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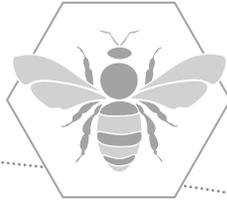
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THE HONEY BEE, A FOREST INSECT

INTRODUCTION

The cold season stops most insects in their tracks. They survive chilled and in a state of suspended animation under loose tree bark or buried in the ground. They survive as eggs, larvae, in the pupal stage, or even as fully developed insects, like the future queens of wasps, hornets or bumble bees, the only members of their species not to die in the autumn.

In contrast, colonies of honey bees spend the winter well protected and, by generating their own heat, snugly tucked into hollow trees in the forest. At least that was their natural habitat until humans began transforming the world at large and that of the bees with it. Ever since beekeepers began housing honey bees in hives, these insects have been known mainly as ones that live in hives.

But wild, forest-dwelling honey bees do still exist in hollow trees – even in temperate latitudes. And they are more important and valuable than ever before, especially now when the significance of preserving the biodiversity in our forests is more widely understood, and knowledge of the biology of wild bees could help to reshape the practice of beekeeping.

We set out on the trail of wild honey bees, observing and photographing their behaviour, and in doing so obtaining insights into hitherto unknown details of their way of life. During our research we were out and about in forests, where we encountered *Apis mellifera*, the western honey

bee. In addition to this species, there are many other species of bees around the world, of which the eastern or Asiatic honey bee is the most important, occurring primarily in Asia and being responsible for transmitting a dangerous parasite to our bee colonies – the *Varroa* mite.

A remarkable number of wild honey bee colonies still exist, living in hollow trees inside the forest, largely unnoticed by humans and in greatly underestimated numbers. They live in conditions that have shaped their characteristics and abilities across countless generations. Therefore, given everything we know today, it should come as no surprise that these honey bees, original dwellers of the forest, are better able to cope with diseases and parasites than our ‘pet’ bees. They have no choice in the matter as there is no beekeeper there to help them. Nature provides them with what they need to survive and multiply.

If one takes a closer look at honey bees in the forest, in their ancestral habitat, it quickly becomes clear that they are deeply integrated in highly complex relationships and play a paramount role in the preservation and structure of their environment.

Habitats are especially stable when they are based on a variety of species of flora, fauna and microorganisms, which are all interlinked and interdependent. The forest is no exception.



—
A bee collecting honeydew on a fir tree, which will be converted into forest honey back in the bee's nest.

But what is a forest? What distinguishes it? It cannot exist without trees, but a bunch of trees does not constitute a forest. It is essential that the trees stand close together, in contrast to an open, wooded park landscape. The tightly packed trees create a forest climate, and thus a characteristic that is considered entirely unique. A forest climate is characterized by steady temperatures, moderate air movements, dampened light and high humidity. These factors are not only climatological parameters but also living conditions, for the honey bees as well. Many of the attributes and abilities inherent in honey bees can be explained by their life as forest dwellers. Indeed, many of the problems affecting honey bees housed in hives today can be understood by regarding the forest as their natural habitat and the one to which they are adapted.

»MANY OF THE ATTRIBUTES AND ABILITIES INHERENT IN HONEY BEES CAN BE EXPLAINED BY THE LIVING CONDITIONS IN THE FOREST.«



—
OPPOSITE

Forager bee preparing to land on a goldenrod.

—
OVERLEAF

Wild garlic, a flowering paradise for forest-dwelling bees.



We humans have drastically interfered with the natural life of honey bees. We keep them in geometrically exact, standardized boxes, made of wood at best. We have radically changed our environment and that of the honey bees. Far-reaching, contiguous woodlands have disappeared and, where they still exist, they are rarely used as homes for bee colonies. Commercially optimized forestry has led to forests being clearly laid out as delineated monocultures in order to simplify processing, and to them no longer bearing any resemblance to the healthy, well-balanced forests that once existed.

Such habitats are especially vulnerable to parasites as well as to the rapid warming of our atmosphere, which we refer to as climate change. This should give us pause to rethink what type of forest we actually want. It is fascinating to see that the honey bee is a central subject in this context as well. However, it becomes clear straight away how little we know about the life of honey bees in their natural forest environment.

The forest has ceased to be the natural habitat for the vast majority of bee colonies that exist today. To a great extent it has been replaced by cultivated land, thus causing changes in the home environment to impact 'pet honey bees' even more severely. Tree cavities host a wide array of other living creatures, representing a 'mini biotope', which is not without impact on the bee colonies, and vice versa.

Even the physical conditions offered to the bees inside the tree are not necessarily found in the structures used by beekeepers to house their bee colonies. This does not necessarily pose a problem in itself – after all, honey bees are extremely resilient creatures – but we do not yet have sufficient knowledge about the complex interrelationships to draw conclusions about whether or not the unintended departure of bees from the forest creates problems for the animals.

What we can say for certain is this – wild honey bees are a natural element of a healthy forest. Both realities should coexist – bee colonies cared for by beekeepers for our mutual benefit, and wild bee colonies which constitute an important component of the forest ecosystem. Beekeepers can offer their honey bees the best possible living conditions and can at the same time profit from the natural selection that takes effect among wild bee colonies.

This book is intended to provide a closer look at the life of honey bees inside the forests of Central Europe. With glimpses into their lives that have never been seen before, we hope to contribute to honey bees being seen for what they truly are – creatures of the forest.

Ingo Arndt & Jürgen Tautz

