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The reappearance of *Pseudoclavellaria amerinae* (Linnaeus, 1758) in Germany (Hymenoptera, Cimbicidae)

With 2 figures

Andrew D. Liston [1] and Peter Skacel [2]

[1] Senckenberg Deutsches Entomologisches Institut, Eberswalder Straße 90, 15374 Müncheberg, Germany. – aliston@senckenberg.de
[2] Vehlgast 26, 39539 Havelberg, Germany. – peter.skacel@web.de
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Summary

The sawfly *Pseudoclavellaria amerinae* was last found in Germany in 1976 and was treated as extinct in the latest national list of endangered species. Two recent occurrences in Saxony-Anhalt, Germany, are reported, and discussed in the context of older distributional data. Most records of *P. amerinae* in central Europe are from alluvial forest along lowland stretches of major rivers and their tributaries. In eastern Germany, historic and current occurrence is concentrated on the Elbe river system. Data on the larval host plants are reviewed: these are primarily smooth-leaved *Salix* species (particularly *S. fragilis* and *S. alba*), with *Populus* species as important secondary hosts.

Key words

sawfly, distribution, Europe, Elbe, host plants, floodplain forest

Zusammenfassung

Die Keulhorn-Blattwespe *Pseudoclavellaria amerinae* wurde zuletzt 1976 in Deutschland gefunden und deshalb in der neuesten Roten Liste der gefährdeten Arten Deutschlands als ausgestorben eingestuft. Zwei neuere Funde in Sachsen-Anhalt werden gemeldet und im Rahmen der älteren Verbreitungsdaten diskutiert. Die meisten Nachweise von *P. amerinae* in Deutschland stammen von Weichholzauen entlang der großen Flüsse und deren Nebenflüsse im Tiefland. Im östlichen Deutschland sind historische und aktuelle Vorkommen am Flusssystem der Elbe konzentriert. Daten zu den Futterpflanzen der Larve werden ausgewertet. Diese sind in erster Linie glattblättrige *Salix*-Arten (insbesondere *S. fragilis* und *S. alba*), mit *Populus*-Arten als wichtige sekundäre Wirtspflanzen.

Introduction

The sawfly *Pseudoclavellaria amerinae* (Linnaeus, 1758) is large, conspicuous and at least the females (Fig. 1) are rather easily recognized, even when only photographs are available. In this sex, confusion with the smaller *Praia taczanowskii* Wankowicz, 1880 is possible, but the latter has pale femora (nearly completely black in *P. amerinae*). Males of *P. amerinae* differ greatly in appearance from females and could easily be mistaken for *Trichiosoma*: see key to Cimbicidae by Taeger (1998) for details. Furthermore, *P. taczanowskii* has only been recorded extremely rarely in central Europe, and not since 1924 (Liston et al. 2012). The cocoons of *P. amerinae* are also distinc-

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tive: these have net-like walls (Fig. 2) and are found in cavities in the trunks, or crevices in the bark of the host trees, often clumped together, but also in leaf litter on the ground (Zaddach 1863). Published records and material in museum collections indicate that the species was widespread and apparently locally abundant in Central Europe at least until the end of the nineteenth Century. Local "outbreaks" sometimes even resulted in the defoliation of the larval hosts (Zaddach 1863). In Central Europe, *P. amerinae* has since become progressively scarcer. The last reported occurrence in Germany was in 1976. The species was later considered to be extinct in this country (Taeger et al. 1998, Liston et al. 2012). Here we document and discuss recent records from the Elbe river system in Saxony-Anhalt, Germany.

Recent German records

Saxony-Anhalt: Landkreis Börde, Bertingen, 52.345512° N, 11.835337° E, December 2011, several cocoons, and 1 female ex cocoon (emerged 2012), leg. H. von Bach (Senckenberg Deutsches Entomologisches Institut; hereafter abbreviated as SDEI). This record and additional information were published by Lippert (2013). Landkreis Stendal, Vehlgast / Havelberg, in garden of house, 52.80270° N, 12.198480° E, 10.05.2014, 1 female, photographed by P. Skacel.

The first locality, on the Elbe, is about 55 km south of the second, on the Havel near where it joins the Elbe.

Older records from the valleys of the Elbe and its tributaries

This is not a complete list. However, all specimens in the collection of the SDEI are listed which were collected since 1900 in the German states through which flows the Elbe, or its tributaries the Havel and the Saale, together with literature records from the same regions made during approximately the same period. It is striking, that both the older and recent records (above) from north-eastern Germany are nearly entirely from the catchment area of the River Elbe, in its wider sense (including tributaries).

Berlin and Brandenburg: Berlin, Finkenkrug (Havel), 21.05.1922, 1 male, leg. Oldenburg (SDEI). Berlin, Finkenkrug (Havel), 25.05.1922, 1 male, leg. Lichtwardt (SDEI). Brandenburg, Potsdam Wildpark (Havel), July 1923, 1 female, leg. Biologische Reichsanstalt (SDEI). Eberswalde (connected by the Finow Canal to the Havel), August 1909, larvae, leg. Schulze (Anon. 1911).

Mecklenburg-Vorpommern: There are no confirmed records from this state (Blank et al. 1998).

Lower Saxony: Recorded by Alfken (1937) as common everywhere in North-West Germany (this referred largely to what is now Lower Saxony) and often reared from cocoons, but without further details. Blank et al. (1998) date the last record in Lower Saxony to 1907, but this record has not been traced.

Saxony: Belgern bei Torgau (Elbe), Elbe Ufer, 07.05.1949, 1 male, leg. H. Köller (SDEI). Dahlen (Elbe), 09.05.1964, 1 male, leg. Birkmann (SDEI). Leipzig (Weiße Elster, a tributary of the Saale), several specimens from in and around the city, the most recent from Portitz dated 1931 (Reichert 1933).

Saxony-Anhalt: 1 male, Dessau (Elbe), 04.05.1925, leg. O. Heidenreich (Zombori 1980). 1 female, Halle (Saale), 21.05.1954, leg. [unknown] (SDEI).

Schleswig-Holstein: Elmshorn (Elbe), May 1873, many individuals ("swarming") (Wüstnei 1885). Blank et al. (1998) date the last record in Schleswig-Holstein to 1954, but this record has not been traced.

Hosts and habitat requirements

Larvae of *P. amerinae* have mainly been recorded feeding on various smooth-leaved *Salix* species (Zaddach 1863), such as *S. fragilis* (Brischke 1891) and *S. alba* (Borowski 2014). A number of authors, such as Weiffenbach (1985), have stated that the larvae even occur on *Salix caprea*, which is rough-leaved. *Populus* species seem to be regular but secondary hosts (Čingovski 1969); Zaddach (1863) specifically mentions *Populus tremula* and *Populus nigra* 'italica' (as "Zitter- und Pyramidenpappel"). Franz (1982) stated that the hosts of the larvae are large-leaved willow species and *Betula verrucosa*. Taeger (1998) also gave *Betula* as a host of the larvae, possibly following Franz (1982). Vollenhoven (1860) noted that much confusion was caused in the early literature by Degeer's misidentification of a birch-feeding *Trichiosoma* species, perhaps *T. lucorum* (Linnaeus, 1758), as "*Tenthredo amerinae*". We have traced no reliable mention of *Betula* spp. as hosts of *P. amerinae* in the literature and the statement by Franz is best interpreted as an error.

Historical collection sites of *P. amerinae* in Central Europe were predominantly lowland, and mostly in the valleys of major rivers. It might be inferred that this sawfly species is largely dependent on the availability of alluvial forest dominated by *Salix* species (German: Weichholzauenwald). The natural form of this habitat, dependent on inundation, is threatened with complete disappearance in Germany (Rennwald 2000). Throughout the whole catchment of the Elbe in Germany, only small such areas remain; they are normally only subject to flooding where they are situated outside the dykes (Burkart et al. 2003, Dziock et al. 2005).

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Discussion

The global range of *Pseudoclavellaria amerinae* is extensive, reaching in the West Palaearctic from Finland and southern Scandinavia to the Iberian Peninsula, south to Algeria (Lucas 1860), eastwards into Russia, Greece and Turkey (Taeger et al. 2006, Benson 1968) and in the East Palaearctic across Siberia to Korea (Gussakovskij 1947). However, there are comparatively few records from outside Europe. The decline and apparent disappearance of *P. amerinae* during the twentieth century occurred throughout large areas of northern and central Europe, with the result that the species was regarded as having become extinct in, for example, Finland (Anon. 1986), Poland (Huflejt 2002), Germany (Liston et al. 2012) and parts of Austria (Schwarz 2000). In Finland, the last recorded specimens were found in 1944 (Viitasaari 1990), but *P. amerinae* was rediscovered there in 1994 (Nuorteva 1999). The situation in Poland was similar to that in Germany: the last specimens were recorded in the 1960's, with new records in 2004 and 2013 (Borowski 2014, Holly 2014). The last known record

Fig. 1: Adult female *Pseudoclavellaria amerinae*, Vehlgast / Havelberg, 10.05.2014. Length approximately 20 mm (Photo: P. Skacel).

of *P. amerinae* in Germany was of an individual from near Breisach (Baden-Württemberg), close to the Rhine, collected in 1976 (Liston et al. 2012). The last recorded occurrence in Saxony-Anhalt, where the species has now reappeared, was in 1954 (Blank et al. 1998). During the same period, it continued to be recorded in a number of warmer regions of Europe, such as in southern France, where Chevin et al. (1995) stated that the Département d l'Isère represents its northern range limit.

We are unable to offer any conclusive explanation for the decline and disappearance of *P. amerinae* in Germany, or for its recent reappearance. Noteworthy is that many other large cimbicid sawflies (*Cimbex* and *Trichiosoma* species) also apparently became scarcer during the latter half of the twentieth Century (Taeger 1998, Liston et al. 2012). Adults of the large cimbicids are impressive and interesting-looking insects, which ensures that they are sometimes collected (or increasingly, photographed) by non-specialists. It is therefore remarkable that not a single specimen of *P. amerinae* has been found in Germany for almost four decades. However, the species can reproduce by parthenogenesis (Peacock 1938), which might enable it to survive at very low population levels. Further features of its life history, in particular the latticed structure of the cocoon, also sets it apart from the other Cimbicidae. On the other hand, re-colonisation cannot be ruled out. Perhaps the recent records from central and eastern Poland (Borowski 2014, Holly 2014) are indicative of the direction from which such colonists could have come. It must be left open, whether a connection exists between the reappearance of *P. amerinae* and the widespread flooding in 2002 and 2013 of areas along the Middle Elbe, which represented a temporary return to more natural river dynamics.

It would obviously be worthwhile if further data could be obtained which might clarify the present status of *P. amerinae* in Germany.

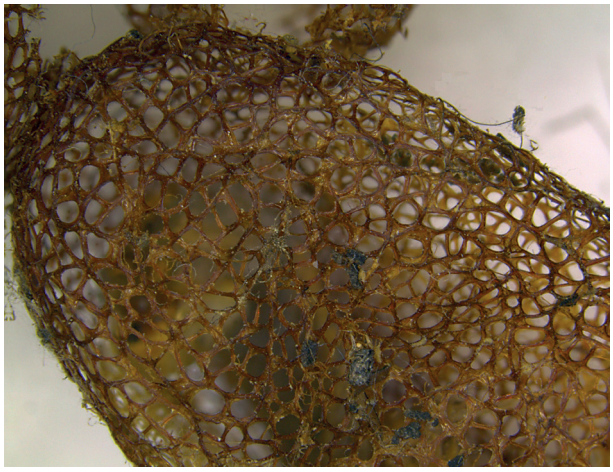

Fig. 2: Lattice structure of *P. amerinae* cocoon, Bertingen, 2011. Length of cocoon approximately 30 mm (Photo: A. Liston).

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