

Honey in the Flowers, “in the Air” and in ... the Reeds

Many Greek authors focused on bees, but the one who made the most systematic research in antiquity on bees was Aristotle. In Book V of the *Treaty on Animal Life*, he includes his observations on the biology, physiology and habits of bees. Of course, Aristotle used the experience of other Greek researchers whose works influenced him. First there are Xenophon's works with very interesting details contained in his work “Economica”.

As any road opener, the coryphaeus of antiquity made a series of mistakes of argumentation.

Undoubtedly, the hives used at the time were a serious obstacle in Aristotle's research. The primitive hives weren't as easy to study as the modern ones.

The first and greatest discovery by Aristotle was that of one individual out of the multitude of bees that was one and half the size of the others and that he called “king”, which although it had a sting, didn't use it. Xenophon too had noticed this, hundreds of years before, but had said that the insect was female and called it “queen” (in the “Economica”).

Similarly to Xenophon also, Aristotle discovered labor division inside the hive, the former attributing the organization of the hive to the “queen”: if in the hive, she would not allow workers to get lazy and sent them foraging. In their view, the “queen“ knew each bee's contribution to the honey crops and at the right time, divided the product as deserved. The “queen” also would oversee honeycombs building, keeping the pace and the right line, and was in charge with raising and accurate feeding of the brood. When the young bees became capable of work, the queen was careful to send them with a young queen to take a new location.

Aristotle noticed that the bees would kill the “kings” if more than one in the colony. Aristotle also knew that when the “king” disappeared, bees did not have the possibility to raise another, which was why the swarm was doomed to perish. Aristotle noticed too that bees would stop to the same flowers with each flight, that they avoided dirt and bad smells. He saw that bees would keep exemplary clean hives that they would never dirty with their excrements and that they would always choose very clean water sources. About the clean water, Calimahos (230 BC) concluded his ode to Apollo in the following sentence: “Bees bring water to Demetrius, not any kind of water but the water from the beautiful valley where water is fresh and clean and comes from the divine spring.”

Related to weather forecast, Ailianos would say that bees could sense bad weather and would fly very little. He noticed that when bees flew against the wind, they would carry a little speck of rock between their legs not to lose balance and maintain course.

This information is taken over from Aristotle who had the merit of the former observations. The latter one referring to the little rock is questionable, more likely Ailianos made a mistake taking pollen for a rock.

But let us also see Aristotle's errors. One of them, especially, is that he did not realize the sex of the big imposing individual in the hive, the “king” master of the hive. He thought it to be male. Five centuries later, Pollux would also write: “the head of the colony is the king and everything depended on him”. The error was the consequence of the result of a serious confusion between females and males in the hive, moreover as no contact was noticed between the two sexes, as with other animals or insects. At the end of the 2nd century AD, the Greek author Athenaios expressed his amazement: “No one ever saw a bee or a drone to have sexual intercourse and therefore no one can say for sure which is the male and which is the female”. Not knowing the drone's role led to erroneous conclusions. Thus,

Ailianos thought the drone's role was to bring water to the hive. Others believed that the drones' role was to keep eggs warm. But most of them thought drones were a useless lot". Finally, Plato believed drones were "a nuisance for the hive, as foreigners were to the City". According to Aristotle, the problem of bees coming to life was obscure, as no one saw how it was possible while no one saw sexual intercourse in the hive. Others believed that bees would bring the brood from certain flowers.

But let us not be unfair to Aristotle, for not knowing about the queen's mating flight, during which was fecundated by the strongest drone. The problem was clarified only in the 18th-19th centuries by scientists like the Dutch nature scientist I. Swammerdam, the French R. Reaumur, the Swiss F. Huber, and many others. So, not only Aristotle, others too, before and after him, were ignorant of the fact that bees are oviparous, their birth not being explained or explainable.

In time, the confusion about the distinction between the male and female bee led to the idea that warms appeared on the body of an ox only 7 days after death and that after other 31 days they would turn into adult bees. This belief persisted a long time and we find it with many authors. It originates in the old myth of Aristeus. Ailianos mentions that "when the ox, this precious useful animal, dies 9or is sacrificed), from its body bees come, very hard-working insects, that make for people the best food: honey."

Also about the origin of honey there were misconceptions for a long time. Aristotle could not understand how honey was produced. All his ideas about it are very confused. He thought that honey came from the air and deposited on plant leaves from which it was picked by bees. At the time nothing was known about nectar secretion of flower plants. Aristotle's statement that bees collected honey from trees was accurate although he had no argument for it. It was of course about a secretion of mildew on certain coniferous from which bees collect large amounts of honey, as Aristotle wrote, saying that only in two days the hive was full of honey.

Theophrastus, his contemporary and disciple, was interested in the origin of honey. According to his theory, honey had three origins: first the flowers, then the air that under the effect of sun rays would turn certain sweet juice into honey that fell on leaves, especially on oak and linden tree and bees collected it, and from ... reed.

Due to an infallible instinct, from the oldest times, bees knew when flowers did not meet its life standards and went to others. Or... crossed to the threshold of poetry...

MARTA GIOGIA