

Bee, Brown Bear, Hornet and Bortevik: Relationship Features

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Received: April 30, 2026; Accepted: May 12, 2026; Published: May 19, 2026

ABSTRACT

Nowadays, in the forests of the Burzyansky district of the Republic of Bashkortostan, the relationship between the honey bee, bear, hornet and man (bortevik) has remained the same as in the past. It is assumed that the type of relationship between the bear and the bee was not «predator-prey». Most likely, the relationship between them was initially formed as a symbiotic one. The long-term coexistence of the bortevik and the "bortevik" bear has formed tolerant behaviors on both sides.

Keywords: Honey Bee, Bear, Hornet, Bortevik, Relationship**Introduction**

In Russia, the Republic of Bashkortostan (Figure 1) stands out for the fact that forest beekeeping has been preserved on its territory, mainly in the most remote and inaccessible Burzyansky district (Figure 2).

**Figure 1:** Republic of Bashkortostan on the map of the Russian Federation

Forest beekeeping has three stages: hunting for "wild" honey, on-board and well beekeeping. At the first stage, bee families live in natural hollows, at the second and third stages -

respectively in the sides (man-made hollows hollowed out on the trunk of trees) and decks (hollows made in the cut of a dry tree). It is noteworthy that today in the forests of this area, the relationship between the honey bee (*Apis mellifera mellifera* L.), the brown bear (*Ursus arctos*), the hornet (*Vespa crabro*) and the man (bortevik) has been preserved. Today, as in the past, they unfold in a vast, slightly disturbed forest area. The study of the relationship between them is very interesting and relevant.

**Figure 2:** Burzyansky district on the map of the Republic of Bashkortostan

In connection with the above, it was decided to investigate the state of the "bortevik - bear - hornet - bee" system in the aspect of forest beekeeping of the Bashkirs. The main task was to identify the types of relationships between a bear and a bee, a hornet and a bee, as well as to clarify the relationship between a bortevik and a bear. The work was carried out in the Burzyansky district in 2018-2023. Assumptions obtained on the basis of bortevik surveys and the author's own observations are given below.

For a Bear, Honey is not the Main Source of Food

Everyone knows that the bear can safely live without honey cells. For example, in other regions of our country, where bees do not live in the forests, this beast lives gracefully. In the honey steppe, his raids on apiaries are rare. At the same time, the bear does not cause significant damage to the apiary. He is often content with only two or three hives. Borteviki believe that the bear is only a lover of honey. In the forest, he does not purposefully look for bee colonies to select onboard honey. The ruin of hollows with a nest of bees is not widespread, but isolated [1]. Forage stocks of onboard bees are facultatively significant summer food for the bear [2].

The Relationship between Bees and a Bear does not develop as a "Predator Victim."

It is controversial, but most likely true. It is difficult to disagree with this reasoning of the Bortevikov. If, they believe, even at the initial stage of bee development of Bashkir forests, the type of relationship between them would develop as predation, then strong and smart, and, at the same time, a touchy and vindictive beast would not leave a chance for a honey bee to master forests and, moreover, survive in them.

The Bear has its Own Side Trees

Proven by practice. According to borteviki, the owner of the forest knows all the trees located on his territory, in the hollow of which bees live [3]. The bear has an excellent memory. Perhaps he keeps the location of the side trees in memory. At the same time, the bear, like the bortevik (Fig. 3), marks the "own" trees with its tamga - scratching claws (Figure 4).



Figure 3: Tamga bortevika



Figure 4: Bear tamga

There is not a single side tree and tree with a deck in the forest that is not marked with a bear tamga [4]. Borteviki say that they often look for bee colonies living in natural hollows in the footprints of bear claws on a tree trunk [1].

The behaviour of the "Bortevik" Bear (as he is jokingly called) is Somewhat Similar to the Actions of a Bortevik

The bear (Figure 5), like the bortevik (Figure 6), climbs the side tree, which is confirmed by the claw marks on the tree trunk.



Figure 5: Bear climbs a tree [4]

It is important to note that the beast, like the bortevik, does not rise above the border (there are no traces of its claws above the hollow). For what purpose does it rise? Borteviki are sure that not for the sake of sweet honey honeycombs, because the beast does not ruin the bee nest. This allows you to put forward the version that the bear is not an enemy of bees, rather, their ally.

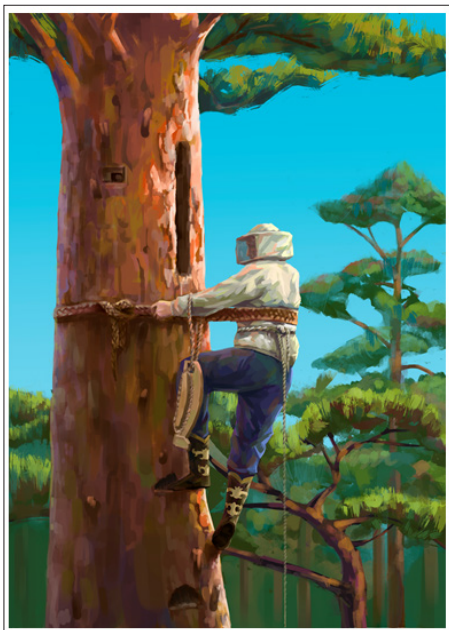


Figure 6: Bortevik climbs a tree

It is Curious that the Amount of Onboard Honey Taken by the Bear is Strictly Regulated

According to Bortevikov, up to 90% of bears are "Borteviki," and only 10% are "honey." Medovik bear is a "specialist" in the field of ruining bee colonies living in tree hollows. At the same time, he is able to convey to his descendants the skills of plundering sides [1]: the "specialist" shows the cubs how to gnaw out depressions in the tree trunk (Figure 7), how to destroy the lower part of the deck trunk (Figure 8), etc.



Figure 7: The upper part of the hollow is gnawed

The assumption that only a small part of the bears are "honey bears" is confirmed in practice. So, after the forced removal of the "honey" bear from a specific corner of the forest (after a successful hunt for it), the ruin of the sides in this land immediately stops.

The Bear is not looking for a Bee Nest - the Queen Bee itself gives it Information

This assumption is not scientifically proven, but logically explainable. It is justified by the fact that the bear sees poorly.

As you know, in a dense forest, trees are tall and branched, the "house" of bees is quite high. Therefore, the bear cannot detect bees flying out of the hollow of the tree from the ground. Borteviki admit that not only this beast, but it is extremely difficult for them to find a tree in the hollow of which bees live. Although the bear sees poorly, he hears well. Therefore, according to borteвики, the bear is able to determine the population of the hollow with bees from the ground. At the same time, the beast is guided not by the buzzing of bees (which is logically true), but by the "calm" sound of the queen bee (which requires scientific confirmation). The bear marks each "signaling" tree with its tamga, according to the flight attendants.



Figure 8: Bottom of deck destroyed

The Bees' Main Enemy is the Hornet, not the Bear

This is controversial, but most likely true. The hornet is recognized as the largest and most dangerous predatory insect (Figure 9).



Figure 9: Hornet is the main enemy of bees

Borteviki believe that in the past, when swarms of bees settled in Bashkir forests, bees became an ideal fodder for this powerful predator: there are many of them, they are easy to catch, after their destruction for dessert, delicious honey remains. Of course, in this unequal battle, small bees were powerless against a huge monster.

The bees had a Hope of Survival when the Clubfoot Owner of the Forest took them Under Protection

Controversial, but understandable. According to borteвики,

bees develop well in those corners of the forest where the bear maintains order on its site. Otherwise, they believe, the bees could not resist the predation of the hornet. Logically true and such a statement of Bortevikov: if the bear and hornet - the most powerful predators in the world of animals and insects - would lead a joint "war" against small and defenseless bees, then bee swarms could never master the Bashkir forests. Borteviki suggests that in the event of a merciless attack by hornets, the queen bee "informs" her defender of this with a "disturbing cry," and the ally bear eliminates this problem. How does the beast solve it? Is the version of the flight attendants correct? There is no scientifically based answer to these questions yet. Most likely, the type of relationship between a bear and bees in the distant past was formed as symbiotic. Undoubtedly, this topic is relevant. The study of the types of relationships of this particular biocenosis awaits its researcher.

The Desire to Avoid Meeting each other allows the Bear and the Flight Attendant to Coexist Peacefully

This is beyond doubt. Of course, the first relationship between a bortevisk and a bear arises as a result of a person's invasion of the habitat of this beast. From early spring to late autumn, on horseback, a bortevisk inspects his land, moving through a huge territory from one side tree to another. Naturally, the route passes through the stations of the bear's habitat. Therefore, at first glance, a meeting with the beast is inevitable, but the bear avoids this. According to the flight attendants, the owner of the forest always discovers a person first and is the first to nimbly "run away" from him - not so much from cowardice as from prudence. In relation to the flight attendant, the bear does not show aggression, not perceiving it as a source of danger, especially as a victim. So, often a flight attendant, rising to the side, from the height of a bear lurking in the bushes.

It is assumed that as a result of prolonged contact, the bear knows the flight attendant in the "face." He well distinguishes the "familiar" Bortevik from a dangerous hunter. At the same time, the flight attendant avoids meeting the beast. Sometimes a young and inexperienced flight attendant can approach a dangerous distance to a predator. In this case, the bear, demonstrating its amazing "vocal" abilities (barking dogs, chattering magpies, the sound of a person coughing, etc.) warns of the inadmissibility of his further approach of a person. Often, a possible reason for a bear not leaving a certain area of the forest is its cubs. Bear cubs are inexperienced, they are curious and do not leave the beloved corner of the forest, although the bear insistently asks them about it. In this case, the flight attendant himself bypasses this dangerous area of the forest.

The Principle of Operation of Airborne Protective Devices should not Provoke a Bear to Attack a Person

Proven by practice. Flight cars mainly use two protective devices - an old tukmak (Figure 10) and a modern shutter-cover (Figure 11).



Figure 10: Tukmak



Figure 11: Shutter-cover

Tukmak is a big club. The tukmak is tied to the branch of the side tree so that its powerful shock part is at the level of the debt. It does not adjoin the borti, but is in a free suspended state, which prevents the bear from calmly "working." The beast pushes him to the side, and he, returning back, hits the robber. The enraged beast tosses the tukmak away until it is knocked off its barrel by itself. Bear believes he lost to the "enemy" in a fair fight. Therefore, on his part there are no "complaints" about the flight attendant. Most importantly, tukmak does not injure the bear: falling from a tree does not harm his health. The shutter-cover is the outer cover of the due. It is a slightly convex oak (sometimes birch) board on the upper side. Such a shutter is installed over the lids properly and rigidly attached to the tree trunk with handicraft nails. For the bear, the shutter-cover serves as a physical barrier. In general, the flight protection devices do not cause aggression in the beast, but also retain a respectful attitude towards the flight attendant. Moreover, the honey bear "working" at the border feels slightly guilty. So, he, noticing the approaching flight attendant, quickly descends and hastily runs away.

Bortevik Avoids the "Conflict" Situation as much as Possible, when a Bear Attack on a Person becomes Inevitable

This is not only true, but vital. Therefore, borteviki do not agree with the frequent statements cited by beekeeping literature that "Bashkirs drive sharp large nails into the tukmak," "drive sharp stakes into the ground below," "stuff iron spokes on the tree trunk," "drive a fragment of a braid into the tukmak," etc. Justify this by the fact that when the bortevik creates such a disrespectful attitude, the bear is peaceful coexistence between them ceases. The wounded beast becomes dangerous not only for the flight attendant, but also for other people in the forest - hunters, lumberjacks, fishermen, berry collectors, tar harvesters, tar makers, etc. In this case, the bear's attacks on a person become inevitable and his attacks often end tragically for a person.

Thus, based on the results of the analysis of the survey of flight attendants and our own observations, the following conclusions can be drawn:

- the type of relationship between brown bear and honey bee is not characterized as "predator-prey." Most likely, the relationship between them initially formed as symbiotic.

The main enemy of forest bees is the hornet, the long coexistence of the bortevik and the bear formed tolerant forms of behaviour.

- The author notes that these findings differ significantly from the opinions of most researchers. Although the assumptions of Bortevikov do not have scientific confirmation and are doubtful, they are still of interest and deserve further study.

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