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JERSEY TIGER (*EUPLAGIA QUADRIPUNCTARIA* (PODA, 1761)) (ARCTIIDAE, LEPIDOPTERA) BIOTOPE AND THE PROPOSITION OF PROTECTIVE MEASURES ON THE TERRITORY ADMINISTERED BY THE STATE FORESTS NATIONAL HOLDING (PGL) LASY PAŃSTWOWE*

BIOTOP KRASOPANI HERA (*EUPLAGIA QUADRIPUNCTARIA* (PODA, 1761))
(ARCTIIDAE, LEPIDOPTERA) ORAZ PROPOZYCJA
POSTĘPOWANIA OCHRONNEGO NA TERENACH
ADMINISTROWANYCH PRZEZ PAŃSTWOWE GOSPODARSTWO LEŚNE
LASY PAŃSTWOWE

Summary. The aim of the study was to determine preventive and protective measures for the Jersey tiger on the territory administered by the State Forests National Holding. On the basis of the natural and forest inventory a characteristics of biotopes was determined, in which the images were most often found. It was concluded that in most of the refugia Jersey tiger occurs in tight forest complexes, as well as that the hemp-agrimony (*Eupatorium cannabinum* L.) was the most important nectar giving plant for the images of *Euplagia quadripunctaria* at over 50% of locations.

Key words: Jersey tiger, *Euplagia quadripunctaria*, Natura 2000, species protection

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Introduction

Jersey tiger (*Euplagia quadripunctaria*, syn. *Calimorfa quadripunctaria*) is a representative of butterflies of the Arctiidae family. In the Appendix II to the COUNCIL DIRECTIVE 92/43/EEC... (1992) it was defined as a priority species, which results in the fact that for each new species location a special zone of Natura 2000 may be created. In Poland, historically, it has been noticed on foothill areas and in the range of the Carpathians, as well as on Wolin Island (BUSZKO 2004, PRZYBYŁOWICZ 2004) (Fig. 1). It lays eggs on leaves of many types of green plants. A dark brown (almost black) larva with cream and white stripes and red protuberances, from which bright hair of different lengths grow, may feed on many plants of the following types: *Lamium* spp., *Urtica* spp., *Corylus* spp., *Rubus* spp., *Lonicera* spp., *Cytisus* spp. and *Epilobium* spp. (BUSZKO 1997, BÉLİN 2003). It is likely that the list of host plants is much longer. It winters as a larva, hiding among fallen withered leaves in ground cover. As an adult insect it feeds on all available flowers producing nectar. Adult insects remain active all day and night from the middle of June to the middle of August.

The species has been placed on the red list of dying and endangered species in Poland under the VU category – endangered (PRZYBYŁOWICZ 2004).



Fig. 1. Locations of the *Euplagia quadripunctaria* according to the “Polish red data book of animals. Invertebrates” (PRZYBYŁOWICZ 2004)

Rys. 1. Stanowiska *Euplagia quadripunctaria* według „Polskiej czerwonej księgi zwierząt. Bezkręgowców” (PRZYBYŁOWICZ 2004)

Materials and methods

In the study we used data from the natural and forest inventory (according to the Habitats Directive) conducted on the forest areas administered by the State Forests National Holding in 2006-2007 (Decision no. 61 of the General Director of the State Forests of 25 July 2006), as well as our own knowledge and experience. The locations of occurrence of particular species, found during the inventory, were assigned to sub-groups. This method allowed for describing settlement conditions and forest conditions of the Jersey tigers. Then the biology of the species was compared with the accepted forest management plan and the recognised biotope which led to the definition of a concept for the species preservation together with the determination of potential threats for the forest production management.

Results and discussion

On the basis of the natural and forest inventory on the territory administered by the State Forests National Holding 78 locations of the Jersey tiger were found (Fig. 2).

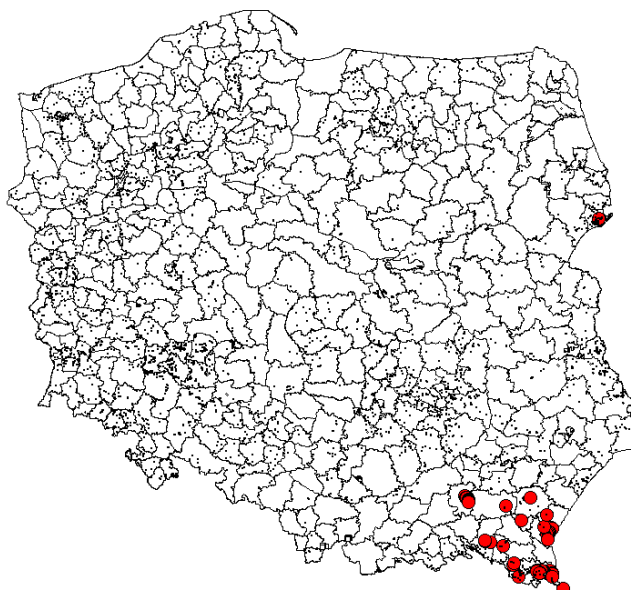


Fig. 2. Locations of the *Euplagia quadripunctaria* according to the nature and forest inventory conducted by State Forests in 2006-2007 (78 locations)

Rys. 2. Stanowiska *Euplagia quadripunctaria* według inwentaryzacji przyrodniczo-leśnej Lasów Państwowych z lat 2006-2007 (78 stanowisk)

During the analysis of the collected materials it was rather surprising to find a location of *E. quadripunctaria* in the middle of a forest complex exploited by a complex cutting system in the Dębica Forest Division (Regional State Forests Directorate in Cracow). The oldest data on occurrence of the Jersey tigers on this territory come from the period before World War II (oral information, TRZECIAK 2009). According to the observations it was a stable and non-endangered population existing on the area of several dozens of hectares (TRZECIAK 2007). Irrespective of lacking protective programs and awareness of the Jersey tigers living on this area, the forest management conducted after the war did not lead to extinction of this species.

At most of the described locations (57%) the hemp-agrimony (*Eupatorium cannabinum* L.) was the most important plant for the imagines. The butterflies used mainly nectar of this plant species. The hemp-agrimony grows in medium fertile humid and wet soil, in lit places, in a complex of alder trees, ash-alder trees and humid forms of riparian forests. Nature habitats, where the Jersey tigers may be found, include first of all: mountain herbs (*Adenostylion alliariae*) and riparian herbs (*Convolvuletalia sepium*) – code 6430), European and Eastern European hornbeam (lit places and more humid places) – code 9170 and fertile beech forests (lit places and more humid places) – code 9130. Due to its host plant it may not be excluded that the species may occur in various types of riparian forests – 91E0, 91F0.

While analysing its habitats the characteristics of refugia of *E. quadripunctaria* in forest areas was determined (Fig. 3).

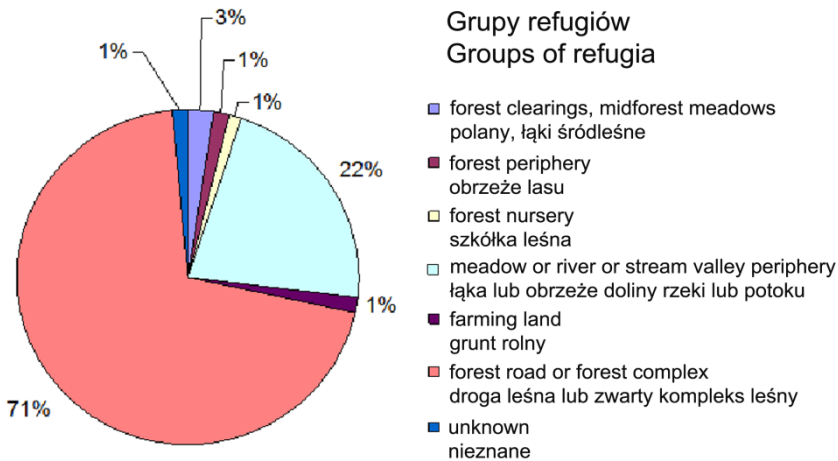


Fig. 3. The structure of the *Euplagia quadripunctaria* habitats according to the nature and forest inventory conducted by State Forests in 2006-2007

Rys. 3. Struktura siedlisk *Euplagia quadripunctaria* według inwentaryzacji przyrodniczo-leśnej Lasów Państwowych z lat 2006-2007

According to the records most locations of the Jersey tigers were found in typically forest environments (71%), thus it may be concluded that forest areas play a very im-

portant role in the existence of *E. quadripunctaria* in Poland. Therefore unreasonable forest management may constitute the biggest threat to the species, including:

- forestation of the insect refugia,
- recultivation of forest clearings and gaps, which reduces the area on which the host plants of larvae and butterflies grow, especially of the hemp-agrimony,
- destruction of pupae and hibernating larvae during the logging work during snowless winters,
- chemical measures against harmful insects (folivores of leaf forests) conducted directly on the border between the forest and the refugium,
- lacking the proper maintenance of territory division.

Based on the research and experience we defined a concept of rules allowing to preserve the species biotope, including the following:

- protection of zones in which the hemp-agrimony and other nectar giving species for the images grow, as well as host plants for larvae, during land management measures, especially during obtaining and preparing land for recultivation,
- inside tight forest complexes:
 - logging works should be conducted in wintertime while the cover of snow is thick,
 - forest cutting management should be directed towards the complex cutting system, using the renewable nests scattering with the maximum use of natural renewal – it influences positively light relationships enabling growth of plants strategic for the species further existence,
 - trying to maintain natural forest clearings, especially those on which the species has been developing,
 - conducting phytomelioration measures aiming at lighting roadsides, stream sides, area division lines, on which the host plants grow – the optimum period for the care measures is the autumn and winter time (October – March) or the turn of June and July as at that time the pupae remain in loose cocoons on the ground surface or in the ground cover,
- on exposed locations, in ecotone zones, in humid nature reserves (wildernesses) the soil should be kept fresh by means of various melioration works,
- chemical measures against harmful insects should be performed providing the buffer zones are used:
 - 500 m from July to the end of August,
 - 100 m from September to the end of June.

Conclusions

1. Most refugia of the Jersey tiger are located in tight forest complexes.
2. On over half of the species habitats the most important host plant for the images of *C. quadripunctaria* was the hemp-agrimony (*Eupatorium cannabinum* L.).
3. The forest management conducted after World War II on the biggest location of the insect in Poland did not result in the disappearance of the species.

4. In order to preserve the species, protection zones should be kept while performing care measures, especially chemical measures against harmful insects.

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Streszczenie. Celem pracy było wypracowanie postępowań zapobiegawczo-ochronnych dla krasopani hera na terenach administrowanych przez PGL Lasy Państwowe. Na podstawie analizy danych z inwentaryzacji przyrodniczo-leśnej sporządzono charakterystykę biotopów, w jakich najczęściej spotykano imagines. Stwierdzono, że na większości refugium krasopani hera występuje w zwartych kompleksach leśnych, a także, że na blisko 50% stanowisk najważniejszą rośliną nektarodajną dla imagines *Euplagia quadripunctaria* jest sadzic konopiasty (*Eupatorium cannabinum* L.).

Słowa kluczowe: krasopani hera, *Euplagia quadripunctaria*, Natura 2000, ochrona gatunkowa

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