

Observations on the developmental biology and occurrence of *Victrix umovii* (Lepidoptera, Noctuidae) in Sweden

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The developmental biology of *Victrix (Poliobrya) umovii* (Eversmann, 1846) is discussed. Eggs were obtained from caught females and the emerged larvae observed. The eggs and early larval stages are briefly described. The larvae were observed to feed only on *Alectoria sarmentosa* of four species of lichens and two mosses offered. The occurrence of the species in Sweden and Northern Europe is discussed.

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Introduction

The developmental stages of *Victrix (Poliobrya) umovii* (Eversmann 1846) (Fig. 1) have remained completely unknown and very little is known about its ecology.

In Sweden, *Victrix umovii* is associated with old forest stands, rich in pendant lichens such as *Usnea* spp., *Alectoria sarmentosa*, *Bryoria capillaris* and *Platismatia glauca*. The species' taxonomic relationship to the genus *Cryphia* and recent integration in *Victrix* (Varga & Ronkay 1989, Fibiger & Hacker 1991) has contributed to the assumption that lichens are the species' main food. Statements that the food could be mosses have been made (for instance, Skou 1991). So far though, no report to confirm either of these assumptions has been published.

The species is classified as vulnerable in the Swedish Red Data List and is considered to be threatened by the large scale rational forestry (Ehnström & Waldén 1986, Ehnström et al. 1993).

The biology of *V. umovii* is partly studied within a project commenced in 1989 concerning *Xestia sincera* (Hydén & Sjökvist 1993).

Observations made

Females that were caught in the province Dalarna produced eggs in captivity and the larvae were raised to the first hibernation. The females used a relatively long ovipositor to place the single

green-greyish eggs under and between lichens on dry twigs. After 20-25 days, the larvae emerged. They were offered the lichens *Bryoria capillaris*, *Alectoria sarmentosa*, *Platismatia glauca* and *Hypogymnia physodes* together with the mosses *Pleurozium schreberi* and *Hylocomium splendens*. To promote eating, the food was lightly moistened regularly. The larvae, which were relatively active, could only be observed to feed upon *Alectoria sarmentosa*, feeding mainly on the outer parts of its twigs and not eating completely through the twigs. Gnaw traces could clearly be observed in a magnifier. As the gnaw traces were small at these early larval stages, it can not be stated with absolute certainty that the larvae neglected the other lichens offered. The behaviour of the larvae, however, supports the observation that they fed exclusively on *Alectoria sarmentosa* and used the other lichens merely as shelter and camouflage. The mosses were completely omitted and almost never visited.

The larvae were uniformly grey-greenish in colour and somewhat stout. When not feeding, they were effectively hiding among lichens. At the time of the first hibernation they reached approximately 5 mm in length, representing the 2nd-3rd instar. They seemed to hibernate on the branches, sheltered by lichens, and not on the ground. They died during the early phase of hibernation.

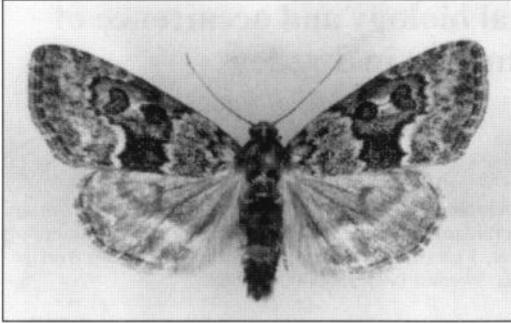


Fig. 1. *Victrix (Poliobrya) umovii*, male. Dr, Boda, 4.7.1989. Wingspan: 29 mm. Photo: N. Hydén.

Hane av barrskogslavfly, *Victrix (Poliobrya) umovii*. Vingbredd: 29 mm.

Discussion

An almost complete list of all findings of *Victrix umovii* made in Sweden up to 1992 has been established (Hydén unpubl.). The list covers all finding places and nearly all findings in the Nordic countries as well as in the rest of the Palaearctic. In Norway one female has been found (Bakke 1972) and in Finland a total of 34 specimens (of which two are not verified as of today). In Sweden, *Victrix umovii* has been found on a total of 14 places, 11 of them in the province Dalarna. Approximately 260 findings have been made in Sweden representing nearly 80% of all findings of the species. Of the Swedish specimens, findings have been made on one occasion in the province Värmland (two males) (Palmqvist 1982) (Fig 2), once in Gästrikland (one male) (Palmqvist 1988) and once in Uppland (one male), the latter representing the first Swedish finding (Svensson 1977). Based on present knowledge it is likely that the species has populations in Dalarna, Värmland and Gästrikland.

It is suggested that *V. umovii* at least in the Nordic countries prefers dry forest stands. This has also been proposed by other authors (Ehnström & Waldén 1986). Several known habitats in Sweden are located on well drained ground. A few localities though, are on or closely surrounded by more humid ground. This is also in agreement with the observations in Estonia where findings have been made in a pine stand and in a coniferous stand on sandy ground (Skvortsov & Thomson 1973, Skvortsov pers. comm. 1992).

In Sweden, findings have been made also in forest stands dominated by pine (Hydén and other lepidopterists unpubl.). These observations

indicate that *V. umovii* is not solely dependent on stands dominated by spruce. This is further supported by the fact that *Alectoria sarmentosa* also occurs in forests dominated by pines.

From the size of the larvae at the time of the first hibernation and the growth rate it is assumed that the species has a 2-year life cycle rather than a 1-year cycle. It is also suggested that the larva hibernates on the twigs and not on the ground.

The behaviour of the imagines at mercury vapor lamps leads to the assumption that the moths reside among the upper parts of the trees. This has also been indicated by other Swedish lepidopterists (eg. B. Wickholm pers. comm. 1992). These assumptions together with the observations of the behaviour of the larvae gives support to the hypothesis that the preferred habitat of the species is the tree crowns.

The transitory population on Houtskär in Finland has been thoroughly followed since its appearance in 1961 and to its disappearance after 1978 (Bruun 1978, 1982 & 1992). Only one specimen was captured in an even numbered year (the last specimen found 1978), supporting the hypothesis that the species indeed has a 2-year developmental cycle (cf. Bruun 1978).

In Sweden, the imagines could be found every year with no clear relation to odd or even numbered years. The appearance though varies greatly between different years. Based on the authors observations in two localities near Boda in Dalarna (cf. Hydén & Sjökvist 1993) the observed year to year fluctuation in appearance is, as it seems, dependent on climatic or other environmental factors. During a few nights in early June 1990 the temperature went down to approx. -15°C . This cold weather situation apparently shifted the main flight years of *V. umovii*: before the event it appeared predominantly in odd years but from 1990 and onwards it has appeared only in even years. These observations gives support to the hypothesis that *V. umovii* has a two-year developmental life cycle. Seemingly, the period of extreme weather did not severely affect the population of imagines that emerged about two weeks later, but instead affected the overwintered larvae that presumably would have given moths in odd years.

After this event a very clear shifting to predominantly even year appearance was observed also for *Xestia sincera* in the same study areas.

Acknowledgements

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Fig. 2. The author (to the right) and Per Åhgren, The nature conservation bureau in the province of Värmland, at the only finding place in Värmland of *Victrix umovii*. Older, light opened coniferous stand on W-sloping sandy ground in the River Klarälven valley. The locality is, however, not rich in the pendant lichen *Alectoria sarmentosa*, the hitherto only known food of the larvae of *V. umovii*. *Xestia sincera* has also been collected here. Vr, Stöllet, Kyrkebol, 21/9 1991. Photo: Sven-Åke Berglind.

Artikelförfattaren (till höger) i samtal med Per Åhgren, länsstyrelsens naturvårdsenhet i Värmlands län, vid den hittills enda värmländska fyndplatsen för *V. umovii* (två fynd från 1981). Ojämnt, äldre granblandbestånd på en sandig västslutning mot Klarälven S om Stöllet. Lokalen är emellertid inte rik på garnlav, den hittills enda kända värdväxten för *V. umovii*. Även barrskogsfjällflyet, *Xestia sincera*, har påträffats här.

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Sammanfattning

Honor av *Victrix (Poliobrya) umovii* (Eversmann 1846) har förmåtts att lägga ägg i bur. Med hjälp av en relativt lång ovipositor placerades äggen enstaka under grenlavar på torra kvistar. De livliga larverna överlevde till första övervintringen och var då ca 5 mm långa och enfärgat gröngrå.

Som foder prövades näverlav (*Platismatia glauca*), garnlav (*Alectoria sarmentosa*), blåslav (*Hypogymnia physodes*) och grå tagellav (*Bryoria capillaris*). Larverna konstaterades äta endast garnlav (*Alectoria sarmentosa*). När de inte åt gömde de sig synnerligen effektivt mellan och under lavarna. Ingen tendens kunde iakttas hos dem att vilja söka sig ner till "marknivå" inför övervintringen, tvärtom syntes de förbereda sig på att övervintra mellan lavarna på kvistar. Troligen övervintrar larverna av *V. umovii* uppe i trädsiktet, vilket betyder att artens egentliga biotop förmodligen helt är i de övre skikten av lämpliga skogsbestånd. Från nära nog kompletta fyndlistor över *V. umovii* kan preliminära slutsatser göras som indikerar att arten föredrar barrskogsbestånd på torrare och mer välldränerade marker, gärna blandbestånd med tall. *Victrix umovii* har i Sverige till och med 1992 påträffats på totalt 14 platser, varav 11 i Dalarna, en i Värmland (2 hanner), en i Uppland (1 hane) och en i Gästrikland (1 hane). Arten har troligen en 2-årig utveckling men uppträder varje år i Sverige till skillnad mot i Finland. En väderkatastrof med extrem kyla över stora delar av Mellansverige i början av juni 1990 påverkade troligen lokala populationer av *V. umovii* så att deras huvudsakliga uppträdandeår ändrades från udda år (studerat under 1987 och 1989) till enbart jämna år därefter.