

FAMILY PIERIDE (LEPIDOPTERA, PIERIDAE) AND EVOLUTION OVER TIME IN FOREST GROVE SIBIU (SIBIU, ROMANIA)

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Abstract

Transylvania, with its geographic location, flora and fauna is a well defined region, whereby, in addition to many common elements with neighboring areas, there are also some characteristic species, which so far continue to maintain the "endemic" status. The previous decades were very important for the development of Lepidopterological research in Sibiu and Transylvania, in the postwar years. The richness of insect fauna and especially the numerous species of Lepidoptera as of its existing knowledge of this group of insects stimulated the curiosity of many researchers since the middle of the 19th century.

Key words: Dumbrava Sibiului Forest, lepidoptera, Pieridae

INTRODUCTION

Dumbrava Sibiului Forest is located in Sibiu Depression at the with the Cindrel Mountains and sediment basin itself and now occupies the piedmont plain and hills, located in the South-West side of Sibiu (Fig. 1). It has an area of 978 ha divided into four bodies forest, two being the highest: Grove I (693 ha) and Grove II (261.5 ha); the other two are NATO troops (18.2 ha) and body Poplaca (5.3 ha). The forest stretches from the outskirts of Sibiu towards settlements Rasinari and Poplaca and is surrounded by pastures, meadows and arable land.

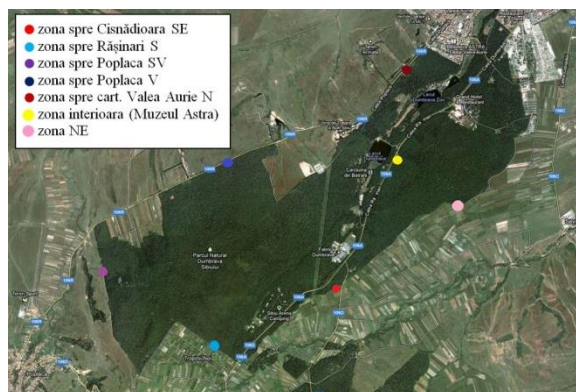


Fig.1. Location of the study area

Swallowtail butterflies are large, colorful butterflies in the family Papilionidae,

and include over 550 species [1]. Though the majority are tropical, members of the family inhabit every continent except Antarctica. The family includes the largest butterflies in the world, the birdwing butterflies of the genus *Ornithoptera* [6].

Swallowtails have a number of distinctive features; for example, the Papilionid caterpillar bears a repugnatorial organ called the osmeterium on its prothorax. The osmeterium normally remains hidden, but when threatened, the larva turns it outward through a transverse dorsal groove [7] by inflating it with blood. The forked appearance of the swallowtails' hind wings, which can be seen when the butterfly is resting with its wings spread, gave rise to the common name *swallowtail*. As for its formal name, Linnaeus chose *Papilio* for the type genus, as *Papilio* is Latin for 'butterfly'. For the specific epithets of the genus, Linnaeus applied the names of Greek heroes to the swallowtails. The type species: *Papilio machaon* honoured *Machaon*, one of the sons of *Asclepius*, mentioned in the *Iliad* [8].

Egg. Dome-shaped, smooth or obscurely faceted, not as high as wide, somewhat leathery, opaque[1].

Larva. Stout, smooth or with a series of fleshy tubercles on the dorsum: sometimes

with a raised fleshy protuberance (the so-called hood or crest) on the fourth segment. The second segment has a transverse opening, out of which the larva protrudes at will and an erect, forked, glandular fleshy organ that emits a strong, penetrating, and somewhat pleasant odor.

Pupa. Variable in form but most often curved backwards. It is angulated, with the head truncate or rounded and the back of abdomen is smooth or tuberculate. It is attached by the tail, normally in a perpendicular position, and further secured by a silken girth round the middle. In *Parnassius*, the pupa is placed in a loose silken web between leaves.

Imago. Wings extraordinarily variable in shape. Hind wing very frequently has a tail, which may be slender, or broad and spatulate, but is always an extension of the termen at vein 4. In one genus, *Arandia*, the termen of the hind wing is prolonged into tails at the apices of veins 2 and 3 as well as at vein 4. Pore wing (except in the aberrant genera *Parnassius* and *Hypermnestra*) with all 12 veins present and in addition a short internal vein, vein 1 a, that invariably terminates on the dorsal margin[2,3].

MATERIALS AND METHODS

The materials used in this research have been: macro lepidoptero fauna, entomological net (net), jar with cork, bottle with dropper for ether or chloroform, tweezers with wide top, very good are the philatelic, entomological pins, boxes field, tension, insectarium boxes for collection, writing pads, label, pencil, magnifying glass pocket.

Collecting butterflies is generally a difficult operation, but also enjoyable for those who love this order of insects. The high speed with which they fly and the tenderness of their wings require more care and attention to Lepidoptera. The Macro Collection Forest Grove daytime Sibiu was performed using the entomological net. It was composed of: Frame circular wire diameter of 1.5-2 mm but with about 33 cm to 35-50 cm opening. Some Lepidopterae need a net opening of 20 cm with folding frame to wear constantly (Photo 1).



Photo 1. Collecting butterflies (photo. orig.)

RESULTS AND DISCUSSIONS

PAPILIONIDAE FAMILY (3446 RO, K. & R. 6939)

PAPILIONINAE SUBFAMILY

Genus *Papilio* Linnaeus, 1758 (3459 Ro, K. & R. 6959)

(sin. *Pterourus* Scopoli, 1777; *Aernauta* Berge, 1842)

Papilio machaon machaon Linnaeus, 1758 (3469 Ro, K. & R. 6960) [4,5]

Examined Material: 2 ex.; 17.V.1902 VW; 1♂17.V.1939 EW; 9.VII.1904 VW; 1♂25.VII.1939 EW; 1♀, 12.VII.2001, 1♂1.X.2007 CM; A: 65-75 mm;

Degree of hazard: EN

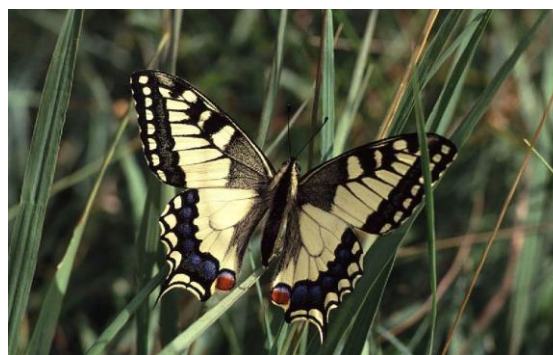


Photo 2. *Papilio machaon machaon* Linnaeus, 1758 ([http://www. biolib.cz.](http://www.biolib.cz.))

Distribution: species well spread all over Europe and in Romania. In the Alps they were observed at over 2045 m altitude. There are many local species. In the Western China, Asia, they are present between 500 and 4,000 m altitude. Because of human intervention, it is now the preferred habitat of a species increasingly rare.

Biology: Ponta isolated eggs laid on leaves, caterpillars hatch after 6-7 days, leading daytime activity. Pupae stage is on a stand clutching a silk thread as a supporting belt. Larva: G1: VIII-IX; G2: VI. Larval development: caterpillars disturbed removes yellow substance odor repellent character. The chrysalis stage G1 takes 21 days in the 2nd G winters and III/IV hatch butterflies. Basically butterflies this species can be seen in III-IX. Green or brown chrysalis, winters. Flight Period: 1-3G/Ang1: III/IV-V/VI; G2: VII-VIII/IX, chrysalis overwinters.

Ecology: Biotope: lush fields, meadows, flower gardens and vegetable plants, grassy mountain slopes, can exceed 1,800 m or even 2,000 m; in the Tibet Plateau they are met up to 4,500 m altitude. Trophic base: *Daucus carota*, *Peucedanum palustre*, *P. oreoselinum*, *P. Cervara*, *sphondylium Heracleum*, *Angelica sp.*, *A. silvestris*, *Feniculum vulgar*, *Anthem graveolens*, *Carum carvi*, *Petroselinum hortense*, *Ferula sp.*, *F. communis*, *Foeniculum capillaceum F. officinale*, *Chaerophyllum temulum*, *Laserpitium gallicum*, *Libanotis montana*, *Lotus corniculatus*, *Melanocarpus crithmifolius*, *Pastinaca sativa*, *Meum sp.*, *Pimpinella Saxifraga*, *P. magna*, *Ranunculus acris*, *Seselj montanum*, *Ruta graveolens*, *Rosa sp.* and other plant species, especially *Apiaceae*.

Ethology: At hatching, the adult has wings folded as seemingly small but for about 20 minutes they unfold reaching normal size and shape, hardening only after half past one when you can fly; a period when the butterfly is very vulnerable. It prefers the nectar of *Echium sp.*, *Trifolium sp.* and *Lychnis sp.*, and also can be seen in the period IV-V on *Prunus spinosa*, *Lamium purpureum*, *Corydalis cava* and *Taraxacum officinale* and in VII-VIII *Canum Cirsium*, *Carduus acanthoides*, *Linaria sp.* and *Centaurea solstitialis*. The adults have a quick flight row and often hovered, being able to travel long distances. Mating occurs often among grasses [16].

Genus *Iphiclides* Hübner, 1819 (3457 Ro, K. & R. 6957)

Iphiclides podalirius podalirius Scopoli, 1763 (3458 Ro, K. & R. 6958) [4,5]

Examined Material: 1♀, 8.V.2001, 1♂, 1.V.2011 CM; 1♀ 27.V.1925 EW; 1♀ 9.VI.2011; 14.VII.1904 VW; 1♀, 22.VII.2011 CM; 3♂♂ 2,4,16.VIII.2011 CM; A: 63-75 mm;

Degree of hazard: VU



Photo 3. *Iphiclides podalirius podalirius*, Scopoli, 1763 (original photo).

Distribution: mainly in the Central and South America, it was observed up to 2,000 m altitude. It is present in the Alps and also in Romania from the plains to the mountains (The Retezat Mountains, 1506 m altitude). [3]

Biology: Type: the female lays larval development: larval stage lasts 1-2 months, and has 2G/year; in the high mountain areas it has only 1G/year chrysalis stage being about nine months. Summer G chrysalis is green hatching being occurred after a month from pupae stage. Ponta isolated host plant leaves. Larva: G1: VIII-IX; G2: VI-VII and VII-VIII. Autumn it is a brown chrysalis of her butterflies hatch next spring. Experimentally, from the same batch of chrysalises of the same age and the same conditions, some butterflies have hatched after 24 days and the other after 250 days (Wohlfahrt in Niculescu, 1961). Flight Period: 2G/year; G1:V-VI; G2:VII-VIII or V-VII only.

Ecology: Biotope: light rare woods, cuts in forests, meadows, fields, orchards with trees and bushes, which can reach 1,500 m altitude meadows. Spring flowers butterflies prefer *Vinca herbacea*, *Lamium purpureum Scabiosa columbaria* and summer ones, *Carduus acanthoides*, *Viola sp.*, *Prunus spinosa*, *Crataegus oxyacantha*, *Cirsium Canum*, *Knautia arvensis*, *Centaurea solstitialis*, *Medicago sativa*, *Sambucus ebulus* etc.

Trophic base: *Betula pendula*, *Prunus spinosa*, *P. padus*, *P. cerasus*, *P. avium*, *P. machaleb*, *P. persica*, *Sorbus aucuparia*, *S. domestica*, *Avelana Corylus*, *Crataegus sp.*, *C. oxyacantha*, *Amygdalus communis*, *Berberis vulgaris* and other trees and shrubs, especially trees.

Ethology: The adult is a good flier, often preferring the flight plan. After rain, clumps of adults may be seen in some wet places where liquid could be suckled. [9,10,11,12,13,14,15]

CONCLUSIONS

The major impact both quantitatively and qualitatively of the Macrolepidopterae population identified in the Forest Grove Sibiu is the result of human factor having often irreversible interventions which led to changes in the natural environment. Human action can witness the changes in topography, climate, vegetation, all of them being in close relation with the environment.

Human action on flora and fauna has two sides: one destructive of deforestation, conversion of grasslands into farmland and one unforeseen by replacing native fauna species living damaging some crops, or because of chemical control of these insect species.

Ecosystem transformation was about the beginning of traditional agriculture which aimed to increase the area of agricultural land that man has resorted to deforestation, conversion of fields, meadows and pastures in agricultural land, overgrazing and intensive modern agriculture then aim drainage of swamps and chemical processing of cultivated land. Other interventions are due to industrialization, urbanization, construction of roads and highways, tourism activities.

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