

## The protection and reintroduction in Poland of *Parnassius apollo* Linnaeus (Papilionidae) (\*)

Eduard Palik

Lewinskiego 11/32, PL-30426 Kraków, Poland

*Parnassius apollo* has been under strict protection with three other butterflies in Poland since 1952. Long lasting observations have shown that *apollo* vanished from many localities and is in great danger to become extinct. This problem can be better understood after examination of the very interesting biology of *apollo*.

The female is able to deposit on average about of 150 eggs on the biotope where she is flying. It is curious, that the females do not search the food-plant but deposit everywhere (on stones, soil, dried plants). The fact, that the eggs are not deposited on the foodplant can only be explained by the fact that *Sedum* is an annual plant. The eggs hatch during the first warmer sunny days – after the snow had melted – that is in March or April. The larval food–plants are

*Sedum maximum* in Tatra Mts. and *Sedum fabaria* in Pieniny Mts. These plants grow singly or in small groups at the foot of limestone hills and mountains. The – at the time – very small plants are for the young larvae difficult to find. The larva therefore remains on the plant once found. The first moulting of takes place by the end of first month. The caterpillar has five instars and pupates after about two or three months. The pupation takes place in a light web among the plants and stones. About eight hours later the pupa attains whitish-grey colour that blends well with the surroundings. The butterfly emerges after about 20 days.

The conditions necessary to ensure the existence of *apollo* on the biotope are the open limestone slopes of southern exposure with sufficient quantities of food plants for butterfly and caterpillar. The overgrowth by trees and bushes in natural or planted way, leads to the diminishing of the living area and in consequence the butterfly is forced to abandon the biotope. Owing to this, *apollo* has already vanished from perviously rich places in Pieniny and Tatra Mts.

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(\*) Read at the First European Congress of Lepidopterology, Paris 1978.

The restitution of *apollo* seems to a simple operation and consists of clearing the previous biotops, replantation of food plants and at last to introduce the imago. This process seems to be well known. However, the success of reintroduction depends on one very important biological condition: to maintain the population about 400 to 600 eggs per 1500 m<sup>2</sup> must be deposited every season. Although this number of eggs seems to be great, the losses from the moment of deposition until spring are considerable. The waters from rains and melting snows kill considerable number of eggs. When the caterpillar left the egg-shell, it can perish owing to quick and frequent changes of weather, especially after frost. The natural enemies of caterpillars are chiefly the ants. The average number of adults on such biotope is 20–30, of these four to six females. The loss of even the half of females from the population endangers the colony. To diminish the losses which occur in the nature it is more suitable to arrange the breeding in the laboratory conditions. One female is usually adequate to provide sufficient amount of eggs to start breeding. The female should be kept in a large cage, filled with flowers of *Carduus* fresh every day. The cage should be kept outside, partly in sunshine before midday, and later on partly in the shadow, not exposed to constant heat. After two three days of acclimatisation to the new conditions the female starts depositing eggs. After the completion of the egg-laying — after two or three weeks — the eggs should be collected and kept in natural conditions until the spring. In higher temperature the caterpillars emerge earlier, that is before the end of winter time.

Breeding in captivity is simple. A polystyren box not smaller than the size of 50x20x10 cm, filled early in spring with planted *Sedum* is slightly covered by dispersed dried parts of plants with seeds. *Sedum* is very suitable as the young caterpillars like to stretch for sunbathing and to hid in its seeds. The box should be closely surrounded by a celophane band reaching about three to four cm above edge of the box. The dry plants will facilitate the access to the food plant: the very young caterpillars cannot climb on the rapidly growing *Sedum* without the assistance of the debris. The caterpillars start to feed several days after they hatched. They are active in the cloudy days and nights if the temperature remains over 15° C. After the third moult the larvae should be released on the biotop prepared for reintroduction. It is obvious that the results should be controled during the flight period to make sure that the amount of adults is adequate for the natural balance in the locality.

The attempts to reintroduce *P. apollo* are at present being made in Pieniny Mts. It is hoped that they will be successful as it is not too late yet. The populations in question are usually referred to *Parnassius apollo frankenbergeri* Slaby.

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Autor(en)/Author(s): Palik Eduard

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