ISSN: 2181-3337 SCIENCE AND INNOVATION
INTERNATIONAL SCIENTIFIC JOURNAL
2022
№ 2

BUTTERFLIES: TAXONOMY AND BIOETICS OF NIGHT AND DAY BUTTERFLIES IN UZBEKISTAN

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https://doi.org/10.5281/zenodo.6643208

Abstract: *Butterflies (Latin: Lepidóptera) are a group of insects that develop by complete metamorphosis. Originated in the early Mesozoic; the main families were formed in the early Paleogene. Fossils are mainly known from the Cretaceous period. Most butterflies' mouths consist of a highly specialized sucking hose, which spirals at the base of their heads. The curtain wings are covered with colored coins. The color of the wings, especially their different colors, is due to the fact that colorless coins absorb light at different angles, and black, yellow and other colored spots are associated with pigment. The shape and length of the mustache vary . Written wings range from 3 , 2 mm (dwarf moths) to 300 mm (dwarfs). The shape of the eggs varies and is of systematic importance. The worms have 3 pairs of thoracic legs and 5 pairs of false abdominal legs. The fungi are closed (usually inside the cocoon) and open (free) in the lower parts. Butterflies are usually divided into lower groups of lower butterflies (equal wings) and higher butterflies (different wings) . In some cases, toothed moths, which have a rodent type of oral organs, are divided into separate subgroups. The system of the butterfly family is not clearly developed, it is divided into 100 to 200 families. About 140,000 species are known. The fauna of butterflies is diverse, especially in the tropics. About 1,500 species have been identified in Uzbekistan. Large families of moths, moths, leafhoppers, and moths are especially rich in species .*

Keywords*: Lepidoptera, moth, oral apparatus, pigmentation, defense mechanisms , nervous system, dangerous butterflies.*

БАБОЧКИ: ТАКСОНОМИЯ И БИОЭТИКА НОЧНЫХ И ДНЕВНЫХ БАБОЧЕК В УЗБЕКИСТАНЕ

Аннотация: *Бабочки (лат. Lepidóptera) — группа насекомых, развивающихся путем полного превращения. Возник в раннем мезозое; основные семейства образовались в раннем палеогене. Окаменелости в основном известны с мелового периода. Рот большинства бабочек состоит из узкоспециализированного всасывающего шланга, который закручивается спиралью у основания головы. Крылья занавески покрыты цветными монетами. Окраска крыльев, особенно разная их окраска, обусловлена тем, что бесцветные монеты поглощают свет под разными углами, а черные, желтые и другие цветные пятна связаны с пигментом. Форма и длина усов варьируются. Письменные крылья колеблются от 3,2 мм (карликовые мотыльки) до 300 мм (карлики). Форма яиц различна и имеет систематическое значение. У червей 3 пары грудных ног и 5 пар ложных брюшных ног. Грибы бывают закрытыми (обычно внутри кокона) и*

открытыми (свободными) в нижних отделах. Бабочек принято делить на низшие группы низших бабочек (равные крылья) и высших бабочек (разные крылья). В отдельных случаях в отдельные подгруппы выделяют зубатых мотыльков, имеющих грызуновый тип ротовых органов. Система семейства бабочек четко не развита, она делится на 100-200 семейств. Известно около 140 000 видов. Фауна бабочек разнообразна, особенно в тропиках. В Узбекистане выявлено около 1500 видов. Особенно богаты видами большие семейства мотыльков, мотыльков, цикадок и мотыльков.

Ключевые слова: *чешуекрылые, моль, ротовой аппарат, пигментация, защитные механизмы, нервная система, опасные бабочки.*

INTRODUCTION

Which is named after the catalog of butterflies in Russia and neighboring countries, shows 965 species of butterflies, and 241 species of butterflies are found in Central Asia, especially in Uzbekistan, which are not found in other regions. A group of families in the night butterfly family, or Lepidoptera, the second largest species in the insect class. In addition, nocturnal butterflies differ from diurnal ones in structural features. Their bodies are thicker, the color of their wings is usually dull, relatively uniform. Antennae (antennae) are often pinnate or filamentous, and in diurnal butterflies their tips are ball-shaped, so Lepidopteras belonging to this group are also called rodents, while nocturnal butterflies are called differently bearded [3].

Life cycle.

The moths lay eggs individually or in groups. Women can “shoot” them in the fly, insert them into plant tissue, or place them on carefully selected objects. Worm-like larvae from caterpillars - caterpillars - are hard-headed, less visible thoraxes that are clearly distinguishable, with three pairs of true articulated legs and abdomen with claws at each end. which usually have five pairs of fleshy lies. legs, the latter at the very end of the body. False legs all butterflies end with a few hook-shaped feathers. After a few molts, the caterpillars turn into pupae, which in most moths are wrapped in silk cocoons woven by larvae. Silk is produced by large special salivary glands. They release a protein-rich fluid that solidifies into fiber when in contact with air. This fiber is used for weaving cocoons, covering the underground chamber, dug by the caterpillar before the doll, building shelters, as well as special methods of protection from enemies. In the puppets of evolutionary taxa, the developing appendages are firmly attached to the adult body (imago) and cannot move. After some time, depending on the species and external conditions, an adult butterfly emerges from the pupa [4].

MATERIALS AND METHODS

The images of many nocturnal butterflies are very similar in appearance. Their body consists of three parts - the head, chest and abdomen. The small head has a pair of complex (angular) eyes and a pair of well-defined antennae. Most species have two pairs of wings on their chests. The whole body is densely covered with feathers and scales [5]. The proboscis of flat butterfly-shaped butterflies is the most specialized oral apparatus in the insect class. When not in use, it is usually hidden under thick scales. The enlarged proboscis is very suitable for sucking liquid food and opens directly into the pharynx with its base. Among butterflies, malnourished adults with rudiments of oral organs are rare. In adulthood, the most primitive representatives of this order are armed with jaws, which are also characteristic of caterpillars of other insect groups.

Typically, butterflies have two pairs of well-developed wings, densely covered with feathers and scales derived from them. However, the structure of the wings is very different: they can be almost completely destroyed (due to evolutionary degeneration), they can be wide flat or narrow, almost. linear structures . Accordingly, the ability of different butterflies to fly also varies. In some forms, such as some waves, the wings are reduced only in females, while males remain good pilots. Winged and wingless females are known. On the other hand, there are species whose wings are normally developed on the outside, but the pilot attachments do not work; an example of this is the silkworm giving commercial silk : its males and females are winged but cannot fly. Probably the best developed in the plane rookie family. Their very narrow wings strike so fast that butterflies not only develop high speeds, but can fly in the air like hummingbirds and even fly backwards [7].

Some moths, such as some hawks and all glass plants, have almost no feathers and scales in the plane of their wings, but this does not affect their ability to fly. The wings of these species are narrow and do not require additional mechanical support provided by the caterpillar coating. In other cases, the vascular system near the wings is significantly reduced, and the supporting function is performed by scales located specifically on their surface. In some very small butterflies, the wings are so narrow that they cannot provide lifting power unless they have long hair bordering on them. They are so much intensive that they are located weather with communication do bearing surfaces area increases . Tungi and daytime butterflies in the middle eng clear structural difference previous and back of the wings stick mechanisms with bog'liq , ya'ni . in flight actions synchronization _ Two of these mechanisms are present in moths. One of them is called bridle . Frenulum - a styloid tumor extending from the lower side , the posterior wing of the leading side at its base. It is included in what is called. the retinaculum in the anterior wing usually resembles a pocket in males and is located in the rib vein below the anterior edge of the wing, while in females it resembles a collection of hairs or stiff hairs located at the base of the medial vein. The second mechanism is provided by a narrow blade attached to the rear wing at the inner edge of the front wing. Only very few primitive forms know this structure called yugum . In daytime butterflies, gravity is associated with the growth of the hind wings, which does not fit the bridle. However, several exceptions are known [9].

Different parts of the moth's body have special sensory structures.

These organs, located in the antennae of most moths, are pineal or wedge-shaped tumors with thin cuticle walls. They are located in the deep layers of the cuticle and are innervated by a special group of sensory cells that are connected to the branches of the sensory nerves. The sense of smell of many nocturnal butterflies seems to be very subtle: it is assumed that this is why they find members of the opposite sex and food sources [10-11].

Hearing organs. Some nocturnal butterflies are known to have tympanic hearing organs, but they are not present in all daytime butterflies. These mechanoreceptors are located in the lateral pits of the metathorax or in the first segments of the abdomen. The pits are covered with a thin cuticular membrane, beneath which is the tracheal cavity. Sound waves propagating in the air cause the membrane to vibrate. This stimulates the excitation of special sensory cells that are transmitted to the branches of the sensory nerves.

Visual organs. The main visual organs of moths are two large complex eyes that occupy almost the entire upper part of the head. Such eyes, which are characteristic of many insects,

consist of many of the same elements that are independent of each other - ommatidia. Each is a simple eye with a lens, a light-sensitive retina, and innervation. The hexagonal lenses of several thousand ommatids of a single eye of moths form its convex polygonal surface. Detailed description The structure and function of such visual organs require a lot of space here, and only one thing should be noted: each ommatidium perceives part of the overall image independently of the others, which eventually turns into a mosaic. Compared to the behavior of nocturnal butterflies, their visual acuity, like that of other insects, is good at close range , but they can see distant objects much more blurred. However, due to the independent action of many ommatidia, the movements of objects falling into their field of vision are probably accepted even on an "extended scale" because they excite hundreds or even thousands of receptors at the same time. . Thus, the conclusion is that these types of eyes are primarily designed to record movements [12].

RESULTS

Pigmentation. As with day butterflies, the color of night butterflies is inherently twofold - structural and pigmented. The chemical composition of the various pigments is formed in the scales, which densely cover the body of the insect. These substances absorb light of a certain wavelength and reflect others, which is part of the solar spectrum we see when we see a butterfly. Structural coloring is the result of refraction and interference of light rays that are not related to the presence of pigments. The layered structure of the wing scales and membranes, as well as the presence of longitudinal ridges and grooves in the scales, leads to the deflections and interactions of "white" sunlight, some of their spectral components are amplified. and are perceived by the observer as colors. In moths, the natural coloring is mainly pigmented.

Protective mechanisms. Different defense mechanisms are found in pupae and adult moths [13].

Shell caterpillars build similar mobile homes from leaf fragments, shed larvae, and similar materials, securing them with salivary gland secretions and their feces.Feeds, glands, and other larval structures.

Means of protection of pupae. Protective coloring. Adults of caterpillars and moths widely use protective (mysterious) and warning (scary) colors. The latter attracts the attention of predators and is represented by species that have some kind of strong defense accordingly. Brightly colored, for example, covered with numerous caterpillars or burning feathers, which have an unpleasant taste due to the secretion of special glands. The mysterious color that allows it to be added to the background is wonderfully developed in the larvae of some species. If a caterpillar finds food on a coniferous tree , it may be almost indistinguishable in color and shape from the surrounding needles or scales . In other species , the larvae not only look like tiny nodes in appearance, but also rise to the branches during danger, further emphasizing this similarity. Such a mechanism is typical, for example, of moths and some tapeworms [14].

DISCUSSION

The mysterious color of night moths in adults can be illustrated by many examples. Resting individuals of some species in distant families resemble bird droppings, while others blend perfectly with the granite stones, bark, leaves, or flowers that usually sit. The ribbons show a bright alert color of the rear wings during flight, but are almost indistinguishable at rest, as the mysterious patterns of the front wings folded on the back camouflage the insects perfectly on

rocks or tree trunks. Many moths have spots that are very similar to the broad wings on the wings of open moths large predators . This frightens enemies who try not to endanger them by knowing the true size of the animal being “looked at”.

industrial melanism

- one of the most interesting phenomena that has attracted the attention of biologists to moths for many years. In populations, usually against the background of colored insects, there is often a small percentage of dark people (melanists). The formation of pigments in them is different from others, due to a gene mutation, ie. inherited _ It has been noted that in the last century, the proportion of melanized forms in the populations of some species of night butterflies has increased significantly , and that this has occurred in industrial areas, mainly in Europe. Often, dark butterflies almost completely replace the light colors that were previously considered the norm of the species. Clearly, we are talking about some rapidly evolving process [15].

A study of species with industrial melanism showed the following. The probability of survival of the "normal", viz. light, shapes in rural areas are higher than in melanists, because it is a simple color that is mysterious in this type of environment. True, the clock dark butterflies have a physiological advantage - they survive in conditions of food deficiency (lack of some nutrients), which is fatal to their bright counterparts, but, of course, insects are wrong more often than not eat, they are at risk of being attacked by predators, so melanists not only squeeze out ordinary individuals, but stay in the minority. In industrial areas, most of the things that butterflies land on are usually covered in heat, and here a darker color is better at camouflaging enemies than a normal light color. In addition, the reduction in melanists ’food quality requirements is of particular importance in conditions where forage plants suffer from contamination. As a result, they displace ordinary butterflies in industrial conditions, and if the risk of food shortages is more important than predator attacks, they dramatically increase their presence in rural areas. Thus, the basic position of the modern theory of evolution is confirmed: genes that give preference to an organism are distributed in the population, unless they simultaneously lead to the appearance of traits that reduce physical condition. Interestingly, the melanistic color prevalent among butterflies in industrial and neighboring rural areas is inherited as a dominant trait. The phenomenon of industrial melanism still requires further study. It is a wonderful example of the very rapid evolutionary process before our eyes, which allows us to better understand some of its basic mechanisms.

Distribution. Moths are found on all continents except Antarctica and many oceanic islands. Undoubtedly, the ability of adults to fly has become the most important factor explaining the prevalence of most species. However, the basic methods of propagation in some taxa are different. Yes, high altitudes and in places that are supposedly too far from the incubation sites, young caterpillars are caught walking in the air with the silk threads they produce. The spread of the species is also facilitated by the attachment of the eggs to logs and other objects, which are then carried away, for example, by flood waters or wind. Many nocturnal butterflies are associated with symbiotic relationships with other species, and their range practically corresponds to the distribution area of “hosts”. An example is the moth moth, which multiplies in the flowers of the load.

The economic importance of moths.

At this level , the oral apparatus is a soft proboscis that most adult moths are unable to pierce. plant tissue , adults of these insects rarely harm humans. In many cases, they feed on flower nectar and provide undeniable benefits as pollinators of important crops.

Such a benefit and simultaneous symbiotic interaction is the relationship of yucca moth with yucca plants. The flower of the latter is placed in such a way that fertilization of the ovaries and the development of seeds from them is not possible without the help of a pollinator. Such help is provided by the female yucca moth. Collecting pollen from several flowers, he sculpts a ball out of it, carefully places it on the stigma of the pistil, thereby ensuring the fertilization of the ovaries in the ovary, and lays an egg there. Growing yucca seeds are the only food for its larvae, but they consume only a small portion. As a result , the complex behavior of these nocturnal butterflies allows for the proliferation of unusually well- defined plants. Several species of yucca moths are known, each of which is symbiotically related to one or more yucca species [16].

Harm. The caterpillars of moths are very greedy. They can damage the leaves, stems and roots of plants, consume stored food, and break down various fibers and other materials. The larvae of many species of moths cause great damage to agriculture.

Everyone knows the harm of keratophage moths. They lay eggs on wool and fur, which are fed by larvae . The fibers of these materials are also used by some species to build pupae cocoons. Harmful pests are grain moth or barley moth, Indian flour moth and mill moth, which destroy grain in warehouses. All three species are cosmopolitans, viz. almost they are spread all over the world and they need to be treated with insecticides on a regular basis to reduce the damage they cause.

Probably the most obvious type of damage to plants by caterpillars is defoliation. destruction of leaves . Hungry butterfly larvae can literally strip fields, vegetable gardens and even forest plantations.

Classification. The most common classification scheme for the Lepidoptera order divides it into two subcategories, Palaeolepidoptera and Neolepidoptera. Their representatives differ from each other in many respects, including the structure of the larvae, the oral cavity, the wing vessels, and the structure of the reproductive system. Several species belong to the Palaeolepidoptera, but they are mainly represented by a wide evolutionary spectrum of very small forms with miner caterpillars, while the small family of Neolepidoptera unites most of the modern butterflies. In total, there are more than 100 families in the Lepidoptera order, some of which (only for nocturnal butterflies) are listed below.

Glassfishes (Sesiidae): delicate forms with scales transparent wings; resembles bees on the outside; flying during the day .

Fireflies (Pyralidae): small butterflies of various shapes; The wings are folded into a triangular shape at rest: many species are pests.

Fingers (Pterophoridae): small shapes with longitudinally divided wings and scales at the edges.

True moth (Tineidae): Very small butterflies with scales towels along the edges of the wings.

Toothed moth (Gelechiidae): small, often brightly colored butterflies; many, such as grain (barley) moths, are harmful pests.

Hawk Moths (Sphingidae): A large species that usually resembles a hummingbird.

Bagworms (Psychidae): males winged, small, dark in color; wingless females and caterpillars live in silk bags.

Peacock eyes (Saturniidae): very large, broad-winged butterflies with massive bodies; many have “eye” spots on their wings.

Moths (Geometridae): small, slender, broad-winged forms whose caterpillars "walk" in a ring in a vertical plane.

Leaf rollers (Tortricidae): small and medium species; the folded wings often resemble a bell in contour; many - dangerous pests , such as spruce buds and apple moth.

Cosa worms (Lasiocampidae): medium-sized hairy butterflies with massive bodies; caterpillars are dangerous pests.

Bears (Arctiidae): Medium-sized, brightly colored winged hairy butterflies.

Scoops (Noctuidae): Forms with inconspicuous gray or brown wings and filamentous antennae.

Volnyanki (Lymantriidae): males with gray or brown wings and hairy antennae; females are sometimes wingless; caterpillars have a bright color [17].

CONCLUSIONS

In the capital of Uzbekistan, Tashkent, Green Grass Servise together with the Institute of Flora and Fauna opened a garden of the House of Tropical Butterflies. This garden was provided with artificial ponds for 25 species of living tropical butterflies, a flower pond as well as the required air temperature and humidity. The life cycle of sphincters is the same as that of other Lepidopteras. That is, they have an egg stage, a larval stage (5 stars), a puppet stage, and an imago (adult) stage. To be a little more specific, adult sphincters are usually very active. They fly away and most feed on nectar and live much longer (average 1-2 weeks). Oeneis and Pseudochazara 34 generations; 3 types of riodinidae (2 generations); 318 species of Lycaenidae (11 of which are suspicious, mainly from the Neolycaena and Plebeius genera) (57 genera). In total: 965 species of butterflies, 174 genera, by countries: Armenia - 244, Azerbaijan - 225, Belarus - 107, Estonia - 113, Georgia - 211, Kyrgyzstan - 316, Kazakhstan - 344, Latvia - 115, Lithuania - 126 , Moldova - 87, Russia - 522, Tajikistan - 295, Turkmenistan - 159, Ukraine - 192, Uzbekistan - 241 [16-17].

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