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OCCURRENCE OF *Pieris ergane* Geyer (LEPIDOPTERA, PIERIDAE) ON MOUNT SLJEME NEAR ZAGREB, CROATIA

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Occasional occurrence of the Mediterranean butterfly *Pieris ergane* Geyer on Medvednica (Sljeme) Mountain in continental Croatia has so far been enigmatic since the unique (single) ovipositing and host plant: *Aethionema saxatile* of this species was not officially registered in the surroundings of Zagreb, whereas in captivity, the females deposit eggs only on this plant, too.

***Pieris ergane*, Lepidoptera, Pieridae, *Aethionema saxatile*, ovipositing, monophagy, range, evolution, Mt. Medvednica, Sljeme, Croatia**

LORKOVIĆ, Z., Pojava *Pieris ergane* Geyer (Lepidoptera, Pieridae) na planini Medvednica (Sljeme) kraj Zagreba, Hrvatska. - Entomol. Croat. (1996) 1997. Vol. 2. Num. 1-2.: 27-30.

Iznenadujuće je povremeno nalaženje mediteranske vrste leptira *Pieris ergane* Geyer na Medvednici (Sljemenu) iznad Zagreba jer jedina poznata ovipozijska i prehrambena biljka za tu vrstu *Aethionema saxatile* nije bila ustanovljena u zagrebačkoj okolici nego tek oko Lobora u Ivanšćici. Na Sljemenu uhvaćene *ergane* ženke u zarobljeništvu odlažu jaja također jedino na biljke toga roda, pa se pita kako i je li ta vrsta leptira preživljuje na Sljemenu bez *Aethioneme* ili se ta biljka mora naći i u zagrebačkoj okolici.

***Pieris ergane*, Lepidoptera, Pieridae, *Aethionema saxatile*, ovipozicija, monofagija, areali, evolucija, Medvednica, Sljeme, Hrvatska**

On June 24, 1920, as a student and advanced beginner in Lepidopterology, I caught a female specimen of *Pieris ergane* flying over the grassy slope below the Sljeme mountain peak, 1035 meters (Mt. Medvednica). I was very surprised to find this Mediterranean butterfly in continental parts of Croatia, some 130 km away from the Adriatic coast where this species is quite common. In addition to the distance itself, the butterfly was separated from its natural carstic biotope by high woody mountains of Gorski Kotar.

Fifteen years later (June 22, 1935) and with a now considerable knowledge of Mediterranean butterflies, I experienced another surprise. I caught, again, a specimen of *P. ergane* in Podsused, about 10 km east of the city of Zagreb on a steep slope in the valley on the western edge of Sljeme mountain. It was again a female, evidently searching for the place to deposit eggs. I have unsuccessfully searched for the already known host plant *Aethionema saxatile*¹⁾. Also, no eggs were laid on any other plant. Subsequently, female butterflies laid eggs in captivity on a small *Aethionema* plant taken from the Botanical garden of the University of Zagreb.

¹⁾ Some years ago the plant *Aethionema* (mostly *saxatile* species) was established (LORKOVIĆ 1933, 1968) to be the ovipositing and host plant of *Pieris ergane*, confirmed later by DESCIMON (1964, 1966) for the southwestern Alps (Briançonnaise) and by REAL and al. (1967) for the Pyrénées orientales.

During this controlled experiment, several other Brassicaceae plants were submitted to the mentioned female, but the plants failed to stimulate the female to lay further eggs. This negative result was surprising because the occurrence of *Aethionema* was not registered on Sljeme Mountain (FORENBACHER 1911). Also, my subsequent searching of this plant in the target area gave no result. Then, only one locality of *Aethionema* was known at Lobar, on Ivanščica Mountain, about 30 km north of Zagreb (SCHLOSSER & VUKOTINOVIĆ, 1869), separated from Sljeme by the three kilometers wide Krapina River lowland valley. However, in the 1960-s, in the neighbouring Slovenia, an old *ergane* ♀ (together with an old *P. manni* unmated ♀) was found in the rocky slopes of the Sava valley at Krško, separated from Medvednica mountain, by the 30 km large Sava lowland.

Between June, 1935 and summer of 1955, 7 male specimens of *P. ergane* were found on different altitudes of Sljeme Mountain, from the foothills up to the peak located about 1000 meters above sea level. Such a great dispersion of the *ergane* males shows that they were forced to fly a considerable distance searching for females, a distance which is far greater than usually. This is the proof of the rarity of females' vers. *Aethionema*.

The last female, a large and elderly specimen, was caught in this region in June, 1951 on the western slope of Sljeme over a flowery and grassy field (Rudarski vrh). After that 18 species of Cruciferae plants, which were commonly growing around Zagreb then, were offered to this female under laboratory conditions: *Sisymbrium officinale*, *Barbarea vulgaris*, *Rorippa austriaca*, *R. silvestris*, *Cardamine pratensis*, *C. hirsuta*, *Arabis glabra*, *A. hirsuta*, *Cardaminopsis arenosa*, *Alliaria petiolata*, *Diplotaxis tenuifolia*, *Brassica oleracea*, *B. napus*, *Raphanus sativa*, *Lepidium campestre*, *Iberis sempervirens*, *Thlaspi arvense*, and *Reseda lutea*. Again, the female deposited eggs only on *Aethionema* plant. The species *P. ergane* is a good botanist considering the reaction that was not shown only toward the *A. saxatile*, but also toward the *A. pulchella*, *A. grandiflora*, and *A. thomassiana* brought from the Botanical garden. In the meantime, the *Aethionema* was established as a host plant in the neighbouring Slovenia as well (source of the Soča River (Trenta) in the Julian Alps, 25 July, 1950., 15 Aug., 1952). By the way, this butterfly spreads as far as northern Hungary or south Slovakia resp., where different *Aethionema* plants are growing as well.

Even the smear of *Aethionema*'s crushed leaf upon a piece of paper or a leaf of any other Brassicaceae provoked the female to lay eggs, proving that such a common olfactory sense (smell) in insects plays a major role here too (see also Lorković 1968).

The ecological bond between *P. ergane* and *Aethionema* plant must be evolutionary very old. The bluish green-colour of the *ergane* larva is quite similar to the colour of *Aethionema* leaves, meaning that the larva is better adapted to the colour of this plant than to any other species of Brassicaceae - which are more yellow-green, for example, the colour that the larvae of the species *Pieris rapae* or *P. napi* have using the ordinarily green plant species as host plants. The bluish green colours of the *ergane* larvae have remained also after larvae were successfully reared in two generations on yellow-green *Rorippa*, from the beginning of their development. This is the obvious proof of the genetic nature of the color character of the *ergane* larva.

Aggressiveness among young *ergane* larvae on the same *Aethionema* plant represents another kind of adaptation to the host plant. Bearing in mind that *Aethionema*

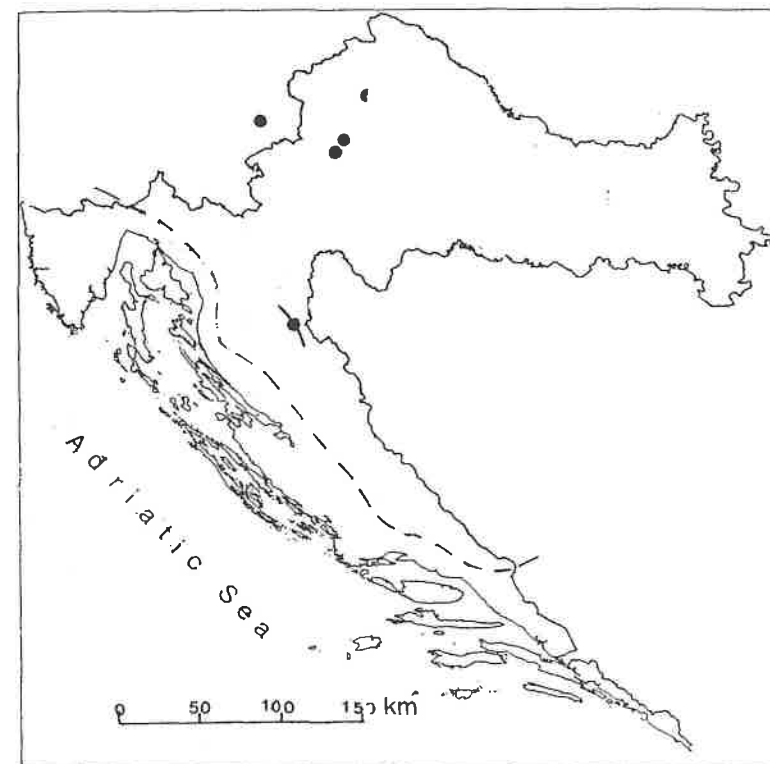


Fig. 1. Republic of Croatia with an approximative boundary of the permanent Mediterranean range of *Pieris ergane* Geyer = interrupted line (with a single enlargement at Plitvice lakes) and isolated localities = full circles for Zagreb and Podsused (two) and one for Krško west of Zagreb, whilst the half circle marks the locality of *Aethionema saxatile* on Lobar.

is a small and thin plant, two *ergane* larvae can seldom be expected to have enough food for surviving. So, only one larva has to remain on the plant and the other must be removed from competition by the bite of the older one at the beginning of the feeding period. The aggressiveness ceases during the third larval stage, when definite growth of the single larva is assured.

The question about today's presence of *P. ergane* on Sljeme Mountain is dubious. Even if the host plant *Aethionema* may have grown once in abandoned quarries, the recent activities and production of the same and new quarries have probably wiped out this species from the region. Promising and future young biologists must confirm the occurrence of *Aethionema* on Sljeme mountain, as well as the presence of *P. ergane* in the Lobar area, where 140 years ago the host plant *Aethionema saxatile* was recorded.

Note added in print

In 1981, D. MIHELJ, an employee of the Botanical garden, found in the archives of the Botanical Institute of the University of Zagreb the manuscript entitled "Flora

and Vegetation of Podsused and its Vicinity "by B. SIROVATKA (1956). In this paper *Aethionema saxatile* was mentioned to have been found" along the footpaths. Since the manuscript was never published and the corresponding herbarium was not preserved, the report is not scientifically reliable enough. Nevertheless, it deserves to be mentioned here, as it tends to confirm the persuasion that the presence of *P. ergane* strongly suggests that *Aethionema* must also be present in the Zagreb area. The SIROVATKA paper thus provides the key to the solution of the problem addressed in the above paper.

Acknowledgments

I am grateful to the administration of the Botanical Garden, Zagreb for the permission to use a limited amount of the plant *Aethionema saxatile* or *Ae. thomassiana*. Also, I appreciate Mr. dr. LEINER's help in correcting my English.

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ZAPISI O KUKCIMA I PAUCIMA U HRVATSKOJ U DJELIMA ALBERTA FORTISA

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Venecijanski opat, prirodoslovac i putopisac A. Fortis boravio je u hrvatskim krajevima od Istre do Dubrovnika 11 puta kroz 26 godina (1765-1791). Prikazani su manje poznati ili nepoznati Fortisovi zapisi o kukcima i nekim srodnim životinjama s tog područja. Iz detaljnog opisa te crteža štite uši na smokvi na otoku Ugljanu autor zaključuje da se radi o smokvinu mediju *Ceroplastes rusci* L. Fortis spominje i najvećeg europskog pauka tarentulu *Lycosa tarentula* Rossi, te najotrovnijeg pauka Europe i jednog od najotrovnijih pauka na svijetu crnu udovicu *Latrodectus tredecimguttatus* Rossi. To je i prvi zapis latrodectizma u Hrvatskoj kao i prvi opis liječenja latrodectizma u pučkoj medicini. Opisujući na više mjesta komarce i malariju, Fortis je - doduše - pretpostavljao njihovu uzročnu vezu, ali mu je ona ostala nejasna. Opisuje se i uzgoj dudovog prelca *Bombyx mori* L. od pradavnih vremena na više mjesta na kopnu i otocima, kao primjerice na otoku Rabu još početkom XI stoljeća.

Pauci, kukci, *Ceroplastes rusci*, *Bombyx mori*, povijest, Fortis, Hrvatska.

BRITVEC, B. - The records on insects and spiders in Croatia in the works of Albert Fortis. - *Entomol. Croat.* (1996) 1997. Vol.2. Num. 1-2.: 31-43.

Venetian abbot, naturalist and travel writer A. Fortis visited different parts of Croatia from Istria in the north to Dubrovnik in the south for 11 times through 26 years (1765-1791). Presented are less known or even completely unknown writings by Fortis on insects and some related animals in the area. From a detailed description and drawing of scale insect on fig-trees on the island of Ugljan, the author concludes that it is the fig scale *Ceroplastes rusci* L. Fortis also mentions the largest European spider tarantula *Lycosa tarentula* Rossi, as well as Europe's most poisonous spider, and one of the most poisonous spiders in the world - the black widow spider *Latrodectus tredecimguttatus* Rossi. This is also the first record on latrodectism in Croatia, as well as the first description of latrodectism treatment in popular medicine. While describing mosquitos and malaria on several occasions, Fortis did indeed anticipate a causal link between them, but it remained unclear to him. Described is also the breeding of silkworm *Bombyx mori* L. since ancient times in several places on both mainland and the islands, like, for instance, on the island of Rab, back towards the beginning of the 11th century.

Aranea, Insecta, *Ceroplastes rusci*, *Bombyx mori*, history, Fortis, Croatia.

Alberto FORTIS, opat, prirodoslovac i putopisac svojim je djelima prvi u Europi skrenuo pozornost na našu zemlju, posebice na Dalmaciju. U svojoj je svestranosti marljivo zapisivao sve što bi na putovanjima vidio ili čuo. Najpoznatiji su njegovi paleontološki, arheološki i etnografski zapisi, kao i zapisi o narodnom pjesništvu. Manje su poznati njegovi zapisi o biljkama i životinjama, osobito o kukcima i drugim člankonošcima.

Na Fortisove zapise o člankonošcima u Dalmaciji i Istri prvi su kod nas upozorili Zvonimir MARETIĆ i Drago LEBEZ (1985), te Z. MARETIĆ (1988) i to o otrovnim paucima, a Guido NONVEILLER (1989) o nekim kukcima u Dalmaciji.