



**NEW FINDINGS OF SPECIES *Saturnia pyri* (Denis & Schiffermüller, 1775)
(Insecta: Lepidoptera) IN BOSNIA AND HERZEGOVINA**

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SYNOPSIS

Key words:
new findings,
narrow locations,
Saturnia pyri,
Giant Peacock Moth.

This paper contains new data about distribution of species *Saturnia (Saturnia) pyri* (Denis & Schiffermüller, 1775), on some narrow units and specific locations in Herzegovina.

INTRODUCTION

Many years of entomologic and lepidopterologic studies in Bosnia and Herzegovina can be divided into four periods: period before 1904, period from 1904 to 1945, period from 1945 to 1992 and war and after-war period (LELO 2004, PLOCIENNIK et al. 2007).

Unfortunately, many years of mentioned studies of butterflies of Bosnia and Herzegovina are practically reduced onto few groups (daily butterflies), while for many of them, even for most attractive species, data can be treated as very old. Amongst those are surely the data about findings of individuals of species *Saturnia (Saturnia) pyri*. The first data about mentioned species are given in the listing of H. Rebel: Derventa (coll. Hilf), Mostar (coll. M. S.), Stolac (coll. Wineguth) and Trebinje (coll. Matulić, 1900; Rebel 1904, Lelo 2004). After that this species has been mentioned in many publications as present in Bosnia and Herzegovina, but there is no data (in the available bibliography) from the reliable experts about its findings on the specifically determined locations.

In accordance with basic bio-systemic status, the species *Saturnia pyri* (Denis & Schiffermüller, 1775) is a moth from the very numerous class Lepidoptera Linnaeus, 1758, that in Bosnia and Herzegovina has 1,631 species of 3,000 expected species

(LELO, 2008). Within the family of Silk Moths (Saturniidae Boisduval, 1834) very distinct, the biggest and most impressive units in Bosnia and Herzegovina have been described; they are characterized with slightly angular, square body covered with thick hairs, reduced labial part and small head. Sometimes they are distinctly clear in tones and some representatives have eye-like spots in the middle of the wings. Sexual dimorphism varies from species to species, but males are almost always with bigger and feather-like wide antennas. The wing-span at adult units is usually between 3 cm and 15 cm, while some tropical species may have wing-span up to 30 cm. This family includes about 1,500 species distributed into 165 types, out of which, in Europe, nine species have been described (KARSHOLT & RAZOWSKI, 1996).

Type *Saturnia* Schrank, 1802 is distributed throughout the northern hemisphere with about 30 known species. They mainly appear in Palaearctic Eurasia, while few of them inhabit California and tropical south-eastern Asia.

In accordance with the basic morphologic characteristics, Giant Peacock Moth is quite similar to Emperor Moth (*Eudia pavonia* Linnaeus, 1758), but it is significantly bigger. Sexual dimorphism is not especially distinct, but it is possible to differentiate genders, because males have distinct feather-like antennas and more distinctive brown body tone as well as wings that are lighter in tone than those of females and they have filiform antennas. Also, females have wider wing-span than males and more rotund abdomen. Wings are unequally toned with tinges of grey and dark-brown. The outside edge of the wings is bounded with beige hue, while inside edge of the wings is white. Approximately in the middle of the forewings there are red and beige corrugated stripes.

On the hindwings, in the last third, there are similar but lighter, curved lines. Second, equally toned, but almost straight line is in the upper part of the forewings. In the middle of each wing there is one big black spot, circled with red edge. These spots (eye-like spots) remind on those on peacock's "tail" plumage, what is the reason for naming the whole family and respective species. The tone of these spots may be brown, black, white or red and it is considered that they are playing an important role in escaping from predators that are seeing them as eyes of vultures (KOVAČEVIĆ, 1961; KRUNIĆ, 1984; FESTIĆ, 1996).

This one-generation species is not fed in adult conditions, but polyphagous larvae are typically raven i.e. they are fed especially with different deciduous trees and bushes, and also they can be found on numerous fruit trees. The head of the caterpillar is strengthened with chitin layer that, in the outside part from the lower side, has usually six ocelli. On the head the most distinct and dominative is mandible. Lower labium contains labial glandules that leach secrete used by larva for the creation of the cocoon.

The development of larva can last from 35 to 40 days. Accumulated food reserves that are provided in the larval stage are used for the development of pupa and adult. In the middle and end of July i.e. August caterpillar is fully grown. Adults

are coming out of the cocoons in late morning until the middle of the afternoon, so their wings are dry and ready to be used before the dark. In principle, females are not flying, they stay hidden in vegetation and leach pheromones calling males for breeding that same night. Males have smell receptors on the antennas that are composed of thousands of sensor cells and when molecule of sweet smell is captured they simply go in the direction of the smell source. They have extraordinary capability to detect only one pheromone molecule that is emitted by female even from few kilometres of distance (up to 5 km), following love path to the female (KOVAČEVIĆ, 1961; KRUNIĆ, 1984; FESTIĆ, 1996).

Female, burdened with the weight from eggs she carries, can hardly fly and, usually, she climbs in the higher parts of the bush. In May or June female lay eggs into uneven groups on small branches and leaflets, where she leaves 5-8 nests with about 30 eggs. She lays about 200-250 eggs in total. Eggs are spherical, their length is 2.5x2 mm, pretty big and their tone is grey-white. Larvae incubate after 14 to 30 days. After incubation from the egg, caterpillar, during its growth, throws out its skin 4 times. Below old skin the new one is formed and old one bursts. Caterpillar is using its muscles to push old skin backwards and pulls out from it. Larval stage happens in the middle of spring time and in early summer. After they are maximally grown they choose appropriate place to become cocoon and transform in pupa stage. Those places can be in the lower part of host herbs, in the grass, high on the trees, on branches and small branches. Before it transforms to pupa stage the body tone of the caterpillar is changed in the golden-brown (KOVAČEVIĆ, 1961; KRUNIĆ, 1984; FESTIĆ, 1996).

One of not-well known facts related to species *Saturnia pyri* is the wideness of its areal in Bosnia and Herzegovina. All the existing data, including this paper, are giving faunal data without clearly organized studies that are unfortunate feature of B&H zoological studies (REBEL, 1904; LELO, 2004; 2008).

MATERIALS AND METHODS

Material, units of species *Saturnia pyri*, are the available bibliographical data and own findings of the mentioned species (data from field notebooks of earlier period) and collected moths during 2009, as well as the data of Scientific Entomologic Collection of The National Museum of Bosnia and Herzegovina in Sarajevo.

Respective photos of the collected material have been taken by digital camera (Olympus μ 720).

Findings are presented on the blind map of Bosnia & Herzegovina from ArcView software.

RESULTS AND DISCUSSION

Analysis of bibliographical data has shown that there are a small number of specific mentioned locations in Bosnia and Herzegovina where species *Saturnia pyri* has been spotted.

The oldest data can be found in the work of H. Rebel and are related to the locations of: Derventa, Mostar, Stolac and Trebinje (REBEL, 1904; LELO, 2004).

With detailed inspection of Entomologic Collection of The National Museum of Bosnia and Herzegovina the units have been found on the locations of: Derventa (Derventa, coll. Hilf), Banja Luka (May 5th, 1966, coll. Mihaljevic), Kraljica – Ozren-mountain near Doboj (May 4th, 1972), Sarajevo (March 27th, 1980, pupa), Jablanica (May 1st, 1925, coll. Wineguth) and Čapljina (April 17th, 1948, coll. Martino).

Now, we have added our data from field notebooks (where dominant are data from Lelo collected during material collection for doctoral thesis): Bihać – Debelj (spotted remains, Ž, S. Lelo, July 6th, 2000), Gradačac – kula Gradašćevića (spotted, Ž, S. Lelo, June 28th, 2000), Tuzla – Poljice near Modrac Lake (spotted, M, S. Lelo, May 28th, 2000), Fojnica – road to mountain Vranica (spotted, M, S. Lelo, July 28th, 2000), Vareš (spotted, M, S. Lelo, may 7th, 2000), Župča – near Breza (spotted, M, S. Lelo, April 29th, 2000), Zvijezda-mountain, Mountain House Bijambare (spotted, Ž, S. Lelo, May 28th, 2000), Konjic – source of the River Ljuta (spotted, M, S. Lelo, April 22nd, 2000), Visoko – Kralupi (spotted, M, S. Lelo, May 13th, 2006), Zavala – Popovo polje (photo, Ž, A. Vesnić, May 11th, 2007), Livanjsko polje – Ždralovac (photo, M, V. Jolić, May 2009), Vitina near Ljubuški (photo, D. Kulijer, May 2nd, 2009), Kravice near Ljubuški (photo of forewings, M, S. Lelo, May 9th, 2009).

One photo of male taken on location of Čapljina May 11th, 2009 (photo: Mick Holstead) has been found on Internet (Fig. 1-2).



Figs. 1 - 2. Demonstration of upper side of male (left; Čapljina, May 11th, 2009, photo: M. Holstead) and female (right; Zavala – Popovo polje, May 11th, 2007, photo: A. Vesnić) species *Saturnia pyri* (Denis & Schifferrmüller, 1775)

During 2009 the detail inspection of the material collected by students of Entomology Course from Teachers' Faculty, University „Džemal Bijedić“ Mostar, under

supervision of Professor Dr. Sc. S. Lelo and Senior Assistant Mr. Sc. Denisa Žujo Zekić, has been done. In inspection of the collection many samples of Giant Peacock Moth have been found: Stolac – Krajičina (Zoological collection „Lelo“, S. Šaravčić, April 10th, 2009), Počitelj (Zoological collection „Lelo“, A. Boškajlo, April 15th, 2009), Stolac – Ćuprija (Zoological collection „Lelo“, T. Haračić, April 22nd, 2009), Mostar – Šehovina (Zoological collection „Lelo“, A. Husović, May 14th, 2009), Stolac – Luka (Zoological collection „Lelo“, M. Bešo, May 24th, 2009), Konjic – Tuhobić (photo, Ž, Zoological collection „Lelo“, A. Šabanović, June 1st, 2009).

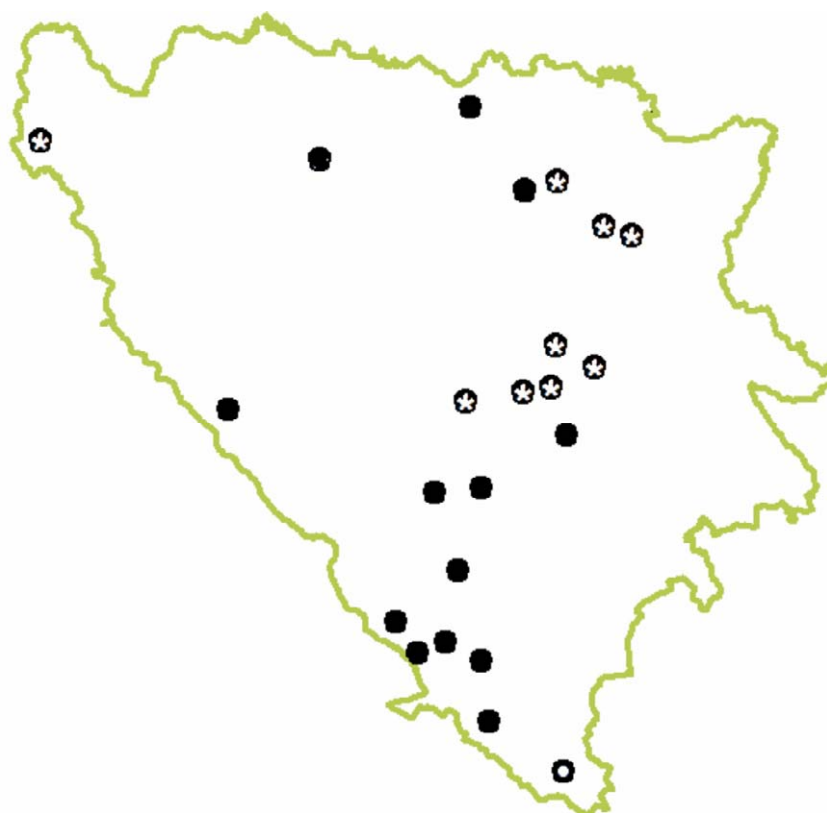


Fig. 3 Graphic demonstration of distribution of species *Saturnia pyri* (Denis & Schiffermüller, 1775) in Bosnia and Herzegovina on blind map of B&H in ArcWiev software, bibliographical data – empty circle, spotted units – star, locations where collected units are found and units from collections – black circle

It is interesting to add that in very comprehensive entomofauna studies of forests in Bosnia and Herzegovina there is no finding of Giant Peacock Moth (Georgijević, 1974). Also, in private entomological collection of entomophilias Mijo Korčmaroš that is archived in Scientific Museum of Banja Luka there is no unit of this species from Bosnia and Herzegovina.

Review of locations by Bosnia & Herzegovina geographical regions in which, until present day, the units are registered, is given in accordance with NURKOVIĆ & MIRIĆ (1998).

- 1₁: Bihać;
- 1₂: Banja Luka, Derventa, Doboje, Gračanica;
- 1₃: Tuzla, Lukavac;
- 2₅: Breza, Vareš, Visoko, Zvijezda-pl., Fojnica, Sarajevo;
- 3₇: Ždralovac (Livno), Vitine (Ljubuški), Kravice (Ljubuški),
- 3₈: Jablanica, Konjic;
- 4₉: Kravice (Ljubuški), Vitine (Ljubuški);;
- 4₁₀: Mostar, Čapljina,
- 4₁₁: Stolac, Zavala, Trebinje.

CONCLUSION

From earlier presented papers, species *Saturnia pyri* represents cosmopolitan species inhabiting Pannonia and Peripannonia zone (Ozren, Banja Luka and Derventa) on north, sub-Mediterranean zone (Čapljina, Jablanica and Vitina near Ljubuški) on south, and in accordance with findings from Sarajevo, most probably it inhabits also mountain zone that stretches from Peripannonia to Mediterranean-mountain zone on south. With insight in detailed analysis of new findings of species *Saturnia pyri* from the area of Stolac, Počitelj, through Mostar to Nevesinje and Konjic, it can be concluded that subject species inhabits practically whole Bosnia and Herzegovina, what is the confirmation from most collectors that have been able to spot units of Giant Peacock Moth.

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Summary

NOVI NALAZI VRSTE *Saturnia (Saturnia) pyri* (Denis & Schiffermüller, 1775) (Insecta: Lepidoptera) U BOSNI I HERCEGOVINI

Dugogodišnja istraživanja leptira Bosne i Hercegovine praktično su svedena na nekoliko skupina (dnevni leptiri), dok se za mnoge, pa i za one najatraktivnije vrste, podaci mogu tretirati samo kao jako zastarjeli. Među takve navode zasigurno možemo ubrojati i podatke o nalazima individua vrste *Saturnia (Saturnia) pyri* D.&S – ili velikog noćnog paunovca. Prve podatke o nalazima pomenute vrste nalazimo u popisu H. Rebel: Derventa, Mostar, Stolac i Trebinje (REBEL, 1904; LELO, 2004). Iza toga je ova vrsta spominjana u nizu publikacija kao prisutna u Bosni i Hercegovini, ali nema podataka (u nama dostupnoj literaturi) od pouzdanih poznavalaca o njenim nalazima na decidno navedenim lokalitetima. Zbog navedenog autori su odlučili da posvete pažnju ovoj vrsti i u ovoj godini sakupljeni su aktuelni podaci, nakon prvih organiziranih istraživanja ove vrste u 21. vijeku, o pojavljivanju individua na bosanskohercegovačkom teritoriju.

Prije svega je pregledana Naučna kolekcija Zemaljskog muzeja Bosne i Hercegovine gdje su pronađene individue sa sljedećih lokaliteta: Derventa, Banja Luka, Ozren-pl. (kod Doboja) – Kraljica, Sarajevo, Jablanica i Čapljina.

U zbirci Odsjeka za biologiju Prirodno-matematičkog fakulteta Sarajevo pronađena su dva primjerka iz Jablanice.

Zatim smo pridružili svoje podatke iz terenskih bilježnica (među kojima dominiraju podaci S. Lele prikupljeni tokom sakupljanja materijala za doktorsku tezu) i ovogodišnjih istraživanja u Bosni i Hercegovini. Kao najznačajniji doprinos smatramo analizu materijala koji su sakupljali studenti kursa Entomologija sa Nastavničkog fakulteta Univerziteta "Džemal Bijedić" iz Mostara, a pod rukovodstvom prof. dr. S. Lele i višeg asistenta mr. Denise Žujo Zekić.

Iako su naša istraživanja bila bez finansijske podrške te uz značajnu pomoć studenata i drugih amatera, možemo zaključiti da su prikupljeni značajni podaci.

Smatramo da je posmatrana vrsta stanovnik cijele Bosne i Hercegovine te da će se broj nalaza vremenom povećati.

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