# The Effect of Moisture on the Silk Worm

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***Abstract:*** *Since relative humidity indicates the evaporative power of the air at a certain temperature, relative humidity can be used in most cases. Moisture affects the worm organism directly through the air environment. On the other hand, the body of the worm is affected by moisture through food. The fresh mulberry leaf, which is the food of the silkworm, is 75 percent water. Part of the water is absorbed into the intestines of the worm, and the rest is excreted with feces. 40 percent of the water absorbed in the gut of the worm evaporates through the skin of the worm, and the rest remains in the body. In older worms, water evaporates faster, because at this time the skin of the worm is smaller compared to the size of the body. The coefficient of water absorption in young worms is higher than that of adult worms, and the droppings of young worms are drier than those of adult worms. Due to the increased exchange of water in the body of young worms, heat consumption also increases. In other words, more heat is spent in the body than accumulated.*

***Keywords:*** *Organism, worm, temperature, evaporation, humidity, nutrients.*

When the air is warm, the worm's breathing increases, its heartbeat and development accelerate, its appetite increases, and it becomes difficult to digest food. But these events do not affect the final size of the worm. High temperature together with humidity has a strong effect on the worm organism. A decrease in humidity can alleviate the harmful effects of high temperatures to some extent. Sometimes this relationship is one degree for every 4 percent of relative humidity.

Air humidity has a stronger effect on the degree of cooling of the insect's body. In insects, the ability to evaporate moisture from the body (sweating) is weak. Evaporation of water occurs only in the trachea of the insect. As the air temperature rises, this phenomenon of evaporation increases, because the carbon dioxide produced due to increased metabolism forces the respiratory pores to open more often. As a result, the air exchange of the larynx accelerates and the evaporation of moisture increases. In insects, the phenomenon of releasing moisture through the skin is very slow. This phenomenon occurs due to the fact that the air with a large amount of moisture is exposed to the skin at a very high temperature. As a result of the evaporation of water, the body of the insect cools down to several degrees, sometimes, especially when the humidity in the outdoor air is low, such cooling can be Bam lower than the temperature of the surrounding air. Most of the water in the insect's body is lost by evaporation when there is no air. Prolonged loss of moisture in small insects is more dangerous than in large insects. Insects regulate the effects of moisture by feeding on moisture in food. For example, a silkworm that feeds only on mulberry leaves meets its moisture needs with the amount of leaves it eats. If the air is dry, the amount of

water in the mulberry leaf may not reach the worm. Without this, the silkworm's need for water increases. On hot days, worms drink water with appetite, if water is poured into the milk where the worms are fed, they will start looking for water. Lack of moisture can stop the development of the worm. In this case, on the contrary, in the summer season, feeding the worm with wet leaves helps the ulam to develop well. When there is excess moisture, the water in the leaf evaporates less, the absorption coefficient of water decreases. When the air is too dry

The insect organism adapts differently to this phenomenon. The optimal air humidity for silkworm feeding should be 65-75 percent relative humidity. If the humidity exceeds this, the worms begin to die in large numbers.

If the humidity is less than this, the worms will eat less leaves, the development of the worm will slow down and the cocoons will be much smaller. For adult worms, it is recommended that the relative humidity is around 60-70 percent, while for young worms, the relative humidity should not exceed 75 percent. If adult worms are fed in a dry atmosphere, their resistance to starvation is reduced, and worms that have just hatched from the seed and have enough nutrients in their bodies cannot withstand excessively dry air, but the dry air

lives more in When the weather is warm, it takes a long time for the mature worm to pupate. In the conditions of Central Asia, where the air is very dry, the issue of the effect of moisture on the silkworm organism is of great practical importance. With this in mind, this issue should be studied well.

The humidity of the environment varies, and the relative humidity of the air, that is, the level of saturation with water vapor, is important in the ecology of insects.

3 different quantities are used to estimate air humidity:

1. Absolute humidity is the amount of water vapor in 1 $m^3$ of air amount is determined.
2. Maximum humidity - water poured into the air at a certain temperature amount of steam.
3. Relative humidity is the percentage ratio of absolute humidity to maximum humidity. in which:

$$H=\frac{A}{M}\cdot 100$$

H-relative humidity;

A - absolute humidity;

M- maximum humidity.

If the air temperature is high, the maximum humidity will increase, if the temperature decreases - it will decrease. Air humidity depends on temperature. For example, 4.9 g of water is required to saturate 1 m3 of air with steam at $0^oC$, 9.4 g at 10 $^0C$ and 30.4 g at $30^oC$. When the air temperature decreases, the humidity increases, when the temperature increases, the amount of humidity decreases.

The relative humidity of the air should be in the same range as the temperature plays an important role in the life of the silkworm. Depending on the amount of moisture, the rate of evaporation of water from the worm's body varies. Evaporation of water in the body controls the temperature in the worm's body to a certain extent, affects the digestion and exchange of nutrients.

A freshly cut mulberry leaf, considered silkworm food, contains 75 percent water. Part of the liquid is absorbed in the intestines, and the rest is excreted as food residues. 40% of the water absorbed in the intestines evaporates from the worm's skin, and 60% remains in the body.

Evaporation of water is determined relative to 1 kg of live weight. One day compared to the age of 1 kg of live silkworm during the following amount of water evaporates:

In the first year ..... .....0.52 kg of water

Second age ..... ..... 0.40 kg of water

In the third year..... .....0.32 kg of water

At the age of four ..... 0.26 kg of water

At the age of five ……0.11-0.22 kg of water

Younger worms drink more water than older ones more steaming, a box of five-year-old worms in 1 day.

It can evaporate 60 kg of water. It can be described as follows. In 1 kilogram of worms that have come alive from eggs, there are about 2 million worms

will be The length of the Wu worm is 3.5 mm, the width is 0.75 mm, the volume of the body is 8.2 sq/mm, and the total surface area of 1 kilogram of worms is 165,000 sq cm, that is, 16.5 sq m. The length of one piece of five-year-old qllrt is 80 mm, the width is 8 mm, and the surface is equal to 20 square mm. 250 pieces are equal to 1 kg, and their total surface is 4500 square cm. As can be seen from these figures, total of 1 kg of worms hatched from eggs the surface is 37 times larger than the body mass of five-year-old worms weighing 1 kg. As a result, water evaporation from the body of a young worm is slightly more than that of an adult. That is why the water absorption coefficient (measured as a percentage of the ratio of the amount of water absorbed by the body to the amount of water contained in the food) is higher in young worms than in older ones. The coefficient of absorption of water in the leaf is 45.7% in 5-year-old worms, 70.5% in 4-year-old worms, and this indicator is even higher in young ones. Due to the strong water exchange process in the body of young worms, they lose more heat under the influence of radiation than is generated due to the oxidation process in the body.

If the humidity in the worm house increases, drain the water from the worm body evaporation becomes difficult, heat release slows down, body temperature increases, metabolism, breathing and heart rate accelerate in the body. In the 60th percentile of five-year-old worms, the heart rate per minute is 33; in 75 percent - 42; 90 percent of them have 46 times. Worm development accelerates in high humidity, food intake and digestion increases, the volume increases. But the acceleration of metabolism has a negative effect on its vitality. The remains of food become moldy, and the result is butchery. Especially if the temperature is high and the humidity is high, it has a strong effect on the worms. Because the body increases metabolism at high temperature and excess water vapor is formed in the body. But high humidity in the room does not allow water vapor to shine. As a result, the body becomes sick and eventually dies.

Vertebrates increase the amount of water in their body by temperature. It manages somewhat depending on the contraction and decline. The Wu process cannot be performed by silkworms. In insects, with a rise in temperature, the metabolism in the body increases and the respiratory tracts (tracheas) open, the release of carbon dioxide increases, and the evaporation of water increases. As a result, the water in the body decreases, leading to the death of the worm. In such cases, if the worms are given wet and moistened leaves, they will quickly restore the water balance in the body. Therefore, it is necessary to ensure that the humidity and temperature in the worm house are in moderation. On the contrary, if the humidity decreases, the leaf dries quickly, the edible properties of Shlipg decrease, the worms wrap small cocoons, and the quality of the cocoons deteriorates. The most comfortable relative humidity in the room where worms are kept is 70-75 percent for young worms at a temperature of 25-27 $^0$C, 65-70 percent at 24-25 $^0$C for older worms, and 60-70 percent at 25-26 $^0$C during the period of rSha wrapping. is enough.

If adult worms are starved in high humidity, metabolism and physiological processes in the body are disturbed, and the worm gets sick. If the humidity in the house decreases, water is sprinkled on the ground or wet sheets are hung. In summer, when feeding worms, in addition to these, it is necessary to moisten the ground by putting sand (10 cm thick). If the humidity in the room exceeds the norm, the worm house is quickly ventilated and the stove is turned on. In addition, moisture-absorbing materials are spread. It is made from quicklime or table salt as moisture absorbents. Unslaked lime reduces the humidity in the room for a long time (up to two weeks). After that, lime is replaced if necessary. 100 g of moisture absorption usBup 3-4 kg of lime is required.

To use table salt for this purpose, first it is heated well and loses its moisture. Then it is spread on the ground in a worm house with high humidity. It takes 2.5 kg of table salt to regulate the humidity in a 70 m3 worm house. As a result, the 90 percent humidity in the worm house decreases to 75 percent after 1.5-2 hours. Some farmers put 5-8 cm of dry soil on the ground in order to reduce it when it rains in the garden and the cotton in the worm house exceeds the norm (without slaked lime). The soil is taken from the old thatched walls. Calcium chloride is also used to reduce humidity in incubators or seed storage rooms. 100 g of moisture requires 300 g of calcium chloride. Calcium chloride is 4 times cheaper than quicklime. Reducing hopa moisture in worm feeding usBup is the best and a quick way is to ventilate the house, turn on the stove and hang dry cloths over the sows.

**References.**

1. Абдурахманов А. и др. Изучение весеннего развития зародыша в грене. 11 «Шелк» журнали. - Т. 1986. №5.
2. Абдурахманов А., Ахмедов Н Действие формалина на оживляемостb грены. 11 «Шелк» журнали. - Т., 1991. №3.
3. Axmedov NA., Murodov S.A. Ipakchilik asoslari. - T.: O'qituvchi, 1998.
4. Axmedov NA. Ipak qшti: harorat va havo. // «Экологический вестнию) журн. - т., 1999. №3.
5. Ахмедов НА. Аэрация воздуха в червоводнях и её влияние на биологические покозатели тутового шелкопряда. // Вестник селbскохозяйственной науки Казахстана. - Алма-ата, 1999. №4.
6. Soliyeva, M. B., Yuldasheva, K. T., Xatamova, X. K., Kimsanova, X. A., & Isroilova, S. S. (2021). The effect of shelf life of live cocoons on their temperature and quality. *Asian Journal of Multidimensional Research (AJMR)*, *10*(3), 254-260
7. Axmedov N.A., Bekkamov Ch. O'zgaruvchan harorat va namlikning ipak qurtining tana ko'rsatkichlariga ta'siri. // Magistratura talabalari, aspirantlarning qishloq xo'jaligi yo'nalishidagi ilmiy to'plami. - т., 2004.
8. Soliyeva, M. B., Sh, T. J., & Asronov, E. K. (2021). To Learn Of Biological And Productive Indicators Of Imported Mulberry Silkworm Breeds. *The American Journal of Applied sciences*, *3*(04), 131-137.
9. Asronov, E. K., & Soliyeva, M. B. (2020). The importance of feeding silkworms under polyethylene. *ACADEMICIA: An International Multidisciplinary Research Journal*, *10*(10), 1169-1174.

10. Асронов, Э. К., & Солиева, М. Б. (2020). ВЛИЯНИЕ ИЗМЕНЕНИЯ ТЕМПЕРАТУРЫ НА ПРОДУКТИВНОСТВ И КАЧЕСТВО КОКОНОВ ВО ВРЕМЯ КОРМЛЕНИЯ ТУТОВОГО ШЕЛКОПРЯДА. Экономика и социум, (12-1), 388-391.
11. Sokhibova, N. S., Nazirova, M. I. K., & Botirovna, S. M. (2020). INFLUENCE OF REARING SILK WORMS WITH HIGH PRODUCTIVE MULBERRY LEAVES ON THE BIOLOGICAL INDICATORS OF SILK GLAND AND RAW SILK EFFECTIVENESS. *Life Sciences and Agriculture*, (2).
12. Асронов, Э. К., Салиева, М. Б., Салиев, С. А., & Давлатов, Х. Р. (2018). ХРАНЕНИЕ ПЛОДООВОЩНОЙ ПРОДУКЦИИ. In Северный морской путь, водные и сухопутные транспортные коридоры как основа развития Сибири и Арктики в XXI веке (pp. 264-266).
13. Асранав, Э. К., Салиева, М., & Алижанов, Ж. (2019). ЛЕЧЕБНЫЕ СВОЙСТВА ТУТОВНИКА. *Академическая публицистика*, (5), 24-28.
14. Alisher, V., Komiljonovna, K. H., Botirovna, S. M., & Yulbarsovna, D. S. (2020). БАМИЯ-ШИФОБАХШ ЎСИМЛИК ВА УНИ ЕТИШТИРИШ ТЕХНОЛОГИЯСИ. *PalArch's Journal of Archaeology of Egypt/Egyptology*, *17*(6), 3479-3482.
15. Soliyeva, M. B., & Abdumutalipova, G. A. (2022). Influence of cocoon wrapping agrotechnics on the quality of cocoons. *ACADEMICIA: An International Multidisciplinary Research Journal*, *12*(2), 380-386.
16. Soliyeva, M. B., & Nabiyeva, Z. A. (2022). Influence of Silk Gland Activity on the Quality and Technological Performance of Cocoons. *European Multidisciplinary Journal of Modern Science*, *6*, 333-339.
17. Soliyeva, M. B., & No'monov, N. N. (2022). Processes for Obtaining Quality Silk Raw Materials From Industrial Silkworm Cocoons. *CENTRAL ASIAN JOURNAL OF THEORETICAL & APPLIED SCIENCES*, *3*(6), 88-92.
18. Soliyeva, M. B., No'monov, N. N., & Isroilova, S. S. (2022). INFLUENCE OF SILKWORM FEEDING ON QUALITY MULBERRY LEAVES ON LARVAL VIABILITY AND BIOLOGICAL PARAMETERS. *Web of Scientist: International Scientific Research Journal*, *3*(6), 378-386.
19. Ларькина, Е. А., Акилов, У. Х., Туйчиев, Ж. Ш., Асронов, Э. К., Солиева, М. Б., & Абдикаюмова, Н. К. (2022). Использование способов управления размножением тутового шелкопряда (Bombyx mori L.) в практическом шелководстве. *Аграрная наука*, *1*(7-8), 114-120.