Male patrolling modes in Apollo butterfly *Parnassius apollo* (L.): simulation of optimal choice (*Lepidoptera*: *Papilionidae*)

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Abstract

After examining the flight pattern of *Parnassius apollo* males we have discovered that the patrolling strategy of that species can be divided into two modes – random flights exhibited when females were abundant and there was limited time for flight (bad weather conditions), and scanning flights when the population was sparse and favourable climatic conditions allowed undisrupted flight.

According to the field observations we have assumed that time limited by weather conditions and female abundance on the field causes the switch in the male's flight mode. The assumption was simulated on the computer where on the "field" of 10000 cells two patterns of male flights were examined. The computer simulation confirmed our supposition that large number of females and the short time for hunting give an advantage (higher probability to find the female) to the random flights, and on the field where there was one or only a few females and the duration of flights were not limited, then the scanning flights were more beneficial.

Key words

Parnassius apollo, males, modes of patrolling behaviour, computer simulation.