

## FORMATION OF CONDITIONED AND UNCONDITIONED REFLEXES IN BEES AND ITS SIGNIFICANCE

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**Abstract.** *In the article, simple and complex reflexes are included in a number of innate reflexes transmitted from generation to generation in bees. In the complex behavior of bees, it is necessary to distinguish between such basic concepts as reflex and instinct. It provides information about the reflex - the reaction of the body to external influences and the presence of two types of reflexes - unconditioned and conditioned - in the animal world, including bees.*

**Keywords:** *reflex phenomenon, complex reflex, simple reflex, unconditioned reflex, conditioned reflex, instinct phenomenon, building instinct, food instinct, food instinct, bee dance, flower, pollen.*

**Introduction.** The phenomenon of reflex, when bees perceive the external environment with their nerve nodes and respond to it through nearby nerve tissues, is called a simple reflex. Reflex is derived from the Latin word reflexi - reflection.

If you press harder on the legs of a bee sitting on your hand, under your influence, it will quickly reach the nearby nerve chains or through its nodes to the part of the brain. During this period, bees activate all their nervous tissues, and as a result, all the muscles in the bee's body are activated. Then the reaction to the bee will occur and it will start to sting you. This process happens so fast that you won't even notice it. This behavior of bees is called a complex reflex.

Simple and complex reflexes are among the innate reflexes that are passed from generation to generation in bees.

In the complex behavior of bees, it is necessary to distinguish basic concepts such as reflex and instinct.

Reflex is a reaction of the organism to external influences. In animals, including mammals, there are two types of reflexes - unconditioned and conditioned.

**An unconditioned reflex** refers to innate, i.e. reflexes that have become natural in animals as a result of the influence of external environmental conditions. For example, in vertebrates, dilation of the pupil when the light decreases and vice versa, constriction of the pupil when the light increases, the act of sucking in a newborn baby, etc. are unconditioned reflexes.

Bees also have behaviors similar to unconditioned reflexes, such as the sound of bees inside when knocking on the hive wall, the bees quickly filling the honeycomb with honey when exposed to smoke, getting angry with the smell of sweat and other pungent odors, immediately cleaning mustache when it gets dirty. In this case, the adaptation to preserve bee species in nature is of great biological importance. Bees are not taught anything, but they become habitual in the development of the species in the process of evolutionary development. For example, when a hive is covered with smoke, bees fill their bag with honey, because smoke is a sign of danger, and when moving to a new hive, it is necessary to take food reserves and fly.

**A conditioned reflex** is a temporary phenomenon that occurs on the basis of an unconditioned reflex in bees. The Russian physiologist I. P. Pavlov and his school made a great contribution to the study of the higher nervous system of animals, to the creation of the doctrine of the method of using basic reflexes and conditioned reflexes. Painful reflexes play a major role in the life of animals and insects and their behavior.

Bees fly to collect nectar and pollen according to an innate unconditioned reflex, when it lands on a flower, the unconditioned reflex turns into a temporary conditioned reflex as a result of the change in the shape, color, and smell of the flower. Bees trained to get food from the blue or yellow square flew to those squares even if there was no food. When bees were fed sugar syrup flavored with the same odor, they were found to fly to a control box that had the same odor but no food.

Bees have the ability to remember well when plants produce the most flowers. Experiments have proven that bees can be trained to fly to the food source at different hours in the same day. For this, the interval between each feeding should not be less than 2 hours. These events also belong to the category of temporal relations, where plant sap is the unconditional effector and hours of the day are the conditional effectors.

Knowing the properties of bees for establishing temporary connections is of great importance in practice. This can be seen from the following examples. It is possible to feed the bees with fragrant juice and ensure that they go to the desired plants. Painting the beehives in distinguishable colors will positively help the bees to collect nectar and quickly find their nests, as well as the growing trees, bushes and various objects are of great importance for the bees to be able to distinguish the color and location.

At the same time, two or three conditioned reflexes can appear in bees at different times of the day depending on the flowers of plants. The ability of bees to perform tasks within the hive varies, and they can be very complex. Bees have special innate instincts to perform these tasks on time. A set of unconditioned reflexes is called instincts.

**A phenomenon of instinct.** It is derived from the Latin word *instinctus*, which means involuntary movement.

Instinct is an involuntary action, an innate, necessary behavior shown by the organism in response to internal and external impressions. It has its own appearance in each animal species and is passed down from generation to generation. Instincts are divided into several groups: feeding instinct, food search, food gathering, defense instinct, struggle for survival, sexual instinct to mate with female species, etc.

Instinct is a complex innate form of animal behavior. Instinctive action has no prior training or life experience factors. Instinctive behavior is aimed at preserving the species under certain conditions in nature, that is very beneficial to the life of bees..

There are several different instincts in the life of a bee.

*a)* The building instinct is the ability of bees to build complex beeswax nests—hexagonal nests, while young bees outside the cages can be shown to build nests of the same regular shape as the bees that have always been inside.

In the spring, bees that have never seen the nests of male bees and queens build male cells and queens build queens, as an example of the instinct to see them..

*b)* Foraging instinct. Bees fly to collect flowers and pollen. When the weather is favorable, they prepare a large amount of food. In some cases, so much energy is spent to collect

excess food reserves that even the majority of bees die as a result. Of course, such actions are not rational and conscious. The foraging instinct of bees and the instinct of producing honey from flowers is one of the important biological features that have given humans the opportunity to use them for economic purposes.

c) The new mother's nurturing instinct. If for some reason the queen bee is lost or old in the bee colony, the bees feed the young day-old larvae of the colony and produce queen bees from them. This adaptation of the bee family seems beneficial in terms of preserving the species, and at first glance it seems like a conscious move. However, if we take into account that bees sometimes try to raise queen bees from unfertilized eggs, it becomes clear that such actions are instinctive and unconscious.

The same situation is repeated in cases where the bee family is without a mother bee for a long time. At such a time, anatomically masculinized worker bees begin to lay eggs, and only male bees grow from such unfertilized eggs. But while such colonies are inevitably doomed to collapse, the worker bees unconsciously feed on such larvae.

d) **Reproductive instinct.** Usually, the reproductive instinct in a family of bees manifests itself in two different ways.

1. After the male and queen mate, the queen lays fertilized and unfertilized eggs. Unfertilized eggs produce only male bees, and fertilized eggs produce queen and worker bees.

2. The second way of reproduction of bees is to create a new family by migration. In this case, the old mother bee in the bee family separates from the family with a swarm of worker bees.

When the floors are replaced, the bees are replaced.

**Research results:** "Dance" of bees. Early in the morning, searcher bees fly out of the hive. They find nectar, fill their honey bag, and return to the hive to give it to the honey bees. If there is a lot of flowers on the plants, the bees will return to the hive disturbed. After handing over the given flower, they do not immediately return to their tracks, but go to the wax cells and do various movements, that is, they "dance". Such behavior of bees is considered as their instinctive form.

The bees tell by their movements where they found the flower, which side it is and the distance. The movements of this type of searcher bee on wax cells is called "bee dance".

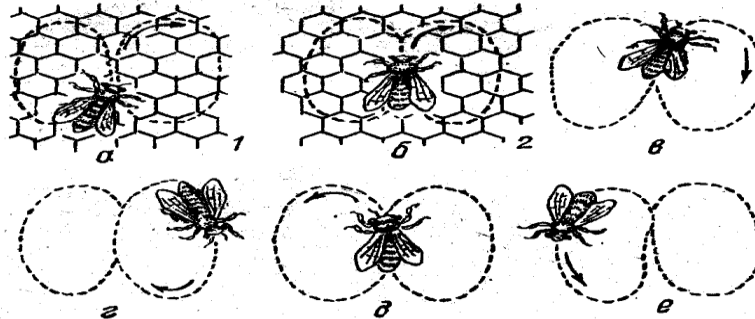
Various dances can usually be observed in the bee family. Bees can make various movements in rounds, circles, semicircles, figures of eight, and others. The dances of bees are now so well studied that a winter observing them in detail can determine exactly where the bees found the flower.

The round dance begins after the bees have handed over their cargo. Since the dance is in a densely populated area, these movements will excite the bees in the hive. The bees near it also start to dance. During movement, it tries to touch the belly of dancing bees with its whiskers. This dance lasts from a few seconds to a few minutes. The dancing bees continue this dance in another part of the hive. Then they fly out of the nest.

In addition, bees also dance in the form of a half circle and figure eight. At this time, it runs in a semicircular path between the nests, returning in a straight line to its previous place. This game of bees is a special form of warning. The searcher bee finishes its dance and flies away, and other bees that see it follow suit to get nectar.

When bees find flowers and pollen, when they return to the hive, they use this message to inform the bees there that there is a food source. Dancing excites the bees in the hive. And the smell of the flower of the plant where aphids are collected helps the "mobilized" bees to quickly find a source of food.

**Bee's dancing by licking its abdomen when it finds a place where there is food**



a, b, v, g, d, ye, sequence of dances; 1 and 2 –bees dancing on honeycell.

**Conclusion.** Thus, as a result of collecting nectar from the same plant, a conditioned reflex is formed in bees, and it does not land on another plant. When the plant full of nectar stops producing it, it takes a long time for the bees to lose their reflex to that plant and to go to another new nectar flower. Bees choose a flower randomly.

### REFERENCES

1. R.Jamolov, O.To'rayev, D.Xatamova, «Asalarichilik asoslari», O'quv qo'llanma. 2022 yil.Farg'ona. "Classik" nashriyoti.
2. Qaxramonov B., Isamuhamedov A., Ballasov U., Ergashev S., To'raev O.S. Shaxsiy yordamchi, dehqon va fermer xo'jaliklarida asalari oilalarini parvarishlash. Toshkent, 2009.
3. Нуждин А.С. и другие. Учебник пчеловода, Москва. «Колос», 1984.
4. Jamolov, R., Tolipova, X., Oxunova, D. (2022). O'zbekiston iqlim sharoitida asalarilarning vorroatoz kana kasalligi va unga qarshi kurashish usullari. *Science and innovation*, 1(D7), 50-55 b.
5. Kushmatovich, J. R., Safarovich, T. O. (2022). The effect of artificial insemination of queen bees in the fergana valley on its ovulation. *Academia Globe: Inderscience Research*, 3(6), 1-5 b.
6. Qoshmatovich J. R. et al. Technology of feeding families of bees in different types of households in uzbekistan //Galaxy International Interdisciplinary Research Journal. – 2022. – T. 10. – №. 3. – C. 295-301 b.
7. Jamolov, R., Azizov, R., O'Ktanova, Z. (2022). Asalari oilalarining tinch yo'l bilan ona asalarini almashtirishi va ona asalari sifatiga ta'sir etuvchi omillar. *Science and innovation*, 1(D7), 229-233 b.
8. Jamolov Rapiqjon Kushmatovich, "The role of bee pollination in uzbekistan and its role in increasing productivity." *Pedagogs jurnali* 12.2 (2022): 176-179 b.
9. Jamolov, R., To'Raev, O., Azizov, R. (2022). Farg'ona viloyatining tog'va tog'oldi xudud sharoitida parvarishlanayotgan erkak asalarilarning yoshiga qarab sperma urug'ini yetilishi va o'zgarib turishi. *Science and innovation*, 1(D8), 496-501 b.

10. Jamolov, R. Q., Xatamova, D. M., Xolmatova, M. A. (2022). Asalning tasnifi va kimyoviy tarkibi. *Oriental renaissance: Innovative, educational, natural and social sciences*, 2(11), 1031-1036 b.
11. Jamolov, R., Abduvaliyev, B., Ma'Murova, Z. (2022). O 'zbekistonda asalarichilikni rivojlantirish va uning ahamiyati. *Science and innovation*, 1(D8), 462-466 b.
12. R.Q.Jamolov., D.M.Xatamova., M.A.Xolmatova. "Asalarilar oilasining yashash tarzi". *Science and innovation*, 1(D7), 666-671 s.
13. Teshaboyev, N., Tursunaliyev, S., & Obidjonov, X. (2022). DORIVOR O' SIMLIKSHUNOSLIKDA ILMIY IZLANISH MOXIYATI, MAQSAD VA VAZIFALARI. *Science and innovation*, 1(D8), 493-495.
14. Teshaboyev, N., Teshaboyeva, M., Sheraliyeva, Z., & Xoliqova, O. (2022). KUZGI BUG 'DOYNI ASRNAVI HOSILDORLIGIGA URUG 'EKISH MUDDATLARINI TA'SIRI. *Science and innovation*, 1(D7), 122-125.
15. Teshaboyev N. et al. URUG 'EKISH MUDDATLARINING KUZGI BUG 'DOY NAVLARI HOSILDORLIGIGA TA'SIRI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 118-121.
16. Тешабоев Н. И. и др. ТОМЧИЛАТИБ СУҒОРИШНИНГ ТУПРОҚ ВА ЎСИМЛИКЛАРГА ИЖОБИ ТАЪСИРИ //Academic research in educational sciences. – 2022. – №. Conference. – C. 749-754.
17. Жамолов Р. Қ., Тешабоев Н. И. ФАРҒОНА ВОДИЙСИДА ОНА АСАЛАРИНИ СУНЪИЙ УСУЛДА УРУҒЛАНТИРИШ УЧУН ЭРКАК АСАЛАРИ ЕТИШТИРИШ ТЕХНОЛОГИЯСИ //Academic research in educational sciences. – 2022. – №. Conference. – C. 511-520.
18. Ikromjonovich T. N., Ikromjonovna T. M. URUG 'EKISH MUDDATLARINING KUZGI BUG 'DOY NAVLARI HOSILDORLIGIGA TA'SIRI.
19. Teshaboyev N., Muhammadaliyev M., Usmonova Z. G 'O 'ZA QATOR ORALARIGA CHUQUR ISHLOV BERISHNING PAXTA HOSILDORLIGIGA TA'SIRI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 660-664.
20. Teshaboyev N., Akbarova M., Axmadjonova S. QATOR ORALARNI CHUQUR YUMSHATISH VA PAXTA HOSILDORLIGI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 612-616.
21. Teshaboyev N., Ro'Zimamatov J., Ro'Zmamatova I. EKISH MUDDATLARI VA MEYORLARINING O 'RTAPISHAR SHOLI NAVLARINING BARG SATHI VA FOTOSINTEZ SOF MAHSULDORLIGIGA TA'SIRI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 650-654.
22. Teshaboyev N. et al. KUZGI BUG 'DOYNI ASRNAVI HOSILDORLIGIGA URUG 'EKISH MUDDATLARINI TA'SIRI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 122-125.
23. Teshaboyev N., Tursunaliyev S., Qodirjonova R. G 'O 'ZANING PAXTA HOSILDORLIGI QATOR ORALARNI CHUQUR YUMSHATISHNI TA'SIRI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 655-659.
24. Teshaboyeva M., Vaxobova N., Akmaljonova M. MAHALLIY KUZGI YUMSHOQ BUG 'DOY NAVLARI DON TARKIBIDA TEMIR MIQDORINING AAS TAHLILI //Science and innovation. – 2022. – T. 1. – №. D7. – C. 570-574.

25. Teshaboyev N. et al. YERYONG ‘OQNING “MUMTOZ” NAVI EKINIDA DUKKAKLAR SHAKLLANISHIGA TA’SIR ETUVCHI OMILLAR //Science and innovation. – 2022. – T. 1. – №. D7. – С. 402-405.
26. Teshaboyev, N., Joraboyeva, F., Alijonova, N., Rustamova, A., & G‘Ulomova, D. (2022). YERYONG ‘OQNING “MUMTOZ” NAVI EKINIDA DUKKAKLAR SHAKLLANISHIGA TA’SIR ETUVCHI OMILLAR. Science and innovation, 1(D7), 402-405.
27. Teshaboeva, M., Abdug'Anieva, D., & Raximjonova, S. (2022). ТАКРОРИЙ ЭКИЛГАН МОШ ҲОСИЛИ ТАРКИБИДАГИ ПРОТЕИН МИҚДОРИ. Science and innovation, 1(D7), 517-526.