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THE USE OF ALTERNATIVE FODDER PLANTS IN THE REARING OF THE SILKWORM

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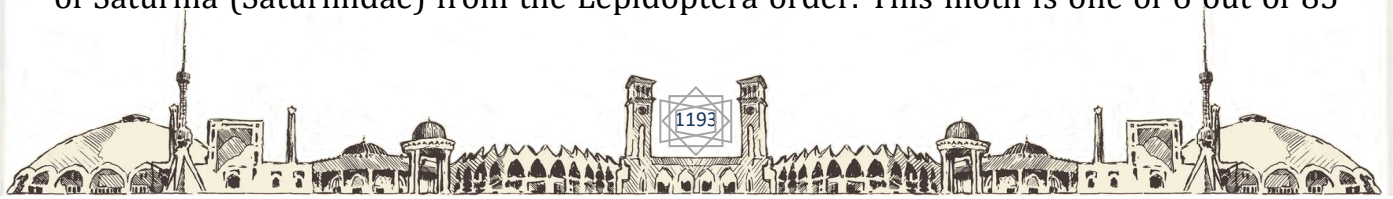
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Annotation: *The article presents data on the characteristics of the biology of mulberry and oak silkworms, as well as the first results of an experiment on feeding silkworms with alternative types of fodder plants.*

Key words: *silkworm, Chinese oak peacock eye, fruit trees, alternative forage plants, live food.*

As you know, the object of sericulture in Uzbekistan is the silkworm, which gives high quality silk. This species belongs to the Family of real silkworms (*Bombycidae* Latreille, 1802), which includes about 200 species, distributed mainly in Southeast Asia, Africa and Australia. Butterflies of this family can be easily distinguished from representatives of other families of the *Bombycoidea* (Silkworm) group by the way their wings are folded at rest: the hind wings are tucked under the front ones, as a result of which they are almost invisible. The wings are developed, but relatively small. Butterflies of real silkworms are twilight and nocturnal, they are medium in size, their wingspan is 36-46 mm. They are characterized by broad wings, a short, densely pubescent, thick, massive body covered with dense hairs. Adults do not feed, their mouthparts are rudimentary.

Silkworm. *bombyx mori*. In adults, sexual dimorphism is well expressed: In males, the antennae are comb-shaped, in females they are with small teeth. The forewings are crescent-shaped and notched along the outer margin. The small hind wings are rounded and covered with a short fringe along the edge. The legs are short and strong. The body of the caterpillars is elongated. On the dorsal (dorsal) side of the segments of the chest and abdomen, there are paired tuberosus warts or spines. On the last eighth segment of the abdomen, there may be a short spike-like outgrowth in the form of a hook-shaped horn. The silkworm caterpillar has 16 legs, mostly covered with thick fluffy hair, the silkworm is almost naked. Caterpillars pupate in cocoons. The pupa is thick, blunt. Silkworms are trophically associated mainly with plants of the mulberry family. For 1 kg of cocoons, up to 16-17 kg are required, and with a rational consumption, about 12 kg of mulberry leaf. To obtain silk, the Oak silkworm, or Chinese oak peacock-eye (*Antheraea pernyi*) is also used, which belongs to the family of *Saturnia* (*Saturniidae*) from the *Lepidoptera* order. This moth is one of 6 out of 85





known species of the genus *Antheraea*, the quality of the silk thread of the oak silkworm is inferior to that of the silkworm (*Bombyx mori*), but it is much cheaper. It was possible to domesticate these insects about 250 years ago in southern China. The habitat of the nominative subspecies occupies the eastern part of the Palearctic. It extends from the Far East of Russia to the central and eastern regions of China and Korea. The subspecies *Antheraea pernyi korintjiana* and *Antheraea pernyi roylei* are distributed in northern India and Southeast Asia. The oak silkworm was brought to Europe and successfully acclimatized in Spain and the Balearic Islands, and was also introduced to the Japanese islands. Typical habitats of oak silkworms are deciduous forests dominated by oaks (*Quercus*). Representatives of this species are nocturnal. Their butterflies are very attracted to artificial lighting. Chinese peacock-eyes can often be seen even on cloudy days. Near street lamps and other light sources, more often at noon or late in the morning. A butterfly hatched from a cocoon dries out for a couple of hours and flies away in two hours. In the evening, females emit pheromones that attract males. In the daytime, adults do not show activity and are inactive. They have no mouthparts, do not feed, and die shortly after mating. The features of the biology of reproduction of the silkworm, the Chinese oak peacock, as well as the Japanese subspecies are very similar. So the pairing of oak silkworm butterflies occurs at midnight and lasts up to 24 hours. After mating, the females look for plants to lay their eggs. Most often they are changeable oaks (*Quercus variabilis*), a little less often forest beeches (*Fagus sylvatica*), sowing chestnuts (*Castanea sativa*), birches (*Betula*), hornbeams (*Carpinus*) and hawthorn (*Crataegus*). From fruit trees they are attracted primarily by plums (*Prunus*). Eggs are brown, spherical in shape, laid on young shoots of trees. The female lays up to 40 batches of eggs, with each subsequent batch on a new plant. So oak silkworms cover a large area and increase the survival rate of offspring. Caterpillars of the silkworm, similar to the oak silkworm, hatch 10-14 days after laying eggs. Caterpillar stage lasts 35-40 days in spring, 45-50 days in autumn. The first days the caterpillars do not move much, and then proceed to increased nutrition. After the third molt, the caterpillars become very voracious and eat up all the available foliage in 4 days. They go through 5 stages of development, growing up to 9-10 cm in length and reaching a weight of 14-16 g.

Oak silkworm caterpillars are colored green, pupation occurs in an ovoid cocoon 50x25 mm in size. In the wild, oak silkworm pupae successfully hibernate and are able to withstand severe winter frosts. In the spring, after 20-25 days, a butterfly emerges from the cocoon. Two generations appear during the season. Mass departure is observed in May and August. Wingspan 110-152 mm. Females are noticeably larger than males and have a more contrasting coloration. In males, the forewings are more curved, and the feathery antennae are colored ocher brown. The antennae of females are comb-shaped (covered with small teeth). The color of the wings varies from yellow-brown to red-brown. The outer edge of the front wings is even. On both pairs of





wings of the oak peacock-eye there are circular black spots resembling eyes. The life span of the adult Chinese oak peacock-eye does not exceed 9-11 days.

In order to identify the possibility of using alternative fodder plants. We conducted an experiment on feeding the silkworm with other plant species.

Silkworm eggs were placed in a thermostat on September 19, 2022. At a stable temperature of 25-27°C in a Petri dish. Leaves of 20 plant species were prepared: oak, paulownia, Turkestan juniper, pine, apricot leaves, horse chestnut, Canadian maple, plane trees, paper tree, mulberry, walnut, maclura, as well as quince, cherry plum, plum, grape, apple, persimmon, willow, fig. After 7 days, caterpillars hatched from the eggs.

The next day, caterpillars in equal numbers were placed in boxes at room temperature 25-26°C. A day later, new fresh leaves of the plants indicated above were added. The leaves were finely chopped, since the caterpillars were very small and it was easier for them to eat finely chopped leaves. It turned out that the leaves of mulberry, grapes, and quince were partially consumed. Room temperature was stable at 25-26°C, fresh, finely chopped leaves of 20 plant species were also placed, but no change was observed. The caterpillars were passive. Room temperature was also unchanged.

On September 30, 2022, caterpillars that were fed with leaves of oak, paulownia, local juniper, pine, as well as leaves of apricot, horse chestnut, Canadian maple, plane tree, paper tree, walnut, maclura, cherry plum, plum, apple tree, persimmon, willow, fig died, after them, on October 1, 2022, caterpillars in boxes with leaves of quince, grapes and mulberries died.

Conclusions. Despite the unsuccessful result and the forced termination of the experiment, the following should be noted:

1. Autumn leaves of plants offered to silkworm caterpillars need to choose only the most juicy ones.
2. The setting of the experiment should be more thorough, in particular:
 - a. there should be a stable temperature regime of 25-27 ° C and also a relative humidity of 75%;
 - b. observation of caterpillars should be more regular - at least once every 2 hours around the clock;

With. To encourage caterpillars to eat leaves, they should be handled appropriately;

3. A second experiment should be carried out in April-May 2023.
4. Caterpillars of the 5-6th age silkworm are very promising for use as a high-protein live food in pond fish farming.





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