

ОБРАЗОВАНИЕ,

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SOME SPECIES OF BLACK BEETLES-TENEBRIONIDAE HARMFUL TO FOOD

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Abstract: the article presents data on the morphology of black-bodied beetles-Tenebrio molitor. Their signs, morphology and harm to food products.

Keywords: coleoptera, beetles, egg, larva, pupa, imago.

Nature endows the Earth with beauty due to its biological diversity. Every organism, regardless of whether it is useful or not, even if it is a pest, in nature has its own function that they must perform, as well as a role in the food chain. The destruction of one organism as a vector of disease or pest can lead to the loss of its place in the food chain, as well as to a reduction in the number and populations of other related species. Among the representatives of the order Coleoptera, as pests of grain and flour, species of the black-bodied family (Tenebrionidae), better known as Khrushchaks, stand out. These include the large flour crunch (Tenebrio molitor L.), dark flour crunch (Tenebrio obscurus F.), small flour crunch (Tribolium confusum Jacq.) and bulbous crunch (Tribolium castaneum Herbst.). Their larvae are commonly called mealworms. As a rule, khrushchaks do not often eat whole grains, but eat spoiled and broken ones. Basically, they settle in flour, bread products, bran. Flour becomes lumpy when populated with khrushchaks, acquires an unpleasant odor and is unsuitable for food. The large flour crunch is a medium-sized insect 13-17 mm in length, the body is elongated, flattened, at first white, and as the chitin hardens, dark brown or black in color. The underside of the body and legs are reddish-brown. The length of the elytra is 2 times greater than the width. The beetle has two pairs of developed wings and flies well, usually at night. The female lays 270 to 570 eggs on food. One generation develops for about 600 days.

Beetles and larvae feed on a wide variety of foods of plant and animal origin. They prefer flour and bran, especially raw and musty ones. In the grain, first of all, the embryo is damaged, and then the mealy part is eaten out. The harm of beetles and larvae consists not only in destroying some of the products, but mainly in polluting them with excrement and larval skins. They overwinter in products with high humidity. Flour crunch larvae are very readily eaten by many birds and terrarium animals. This is a good additional food for many lizards (especially desert ones), some turtles. Amphibians swallow food whole, so the larvae enter their stomach while still alive and



can cause serious injuries to internal organs with their powerful jaws. To feed amphibians, the head of mealworms is crushed and the worms are fed with tweezers or from special feeders. For lizards and turtles that crush prey with their jaws before swallowing, such treatment is not necessary. The highly developed chitinous covering of larvae and beetles can also injure the digestive tract of small animals or cause its blockage. Therefore, it is recommended to use freshly moulted larvae with white and soft integuments for them. You can also grind it into flour and use it for feed.

Mealworms are not a valuable nutritious food and are characterized by an unfavorable ratio of nutrients and minerals, high fat content. Feeding mealworm in large quantities can cause obesity in ornamental birds. It is better not to use it as a main feed, but only as an additive, a kind of "delicacy".

The feeding value of the larvae of the large flour crunch

| Squirrels, % | Fats, % | Carbohydrates, % | Energy value, kcal/g | Calcium, % | Phosphorus, % |
|--------------|---------|------------------|----------------------|------------|---------------|
| 53 | 33 | 6 | 6,49 | 0,11 | 0,77 |

Eating flour, excreting its excrement, flour becomes unusable, especially if the flour is in a bag. To preserve the quality of flour, the following folk methods of beetle control should be used.

For 50 kg of flour in a bag, add 1 kg of mint, mint leaves contain 2.5- 3%, flowers 4-6%, shoots 0.3% menthol, which is part of validol, as well as essential oils. This substance repels an adult insect and prevents reproduction. There are also folk ways to combat harmful bugs. You can also use mint, wild, mountain or cultivated, you can add salt to the grains in a dry product, in grains or beans.

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| № | The subject of the article / Тема статьи / Maqola mavzusi | Page / Страница / Sahifa |
|----|---|--------------------------------|
| 1 | TA'LIMGA OID YANGILIKLAR | 3 |
| 2 | МАТЕМАТИКА ДАРSLARIDA INNOVATSION TEKNOLOGIYALARDAN FOYDALANISH | 5 |
| 3 | SOVUQ URUSH | 8 |
| 4 | TEYLOR QATORLARINING ISBOTI | 10 |
| 5 | ZILZILAVIY HUDUDLARDA LYOSSLI ZAMINNI ZICHLASH USULLARI | 13 |
| 6 | АЛЛЕРГИЯ | 21 |
| 7 | 2019-23 йилларда чирчиқ шаҳрида аниқланган ирсий ва туфма касалликлар статистикаси | 26 |
| 8 | SOME SPECIES OF BLACK BEETLES-TENEBRIONIDAE HARMFUL TO FOOD | 32 |
| 9 | BUXORO VILOYATI QUMSULTON KO'LIDAGI FITOPLANKTON TURLARINI ANIQLASH | 34 |
| 10 | CURRENT PROBLEMS OF LINGUOCULTUROLOGY | 37 |
| 11 | EDUCATION AT THE PRESENT STAGE | 40 |
| 12 | IMPROVING THE QUALITY OF BIOLOGY TEACHING IN SCHOOLS | 43 |
| 13 | ЎЗБЕКИСТОНДА ШИРИНМИЯ (GLYCYRRHIZA GLABRA L.) ЎСИМЛИГИНИНГ БИОЭКОЛОГИК ВА БИОФАОЛЛИК ХУСУСИЯТЛАРИ | 46 |
| 14 | SPORTCHILARNING INDIVIDUAL PSIXOLOGIK XUSUSIYATLARINI O'RGANISH | 51 |
| 15 | O'ZBEKISTON RESPUBLIKASI KONSTITUTSIYASIDA ADVOKAT FAOLIYATINING O'RNI | 57 |
| 16 | CHET TILIGA IXTISOSLASHTIRILGAN MAKTABLARDA SINF O'QUVCHILARINING ISBANI TU IDA KOMMUNIKATIV | 59 |