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Distribution, conservation and prognosis for *Gampsocleis glabra* (HERBST, 1786) (Insecta: Ensifera) in Slovakia and the Czech Republic

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Abstract

The Heath Bush-cricket (*Gampsocleis glabra*) can be considered as a really xerothermophilous species preferring dry and warm steppe-like formations, quite intolerant to different or changed ecological conditions. Although this Euro-Asian bush-cricket occurs in many European countries, the distribution in Slovakia can be still classified as "mystic and unclear". However several records have been published on its presence from Slovakia (E and SW) and the Czech Republic (N). The references hinted at the fact that *G. glabra* seemed to appear just in Eastern Slovakia on its South close to the boundary with Hungary. However in the 90's the species was collected in South-Western Slovakia, especially in the surroundings of the Danube River. Due to a lack of sufficient information on the occurrence of *G. glabra* in Slovakia as well as in the Czech Republic it seems to be difficult to define the exact ecosozological status of the species and to determine relevant activities for its conservation. Since the main threat seems to be connected with the destruction of real and potential localities, conservation efforts should be proposed from this point of view.

Zusammenfassung

Die Heideschrecke (*Gampsocleis glabra*) ist eine ausgesprochen xerothermophile Art, die trockenwarme, steppenähnliche Lebensräume bewohnt und sehr empfindlich auf Änderungen der Habitatbedingungen reagiert. Obwohl diese eurasische Laubheuschrecke in einigen Ländern Europas vorkommt, ist ihre Verbreitung in der Slowakischen und Tschechischen Republik noch weitgehend unklar. Es liegen einzelne publizierte Nachweise der Art aus beiden Ländern vor. Ursprünglich wurde angenommen, *G. glabra* käme in der Slowakei nur im Osten nahe der ungarischen Grenze vor. In den 1990er-Jahren gelangen jedoch Aufsammlungen der Art im Südwesten des Landes in den Donauniederungen. Die nach wie vor unklare Verbreitungssituation in beiden Ländern erschwert eine genaue Bestimmung des Gefährdungsstatus und die Formulierung geeigneter Schutz- und Fördermaßnahmen. Da die Gefährdungsursachen für die Art zu einem erheblichen Teil in der Zerstörung bestehender und potenziell geeigneter Lebensräume liegen dürften, sollten sich Schutzbemühungen für *G. glabra* v.a. auf diese Problematik konzentrieren.

Introduction

The Heath Bush-cricket (*Gampsocleis glabra*) is a xerothermophilous species preferring dry and warm steppe-like formations, quite intolerant to different or changed ecological conditions. ČEJCHAN (1959) has even classified it as a deserticolous species. It usually inhabits various meadows with sparse bush or tree stands. GULIČKA (1992) underlined sites with poor grass vegetation as well as dry soils. BELLMAN (1985) considered as suitable habitats those steppe regions with high grass (*Stippa* spp.). However, it obviously depends on the availability of habitats, geographical, and ecological aspects. HARZ (1957) and KNIPPER (1958), for example, emphasized even heather (Callunetum) as the only alternative of habitat for the Heath bush-cricket in the Lüneburger Heide (Germany).

It feeds on various foods – plant as well as animal organic matter. As a heliophilous species, it is active especially in sunshine; the stridulation is similar to that of *Tettigonia viridissima* or *Metrioptera roeselii* (BELLMAN 1985). More detailed information on biology and ecology of *Gampsocleis glabra* can be seen in HARZ (1957).

Distribution in Slovakia and the Czech Republic

This Euro-Asian Bush-Cricket occurs in many European countries. KALTENBACH (1970) presents its distribution from Western Siberia and Kazakchstan to Spain, including Eastern and Southern Europe. However, it is absent from the British Isles, Portugal and Italy and occurs only in isolated spots in Spain, Germany and Poland (LIANA 1992, MAAS et al. 2002).

The distribution of *Gampsocleis glabra* in Slovakia can be still considered as unclear. GULIČKA (1992) hints at its "sporadic occurrence" in former Czechoslovakia. However several records have been published on its presence either in Slovakia or and rather than in Moravia and the Czech Republic (Figure 1, 2). In the 50's MAŘAN (1954) observed the species in Eastern Slovakia (Svätá Mária) while he was dealing with xerothermophilous orthopterans historically immigrating from the pannonian lowlands of Hungary and Austria. And finally at the end of 50's ČEJCHAN (1959) updated the previous knowledge by the record from Veľký Kamenec (mentioned as well as Veľký Kevežd) (Eastern Slovakia). This information came from Dr. A. Hoffer, who had found 22 males and 14 females here in July 11, 1953. Therefore ČEJCHAN (1959) considered this locality as the one with the most abundant population of *Gampsocleis glabra* in Slovakia. In 1985 he summarized all the available data on the occurence of the species and added the new record from Somotor (Eastern Slovakia), when Dr. Hoffer had collected one female in 1951 (ČEJCHAN 1985). GULIČKA (1992) dealt with the conservation of this bush-cricket and as for its occurence he mentioned "for example" Bodrog and Veľký Kamenec (Eastern Slovakia) with no more detailed data or reference.

All the available references hinted at the fact that *Gampsocleis glabra* seemed to appear just in Eastern Slovakia on its South close to the boundary with Hungary. ČEJCHAN (1985) wrote that it has not been recorded out of Eastern Slovakia yet. However in the 90's the species was collected in South-Western Slovakia, especially in the surroundings of the Danube river. This region, although formed mainly by floodplain forests, sporadically provides very dry and warm ecological conditions suitable for xerothermophilous species such as the Heath Bush-cricket. In July 17, 1991 Majzlan found one specimen in Dobrohošť (MAJZLAN, 1992) and in July 26, 1998 Fedor captured one female in Gabčíkovo – Istragov – in meadow communities of Dauco-Melilotion on gravel terraces (FEDOR 2000, 2001). Another specimen of *Gampsocleis glabra* from South-Western-Slovakia was recorded in Abov-Hurbanovo, a sandy xerothermous site, in August 1999 (MAJZLAN et al. 2000a, b).

The first record of *Gampsocleis glabra* from the Czech Republic was published by SEIDEL (1836), from Sedlo hill near Litoměřice. Although, this record was marked by GULIČKA (1992) as disputable, from the zoogeographical point of view the occurrence is possible. The area of northwestern Bohemia is very dry and warm with the occurrence of several xerothremic species on the northern edge of their ranges (MAŘAN 1964, ČEJCHAN 1981, 1982, HONCŮ 1993, HOLUŠA & HOLUŠA 2002). Recently, the existence of population in this locality of Sedlo is impossible, due to reforestation of hill.

The only record of the Heath Bush-cricket from Moravia comes from the locality of "Větrníky" at the town of Vyškov mentioned by GINTER (1951) (recently a national natural reserve Větrníky, 15.09.1943, 6M, ??F, 02.08.1946, 2M, revid. J.Holuša, coll. MJM). The local occurrence of the species in Southern Moravia has been recorded by GULIČKA (1992) as well. Recently, we do not know any locality with its population.

The record by HYKEŠ (1925) at the town of Osoblaha in Silesia (former historical country) is very questionable (ČEJCHAN 1959). It is not clear whether it is an original or taken record. In spite of other improbable species (*Anechura bipunctata*) noted from Silesia, the record seems to be unreliable. ZACHER (1907) cited only localities from Upper Silesia.

The following survey presents a list of localities of *Gampsocleis glabra* in Slovakia and the Czech Republic with a grid reference number and relevant literature references.

Slovakia

Svätá Mária (7596): MAŘAN (1954).

Veľký Kamenec (Veľký Kevežd or Kevežď) (7696): ČEJCHAN (1959) GULIČKA (1992).

Somotor (7596): ČEJCHAN (1985).

Dobrohošť (8070): MAJZLAN (1992).

Gabčíkovo – Istragov (8171): FEDOR (2000, 2001).

Abov – Hurbanovo (8175): MAJZLAN et al. (2000 a, b).

The Czech Republic

Sedlo hill (5451): SEIDEL (1836).

Větrníky u Vyškova (6768): GINTER (1951).

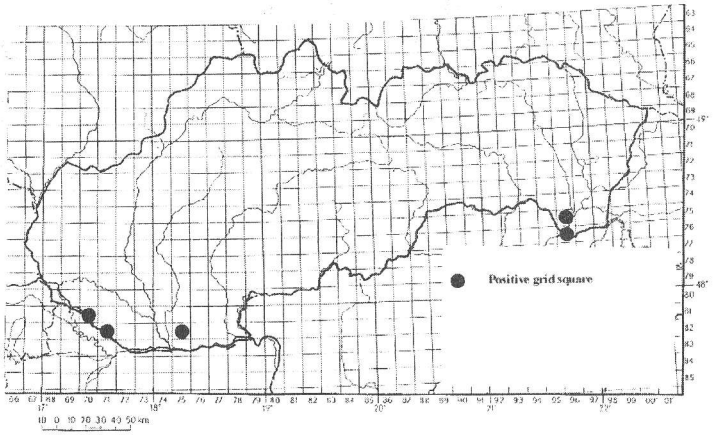

Fig. 1: Distribution of *Gampsocleis glabra* in Slovakia.

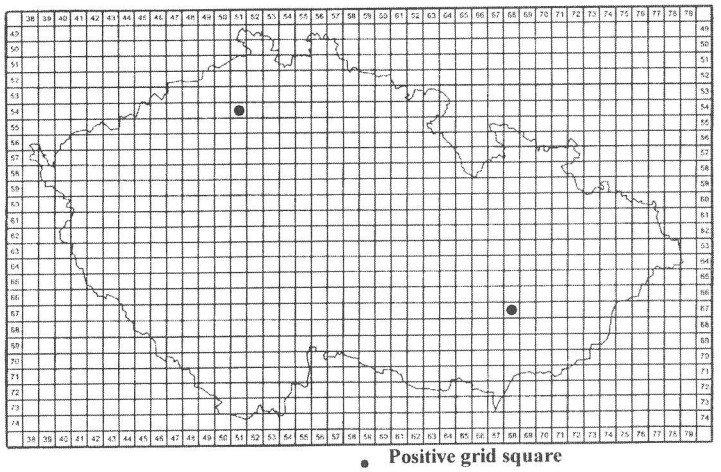

Fig. 2: Occurence of *Gampsocleis glabra* in the Czech Republic.

Conservation and prognosis for future

Due to a lack of sufficient information on the occurence of *Gampsocleis glabra* in Slovakia as well as in the Czech Republic it seems to be difficult to define the exact ecosozological status of the species, and to determine the relevant activities for its conservation absolutely reliably. The species has been listed in the Red Data Book of Slovakia and the Czech republic as an endangered insect (GULIČKA 1992). Generally, the Heath Bush-cricket is usually included in national Red Data Books in Central Europe. Even in Hungary, where the population is much more abundant than in Slovakia, the species has been under the nature conservancy (SZÖVÉNYI & NAGY 1999). In Niederösterreich (Austria) it has been considered as an endangered species classified into the category 1 ("vom Aussterben bedroht"; BERG & ZUNA-KRATKY 1997). The species has been included into the Polish red list as well (LIANA 1992)

Gampsocleis glabra occurs on the northern edge of its range in Slovakia and the Czech republic. The known data are concentrated in the southern parts of the countries mentioned. Therefore, the occurrence is very local and may be ephemeral. But even in much more warm areas the fact is that the Heath Bush-cricket finds its suitable ecological conditions sporadically, on remarkably dry and warm sites. Hence the threat must be intensively interacted with the destruction of real and potential localities. This is actually the problem of many other xerothermophilous orthopterans, e.g. *Saga pedo* or *Acrida ungarica*. GULIČKA (1992) presented as main reasons of the threatening the radical impact on original steppe and wooden-steppe communities, especially their change into farmland with intensive management (application of chemicals, deep tilling etc.). Today, *Gampsocleis glabra* escaped to refugia, that have not been under significant intensive human land use, especially due to its low value for agriculture (sand dunes, gravel terraces, dams etc.).

The conservation of the species is only possible in protection in situ. Nature reserves of various character and status may save or keep the populations locally. A need for conservation of steppe habitats as potential biotops for *Gampsocleis glabra* has been presented by BERG & ZUNA-KRATKY (1997). This seems to be a general plea for nature conservation in endangered habitats of xerothermous formations. Southern Slovakia is the most northern point of the formerly large pannonian steppe with its center in Hungary and Austria. Thus, the study of its species diversity is necessary for effective conservation activities. The same consequences appear from the paper by BERG & BIERINGER (1998) from Niederösterreich (Austria).

On the other hand an interesting question appears in effect of aridization that significantly leads to increase in abundance of some xerothermophilous species and their infiltration into suitable biotopes. This phenomenon may cause a significant increase in population density of *Gampsocleis glabra* in future, actually as it has been observed at several other species such as *Oecanthus pellucens* (GEREND & PROESS 1994, FEDOR & MAJZLAN 2001).

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