

## NEW OBSERVATIONS OF *CHARAXES JASIUS* (LINNAEUS, 1767) (LEPIDOPTERA: NYMPHALIDAE) ON THE *CITRUS SINENSIS* ORANGE TREE IN NORTH ALGERIA

Mimoun Karim\*, Mimeche Fateh\*\*

\*University of M'Sila, Department of Agricultural Sciences, BP 166 Echbilia, 28000, M'Sila,  
Algeria, e-mail: [fateh.mimeche@univ-msila.dz](mailto:fateh.mimeche@univ-msila.dz)

### Abstract

The two-tailed pasha *Charaxes jasius* is a common butterfly in the Mediterranean scrub near the coasts where the *arbutus* abounds, and is one of the most endemic butterflies in the Mediterranean. The species is also occurring in agricultural environments surrounding. In this study, we recorded the presence of *Charaxes jasius* caterpillars for the first time on orangetrees (*Citrus sinensis*) in Algeria. The caterpillars of this Lepidoptera have been observed from October 2018 to February 2019 in the Ouaguenoun area (Tizi-Ouzou province, Northern Algeria). *C. jasius* is bivoltine, overwintering occurs in the larval state, generally from November to March. In April-May, caterpillars must complete their growth in order to pupate and give birth to butterflies. Adults were seen in the research area in September 2019 eating on mature figs that had fallen to the ground. The diversity of the host plants of *Charaxes jasius* allows this species the ability to populate various territories.

**Key words:** *Charaxes jasius*, Lepidoptera, *Citrus sinensis*, North Algeria

### INTRODUCTION

*Charaxes jasius* (Linnaeus, 1767) is one of the most endemic butterflies in the Mediterranean. It is a non-migratory species that has adapted to Mediterranean conditions (Larsen, 1986).

*C. jasius* is mostly distributed along the Mediterranean coast. In North Africa, the butterfly can be found in Morocco, Algeria and Tunisia, but it has not been reported from the Mediterranean coast of Libya and Egypt (Tarrier and Delacre, 2008; Kemal and Koçak, 2011).

Although not considered an endangered species, studies predict that it could be severely affected by climate change (Van Swaay et al., 2010).

*C. jasius* is a species which evolves at the expense of *Arbutus unedo*. This shrub is certainly its preferred plant on which it reproduces, but it can evolve on other host plants. Adult butterflies feed on overripe figs in summer and can get completely drunk on the juice (Blondel and Aronson, 1999).

*Charaxes jasius* like others butterflies are recognised as bioindicators of the health of natural environments. Within ecosystems, these insects have several roles; they regulate plant production through the feeding of caterpillars, they are an important link in the food chain for many birds and small mammals.

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# Corresponding author

The aim of this paper is to mention for the first time the occurrence of *C.jasius* on orange tree in Algeria and to give some data about the bioecology of this butterfly. In addition, to provide updated information on the distribution of this species in northern Algeria.

## MATERIAL AND METHOD

### Study area

This study was carried out in the region of Ouaguenoun (36° 46' N and 4° 10' E) which is located at 16 km from the north of Tizi-Ouzou province (Northern Algeria) (Fig. 1). It is situated at a low altitude of about 240 m. According to weather data obtained from the meteorological station of Tizi-Ouzou province, the study area belongs to the Mediterranean sub-humid climate stage with temperate winter (minimal temperature = 6.30 °C; maximal temperature = 36.10 °C) and where the seasonal rainfall (802.18 mm) regime is Winter-Spring-Autumn-Summer.

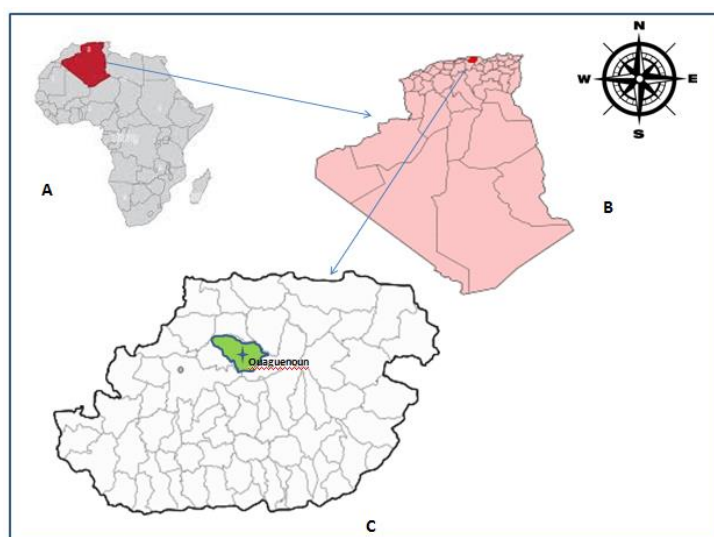


Fig. 1. Geographical location of the study area. A: geographical location of Algeria in Africa. B: geographical location of Tizi-Ouzou in Algeria. C: geographical location of Ouaguenoun in Tizi-Ouzou Province.

The climate is characterized by wet winters and dry summers (Mimeche et al., 2013). The studied site is an agricultural environment where fallow land dominates alongside of some plots occupied by cereal crops and fruit orchards.

The region of Ouaguenoun is reserved by the olive tree, but other trees such as fig, plum, apple, pomegranate, lemon and orange (*Citrus sinensis*) are part of the food crops for farmers.

### Methods of collection

The field work consists in monitoring the evolution of *Charaxes jasius* larvae after having the chance to observe them on an orange tree which is not their usual host. Indeed, about ten young larvae were counted on this tree. The evolution of the larvae was followed in situ from October 2018 until February 2019 by making weekly visits, in Ouaguenoun area (Tizi-Ouzou province).

In October 2018, a larva was manually collected by “mowing”, with entomological net. Afterwards, deposited at the Agricultural Sciences Department's Laboratories (M'sila University). Identification was made using the descriptions and keys in Tarrier and Delacre, 2008.

### RESULTS AND DISCUSSION

In October 2018, the first observation of immature *C. jasius* caterpillars (L1) was made on a young orange tree, of the Tomson variety in an agricultural setting that is not, however, their primary habitat. A number of ten larvae were counted and each of them was dispersed separately on the upper surface of the leaf. In Algeria, *C. jasius* is most common in the maquis and scrublands near the coast, where the arbutus *Arbutus unedo*, its favorite host plant, is abundant.

Döring and Hoffmann, 2004, note that the caterpillars in southern Turkey feed on the leaves of *Arbutus Andrachne*, which is more widely distributed in this region than *A. unedo*.

In Spain, it has been found on the *Cherimola Annona* on the Grenada coast (Muñoz Sariot, 2003) and on *Osyris quadripartita* in the province of Seville (Herrera, 1985).

The caterpillars of this butterfly rarely graze on bay leaf, according to Goetgheluck, 2005. *Citrus sinensis* and *C. nobilis*, are also listed in Morocco (Devarenne, 1989). Other caterpillar feeders mentioned by Danner, 2001, include apricot (*Prunus armeniaca*) and peach (*Prunus persica*).

From October, young larvae of the second generation can be seen on the upper surface of the leaves (Fig. 2). According to Le Charles, 1951, we see this generation's butterfly from the last days of August through the end of October, and it's not uncommon to see the egg and the caterpillar at their second and third moults at the same time, the latter coming from the first egg-laying in September.

More evolved larval stages L4 and L5 (Fig. 3, Fig. 4) are observed at the end of February. In fact, this species overwinters in larval form on food plants. *C. jasius* is bivoltine, overwintering occurs in the larval state,

generally from November to March, when the average daily temperatures drop below 11.5 - 13 °C (Abös and Stefanescu, 1999).

During the weekly visits the caterpillars remain motionless on the upper surface of the leaves. Apparently their food is done at night. The leaves on which they are maintained remain intact.



Fig. 2. Young larva (L2) of *C. jasius* on *Citrus sinensis*



Fig. 3. Larva of the penultimate instar (L4) of *C. jasius* on *C. sinensis*

Beyond February the caterpillars could not be observed on their food plant, probably they were eaten by insectivorous birds. Caterpillars that do

not go through winter diapause are more vulnerable to cold and predation, according to Lebard and Canut, 2018.

In April-May, caterpillars must complete their growth in order to pupate and give birth to butterflies. These butterflies leave immediately after laying the first summer generation's eggs, which will become butterflies in late summer.

Adults were seen in the research area in September 2019 eating on mature figs that had fallen to the ground (Fig. 5).



Fig. 4. Larva of the last instar (L5) of *C. jasius* on *C. sinensis*



Fig. 5. Adult of *C. jasius* forages on figs that have fallen to the ground

## CONCLUSIONS

The diversity of the host plants of *Charaxes jasius* allows this species the ability to populate various territories. Indeed this species can occur in the scrubland, and the agricultural rural areas near the coast.

This particularity provides the species with a chance to remain safe from extinction.

The decline of butterflies is linked to the destruction of vegetation and habitat. Every year the Mediterranean scrub is subject to destruction by fire and anthropic activities such as road realization and construction of tourist complexes. Therefore the protection of the natural environment is of paramount importance to keep the diversity of fauna and flora.

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