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Uromenus dyrrhachiacus (Karny, 1918), (Orthoptera: Tettigoniidae), an Albanian endemic species on the brink of extinction

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Abstract

Uromenus dyrrhachiacus is an Orthoptera species which endemic to the region of Durrës in central Albania and currently is threatened with extinction. The last observations of this species concern only one locality. Its natural and original habitat continues to be drastically reduced by increased anthropization. A first prospecting campaign in the field and indoor breeding were set up during the summer of 2022. This before quickly undertaking measures to protect and manage the residual habitats, to ensure the survival of the remaining populations.

Keywords: breeding, field survey, species conservation

Zusammenfassung

***Uromenus dyrrhachiacus* (Karny, 1918), (Orthoptera: Tettigoniidae), eine endemische albanische Art am Rand des Aussterbens.** *Uromenus dyrrhachiacus* ist eine endemische Art für der Region Durrës in Zentral-Albanien und vom Aussterben bedroht. Die letzten Beobachtungen der Art liegen von nur einem Fundort vor. Die Lebensräume der Art haben sind durch anthropogene Einflüsse drastisch eingeschränkt. In 2022 wurde eine Feldstudie und ein Zuchtversuch durchgeführt, um Hinweise für den Schutz der Art geben zu können.

Schlüsselwörter: Artenschutz, Freilandstudie, Zucht

Introduction

Uromenus dyrrhachiacus (Fig. 1) was discovered by Karny in 1918 near the town of Durrës in central Albania. Three main areas located on the coastal hills had been defined by the author at that time, from south to north (current names in brackets): Shkâmb (Shkëmbi i Kavajës), Mali Durcit (Mali i Durrësit) and Porte (Portez). This *Uromenus* species belongs to *rugosicollis* group (Orthoptera species files 2022) which mainly occurr in North Africa. *Uromenus elegans* is the only other species of this genus found in the Balkans, more precisely in southern Greece (Peloponnese and Crete). Furthermore, it is known from Sardinia and the western part of the Italian peninsula.

After the discovery by Karny, no specific mention of its presence is indicated in the literature for more than half a century. In 1996 (Fontana & Kleukers, pers. comm.), it was reported again in a bushy plant formation above the sea, west of the commercial port, then more recently in 2015 (Puskás & Szövényi in Heller et al. 2021), further north, but still within the area given by Karny in 1918. In 2022, these last two sites were destroyed. The first probably by landslides linked to urbanization above and which destroyed the original biotopes. The second by bulldozers which are levelling the hill as part of the creation of a new industrial port terminal.

The elective habitat of *U. dyrrhachiacus* is located in the coastal region of Durrës, included in the peri-Adriatic depression and made up of hills of sandstone with cement clay limestone (molasses). The plant formations located between 15 and 100 m elevation are composed of a rather sparse herbaceous vegetation, with a dominance of woody or woody-based plants. In the field, the first adults are encountered in June with a peak occurrence at the beginning of July. According to Karny (1918), some individuals can survive at least until mid September.

In 2015, the species was listed as critically endangered (CR), on the IUCN Red List of Threatened Species (Chobanov et al. 2016).

Fig. 1: *Uromenus dyrrhachiacus* male (left) and female (right). (Photo M. Lemonnier-Darcemont)

Material and methods

Field research

In the frame of this first study, we targeted the most recent sites as a priority and extended the research to the entire distribution area defined by Karny in 1918. A large part of the appropriate natural habitats at the beginning of the 20th century have now disappeared, swept over by the progression of the city and its infrastructures. Nevertheless, a few natural spots remain and we began their exploration, at a time considered to be most favourable (Karny 1918), on July 3 and 26, 2022. We prospected the hillside habitats in the close vicinity of the sea, with plant formations similar to those described by the various observers, with more particularly the presence of *Spartium junceum, Scolymus hispanicus*, *Cirsium spp.* and *Carduus spp.* (Karny 1918 ; Szövenyi & Puskas, pers. comm.).

Breeding

In order to acquire a better knowledge of the biology of the species and also to have a sufficient reserve of individuals for the purpose of possible reintroduction we have set up two terrariums (45L x 45W x 45H cm) in our premises in Greece (Fig. 2). These were placed near natural light and equipped with heat lamps programmed according to the length of the day. Inside the breeding cages we placed and regularly renewed fresh plants identical to those recorded on the natural sites of the species. A large number of stems of potential plant species for egg laying were planted in a tray filled with soil, placed inside the terrarium.

Fig. 2: Breeding indoor terrarium (Photo C. Darcemont)

Results

Field research

Our 2022 investigations on the historic stations of Karny enabled us to confirm the presence of the species in at least one area of the northern sector of Portez: Portez beach site (N 41.395, E 019.407) - Durrës district (Fig. 3). It is a more or less dense overgrown herbaceous vegetation (Fig. 4) with a clear predominance of *Spartium junceum, Scolymus hispanicus* and *Cichorium sp.,* also *Eryngium sp., Foeniculum vulgare, Vitex agnus-castus, Phragmites sp.* This relatively homogeneous site extends over at least 2 ha, between 10m and 35 m above sea level and about 200m from the sea.

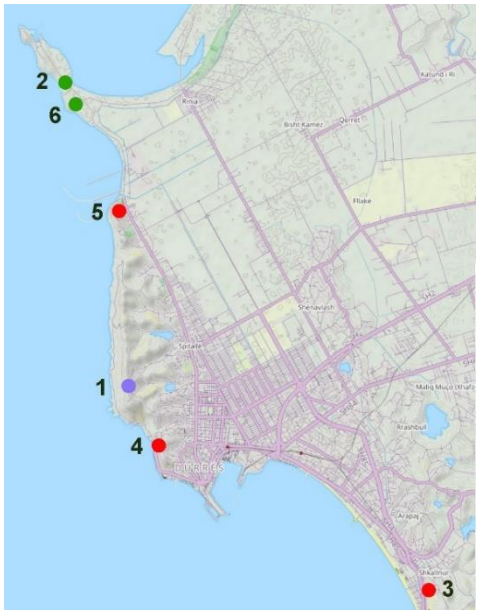

Fig. 3: Map of historic and recent records: 1 to 3 (Karny), 4 (Fontana & Kleukers), 5 (Puskás & Szövényi), 6 (authors, 2022). In 2022: red= absent, green= present, purple=unchecked.

Fig. 4: Site with *Uromenus dyrrhachiacus* found in 2022 (Photo M. Lemonnier-Darcemont).

During our first visit at the end of the afternoon on July 3, adults and sub-adults were frequent and although we did not take density measurements, in certain areas the number of individuals was ≥ 5 /m2. All were observed on woody stems, mainly on *S. hispanicus, Cichorium sp.* and *S. junceum,* at least 50 cm from the ground.

On July 26, only a few individuals were seen on the field, especially on *S. junceum.* At this date, the egg-laying holes are easily spotted in the stems of *S. junceum, Phragmites sp., Cichorium sp.* and *F. vulgare.* Some of them, the finest, seem gnawed for purely food purposes (observation confirmed in breeding).

Breeding

All the information we have gathered during this season only concerns adults.

- 3 ♂ and 2 ♀ adults, 1 ♀ sub-adult, collected at this site on July 3, placed in a terrarium (T1).
- 2 ♂ and 2 ♀ adults, collected at the same site on July 26, placed in a terrarium (T2).

Feeding

The search for food, like most of the activities of this insect, takes place at dusk and at night. They like the stems and leaves of fennel, the tender stems of *S. junceum*, the flowers of *Vitex agnus castus*, mainly at the beginning of their adult life before the first matings, less regularly in July, and less often in August. They also like watermelon and especially zucchini and wheat bran, which are eaten throughout their active live. In hot weather, *Uromenus* are strongly attracted by the drops of water that remain on the vegetation after their daily vaporization.

Live insects seem to be neglected as prey, unlike dead Orthoptera which are commonly eaten, with a peak in the middle of the breeding season and until about two weeks before death. Medium-sized grasshoppers are most liked, such as *Aiolopus strepens* or *Chorthippus spp.*, larger species like *Ruspolia nitidula,* are moved but not eaten.

Juveniles during moulting are easy and vulnerable preys due to their low mobility. In certain spots of high density of individuals, they are undoubtedly frequent victims of cannibalism. This happened with our sub-adult male collected at the beginning of July and devoured a few days after his capture, during his imaginal moult.

Song and mating

Singing is not common in this species. We have heard and recorded it in males, mainly in the first days of July, at the beginning of their adult life (Fig. 5). It does not seem systematic before the matings. When caught by hand, both males and females stridulate, like *Ephippiger*.

The first matings were observed at the beginning of July and the last in mid-September, always after sunset, at the end of the evening and especially at night. During her life, a female mates several times when she has the opportunity, and up to two weeks before her death. The spermatophore deposited by the male is relatively large (±20 mm) and is eaten by the female in less than 24 hours.

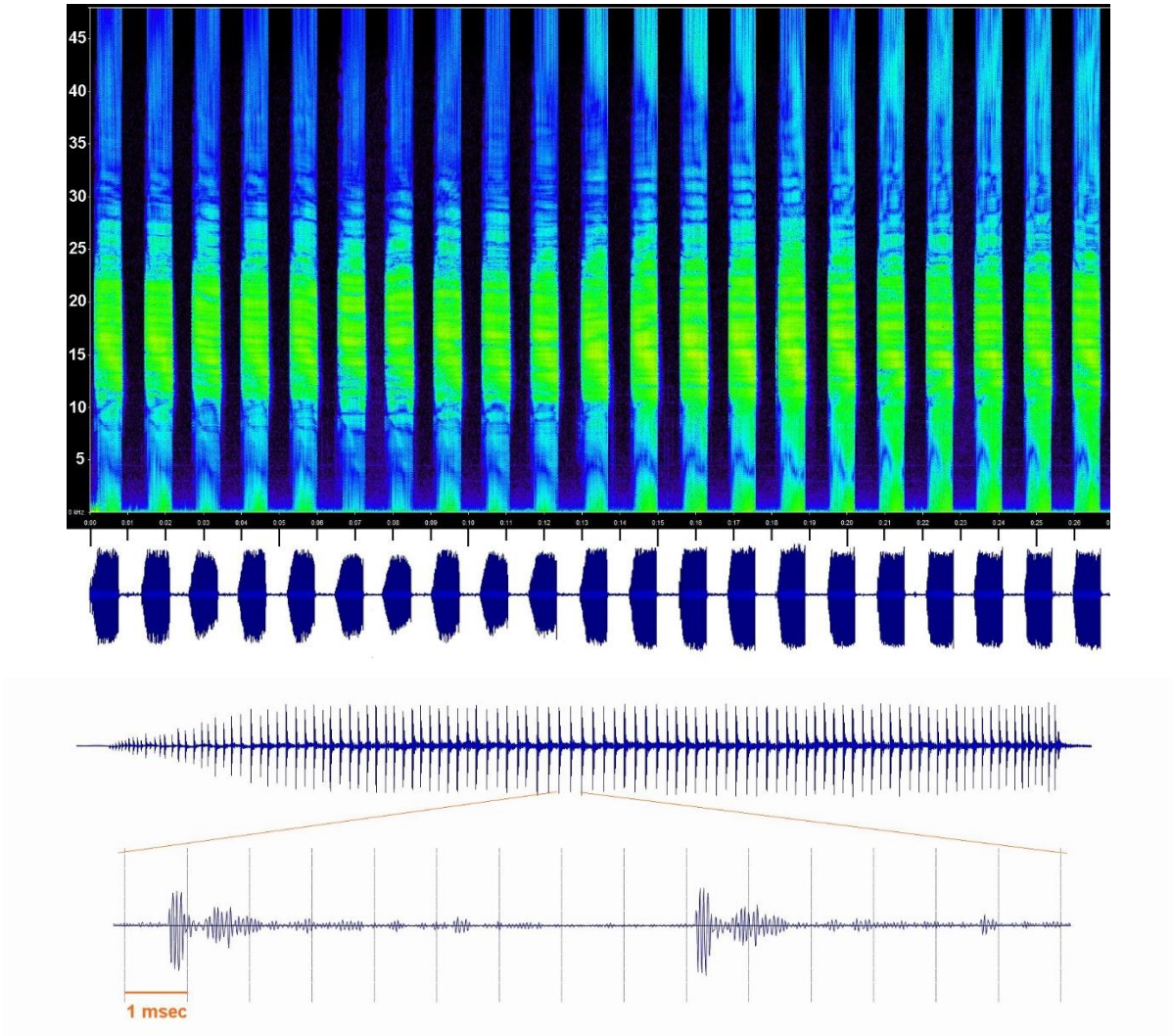

Fig. 5: Oscillogram and spectrogram of 27 seconds of calling song of male, recorded the 5 July 2022. The peak of energy is between 15 to 20 KHz (above). Detail of one syllable (700 to 800 msec, composed of about 100 impulses) and detail of two impulses (below).

Egg laying

Egg laying occurs from the third day after mating, both at night and during the day. Before laying her eggs in a woody plant stem, the female opens first the hole by nibbling. She preferably chooses fresh stems but not exclusively. Among the plants present in their natural biotope and which have been made available for breeding, *F. vulgare, S. junceum* were preferred, and a little less frequently *Cichorium sp.* and *Vitex agnus castus. Astragalus sp.,* was the only plant which was absent from the site, was also selected for spawning. A stem most often includes 3 to 12 egg-laying holes - more rarely up to 20 - spaced about 2 cm (Fig. 6).

Fig. 6: Stem with egg-laying holes (Photo C. Darcemont).

Life duration

At the end of life, the body of the *Uromenus* is dotted with small brown spots, mainly on the abdomen and the legs, the ends of which become necrotic, the antennae break. Insects move and feed less and less and finally die. Specimens collected in early July (T1) died between mid-July and mid-September. For the couple collected at the end of July (T2), the female died in mid-October, i.e. a lifespan as an adult of more than three months in captivity.

Discussion

The survival of *Uromenus dyrrhachiacus* is threatened by serious damage to its habitat due to human activity, especially industrial, on the coast of Durrës. We think also that the urbanization by residents will continue in the following years. This Ensifera may disappear definitively if no conservation action is undertaken rapidly. To better assess the status of this taxon and put in place an adequate action plan, it is important to conduct additional surveys next spring throughout the favourable area, particularly of the military terrain currently prohibited from access to the public and located north of the city of Durrës (Portez).

Through our local scientific network (University and Museum of Natural Science of Tirana), the support from IUCN SSC Grasshopper Specialist Group, we have submitted a request for funding to initiate several urgent conservation actions in order to respond urgently to the threat of extinction of this bush cricket:

- Ex-situ breeding indoors and outdoors (small plot of herbaceous formation planted with plants favourable to food and egg-laying), so as to have a sufficient number of individuals, with an objective of possible reintroduction in the natural habitat of the species.
- Information and training of people involved in local NGOs and to be able to act quickly in the event of new and unexpected threats.

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