 were collected. The specimens have taken in the nest, under the stone, on the web.

RESULTS

Collected specimens have taken into the laboratory, activities of bringing and hatching out the cocoon has observed in a vivarium. Descriptions of *Eresus cinnabarinus* has listed and given as below:

Eresus cinnabarinus (Olivier, 1789); the length of female is 8-16 mm; the length of male is 6-11 mm; the carapace is very wide in front, head very convex, descending steeply behind to thoracic region, which has no fovea; eyes are all dark; clypeus is very narrow, bearing a small projection between bases of chelicerae; chelicerae are robust and strong, sternum is long and narrow; labium is much longer than wide; legs are short, rather thick; tarsi with three claws; metatarsus IV with a calamistrum is poorly developed in the male; cribellum is divided by a thin ridge; degenerate in the male; anal tubercle is short but well developed (Lockett and Millidge, 1951) (Fig. 1).

The males are engaging; females are almost uniform velvety black appearance; the abdomen may vary from

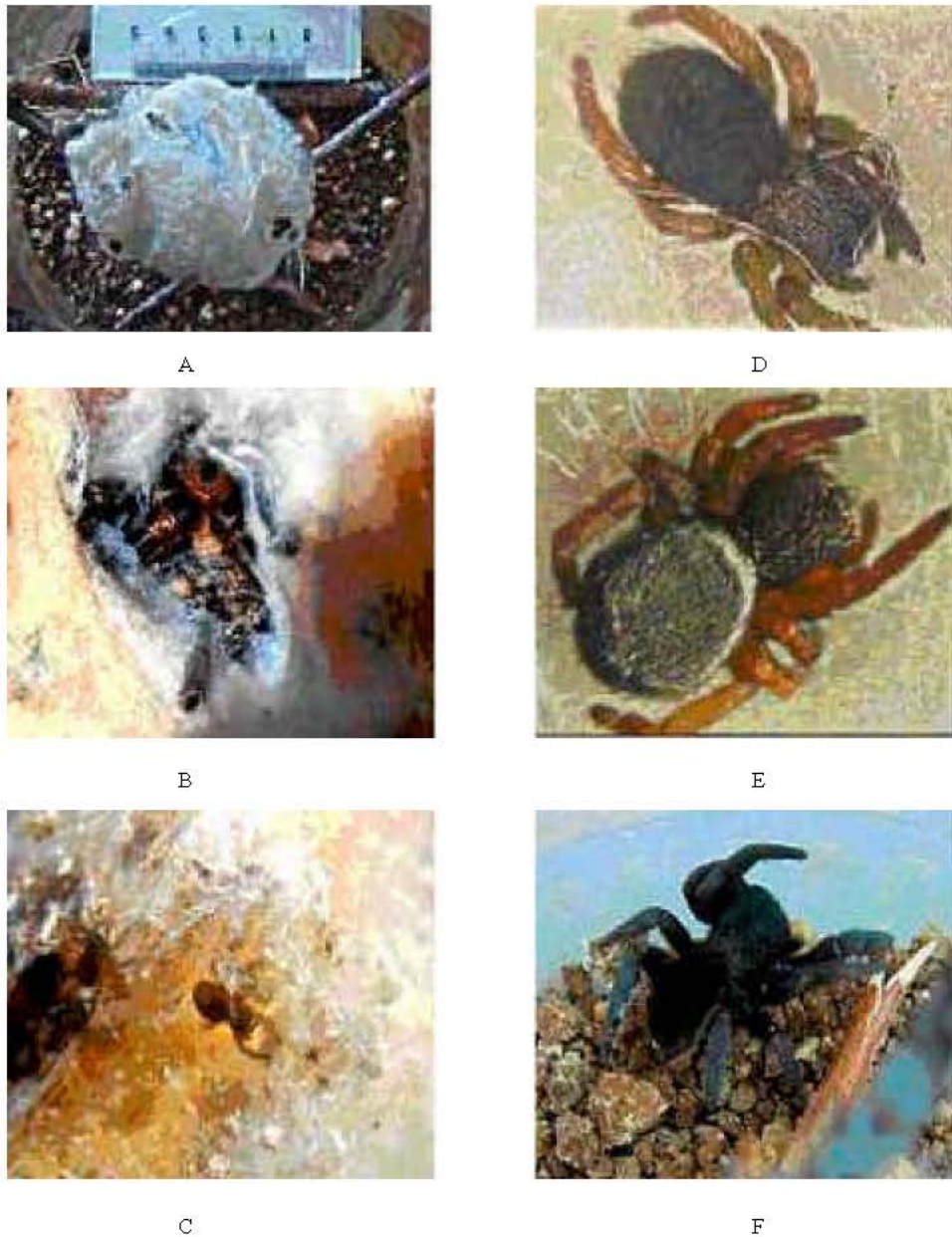


Fig. 1: The Life stage of *Eresus*: A-Cocoon, B- Alive main individual in cocoon, C- Sub adult that two days old leaving from cocoons, D-Sub adult that three months old on zoom $\times 2.5$ length 0.7 mm, E-Sub adult that three months old on zoom $\times 0.7$ length 0.3 mm, F- adult female (Length 3.2 cm)

bright red to orange; the cephalothorax of this fine and showy spider is black with a short red tapering band on the hinder part of each lateral margin; on the femora of the second, third and fourth pairs furnished with red hairs; the palpi colour is also black with dirty white; the palpi are thickly clothed with short hairs and it has a bright scarlet red with four large black spots at the upper side, edged with white hairs, forming a square (Locket and Millidge, 1951).

As a result of study, last ovulation period was June, hatching out of cocoon was in the middle of August and then, the incubation period of *Eresus cinnabarinus* was determined as 57 days (Fig. 1).

It has observed that, first cocoon has opened in the middle of August and 382 individuals have hatched out. Sub-adults had light-yellow color when they have hatched out of the cocoon at 18. 08. 2003, later adult's bodies were completely bright and dark black.

At the end of the daily observations, it was determined that when spiders were fall down, they have pulled their legs towards body and acted like dead. This behavior has called catalepsy (Fig 1).

DISCUSSION

Generally, female spiders look after sub-adult individuals for a few days or a week after leaving cocoons. While taking care of *Eresus cinnabarinus* spider-lings are became differently by mother spiders. In this study, it has established that the female *Eresus* prepared the nutrient for spider-lings by imprisoning itself in the cocoon at the end of its life span. The spider-lings have fed by their mother's death body after hatched out the eggs.

The incubation period of spiderlings of *Eresus cinnabarinus* has approximately 60 days that have collected from Manisa province and Gaziantep province. It found out that no difference between the phenology of pattern that collected from different locations. It is observed that adult spiders were fed by different foods belonging to order of Coleoptera, Diptera, Tysanura, Homoptera but they hadn't prefer Termite as a nutrient.

Stegodyphus dumicola belonging to Eresidae family; male spiders matures January, first cocoon brought out on February and reproduction periods were finished in May/June. It has observed that the bringing out the eggs period of *E. cinnabarinus* was half of the June, the spiderlings hatched out of cocoon in the second half of the August. The incubation period of *E. cinnabarinus* is fifty seven days (Toft and Scharff, 2002).

E. cinnabarinus brought out two cocoons. The diameter of first has five centimeters and outside color is golden yellow, inside coloring is the light yellow. The second one has the same coloring as like as first cocoon, the diameter has narrower in the second cocoon, it is measured as 1.5 cm.

The spiders generally bring out a few cocoons. These cocoons left different places. In this study, the female has brought out second cocoon inside of the first cocoon. She was imprisoned itself in first cocoon at the end of its life span. The first cocoon hatched out in the half of the August. Three hundred and eighty two sub-adult individuals hatched out of the cocoon. The opening of second cocoon has not ripened.

Influence of the food on spider reported by Bodasing *et al.* (2002). They observed that low food conditions increased mortality of spiders. In this study, at the preface three *Drosophila* sp. has given but later twelve *Drosophila* sp. has given at the end of the study. It has observed that sub-adults have fed by *Drosophila* sp. That they observed at the microscopy.

This knowledge showed that spiders required more food during the growing phases. Therefore, the amount of food has to increased parallel to growing periods.

The behaviour of *Stegodyphus sarasinorum* has observed by in the laboratory conditions (Willey and Jackson, 1993). The ready food has given at determined sequences and so the feeding competition was disappeared because of this, the feeding time of spiders was not changed. In this study, the findings were parallel with the investigation of Willey and Jackson (1993), because the feeding competition was disappeared by giving regular food.

The first specimen of *Eresus cinnabarinus* has reported from the southeastern part of Sweden, which was an adult male (Lundberg, 1994). The spider has known one of the most endangered species of spiders in the other parts of Europe.

The distribution of *Eresus cinnabarinus* in Turkey was reported by Karol (1967). *Eresus cinnabarinus* is one of the poisonous spider in the list of Turkish spiders. In formal records, there is no event about spider bite in Turkey, but the spider bites happen in every year. For the aim to product antidote, it is necessary to learn the biology of *Eresus cinnabarinus*.

However, *Eresus cinnabarinus* is a member of Palearctic, prefers the places where are far away from the settlement places as habitat.

According to England laws, *Eresus cinnabarinus* is under protection and this species distributes only South of this country. *Eresus cinnabarinus* distributes rarely in Europe. It shows distribution up to north of Denmark (Roberts, 1995).

In this study, some information about life span of *Eresus cinnabarinus* has been determined and it could handy for trying as an effective agent in the biologic control.

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