The Italian locust *Calliptamus italicus* (Linnaeus, 1758), a recent addition to the Orthopteran fauna of Luxembourg (Insecta: Orthoptera, Saltatoria, Acrididae)

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Abstract. The Italian locust *Calliptamus italicus* has been recorded for the first time in Luxembourg. It has been found in two different locations in the Gutland region, one of them a former open-cast iron ore mining area in the south of the country which is well-known for its many warmth-loving species. The discovery in Luxembourg is coterminous with new records after more than half a century from neighbouring Belgium. We assume that this recent expansion of the species' range can be linked to the sequence of unusually dry and hot summers in western Europe in recent years.

Key words. Insecta, Orthoptera, Caelifera, Acrididae, *Calliptamus*, Luxembourg, Belgium, climate change.

1. Introduction

Calliptamus italicus is a species presenting a Eurasian distribution reaching from the Iberian Peninsula through France, the Alpine region and most of Central Europe southeastwards to the Balkans and Turkey. It is absent from the northwestern lowlands but does occur in eastern Germany and lowland Poland (Detzel, 1998 and GBIF). The region around Luxembourg demarcates the species' northern limit in this part of the continent but its presence has always been well-established in the larger river valleys of northeastern France (Meuse and Moselle), where it is still locally common, linking the eastern French populations to the species' former strongholds in southern and south-central Germany (Detzel in Detzel, 1998). It used to be known from a limestone area in southernmost Belgium but the population became extinct shortly before 1950 (Goetghebuer 1953 cited in Hofmans et al. 1989).

The species has quite recently been discovered by Andreas Werno in the Moselle valley near Apach/Perl on the slopes of the "Hammelsberg" very close to the German border (Werno & Staudt, https://www.delattinia.de/node/696) and indeed just a stone's throw from Luxembourg. According to these authors the species has not been observed in the German Moselle valley further downstream but populations do exist in the wine-growing region of the Lower Nahe valley which has a reputation for its xerothermophilous fauna and flora.

The Orthopteran fauna of Luxembourg has first been studied by Hoffmann (1960, 1962) and Reichling & Hoffmann (1963). A revived interest in these insects led to the publication of a Red List in 2000 (Proess et

al. 1999)) and an atlas by one of us (Proess 2004) which mentioned a total of 47 species then known or previously recorded from the Grand Duchy. With the addition in 2010 of *Meconema meridionale* (Costa, 1860) (Proess 2010), the list of currently extant species was brought to 43 (5 species of the original 47 being considered locally extinct). Unlike in Belgium *Calliptamus italicus* had so far never been found in Luxembourg.

2. Material and methods

Specimens of *Calliptamus italicus* were photographed in the wild by the second author (FB) and later identified by the first author (RG). No voucher specimens exist for this observation. Another locust taken by chance has been kept refrigerated until dry-mounted by the first author. It will be integrated in the Luxembourg Natural History Museum's Orthopteran collection. Identification is based on Sardet et al. (2015).

3. Results

The species has been recorded at the following locations:

L-Differdange "Giele Botter", LUREF 67623N 59044E, 49°32'34.7"N 5°52'42.9"E, 378 m a.s.l., former open-cast mining site, 2 individuals, 08.08.2019 phot. F. Birlenbach, det. R. Gerend.

Ibid., 1 individual, 14.09.2019, vid. R. Proess, F. Birlenbach & C. Braunert.

L-Senningerberg, built-up area of village, LUREF 79788N 84094E, 49°39'09.6"N 6°13'29.3"E, 398 m a.s.l., construction site with bare ground, 1 male, 11.09.2019, leg. Ben Louis, det. Michelle Clemens, teste R. Gerend, in coll. MNHNL.

The species was first observed in Luxembourg in August 2019 by the second author (FB) who took pictures of a greyish-brown grasshopper in the former iron-ore mining zone, now a nature reserve called "Giele Botter", near the town of Differdange, in the extreme south-west of Luxembourg (Fig. 1). The pinkish tinge of the wings brought back a discussion he had had with the first author (RG) barely a week before, about grasshoppers with coloured hind wings other than the rather common *Oedipoda caerulescens* (L., 1758) which is a characteristic species of these deforested extraction sites with their bare or sparsely vegetated ground. The photographs were posted on a social media website where the first author (RG) saw them and identified the specimens as belonging to the Italian locust *Calliptamus italicus*. A month later another specimen of this species was captured by a forestry agent (Ben Louis) on a construction site in the village of Senningerberg and then presented to Michelle Clemens of SIAS who identified the insect and contacted RP and RG for further corroboration of the unusual discovery. On a return visit to the Differdange site on 14th September 2019 the authors found another specimen which somehow managed to escape. A visit to the Senningerberg area's sandstone quarries, adjacent to where the single specimen was found, by one of the authors (RP) yielded no further records. With the addition of the Italian locust, 44 species of grasshoppers and crickets are currently known to occur in Luxembourg.

4. Discussion

A quick search on the internet showed that the species had indeed also been found in nearby Belgium this summer where it made it onto the pages of several regional newspapers. These records, communicated by the press agency Belga (they have not been published in a scientific magazine), were made in several locations in the southeast of Belgium, sandstone quarries near Arlon probably being those nearest to the border with Luxembourg (www.rtl.be/info/magazine/science published August 9, 2019). The news release mentions the fact that the Italian locust had not been seen in Belgium for more than a century ("…. depuis le début du 19e siècle"), clearly a mistake as Goetghebuer (1959) mentions last sightings of the species from the 1940ies near Torgny. As in Luxembourg, isolated individuals were spotted in a couple of locations but the presence of several locusts seen in the same place in the south of the Belgian Province de Luxembourg hints at the presence of a budding population.



Fig. 1. Adult Italian locust *Calliptamus italicus*. Nature reserve "Giele Botter" Differdange. Photo: F. Birlenbach.

The year 2019 clearly seems to have been a propitious one for this locust as a single sighting is even reported from the Netherlands, where a specimen was observed on the 14th of August amidst numerous *Oedipoda caerulescens* in the valley of the Geul stream which is part of the RivierPark Maasvallei nature reserve (Verhees et al. https://www.naturetoday.com/intl/nl/nature-reports/message/?msg=25416)

According to Detzel (1998), the Italian locust is now much rarer in southern Germany than at the beginning of the 20th century, when the species was known to be extremely common ("ungemein häufig") in the Upper Rhine Plain and in the warm foothills of the Vosges mountains (Huber, cited in Detzel, 1998). It seems to have declined dramatically since, throughout its German range, with many of its populations now lost or greatly reduced in numbers.

Calliptamus italicus is a warmth-loving species which has a predilection for open, sparsely vegetated situations with often stony or rocky ground such as can be found in dry limestone grassland, areas of scree on exposed slopes or dry parts of alluvial plains. It shows a clear preference for areas with a high proportion of open ground next to patches of somewhat lusher, more vigorous vegetation (Maas et al., 2002 cited in www.bemann.alfahosting.org/Calliptamusitalicus.htm). Characteristic habitats in southern Germany seem to be vineyards with much open ground as well as areas of xeric grassland on steep rocky slopes. With these habitat requirements in mind, its presence in the former iron ore extraction sites of southern Luxembourg does not come as a surprise, the more so, as these locations are renowned for the many warmth-loving species found as part of their fauna and flora (Cungs 1991, Cungs & Jakubzik 2001). The praying mantis *Mantis religiosa* has established a thriving population in these protected areas in the last years, to name only one such species (personal observations by the authors).

The Italian locust still has some viable populations in the valleys of both the Meuse and the Moselle in northeastern France (Recorder database of the MNHNL, personal observations), some of them quite close to the Luxembourgish border. These could be the steppingstones from where the species can expand its range in propitious years. The former Belgian site of Torgny is less than 40 km away from Differdange. The region of northern Lorraine, southern Belgium and Luxembourg represents the fluctuating northwestern limit of the Italian locust's range, an area where a species is likely to be confined to only the most suitable habitats available and where its populations are even more prone to environmental changes. We can safely assume that the sequence of unusually hot and dry summers in recent years enabled this species to build up larger populations, hence making possible the colonisation of new sites, especially as *Calliptamus italicus* is known to be a species

with a strong dispersion ability (Poniatowski et al. 2018). Whether the founder specimens will successfully establish new populations remains to be seen. As in Luxembourg the former open-cast mining sites are, to this day, the only areas which still maintain sizeable tracts of barren rocky ground with xero-thermophilic vegetation, it is probably crucial, and this not only for the benefit of the Italian locust, that these nature reserves be kept as open as possible, lest their vegetation reverse to brush and eventually woodland.

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