

MEDITERRANEAN PLANTS FOR BEES:

1. THE LOQUAT AND ITS AUTUMN FLOWERS

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Observing honeybees foraging on flowers in the garden evokes a moment of paradise. It is a part of our collective memory. We know instinctively that a place where bees forage is a good place to be. We know too that, besides pollinating plants and making honey, they also function as guardians of our environment and tell us when the cocktail of pollution reaches much too high levels. Honeybees have been connected to humans for more than 10,000 years. Beekeeping is practised all over the world and there are nine species of *Apis* worldwide. Of these, the one that has become a global slave for the production of honey is *Apis mellifera* 'Ligustica', the Italian bee.

Honey is made exclusively by honeybees. They forage for nectar, pollen and honeydew to transform the 70% watery liquid of trees and flowers into a highly concentrated matter with a water percentage of less than 18% that is based on sugar and enriched by essential oils acting as a source of energy. It is the carbohydrate-energy source of the hive and it is a special gift for humans.

Bees prefer flowers that produce nectar with a high sugar concentration to make honey, but they also forage other flowers in lower quantities for feeding the hive. Flowers attractive to bees are mostly blue/violet, yellow or white, followed by pink/red. A bee colony can forage up to 200 litres of nectar per year which will be transformed to 70 kg of honey that is mostly used during the flowering season by the 35,000 to 40,000 individuals of the superorganism although some of it will be harvested by the beekeeper.

Honeybees are very adaptive to the environment and very creative. The relationship between bees and beekeeper is as unique as the relationship between a gardener and his or her plants. If bees are not kept for commercial purposes only, there is a wide range of relationships between bees and beekeepers.

Success in keeping bees at a particular site is mostly based on experience rather than scientific knowledge. It's work that is full of surprises, changing every year, and you will never reach the pinnacle.

Honeybees have been my companions for almost 20 years. There was only a short period of six months when I was without my own hives – the time when I moved from Berlin to Rome three years ago.

What I aim for is the harvesting of a special honey rather than a high quantity. To achieve this, a bee colony needs to develop a particular taste that comes from a particular character. My beekeeping technique is based on liberation rather than manipulation, so I want them to produce honey primarily for themselves (rather than for the beekeeper) and I will then simply take a share of it.

I harvest honey several times a year but only in small amounts. In 2023, for example, there were 10 different types of honey from three hives at one location. On August 5, for example, I took honey from two hives that stand next to one another. One of them produced a dark-coloured honey and the other a light-coloured honey. They were absolutely different in taste although the bees from both hives forage on the same land. Honeybees are very creative creatures in relation to their survival strategies and in their way of making honey. To me, honeybees are artists.

Thus each year I try to find a special honey: an artful reflection and a balanced concentration of all the factors that interact and have an influence on the making of honey, such as the weather, nearby nectar- and pollen-producing plants, beekeeping technique and moreover the character and strength of the hive.

My story is about my discovery of the loquat (*Eriobotrya japonica*), called in Italian *nespolo*, a tree that grows all over the Mediterranean region; it is usually a late winter source for the hive, but in 2022 it changed its purpose to become the main nectar source for the hive to make a special honey.

This tree has been cultivated in Asia for a long time. It spread from China to Japan more than 1,000 years ago. It was then introduced into Europe 250 years ago, first to Paris and Naples to be planted in botanical gardens (by Maurizio Island), after which it spread all over the Mediterranean countries both as an ornamental plant and for fruit production. In China, its native land, a myth tells how loquat fruit falling into the rivers gave the koi carp the strength and desire to swim against the current and up waterfalls whereupon they were turned into dragons. The loquat is therefore considered as an auspicious tree representing a happy and blithe life.

This is wonderful. Because this is what happened in autumn last year: the hives turned into dragons and used their extraordinary power to create a special honey.

Eriobotrya japonica is a rather small tree with evergreen, dark green lance-shaped, serrated and leathery leaves that have a rough upper surface and a cotton-like brownish-grey underside. Most people probably know

the loquat as a fruit tree. Its fruits are round and orange-coloured with black seeds inside. They are very healthy because of their high content of vitamin A and beta carotene, an antioxidant. The time to harvest the fruits here in Rome is around mid-May. This year it was around the 22nd of the month. Five to six months later the tree will be covered in blossoms. It is one of the late autumn or early winter-flowering trees. It fits into the gap of the flowering window for honeybees because it flowers at a moment of the year when there are not so many plants in bloom for the bees to forage, but still high enough temperatures for them to fly out and collect nectar and pollen. It is a nectar source for over-wintering, the last one of the year. The flowers vary from cream-coloured to brownish-white. They form a cluster of about 60 flowers on the tips of the central shoots. The flowers are scented. They give off an almond-like scent, barely perceptible to the passer-by.

There are a few *nespolo* trees in the park of the German Academy of Arts, where I work as a gardener and beekeeper. This 3.5-hectare park in the centre of Rome has more than 700 trees, mostly evergreens from the Mediterranean, but also a lot of citrus fruits, laurel hedges, a few succulents like the San Pedro cactus and the American agave and a few palm trees. The old map of the trees in the park did not include the loquat trees because they were not recognised as part of the planting. For they were indeed not planted but seeded themselves and in the end were never removed. They are off the grid of the structured park design but are surely part of the park. Their beauty lies in the naturalness of their appearance. They are a bit shy, they come from far away, they do not dominate the site (as *Ailanthus* would do) and above all they have a desire to grow.

There are *nespolo* trees everywhere in the city of Rome: in gardens, at roadsides, peeking over the top of a wall. In 2023 they flowered five weeks later than in the year 2022. Their response to weather conditions is enormous. They seem very adaptable to a changing climate.

Two trees grow directly in front of my apiary, about 25 metres from the hives. This is where the story begins: It happened in autumn 2022 when the trees were in full flower from the end of September and throughout October, until the beginning of November. The weather was still hot and dry. It was as if summer would never end. The temperatures fell below 30 degrees in late September. They were still around 25 degrees through October. One day while going for a walk I heard a humming sound coming from a tree that was standing in a semi-shaded position between a housing complex and the wall by the pavement. There was a moment of sunlight on the flowers and the bees were crazy for them. Thousands of them flew from one flower to another. A branch hung relatively low over the wall. I was able to grab it and smell the flowers. I was delighted. They smelled like almonds and marzipan, a wintery smell, delicate and deep at the same time. I was intrigued.

The next day I went to work to check the apiary and see what was going on there. I thought that the bees would have already moved towards their winter mood (in Northern Europe this is what they would have done).

I realised at once that my bees were also feasting on our trees. The trees in the Villa Massimo park are unfortunately very tall, craving for light, surrounded by tall evergreens.

The collection of nectar started in the morning and continued until the afternoon. The large amount of fresh nectar at this point of the year was a real delight for the bees because the superorganism that is a colony of *Apis mellifera* is now preparing for the winter. Starting in September and continuing into November, until the first night of frost, the colony will produce long-lived bees that feed the queen bee throughout the winter and keep the temperature in the hive at around 20 degrees Celsius. The long-lived bees, which live from September to March, are usually not those who produce honey but those who feed the honey to the queen bee. They must not exhaust themselves because their lifespan is rather long. The short-lived bees that live in the period from February to October are the ones that produce honey. They live for only about six weeks. The queen bee lives for about three years (in former times up to five years) and the drones, the male bees, are usually in the hive during the period from March to July. They live for about two months. This applies to all *Apis mellifera* colonies, even those that survive in the far North, in the icy winter. *Apis* is a master at maintaining nest temperature.

Bees survive the summer heat of Rome primarily by cooling the hive to keep the brood nest temperature at 37 degrees as they continue to breed; some leave the brood and keep the nest temperature at 20 degrees. The bees mainly bring in water in order to wet the hive with minute drops. This creates a cooling air current with the wind generated from the bees at the entrance hole. It is a fascinating interaction of many individual bees, all of which essentially act in accordance with the well-being of the hive.

Since last year, the hives have been experiencing attack by a new pest, *Vespa orientalis*, a species of hornet that is spreading northwards. It is the only species of hornet that can tolerate desert climates. It comes from the eastern Mediterranean and is already widespread in some parts of the world. *Vespa orientalis* only recently appeared in Rome. In 2022, my apiary was hardly affected, in contrast to 2023, where the damage was severe. There were more than four times as many hornets which besieged the hives every day from mid-July to mid-October. This is fatal because it occurs at the time when the hive is in transformation from the short-lived to

the long-lived organism. The hive needs energy to make this change. The constant attack by hornets requires too much attention. Last year only the young hives were affected by the attack; the older hives were able to defend themselves well by bees hanging like a beard in front of the entrance holes and repelling the hornets when they attacked. This year all hives were attacked.

Bees make honey for over-wintering the hive during the flowerless period of the year. How much honey the hive needs in order to over-winter depends on several factors. It takes a little experience to leave the right amount of honey in the hive. A beekeeper is someone who steals the honey and cares for the hive at the same time: taking out honey while ensuring that there is always enough honey in the hive is the key to successful beekeeping.

At the end of October last year I looked into the hives and saw honey cells filling up. The bees were in such a good mood that even the winter bees wanted to produce honey!

The scent of almond and marzipan had already spread through the hive. I decided to take a few honeycombs out at the beginning of November, knowing that the bees only need about five kilos of honey to over-winter. It turned out to be a perfect winter honey – harvesting honey in early winter is something I wouldn't even have dreamt of. The colour was a dark amber with a touch of dark red. The taste was exactly like the fragrance of the loquat flowers, one to one (this is not always the case): a liquid almond honey fresh from the hive. It crystallised about 10 to 12 weeks later in a cool environment. But by then 99 % of the honey had already been enjoyed.

It was magical and I was hoping to repeat it this year, but it didn't work out. The game of forces played out differently... The bee family that was making the very best honey at my apiary died last week after three years of fantastic performance: gentle bees, gifted honey-makers and beautiful comb-builders. Just perfect. Let's see if some of them moved to the family next door and are teaching them over the winter months how to make good honey. It will show next spring.
