Whittleia retiella (Newman, 1847) (Psychidae) from the salt marshes of Schleswig-Holstein, Germany, with descriptive and life-history notes

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Abstract. In 2007 new localities for *Whittleia retiella* (Newman, 1847) were found in the salt marshes of Schleswig-Holstein, Germany. Known only from a few old records this psychid moth was considered to be a very rare resident of the salt marshes in Germany, although occurring in the neighbouring states. During 2007–2009 it was found in several locations in great abundance although the flight period was very short. The classification as a very rare species (R) according to the Red list of threatened animals in Germany (Binot et al. 1998) should be upheld due to the rarity of suitable habitats.

Zusammenfassung. *Whittleia retiella* (Newman, 1847) konnte 2007 erstmals wieder in den Salzwiesen Schleswig-Holsteins nachgewiesen werden. Die Psychide wurde aufgrund einiger weniger alter Nachweise bisher als auf den Salzwiesen Deutschlands sehr selten vorkommend eingestuft, obwohl sie regelmäßig in den Nachbarstaaten nachgewiesen werden konnte. An mehreren Stellen an der Schleswig-Holsteinischen Küste wurde in den Jahren 2007–2009 während einer kurzen Periode eine große Anzahl an Individuen notiert. Die Einstufung in der Rote Liste der gefährdeten Tiere Deutschlands (Binot et al. 1998) in der Kategorie R sollte aufgrund des auf küstennahe Standorte begrenzten Vorkommens aufrechterhalten werden.

Introduction

Salt marshes in the Wadden sea area extend along the coastline from Esbjerg in Denmark to Den Helder in the Netherlands and form a natural boundary between the sea and the mainland. Plants as well as animals of the salt marshes are exposed to extreme living conditions due to tides, storms, and at times extreme solar radiation, which can result in high salt concentrations. The salt marshes of the Wadden Sea area offer a habitat to many insect species, but there are few studies of the insect fauna of marine salt marshes (Foster 2000). The Microlepidoptera are represented by about 40 halobiotic and some widespread species. *Whittleia retiella* is the only known European halobiotic psychid moth occurring in salt marshes, mostly feeding on *Puccinellia maritima* (Huds.) Parl. (Hättenschwiler 1985). In Denmark there are some inland localities in grassland ecosystems or heaths mostly close to the coast but without *Puccinellia maritima* (Huds.) Parl. and Hoffmeyer (1960) stated that this species should be found on sandy soils all over Jutland, but so far it has only been found in a few localities in East and North Jutland. The species is known from salt marshes of Great Britain, France, Belgium, The Netherlands, Denmark, and South Sweden, and with only older records from Germany.

Description and Life History

The species was named with the very brief description "Mr. Ingall has captured a small *Psyche* with beautifully mottled wings. It is very different from the known British

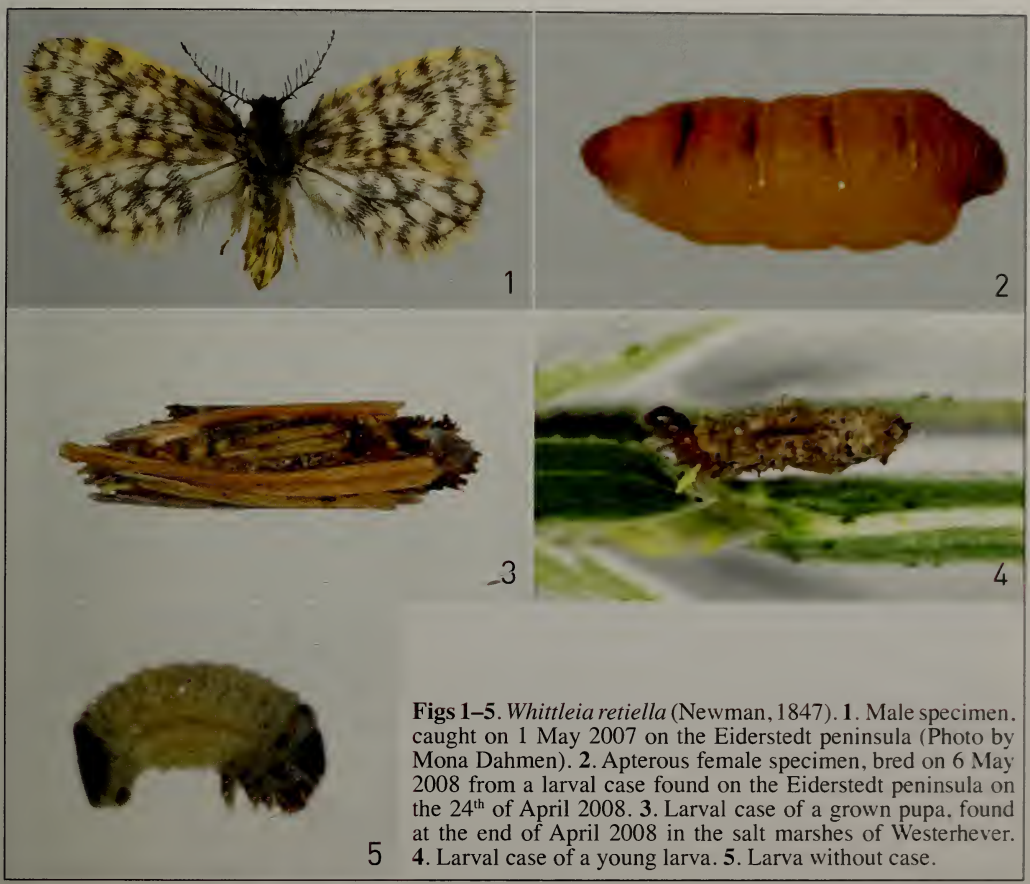
species, but in some degree resembles *Psyche undulella* on the continent: it is proposed to call the new species *Psyche retiella*." (Newman 1847). Newman (1850) later gave a more detailed description of the moth under the name *reticella*, which now is considered a misspelling. Tutt (1900) included the taxon in *Whittleia* as *W. retiella* (Nye & Fletcher 1991). It has also been known as *Epichnopteryx retiella*.

The males of *W. retiella* have a forewing length of only 4–5 mm and are the smallest member of the genus *Whittleia*. The fore- and hindwings are strongly rounded, being whitish with a pattern of dark grey with hair like scales. The antennae have 12–14 segments and are bipectinate, the pectinations without scales (Hättenschwiler 1985) (Fig. 1). Females are wingless with rudimentary legs and absent antennae (Fig. 2) and remain in the case until after oviposition. The case is attached to grass, has a size of 4-6 mm with pieces of dried grass fixed to the case (Fig. 3).

The males fly in the sunshine on warm and windless days around noon and close to the food plant. While male larval cases are often found close to the ground, the cases of female moths are attached close to the middle of the blade of grass. The male moths are attracted by the female pheromones and fertilisation takes place while females are still in the case; they leave the case after oviposition. It is one of the earliest moths in the salt marsh. In the literature a flight period from late May to early June is mentioned (Hättenschwiler 1985), but a flight period from late April and early May is recorded from The Netherlands (Friesland) and Denmark (Hoffmeyer 1960; Jansen 2005; Kaaber 1982).

The citation of subspecies *cimbriella* by Wolf (1949) is incorrect. Wolf cited ssp. *cimbriella* Rebel, 1938 as described in 1933 from Denmark and Schleswig. Rebel (1938) described the specimens found in Denmark (Jutland) as subspecies *cimbriella*, stating that the wingspan of the male continental specimens is smaller (7.5 mm) than that of specimens from Great Britain (8.5 mm) and that the markings on the wing were supposed to be rather blackish grey and less distinct when compared to the dark brownish weblike markings on British specimens. The female specimens are also supposed to be shorter (4 mm) and rather light honey brown compared to the specimens from Great Britain, which have a length of 5 mm and have a darker head. Examination of the large series of specimens (109 ♂ and 27 ♀) from the coast of Schleswig-Holstein suggests that this differentiation cannot be sustained. Males show a variation in size between 7 and 9.5 mm with a mean of 8.6 mm ± 0.49 mm as well as a variation in colour from dark grey to rather brownish black. The length of the females ranges from 3 to 4.6 mm with a mean of 3.8 mm ± 0.4 mm and they have a light honey coloured body with a darker head and slightly darker shades on the back. A possible explanation for the distinction of subspecies *cimbriella* made by Rebel (1938) might be the lack of available wild-caught specimens as he used mostly specimens bred from larvae for his description. However, when comparing newly bred specimens with wild-caught specimens from the same salt marshes on the west coast of Schleswig-Holstein no differences in size could be detected. The distinction of subspecies *cimbriella* thus cannot be sustained.

On the 12th of May 2008 one of the bred females, which was exposed to male moths after collection, laid eggs which developed to small larvae. After 2 weeks the larvae



Figs 1–5. *Whittleia retiella* (Newman, 1847). **1.** Male specimen, caught on 1 May 2007 on the Eiderstedt peninsula (Photo by Mona Dahmen). **2.** Apterous female specimen, bred on 6 May 2008 from a larval case found on the Eiderstedt peninsula on the 24th of April 2008. **3.** Larval case of a grown pupa, found at the end of April 2008 in the salt marshes of Westerhever. **4.** Larval case of a young larva. **5.** Larva without case.

already had constructed a case which resembled those of fully grown larvae but without attached pieces of grass (Fig. 4) and measured only 2 mm. The larva itself measured 1.7 mm and had a creamy white to yellowish colour with a black head and a blackish brown anal plate (Fig. 5).

Occurrence in Germany

A first record of *W. retiella* was made by O. Meder in the end of May 1929 close to Bredstedt near Husum in the remnants of the Bredstedt Heath (Meder 1930). Meder also mentions specimens recorded by Dr. Trautmann from the vicinities of Flensbourg, supposedly from 1913. In 1934 Wolf collected further specimens in the Kolker Heide near Husum and stated that the species should be widespread in the heathlands of Schleswig-Holstein, but was probably overlooked because of its small size (Wolf 1949). H. Wegener found another specimen in the collection of Rill (situated in the Zoological Institute and Museum of Hamburg) caught on 7.V.1959. There are few recent records, but Sobczyk (in Gaedicke & Heinicke 1999) suggested the possible occurrence of the species in Germany since records from Denmark close to the German border were known (Kaaber 1982). Probably because of the scarcity of records generally and no

Fig. 6. Attraction experiment with two bred females of *Whittleia retiella* (Newman, 1847) close to Bredstedt on 5 May 2008.

further records in Germany, *W. retiella* was declared a very rare species in the Red list of threatened animals in Germany (Binot et al. 1998). The species is not mentioned for Germany in Karsholt & Razowski (1996).

From the 1st to the 5th of May 2007 more than 200 males of *W. retiella* were found on the salt marshes of Westerhever; on the 2nd of May specimens were also found at the Hamburger Hallig. All specimens were sitting on the tips of blades of *Puccinellia maritima* (Huds.) Parl. or flying close to the ground in the sunshine around noon. Although a search was also conducted before the 1st of May and after the 5th of May, no further specimens could be found. Peak emergence seems to occur during a short period of warm, sunny, and windless days in May after a longer period of warm spring weather. Though they are not easy to detect, at the end of April 2008 and 2009 numerous larval cases were found in the salt marshes of Westerhever and on the Hamburger Hallig with several females (Fig. 2) and a few male specimens emerging. On the 5th of May 2008 and again in the beginning of May 2009 hundreds of male specimens could be seen flying and were easily attracted to females sitting in a large cage (Fig. 6).

This short and specific flight period might also explain the lack of earlier records, since most collectors might have been simply searching in the wrong period, especially since the literature mentions a flying period from late May to early June (Hättenschwiler 1985), while in the years of 2007 to 2009 the only specimens found were already flying in the first days of May. Despite the recent recording of numerous specimens of this

psychid moth, the classification as a very rare species (R) for Germany is recommended on the basis of its restriction to threatened coastal habitats.

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Note

A recently published paper by Heinicke & Wegener (2009) provides data on recent records of *Whittleia retiella* in Lower Saxony.

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Heinicke, C. & H. Wegener 2009. Aktueller Nachweis von *Whittleia retiella* (Newman, 1847) in Niedersachsen (Lep., Psychidae). – Melanargia **21**: 131–132.