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THE STRUCTURE OF BEE GENITALS.

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Annotation:
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. provides information about the reflex - the reaction of the body to external influences and the presence of two types of reflexes - unconditional and conditional - in the animal world, including bees.

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

Enter. Breeding of bees. The phenomenon of partonegenesis.
The biological function of the bee's reproductive organs is reproductive services and at the same time it preserves its species in nature.
Bees are usually unisexual (female - ♀ and male - ♂), in which sexual demorphism is often clearly known, in which the ovaries and testes are in separate sexes.
In the bee family, there are members of different sexes, they are male bees, which store the male cells - spermatozoa, and have well-developed reproductive organs in their bodies and lay a large number of eggs. consists of female queen bees that have the ability to eat. After mating with a male bee on the first day of her life, the queen receives a large amount of spermatozoa in her testicles. Gradually, during the life of these spermatozoa, during the time when the mother bee lays eggs, it serves to fertilize them.
In bees, male bees grow from unfertilized eggs, and female, mother and worker bees grow from fertilized eggs. The development of male bees from unfertilized eggs is called partonogenesis.

The phenomenon of partonogenesis. Partonogenesis means the development of egg cells in virgin reproduction, that is, from fertilization. In this process, the generation develops and lives, and a certain type of generation is preserved.

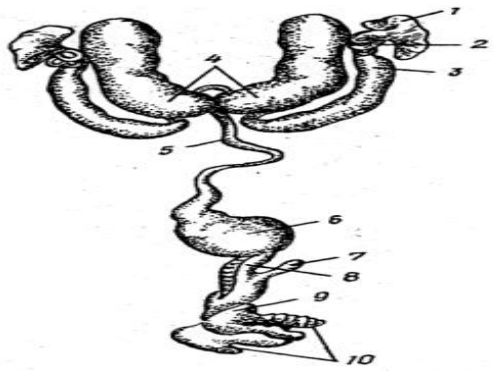
In nature, there are three types of reproduction in animals, asexual and sexual reproduction, and partogenetic reproduction. In asexual reproduction, the animal's body splits into two, or a part of the female's body sprouts, separates and begins to live an independent life. The simplest animals (amoebae, spore-forming, infusoria), flatworms and ringworms reproduce asexually. In sexual reproduction, the sex cells are neutral, and a new individual appears from their fusion. Sexual reproduction is widespread in the animal world, from unicellular organisms to mammals.

Parthenogenesis is the development of reproductive unfertilized eggs. An example of this is the reproduction of galls by partonogenesis. Bees also have partonogenesis. Partonogenesis is of great importance in breeding, because when one breed of queen bees is crossed with another breed of male bees, the offspring of female individuals (mother bees and worker bees) will be hybrids, that is, hybrids, and the offspring of male bees will have the genetic characteristics of the queen bees. will be

Bees usually reproduce in two ways. First, when queen bees lay eggs, new members of the family develop from them (male bees from unfertilized eggs and worker and queen bees from fertilized eggs). Secondly, part of the bee family leaves with the mother bee during migration and forms a new family.

Research results. The reproductive organs of male bees consist of two testicles, two seminal ducts that lead to the seminal vesicles, two appendages or glands that secrete mucus, a duct for releasing sperm, and a copulatory apparatus.

The sperm of a male bee is in the shape of a bean and is located in the abdomen. Its color is yellowish chalk, its length is 5-6 mm and its width is 3-3.5 mm. There are about 200 seminiferous tubules in the ovary, all of which are surrounded by one common membrane. In the seminiferous tubules, there are always male germ cells - spermatozoa are maturing.



Genital organs of male bees.

1. testis, 2. seminal duct, 3. seminal vesicle, 4. accessory gland, 5. seminiferous tubule, 6. bulbous tumor, 7. papillary tumor, 8. penis neck, 9-penis base, 10-horned growth.

After the male bee matures, in 8-14 days, his genitals are ready for mating. It is during this period that the sperms move from the testicles to the seminal vesicles, where the sperms are temporarily stored until the male bees mate with the queen. The wall of seminal vesicles is made up of strong muscles, which are four layers, i.e. outer layer, outer transverse muscle, inner circular muscle and inner long cells.

At the end of the seed vesicles, a light-colored vacuole-like substance is formed, which prevents the seed from returning from the seed vesicles and serves as a plug.

Additional glands in the male bee genitals, two cylindrical shaped 6-7 mm in length and 1.5 mm in diameter. Its main function is to help release the seeds when the male bee is mating, and when pressure tears the barrier, thin membrane, it is completely inserted into the queen bee's reproductive tract, where the spermatozoa are slowly released.

The reproductive organs of the male bee consist of a spermatic canal, a bulb, a bicornuate penis and its neck.

The seminiferous tubule is formed from the accessory glands and consists of two short tubes. The seminal canal is long, its diameter is 0.3-0.5 mm, it consists of a muscular, hard and strong ring-shaped chitin. The canal is bent under the third sternite of the abdomen, curved back and thickened, forming a lucovitsa.

The bulb of the male bee is pear-shaped, its upper walls consist of black-brown chitin plates. In front of the chitin plates of Lukovitsa, near the neck of the penis, there are cone-shaped growths.

The neck of the penis is located under the 6-8 tergites of male bees after the bulb. Inside, it consists of a thin structureless pod, under which there is a cellular layer and an inner layer of light-colored hairy chitin. After the glans penis, it consists of a solid base of the penis and two large growths growing from them.

From the 4th day after the birth of a male bee, spermatozoa begin to develop in his genitals. After 10-12 days, the mature spermatozoa are collected in the seminal vesicles, and the male bees are considered sexually mature. During this period, the seminal vesicles are much expanded and store a large number of spermatozoa. A mature male bee has an average of 0.43 mg of seminal vesicles, and about 10.9 million spermatozoids in its sperm.

External appendages of male bees. Between the last tergite and sternite rings of the abdomen of the male bee, near the cloaca of the excretory opening, the genitals are located. There are three pairs of small, chitinous pads around the genital opening. They have two pairs of lateral protective plates, located near the genital opening. At its end, there are small protective plates and internal protective plates that are not visible from the inside.

Opposite the genital opening is the anal plate, and between the plate and the last tergite is the anal hole. During sexual intercourse, the anal plate is compressed towards the last tergite and closes the anal opening.

Development of spermatozoa. The reproductive cells of male bees develop from their pupal stage. The top of the seminal ducts consists of the last pink epithelium, from which two cells are formed, namely, spermatozoa, which are male reproductive cells, and a large number of follicle cells. Spermatagen are large male sex cells, and small follicular cells are scattered between them. As the pink cells in the seminiferous tubules develop and divide several times, new cells try to escape through the ducts. In this way, reaching the end of the canal, spermatozoids are formed.

Spermatozoa are of three parts; consists of head, neck and tail parts. But the neck has thickened. Spermatozoa are elongated filaments, their length is from 240-250 μm to 275 μm, and their thickness is 5 μm.

The reaction of spermatozoa of male bees is close to neutral, that is, around pH 6.8-7.1. Three types of sugars, fructose, glucose and trehalose, have been found in the seminal vesicles, accessory glands and lycopene of male bees. These sugars are used to feed spermatozoa. It has been found that these sugars are also present in the blood hemolymph of bees.

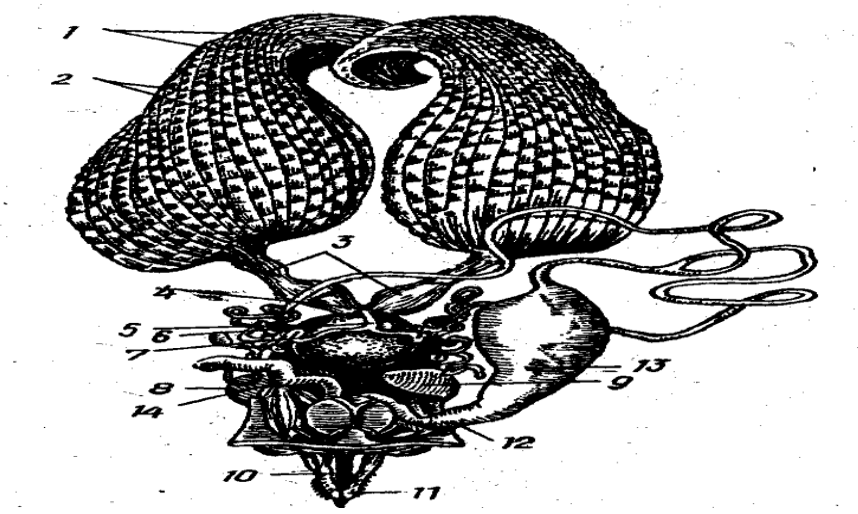
The structure of the reproductive organs of the queen bee. The reproductive organs of the queen bee are located in the abdomen, its main function is to produce eggs. The reproductive organs of the queen bee consist of two ovaries, odd and even oviducts, testicles, prepuce, vagina and niche chambers.

The ovary is located in the upper part of the abdomen of the queen bee, under the lumbar plates, next to the second, third and part of the fourth rings, next to the honey bag. Ovaries pear-shaped. Fertilized queen bee ovary is 5-6 mm long and 3-4 mm in diameter.

The ovaries of the queen bee consist of several egg tubes arranged in parallel. The number of egg tubes in a queen bee's ovary is variable, with 110 to 180 egg tubes per ovary. It has been found that each of the ovaries of the queen bee developed

under good conditions has 200-220, even up to 250 egg tubes. Each of the ovaries of queen bees reared in poor conditions has an average of 120-150 egg tubes (16 photos).

In Central Asian republics, in Uzbekistan in early spring, the average number of fertilized queen bees in each ovary was 173-191, in Tajikistan 178 and in Turkmenistan 152.



The fallopian tubes start from the ovary and join two pairs of fallopian tubes, the odd fallopian tubes, that is, they connect to the front part of the vagina.

Testicles are spherical in shape, its diameter is about 1.5 mm. Fertilized queen bee seed consists of two layers of skin, an inner capsule and an outer sheath.

1. Ovary, 2. Fallopian tubes, 3. Pair of fallopian tubes, 4. Conjoined fallopian tube, 5. Scrotum, 6. Scrotal duct, 7. Accessory gland, 8. -sheath, 9-collecting pocket, 10-spear stylet, 11-spear sheath, 12-large poison gland opening, 13-large poison gland liquid collecting bag, 14-small poison gland opening way.

As the mature egg passes through the opening of the ovary, some of the seed from the reservoir enters the egg through the micropyle hole in the eggshell. In order to release spermatozoa from the testicles, there is a muscular regulator at the beginning of the vagina. The comb ends with a genital hole in the place where the bee nest is located. This hole is not visible from the outside, because it is closed by the last abdominal ring.

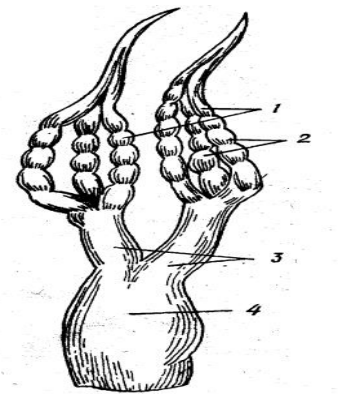
Niche chamber occupies a large space on the inner side of the abdomen of the genital opening of the queen bee, which in turn consists of two parts, namely, the opening of the vagina and the cavity of the back part. At the beginning of the vagina, there is a sexual pocket near the genital opening.

Mating of male and female bees. Usually, the mother and the male bees mate during the flight period in the fresh air. Male bees are considered to be sexually mature from the age of 10-12 days, and during this period, a large number of sperms are ready in their seminal vesicles.

The mother bee flies out of the 2nd-3rd day, familiarizes herself with the environment and remembers everything around her. This flight takes only 3-5 minutes. On the 7th-10th day, the male flies out of the hive to meet the bees. This flight is called the "nuptial" nest, and mating usually continues during the warm weather, that is, from 12 to 3 p.m. The mating flight period is only 12-45 minutes. Queen bees fly up to 10 km and mate with 8-13 male bees. After the male bees fly and gather in the air, an hour later, the queen flies out to mate. During this period, she emits a fragrant smell and attracts the surrounding male bees. Since male bees have highly developed olfactory organs and have up to 7-8 thousand ommatids in their eyes (3-4 thousand in queen bees), they can quickly spot queen bees. It has been found that the queen bee produces these aromatic sex hormones from her upper jaw glands, but the smell of these aromatic hormones affects the male bees only in fresh air, and not at all in front of the hive. it is.

To mate, queen bees mate with 8-13 male bees, eventually bringing the male's genital plume with her. This sign is a sign that the queen will not mate again.

The structure of the reproductive organs of worker bees. The reproductive organs of worker bees are not well developed. But their function is different. Since worker bees have rudimentary reproductive organs, testicles, ovaries and vagina, they have lost the ability to mate. Each worker bee's ovary contains 10-24 egg tubes.



16- igure. Genital organs of worker bees.
1st ovary, 2nd fallopian tube, 3rd paired fallopian tube, 4th confluent fallopian tube.

Research results: Under normal conditions, the ovaries of worker bees in the family do not work. But in some cases, for example, if there is no mother bee in the family

for a long time, egg cells begin to mature in the worker bee's ovary. If such bees do not lay eggs, they are called anatomically male, and if these bees begin to lay eggs, they are called physiologically male. Such bees lay unfertilized eggs, and only male bees emerge from them.

Anatomically masculinized bees sometimes make up 80-90% of worker bees in a hive, and physiologically masculinized bees make up 20-25%. Such bees do not differ in appearance from other worker bees, but they fly poorly, collect less honey, their difference is only in the structure of the ovaries.

Egg laying of physiologically male bees is different from egg laying of normal queen bees. They lay eggs irregularly, several to one cell, or else on the bottom of the cell, on the side wall, on the cells filled with pollen, and also in the cells of the male bees. Later, the male bees inside the cover of mature offspring in such cells grow larger and raise the cover more and more. Worker bees raise the walls of such cages even higher. As a result, the cells appear crooked and tall. The brood in such a cell grows small and spindly, and produces poor quality male bees.

Summary. Anatomically masculinized worker bees can appear in colonies that are just preparing to migrate. Therefore, the beekeeper should always check whether there are queen bees in the family and, if necessary, transfer new queen bees. Otherwise, due to the lack of worker bees, such families may quickly die of hunger.

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