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## **The Mating of the Queen bee with males in the air (1763-1776, Slovenia)**

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**P.S.:** Translation from Slovenian and German to English with the help of DeepL Translator

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## **The Mating of the Queen bee with males in the air – 2020 – Abstract**

Experienced Upper Carniola beekeepers were certainly familiar with the process of mating between a queen bee and drones (males) in mid-air as early as in the 18. century, but most likely, even before that. The first person in the world to publish about it was Scopoli (1763) in his book *Entomologia carniolica*, in which he described the Carniolan honey bee (p. 303 – 304). Scopoli also reports about mating of queens with males in the air in the *Dissertatio de Apibus* (1770). Mating between a queen bee and drones in mid-air was also described by Peter Pavel Glavar in his work *Response* (1768) and by Furlan in his book *Practical Beekeeping* (1768 – 1771(?)). In 1769 Humel observed mating between a queen bee and drones in mid-air. The Carniolan Agricultural Society had his records validated and in 1771 they were confirmed by Peter Pavel Glavar and Matej Furlan. Humel's article was published in 1773 in *Abhandlungen und Erfahrungen* and in 1775 in an abridged version in *Wochentliches Kundschaftblatt des Herzogthum Krain*. The process of mating between a queen bee and males was also described by Anton Janša in both textbooks: *Discussion of the Swarming of the Bees* (1771) and *The Complete Guide to Beekeeping* (1775). Many people falsely ascribe this discovery to Janša. Janša lectured on old Upper Carniolan findings on the mating of queen bees. Mating between a queen bee and drones in mid-air was also described by Peter Pavel Glavar (1776) in his textbook *Discussion About Bee Swarms* (*Pogovor o čebelnih rojih*). Mating of queen bees with drones in mid-air is an original Slovenian contribution to our knowledge of the biology of honey bees.

Keywords: mating of queen bees, drones, Upper Carniolan beekeepers, Scopoli, Humel, Furlan, Peter Pavel Glavar, Anton Janša

### **Source**

Šalehar, Andrej, Šivic, Jasmina. Praha matice s troti v zraku, izvirno slovensko odkritje (Mating of queen bee with males in the air, an original Slovenian discovery). Self-publishing, Ljubljana 2020, 36 pp.

<http://www.dlib.si/?URN=URN:NBN:SI:DOC-J2U13JE7>

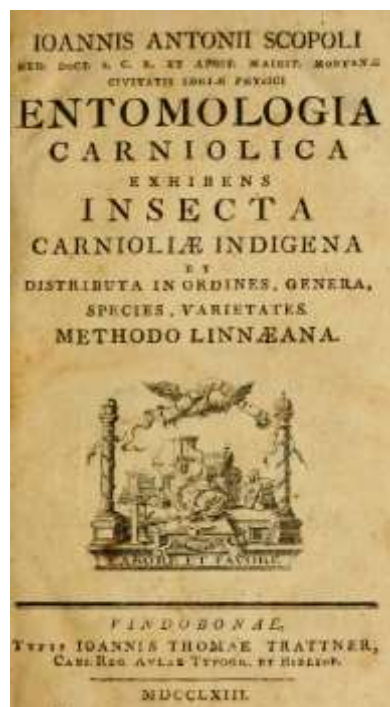
## Giovanni Antonio Scopoli, (1723-1788; in Slovenia: Idrija, 1754–1769)

### Scopoli: The first on mating of a queen bee with a drones in the air – 1763

Scopoli (1763), a physician in Idrija (Carniola) and a naturalist, published the book *“Entomologia Carniolica”* in Latin. He described 1,153 species of insects and arthropods he found in Carniola. Among the hymenopterans, *Apis Mellifica* (honey bee) is described on pages 303-304 under number 811. Scopoli wrote about the queenbee: **“it is surrounded by several drones; she flies away, flying in the air she becomes fertilized... «. This is the first record in the world that drones in the air mated a queenbee.** Scopoli was not a beekeeper and he learned this from conversations with old Gorenjska (Carniolan) beekeepers.

### Scopoli. Entomologia Carniolica (1763)

<http://www.dlib.si/?URN=URN:NBN:SI:DOC-VP8U24VW>

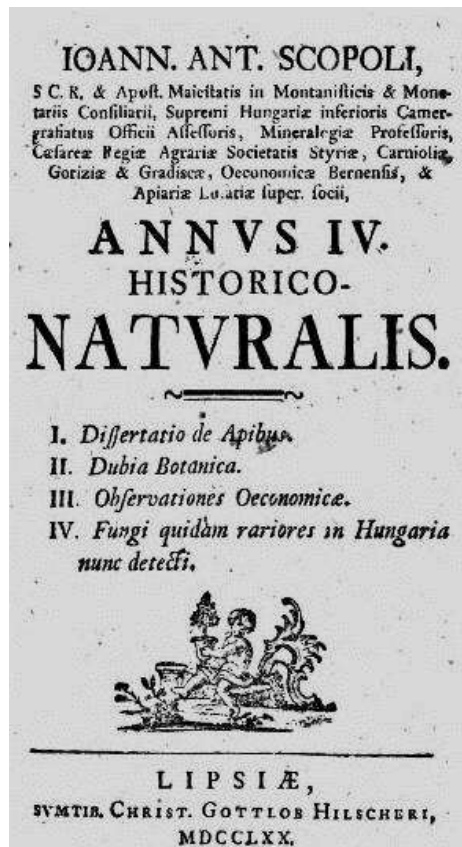


Titel page: Entomologia Carniolica (1763)

**Scopoli: Dissertatio de Apibus – 1770**

(<http://www.dlib.si/?URN=URN:NBN:SI:DOC-S0MLTISX>)

In 1770, in the *Annus historico naturalis*, Scopoli included in the first chapter the work *Dissertatio de Apibus* written in Latin.



Titel page: *Dissertatio de Apibus*

**The tenth observation states:**

»...The purpose of the swarming out is considered by some people as a mating, while others argue that asexuals (worker bees) do not build honeycombs **before the queenbee has brought some thin thread into the hive.**

**Appointment of Giovanni Antonio Scopoli as an honorary member of the Upper Lusatian  
Beekeeping Society – 1767**



Appointment of G.A.Scopoli as an honorary member  
Abhandlungen und Erfahrungen... 1770, page XIII

**Sources**

Scopoli, Giovanni Antonio (1763). *Entomologia Carniolica: exhibens insecta Carnioliae indigena et distributa in ordines, genera, species, varietates, methodo Linnaeana*. Vindobonae, 420 pp.

(<http://www.dlib.si/?URN=URN:NBN:SI:DOC-VP8U24VW> )

Scopoli, Giovanni Antonio (1770). *Dissertatio de Apibus*. p. 7–47. In: *Annus IV. historico-naturalis*. Lipsiae, 150 pp.

(<http://www.dlib.si/?URN=URN:NBN:SI:DOC-S0MLTISX>)



## Matej Furlan (1727-1780, Slovenia)

### Manuscript: Practical Bineneconomie...

Matej Furlan was a priest and a well-known beekeeper who helped Humel with his explanations in Humel's observations of the queen's mating in the air. The Archives of the Republic of Slovenia contain an extensive manuscript in Gothic and German (65 pages) with beekeeping content - title: "*Praktische Bineneconomie, das ist Kurzer Begriff von denen Bienen...* (Practical beekeeping or bee instruction and how they should be treated for specific gain and benefit...«. The author of the manuscript is not mentioned and the probable author of the book was judged the famous beekeeper priest **Matej Furlan**.



Title page: Practical beekeeping or bee instruction and how they should be treated for specific gain and benefit.

Archive of the Republic of Slovenia, fund Gospostvo Krumppek, SI AS 748, folder 44, 65 pages, written by Matej Furlan in 1768/71 (?)

### Chapter 6: On fertilization and reproduction of bees

»... Here, however, I intend to talk about the queen bee in the second or third swarm, which is by no means yet fertile, and therefore incapable of laying eggs. After we put it in the hive

with a swarm, such **a queen flies out of the hive on the third day and drones after it. However, as it rises into the air, also drones rise behind it, attacking the queen and performing fertilization.** Due to the mating instinct, a ball is made and it often happens that they all fall to the ground together with the queen, whereby the most skillful drone gets the game, which I once saw to my great surprise.”

#### Source

Furlan, Matej (1768/1771(?)). Praktische Bineneconomie das ist kurzer Begriff von denen Bienen, wie man mit denenselben mit besondern Vorteil und Nutzen solle, allen jenen so Bienen halten, zum Besten an das Liecht herausgeben von einem besondern grossen Liebhaber dieser unschuldigen Wirtschaft (Practical Bineneconomie...). Manuscript: Archives of the Republic Slovenia, Fund gospostvo Krumperk, SI AS 748, folder 44, 65 pp.

## **Peter Pavel Glavar, (1721-1784, Slovenia)**

Peter Pavel Glavar (1721 – 1784) was a priest and a learned beekeeper in Carniolia. He was a beekeeper in Komenda from 1744 to 1766 and in Lanšprež from 1766 to 1784. He acquired his basic beekeeping knowledge from Gorenjska beekeepers, and he drew a lot of it from foreign beekeeping books.

### **Glavar : The first professional description of Slovenian beekeeping – Reply (1768)**

On 28 January 1768, the Vienna court office sent the *“Vorschläge zur Verbesserung der Bienezucht in den Kaysl. Königl Erbländern (Proposals to improve beekeeping in the royal imperial hereditary lands)»*, prepared by a Lower Austrian company. This document and others related to it are kept in the Archives of the Republic of Slovenia. The Carniolan Agricultural Society also asked its member Peter Pavel Glavar, the priest and owner of estate Lanšprež, to judge it and write an opinion on the matter. Thus, in the same year (July 7, 1768), his famous *„Vorschlag Beantwortung zur Verbesserung der Bienenzucht in den den Kaysl. Königl. Erbländern“*, short *“Antwort”* (Proposal Answer to the improvement of beekeeping in the Kaysl. Königl. Erbländer", short "Reply) was written in German (Glavar et al. (2017)), which is the first professional description of beekeeping in Carniola. On the back of the manuscript, the remark *“sent on July 30, 1768,”* is written, suggesting that the Carniolan Agricultural Society sent the “Reply” to Vienna. The Answer, written by Glavar on the basis of his 24 years of practical beekeeping experience and reading foreign beekeeping books, describes beekeeping in Carniola in detail and professionally.



Title page of the manuscript - Peter Pavel Glavar: Vorschlag Beantwortung...Reply (1768).  
 Manuscript: Archives of the Republic Slovenia, Fund Folder 1, no.2, AS SI 869, Peter Pavel Glavar

He also mentions the mating of bee queens:

From this brood, the queen bees will raise a young queen bee, which will then mated. (Glavar and many other beekeepers in our country knew very well in the 1760s, and probably even earlier, that **queen bees are mated outside the hive in the air**).

It should be noted that the young queen bee of those hives that swarmed, as well as the second and third swarms, **fly for mating in a few days between 12 and 2 o'clock**.

### Glavar 's assessment of Humel's letter - 1771

Glavar received from the Carniolan Agricultural Society in Ljubljana for assessment Huml's records on the mating of queen bee with males in the air. In the Archives of the Republic of Slovenia Glavar's reply to the Carniolan Agricultural Society dated 25 November 1771, which is an assessment of Huml's record on the mating of queen bee.



Manuscript: Glavar's letter to the Carniolan Agricultural Society about Huml's record of the mating of queen bee with males in the air (dated 25 November 1771)  
(folder 1, no 2, AS SI 869 Glavar Peter Pavel, 1751 – 1784)

#### Summary:

... Glavar says from the very beginning that Humel's work deserves all the recognition, because experienced beekeepers from Gorenjska also told him about the queen bee flying with males in the air and that they saw it several times. Therefore, there can be no more doubt about that. After laying, the queen bee no longer allows reunion with males and, except with the swarm, no longer flies out of the hive and remains fertile for the whole life. At the end, he concludes with a recommendation to the agricultural company that, if it deems it worthwhile, he should send this letter to the beekeeping society in Oberlausitz with a recommendation to publish Humel's record in his beekeeping publication...

#### Appointment of Peter Pavel Glavar as an honorary member of the Upper Lusatian Beekeeping Society – 1772

In 1772, the Upper Lusatian Beekeeping Society appointed Peter Pavel Glavar an honorary member.

b) Ehren-Mitglieder zur physikalischen  
Classe.  
— Herr Peter Paul Glavar, Priester zu Lande  
Preis im Herzogthum Krayn. 1772.

Gemeinnützige Arbeiten..., 1773, page XIV

In the Archives of the Glavar's Benefits in Komenda, there is a document of appointment – folder 1/26



Charter of the Beekeeping Society in Upper Lusatia for Peter Pavel Glavar dated 5.6.1772.  
Archive of Glavar's Benefits, Folder 1/26, Komenda



## **Peter Pavel Glavar: Conversation on bee swarms, Landpreis 1776**

written in German by A. JANŠA, a Viennese beekeeping teacher,  
and translated and supplemented into Carniola by a highly respected, venerable, learned  
priest

**PETER PAVEL GLAVAR,**

former parish priest of the Commandery of St. Peter,  
now the owner of the Lanšprež manor.

In 1776

<http://www.dlib.si/?URN=URN:NBN:SI:DOC-PMTK8QLN>

### **Glavar: A Conversation on Bee Swarms – 1776**

Peter Pavel Glavar is the author of the first book on beekeeping in the Slovenian language, which appeared in 1776 with the title »Conversation on Bee Swarms« but its beginnings extended back to 1768 when Glavar wrote his famous »Reply« and offered to write a book on beekeeping for Slovenian beekeepers in the Slovenian language. He sent it to the Carniolan Agricultural Society to issue in 1779. The Society never published it probably due to the text in the Slovenian language. Furthermore, the manuscript was supposed to be lost. Archivist Dr. Marija Verbič noticed about the manuscript, which was found in the central Archive of Slovenia in the years 1950/51. Slovenian Beekeepers' Association in 1976 in the booklet »At the 200 Anniversary of Written Word in Slovenian Beekeeping« published also Conversation on Bee Swarms.

Glavar (1776) writes about the mating of queen bees in XXXI. Chapter –.

**XXXI. Conversation, About mating of queen bee. Pages 119, 121 and 123, paragraphs 349-359**

#### **349. Type of conversation**

We placed swarms and parent colony, some in the home apiary, others were transferred elsewhere for a while. To commence a new house, we have given them a handsome dowry, or we have given them with the necessary lodging for a few weeks, so that they have no cause to complain over us of want. But now we want to know how these and their parents are treated.

#### **350. What is queen bee mating**

After the queen is hatched, or the addition of the uncultivated in place of the previous uncultivated one, according to the doctrine under No. 335, the first work is the queen mating. By grooming we mean the mating or breeding of the queen as a bridegroom with a drones or with her husband, from whose seed received makes her fertile, so that by laying eggs she reproduces the bee brood.

### **351. In what place is the queen breeding**

It is to be known, and yet it must be known, that the queen is endowed with the attribute of creation by God, of all things of the Creator, whose mystery and causes of his wonderful works we are not given to know, in creation this quality of never mating with drones in her dwelling place, but always going out and mating when she is desirous of being ennobled. This flight of the queen beekeeper is called mating fly, and this mating is called breeding.

### **352. The peculiar property of the queen bee is that it is forever fertile after a single mating**

It is also necessary to know the other quality granted by God, that the queen bee, once received from the males a tribe or seed, from a single mating with a male, becomes fertile throughout her life, and never again goes through the tribe. A quality such as - so far as I know - is not assigned by God to any other thing.

### **353. Why the queen bee is mated several times and how many times**

However, the queen is shown not always to mate with the males in a single mating, and even if they mate, because they force the males one after the other towards her, they push each other away and hinder each other from doing their deed completely, and so she does not take the semen into her vessel completely. So she goes to make her fertile, many and so many times to dusting until she catches it.

### **354. Time of queen bee mating**

The mating time is not always the same, but is faster or later depending on the weather and grazing. If the weather is good and grazing is good, and the bees have already made some two to three finger-long honeycombs, the young queen from the swarm or offspring, which no longer intends to swarm, usually goes to mating on the third or fourth day. However, if there is bad weather and also grazing, it is dusted on the 14th day after hatching and even later.

### **355. We saw her mating herself immediately after hatching**

I don't want to keep quiet to my beekeepers, which is what happened to me with two singers. For at one swarm I saw a queen bee fly to the mating and return from a branch before the swarm was hived, and at another from the hive, soon after hived. For one, I can't remember which, I know that the rain kept him in the swarming for a few days, and therefore she also hurried to mating, for the other I don't know whether he was restrained or went out of the way earlier after the tribe.

### **356. How the queen bee is mated**

Between nine o'clock in the morning and four o'clock in the afternoon of a sunny day, the queen bee comes out of the hive, accompanied by several bees and males, walks around on alighting board, spins and looks at the hive in order to get to know it well and not miss it on her return. When she has a good look at it, she flies away, turning back for a while in front of



the hive wider and higher, watching the hive until it disappears from sight; And that's her mating.

### **357. How the queen bee behaves**

When the queen bee has flown in the company of some of the bees and the males from the hive, from the hive after another the males descend one after the other, and a few shots far from the beehive fly together over a beautiful plain, and there in the air, no other than in swarming, they fly to and fro amid a great murmur. The males pressed more and more densely against the queen bee, took it in the middle, and clung to it so that they fell to the ground several times in the form of a ball, and the reapers found in the midst of it a queen bee with its hindquarters open and upwards, and the male under it with a limb thrust into it; So they stuck together.

### **358. How the queen bee comes off the mating**

When the queen bee and the males have sufficiently fulfilled their sexual desire, and the queen bee has achieved what she was looking for, they let each other down, and this married couple, tired from work, flies home again after a short rest, where some of the bees of her family are carefully waiting for the queen bee in front of the entrance. The queen bee again flies in front of the apiary in circles, but always narrower, and when she gets to know the hive well and looks at it, she sits on her alighting board. The bees, with antennae and front legs stretching them towards her, and licking or stroking her with their tongues, accept her, flap her wings with joy, have their butts up, and escort her into the home.

### **359. Sometimes it is not come back until the second day**

What the bees do in the meantime. But it also happens - and it happened to me with one queen reared in the window in the hive - that it does not come back until the next day, because the perch has gone astray and has been blown away by the wind or held back by the weather. If she doesn't come back in time, the family becomes all sad, mourning for her with a sad murmur, missing her, running back and forth, looking for her, giving up and scattering in nearby hives. So this little bee escaped from my hive, and I did not find a queen bee with two bees and one drone until the second evening on the ceiling of the hive.

## **Sources**

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Glavar, Peter Pavel. Pismo kranjski kmetijski družbi o Humlovem zapisu o prahi matice v zraku z dne 25. novembra 1771 (Letter to the Carniolan Agricultural Society about Huml's record of mating queen bee in the air, dated November 25, 1771). Manuscript: Archives of the Republic Slovenia, 8 pages (SI AS 869, Personal Fund of Peter Pavel Glavar).

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Glavar, Peter Pavel et al. (2017). Čebelarstva pisna zapuščina Petra Pavla Glavarja (The Beekeeper's Written Legacy of Peter Pavel Glavar). Brdo pri Lukovici, Novo mesto, 352 pp. <http://www.dlib.si/?URN=URN:NBN:SI:DOC-PMTK8QLN>

## **Anton Janša, (1734-1773, Slovenia)**

### **Anton Janša, the first teacher of apiculture**

Empress Maria Theresa founded the beekeeping school in Augarten in 1769 and on 6 April 1770 appointed Anton Janša the first teacher of apiculture. Anton Janša was a simple young man from Carniola who attended the school for copper engraving and painting in Vienna. Anton Janša came from Upper Carniola in Slovenia, from the environment where beekeeping was very developed, advanced, and also profitable. Janša's beekeeping method was based on the knowledge of Upper Carniolan beekeepers, good knowledge on beekeeping, and Carniolan beekeeping. Janša lectured that the bees must not be killed, he advocated moving hives to bee pastures, he rejected the belief that the drones are water carriers and lectured that a queen bee is inseminated by the drones in mid-air, the fact that the old Upper Carniolan beekeepers were the first in the world to discover. He wrote two books on beekeeping in German language.

### **General information about the queen's mating with drones in the air in Janša's time.**

In Janša's time, there was still speculation about the queen's mating. Most thought it was happening in the hive but no one had seen it yet. Janša's publication in both books, and especially in the first, that the queen mates with drones in the air, aroused much interest and opposition among beekeeping experts. Most people mistakenly attributed this discovery Janša. Even before the publication of Janša's first book in 1771, in the beekeeping literature, where Carniolan (Slovenian) beekeeping is described or presented, this is written in the publications: Scopoli (1763) and (1770), Glavar (1768), Humel (1771) and Furlan (1768-1771 (?)). Here are also described the signs of fertilization of the queen, which are visible at her return - a white thread on her backside. Janša's discovery related to the queen's flying in the air is that several drones fertilize the queen. There is also a living oral testimony that Gorenjska (Carniolan) beekeepers knew from their many years of beekeeping experience that the drones fertilize the queen in the air.

**About the queen's mating with drones in the air in Janša's first book – 1771 (§63)**

**Abhandlung vom Schwärmen der Bienen.**

**(Treatise on the swarming of bees.)**

**Janscha, Anton, Wien: Kurzböck, 1771, 140 Seiten**

[Abhandlung vom Schwärmen der Bienen.](#)



**Titel page** Abhandlung vom Schwärmen der Bienen. Janscha, Wien, 1771

**§63, pages: 85 – 88**

Since we are talking about mating, we should also state the time of mating and the signs by which we can conclude that the queen has been mated. When the queen fly mating depends on the weather and grazing. If the weather is fine, and the grazing is so good that the swarm has been able to set a couple of honeycombs, then the queen flies aside on the third or fourth day after birth. In the event of poor grazing or bad weather, it delays farrowing for 14 days or more.

On a fine day, between nine o'clock in the morning and three or four o'clock in the afternoon, the queen comes out of the hive in a large company of bees and drones. On his chin, he turns in all directions for a while, to remember the hive, so that he can find it when he returns from the mating; Then it rises into the air. For a while, he flies in circles in front of the hive, looking at it and rising slowly higher and higher. When he returns from the mating , he does not immediately go to the hive, but flies for some time in front of him. On this occasion, we should pay attention to the following signs, by which we know that the queen is mated. If the rear of the queen is open where the bees have a sting, or if something white hangs from the rump, like a thin thread, so that it can be seen as if the rear were broken or torn, then the queen

must have been dusted. Within 5 or 6 days, she will begin to lay her eggs. If the first flight is not mated, it must be set aside again on the same day or immediately the next day. Sometimes it even goes out several times until it is mated.

After mating , the queen does not fly out of the hive again until it swarm out again.

Mihelič (1934) enthusiastically welcomed Janša's record (§ 63) about the mating of queen with a drones in the air and wrote:

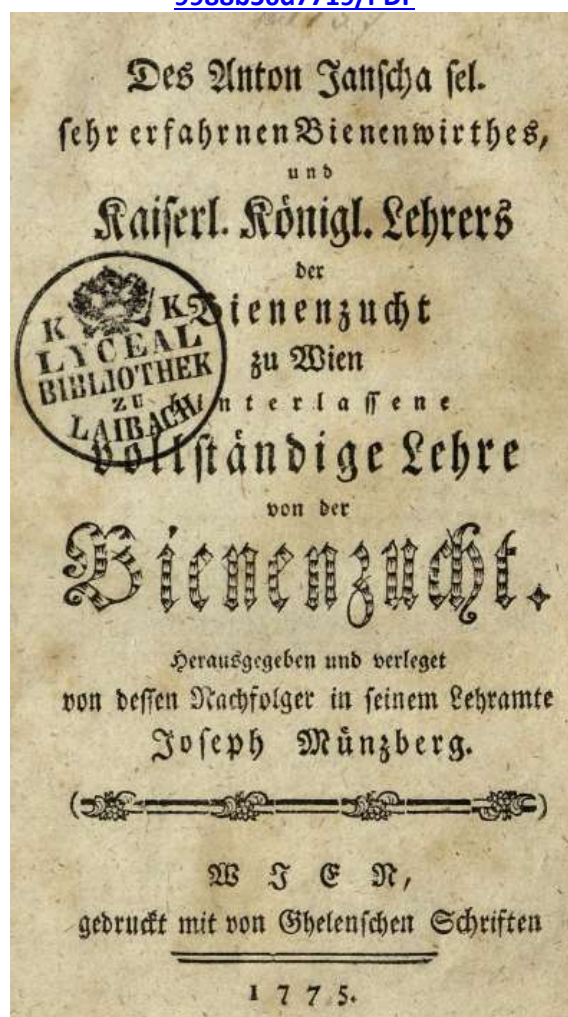
»In a few sentences, Anton Janša has said everything that has been guessed in entire books in others, from Reaumur to Schirach. Janša Writes: The queen bee is pollinated in the air outside the hive. It is pollinated by the trotters. Fertilization is carried out only once for each queen and is sufficient for the entire life of the queen<sup>1</sup>.«

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<sup>1</sup> Excerpt from the book Anton Janša, Slovenian Beekeeper, 1934, page 123

**Vollständige Lehre von der Bienenzucht (1775), (Complete teaching on beekeeping)**  
Janscha Anton, Münzberg, Joseph, Wien 1775, 204 strani

<https://www.dlib.si/stream/URN:NBN:SI:DOC-NTDERK2I/e677ff0e-1700-453d-98c0-9988b56d7719/PDF>



Title page: Vollständige Lehre von der Bienenzucht  
Janscha Anton, Wien 1775

**§ 8, page 8, Drones**

The drones are male. Their only job is to mate the queen. At the time of swarming, on a nice, warm day, each unfertilized queen, accompanied by many drones and bees, flies out into the air, where the drones mated it.

**Chapter IX. Mating of queens. § 51-54, pages 50 – 55.**

Mating however, occurs only in the air (§ 8). In general, the mating depends on the trip, which in turn depends on the weather and grazing. On such a day in time from 9 a.m. to 3 or 4 pm comes the queen, accompanied by a large company of bees and drones; He spins a few times to memorize the hive and can find it on the way back, finally into the air. He flies around the hive for a while, watching it, slowly rising higher and higher. Do not let her out of sight, and you will see them stumbling, rushing drones towards her with some speed; It's a fertilisation.

In a few minutes, he returns home again. Before the queen goes into the hive, she flies a little more time around it.

Now look out for the following sign: If the pointed back of the life, where the sting otherwise is, is open, and hangs out of something white, like a thin thread, as if something had been wounded or torn, then it has already been properly ennobled. Experience has taught me that six-week-old queens don't mating anymore, many don't even fly mating anymore if bad weather has kept them out for only three weeks, and then they are left unused. Such an age-incapacitated queen causes just as much destruction to the hive as motherlessness (§ 7).

### **Sources**

Janscha, Anton. Abhandlung vom Schwärmen der Bienen. Wien 1771, 129 strani.

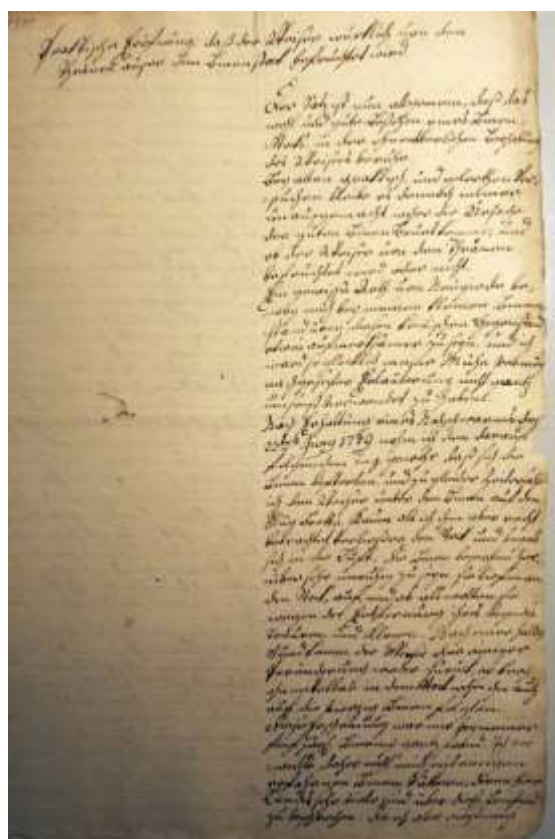
Janscha, Anton, Münzberg, Joseph. Vollständige Lehre von der Bienenzucht. Wien 1775, 244 strani.

Mihelič, Stane. Anton Janša. Slovenski čebelar. Njegovo življenje, delo in doba (Slovenian beekeeper. His life, work, and age.), Ljubljana 1934, 163 pages.

## Anton Humel<sup>2</sup>, (Slovenia)

### Humel: Record of the observation of the mating of queen bee with males in the air in 1769 – letter to the Carniolan Agricultural Society on 25. September 1771

In the Archives of the Republic of Slovenia is a letter from Humel dated 25 September 1771 (folder 1, no. 2b-1 in AS SI 869 Peter Pavel Glavar) entitled: Praktische Eröffnung dass der Weiser wirklich von den Thränen ausser den Bienenstock befruchtet wird (Practical finding that the males outside of the hive mate with the queen bee).



Humel's letter (title page) to the Carniolan Agricultural Society on September 09.1771  
(folder 1, no. 2 in AS SI 869 Glavar Peter Pavel)

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<sup>2</sup> Unknown Biographical Information



#### Summary:

"Humel, a city surgeon from Ljubljana, explains in the introduction that it is still unresolved whether or not the queen bee is mated by males. For this reason, he was especially attentive to this in his apiary. In June, 1769, he noticed in another swarm the very next day that the bees were mated, that the queen bee was on her chin, and then she flew into the air. She returned in half an hour and immediately crawled into the hive, where she was followed by about 40 bees. He saw this for the first time after five years of beekeeping, and he asked experienced beekeepers, of whom there are many here in the country, about it. They said that they had known this for a long time, that with They said that it had been known to them for a long time, that they had always seen in it a good omen if the queen had flown out so early and come home with a white mouth. Humel observed this in a new second swarm, and several more times in subsequent swarms and subsequent years. This was explained to him in more detail by the priest Matej Furlan, who was an experienced and famous beekeeper. He said that his observations are nothing new, because he has noticed it many times during his twenty-two years of beekeeping. He also recounted that twice he saw a clump of trots fall to the ground in front of the apiary, and when he examined it, he always found a queen bee in the middle, which was fused with the male. Humel concludes that it is now clarified that the queen bee is pollinated by males in the air, and encourages other beekeepers to pay attention to this, to see for themselves. Especially for those who have doubts about it."

#### **Publications of the Humel's Observation of the Queen's bee mating in 1769**

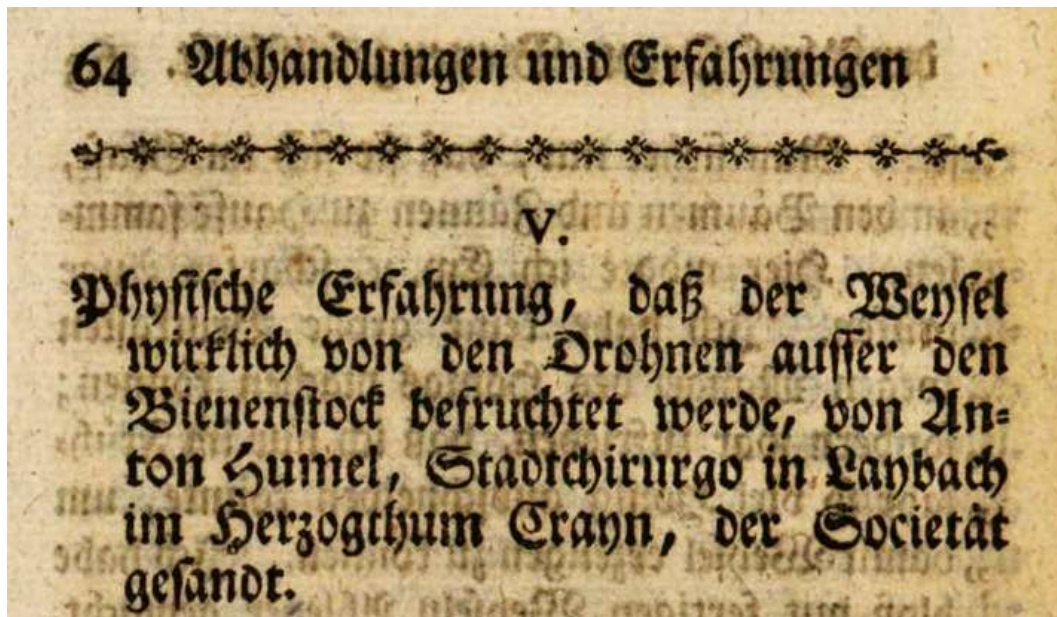
The Beekeeping Society of Upper Lusatia first reported Humel's observation of queen bee mating in 1769 in 1772 (Geschichte ... Bienengesellschaft Oberlausitz, 1772, No 7, pages 5 – 6, (<http://digitale.bibliothek.uni-halle.de/vd18p/periodical/structure/12822322>) she wrote:

#### Summary:

"Although there is no longer any doubt that the fertility of young queen bees is related to mating with males. Nevertheless, by their internal structure, the drones are indisputably by nature men of queen bees, which are fertilized at a certain time to be fertile all year round, even up to three generations. How and when it happens. The incident is still a mystery. Swamnerdam and Reamour never said that this fertilization occurs in hive, but they assume this on the basis of certain connections (touches) of the males with the queen bee. But now they claim Three experienced Austrian bee connoisseurs about its fertilization by mating with male semen outside the hive, some days after hatching, which was clearly seen by Mr. Anton Humel, the city surgeon in Ljubljana, which he first communicated to society. This was followed by the Carniolan Agricultural Society, which sent to our company, together with the opinions of two gentlemen, namely, Mr. Petar Pavel Glavar from Lanšprež and Mr. Matej Furlan from the monastery in Mekinje, who affirmed on the basis of their long-standing experience. This happens mostly from the second to the twelfth day after the formation of the swarm during the mating period, when the queen bee flies out and is left to fertilize, returning with a white thread covered with a rump. We ask all bee lovers to pay attention to this and to take the time and patience to observe it."

## Full publication of Huml's observations in 1769.

Publication title:



Gemeinnützige Arbeiten ..., 1773, page 64

<http://reader.digitale-sammlungen.de/resolve/display/bsb10293787.html>

Translation of the title:

"The physical experience of the males actually fertilizing the queen bee outside the hive from Anton Humel, a state surgeon in Ljubljana in Carniola, who sent it to the company."

### Source

Humel, Anton. Physische Erfahrung, dass der Weyfel wirklich von den Drohnen ausser den Bienenstock befruchtet werde...( The physical experience of the males actually fertilizing the queen bee outside the hive from Anton Humel, a state surgeon in Ljubljana in Carniola, who sent it to the company. pages. 64 - 71. In: Gemeinnützige Arbeiten der Churfürstl. Sächsis. Bienengesellschaft in Oberlausitz : die Physik und Oeconomie der Bienen betreffend, nebst andern dahin einschlagenden natürlichen Dingen. Erster Band. Berlin in Leipzig, 1773, 451 pp.

(<https://books.google.si/books?id=VO86AAAACAAJ&printsec=frontcover&hl=sl#v=onepage&q=HUMEL&f=false>).

### Epilogue

However, according to the records found so far, it is indisputable that Slovenian beekeepers as first discovered the mating of the queen bee with males in the air. Interestingly, after Scopoli's record in 1763, all subsequent writers (5) up to 1776 emphasized the queen bee mating outside the hive in the air with drones. Peter Pavel Glavar wrote this in particular extensively and in detail in 1776 in his work Conservation on bee Swarms.