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Traditional beekeeping in Crete (17th-20th century)

Abstract

Regarding traditional beekeeping in Crete, based on the beekeeping methods and hives that have been recorded in recent centuries, we can distinguish two areas: Central-Western Crete, where vertical hives with movable combs were in use, and the eastern part of the island, where a horizontal hive with fixed combs was used.

Hives with movable combs (or top-bar hives) were constructed from various materials such as clay, woven wicker branches or more rarely from wooden boards. The clay ones were the most widely used and were usually constructed by travelling potters, who organized artisanal groups (guilds) and travelled around the island selling their wares.

The wicker top-bar hives, which usually did not have a base, were used in Western Crete, mostly for migratory beekeeping, while the rectangular wooden top-bar hives were used only rarely in certain areas such as Sphakia.

In Eastern Crete a horizontal, ceramic beehive open at both ends with a truncated-cone shape was in use, usually placed in rows. All the hives in Crete were covered with various materials for protection from the elements and were often placed inside bee enclosures.

The knowledge of traditional Cretan beekeepers regarding bees was limited. Despite this fact, however, the users of hives with movable combs practiced beekeeping in the most rational and effective way that has been recorded prior to the invention of the modern hive. In doing so, they executed a series of beekeeping tasks that were not possible for users of other types of hive. But even the beekeepers in the eastern part of the island, where a horizontal hive with fixed combs was used, applied certain unique methods, which are a testament to the advanced level of beekeeping knowledge they possessed.

Keywords: Traditional beekeeping, traditional beehives, ceramic beehives, top-bar hives, movable comb hives, wicker basket hives, bee enclosures, Cretan apiculture

Beekeeping in Crete has a long history and has been practiced, as all information indicates, at least since Minoan era and the second millennium BC. However, even though almost everyone agrees on the existence of apiculture on the island during this period, our knowledge about the way it was practiced is non-existent. We are still not in a position to know the most important piece of information: the type (or types) of beehive used. Of course, several relevant suggestions have been made, but there is no certainty concerning Minoan hives.[1]

1 Acknowledgements: We must express our warmest thanks to: the Hellenic Folklore Research Centre and the Research Centre for Modern Greek Dialects of the Academy of Athens, for permission to study and use the manuscripts with ethnographic material regarding Cretan apiculture; the Institute of Agricultural Sciences for permission to study and photograph the exhibits in the "Museum of Apiculture", which is under construction on its premises; the Hellenic Scientific Society of Apiculture, for permission to study the archives of Thanassis Bikos, which have come into its

Fig. 1. A “vraski” beehive (Museum of Apiculture in IAS, Athens; photo G. Mavrofridis).

Thus, the oldest beehives that can be dated with certainty, date back only to the 2nd century BC (Francis 2006, 384) and reach the 7th century BC. They are horizontal ceramic hives open at one end, which in some cases have openings for the entry of bees in their closed end (Hayes 1983, 132; Crane 1999, 191). This feature gives them, to an extent, the characteristics of hives open at both ends. In others, the closed end has an unusual dome shape (Yangaki 2005, 162; Francis 2011, 275), while in Panormos a hive has been discovered with a flat closed end, as well as a lid with many small holes (entry points for bees), for protection from the *Vespa orientalis* hornet (Mavrofridis 2012b). Finally, in Gortina (Crane 1999, 191), Eleftherna (Yangaki 2005, 162) and Sphakia (Francis 2006, 382), the short clay extension rings typical in antiquity have been found. However, according to the data so far, none of the ancient types of ceramic hive (ancient and early Byzantine) brought to light by archaeological excavations have survived on the island up to recent centuries.

Consequently, in Crete, based on the recorded data from the 20th century, which is confirmed to a significant degree by those of previous centuries (17th-19th), we can distinguish two areas with completely different methods and practices of beekeeping. The first concerns Central-Western Crete, where vertical hives with movable combs, of various types and construction materials, were in use. The second is the eastern part of the island where a horizontal, open at both ends type of clay hive with fixed combs was used.

Of the hives of the first area, the most widely used was the “vraski” (also known as “fraski” or “flaski”), a vertical clay hive, open at the top, with movable combs of course (Fig. 1). The side walls were sloped and slightly converging at the base, giving the “vraski” an inverted truncated cone shape. This characteristic, typical of all cylindrical top-bar hives, was necessary so the bees did not attach their combs on the walls of the hive as well.[2] Its height varied from 37 to 40 cm,

possession; the journal *Melissokomiki Epitheorisi* for permission to use photographs and sketches which have been published in its pages; the professor of apiculture at the Agricultural University of Athens Paschalis Harizanis for his multifaceted assistance; the agriculturist Vardis Sellianakis for permission to use photographs from his Graduate thesis; and the beekeeper Manolis Zymbragoudakis, who possesses a rich collection of objects related to traditional beekeeping in Crete, for his valuable information.

So far all the main existing types of traditional hive have been put forward(!): vertical cones-open at the bottom (Melas 1999, 489; Harissis & Harissis 2009, 25; Harissis 2017, under publication), vertical-open at the bottom with a flat top (Faure 1973, 159; Melas 1999, 487; Savvakis 1994, 175), vertical-open at the top with movable combs (Mavrofridis 2006, 269-270 & 2007, 152; Harissis & Harissis 2009, 20-22; Harissis 2017, under publication), horizontal cylindrical or with truncated-cone shape (Ruttner 1979, 219), horizontal truncated open ended (Davaras 1986, 43), horizontal open at one end truncated and small in length (D’Agata & De Angelis 2014, 352-353) and horizontal rectangular open at one end (Harissis 2017, under publication).

[2] The so-called western bee, Apis mellifera, attaches its combs on the side walls of its nest as well as on the ceiling of its nest. However, when these walls are angled, converging inwards, then it attaches them only on the ceiling. With the use of suitable wooden bars on the ceiling, as in the case of movable comb hives, it attaches its combs one by one

Fig. 2. A “vsaski” with its tob-bars (Zymbragoudakis Collection; photo V. Sellianakis).

Fig. 3. A beekeeper raises a top-bar with its comb in the 1970s (Photo F. Ruttner).

the external diameter of the opening was 40-48 cm and that of the base was 29-34 cm. It had two short handles and the bees entered through a narrow elongated opening near the base of the vessel called the “anthologos”. At a height of about 10 cm above the entrance, there was often a circular hole of about 1 cm called the “anemologos” for better ventilation of the hive. Ten tob-bars called “kanonia” or “kandineles” (Fig. 2, 3) were usually attached at the opening of each “vraski”.

Twigs with leaves, woven in circular fashion, were often placed over the tob-bars for protection from the cold and the heat (Fig. 4), and over them there was a special clay lid, the “saliera” (Fig. 5). This covering was also used inverted by the beekeeper in other ways, for example to

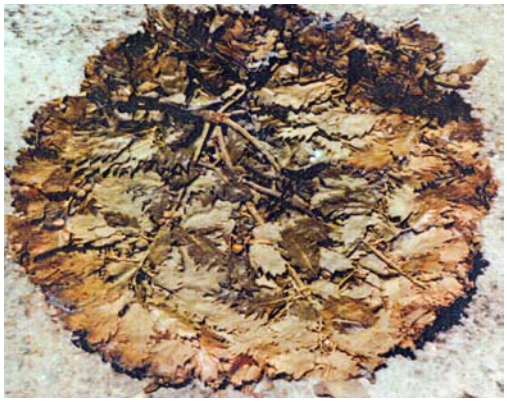

Fig. 4. Layer of foliage that was placed over the top-bars of “vraski” (Zymbragoudakis Collection; photo V. Sellianakis).

Fig. 5. A “Vraski” covered with its “saliera” (Zymbragoudakis Collection; photo V. Sellianakis).

on each tob-bar. This way combs are created which hang attached only on the tob-bars of the ceiling and can then be moved at will, allowing a series of beekeeping tasks (such as monitoring the inside of the hive, easy multiplication of the bee colonies without the need to capture and hive swarms, prevention of swarming, easy harvesting, etc.), which would otherwise be impossible or at least very difficult to carry out.

Fig. 6. Apiary of "vraski" hives in Pitsidia, Heraklion in the 1970s (Photo F. Ruttner).

Fig. 7. Abandoned apiary of "vraski" hives, covered with stone slabs (Photo K. Savvakis).

provide water for the bees in the summer. In certain areas, such as Messara and the mountainous area of Asterousia, instead of the "saliera" they would use a stone slab (Fig. 6, 7) or a large piece of a broken "vraski", and in later years a piece of sheet metal.[3]

The "vraskia" were usually constructed by travelling potters from the villages of Thrapsano in Iraklion and Margarites in Rethymnon, who organized artisanal groups (guilds) and travelled around the island selling their wares (Vallianos & Padouva 1986, 19-22).

We owe the oldest description of a vraski and the way it operated to Zuanne Papadopoli, a Cretan who abandoned the island before the Turkish occupation. In 1696 in Padova, at a ripe old age, he wrote about the recollections of his youth in Italian. Papadopoli had himself been a beekeeper, a fact that obviously lends special gravity to the information he gives us (Harissis & Mavrofridis 2012, 270). He practiced beekeeping in Astrakoi (Papadopoli 2007, 191) in the 1630s and the "vraski"[4] he used had a clay lid, while their tob-bars are referred to as "cantenelle", a name which is used to this day.

In western Crete and mainly in the prefecture of Chania, besides ceramic hives, woven top-bar hives (baskets) called "melissokofina" were also used (Fig. 8, 9).[5] They were made from wicker or myrtle branches and were sealed on the inside with a mixture of mud and dung. On the outside they were sealed only around their two openings at a height of about 10 cm so as to aid aeration of the colony, to reduce weight and to prevent the branches from rotting (Zymbragoudakis

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3 For the "vraski" and its use see mainly: Zymbragoudakis 1979, 49; Ruttner 1979, 220-222; Mavrogenis 1979a, 20-21 & 1979b, 244-245; Karydis 1983, 162-163; Br. Adam 1983, 79-80; Crane 1999, 396-397; Savvakis 1994, 176-178; Bikos 1996, 267-272 & 2012b, 240-243; Rammou & Bikos 2000, 428-429; Bikos & Rammou 2000; Blitzer 2004, 162, 203; Mavrofridis 2007, 134 & 2017a, 316-319. Also the manuscripts: Zografakis 1891; Loukaki 1964; Pelekanakis 1964.

4 It is worth mentioning that hives from the Hellenistic era, similar to the "vraski", which also had movable combs (Mavrofridis 2013a, 23, 27; Mavrofridis 2013b, 82-84), have been found in Isthmia (Anderson-Stojanovic & Jones 2002, 349-351, 355-364).

5 See: Georgandas 1957, 287; Zymbragoudakis 1979, 50; Ruttner 1979, 223; Mavrogenis 1979a, 21; Crane 1983, 197-198 & 1999, 398-400; Br. Adam 1984, 76, 79-80; Savvakis 1994, 179-180; Bikos 1996, 267-269; Rammou & Bikos 2000, 429-430; Bikos & Rammou 2000, 23-24; Mavrofridis 2007, 137, 2012a, 177 & 2017, 301-302; Bikos 2012b, 243-246. Also, Antonioudakis 1964; Perakis 1973.

Fig. 8. An open at top and bottom and an open at top woven “kofini” hive, in horizontal position (Zymbragoudakis Collection; photo V. Sellianakis).

Fig. 9. A Cretan beekeeper of another era raises and examines a top-bar with its comb (photo Ch. Zymbragoudakis).

1979, 50). Their dimensions were usually 38 cm height, 42 cm diameter at the opening and 32 cm diameter at the open base (Mavrogenis 1979a, 21).

In the winter, the baskets were placed on a stone slab called the “skamni” (stool) (Perakis 1973) or “patichali” or – when they stood on a flat rock – “plakoura” (Zymbragoudakis 1979, 50). The bottom opening was fixed to the “patichali” with mud all around, except for a 10 mm space that was left open for the bees to pass through. Small shrub branches and stone slabs or stones were placed on the baskets for protection from the elements (Fig. 10). In all the movable comb hives in Crete, the top-bars were not covered with mud as in other areas (Mavrofridis 2017a, 318). So the bees sealed most of the small gaps that were created with propolis. However, they often left some of them open for use as extra entrances.

Fig. 10. A bee garden with woven, open at top and bottom hives, at Kambani Akrotiri, Chania in 1939 (Th. Bikos Archive; photo P. Papadopoulou).

These hives were almost exclusively used for migratory beekeeping and their transportation was mainly by pack animals and rarely with carts. Seven woven (basket) hives were loaded on the pack animals, two on each side of the saddle vertically and three on the top horizontally. The latter were placed with the axis of their top-bars vertical to the ground so that the combs did not break during transportation (Mavrogenis 1979a, 21). In order to take advantage of flowering plants that usually grew in inaccessible places, such as “malotira”

Fig. 11. Movable top-bar hives made from boards: (Photo Ch. Zymbragoudakis).

Fig. 12. A “dypseli” hive of Eastern Crete (Zymbragoudakis Collection; photo V. Sellianakis).

(*Sideritis syriaca*), the beekeeper himself would carry the hives on foot with one on each shoulder (Bikos 2012b, 243).

The first to mention the wicker hive of Crete was the abbot Della Rocca from Syros in 1790. He had not seen them and their use with his own eyes but he writes that “they have been confirmed by more than one person” (Della Rocca 1790, II, 466). In fact, while he himself had not witnessed their use, it seems he fully understood their mode of operation and refers to it in detail.

Another material that was used for the construction of hives was wooden planks. In Crete these hives were relatively rare but they were used in areas where beekeepers were aware of the movable comb method. The well-known beekeeper Christos Zymbragoudakis had some of these hives in his collection just outside the city of Chania. There were photographs of them (Fig. 11) taken in 1969 according to a handwritten date found on their back. These photographs were handed over by Zymbragoudakis himself to the late researcher of our traditional beekeeping Thanassis Bikos, who in turn gave them to me for publication. Unfortunately, these hives no longer exist, as we learnt from Christos Zymbragoudakis’ son Manolis. They were left outside unprotected and as a result they rotted and were thrown away. They originated from Sphakia, were made of cypress wood and were rectangular with sloped sides, slightly converging to the base.

In the village of Thronos in Rethymnon, the use of plank hives made from repurposed wooden crates has been recorded (Mavrogenis 1979b, 244). They were of various sizes with bars at the top and functioned as movable comb hives.

During the harvest of movable comb hives, the beekeeper removed the combs from the side tob-bars which had honey, and left the middle ones (usually four) for the needs of the colony.

A horizontal open at both ends type of ceramic hive with a truncated-cone shape was used in Eastern Crete (Fig. 12). This type, known as the “dypseli”, “solinas” (pipe) or “chaliki”, was mainly

Fig. 13. Installing the front lid of a "dypseli" (photo E. Vassilakis).

manufactured by the potters from the village of Kendri in Lasithi (Blitzer 1984, 150; Vallianos & Padouva 1986, 19-20, 26).[6] Its dimensions ranged from 64-74 cm in length, 32-37 cm in diameter at the front opening and 20-26 cm in diameter at the back opening. The two openings were shut with lids made of "pitika" (pine bark) that were fixed with mud (Fig. 13), except for the bottom part of the front covering that was used as an entrance for the bees. In some cases the front covering had two segments (Bikos 1994, 228), so that the beekeeper could monitor the situation by removing only the top part, without having to open the hive completely.

The "dypselia" were usually placed in a row, on walls 50-70 cm high. Under the hives and sometimes between them bushes were placed, mainly "astivides" (*Sarcopoterium spinosum*). On top of them was placed a large stone slab sitting on stones as a cover (Fig. 14), or pieces of wood to create a gap for air between the hive and the covering. This was done to protect the

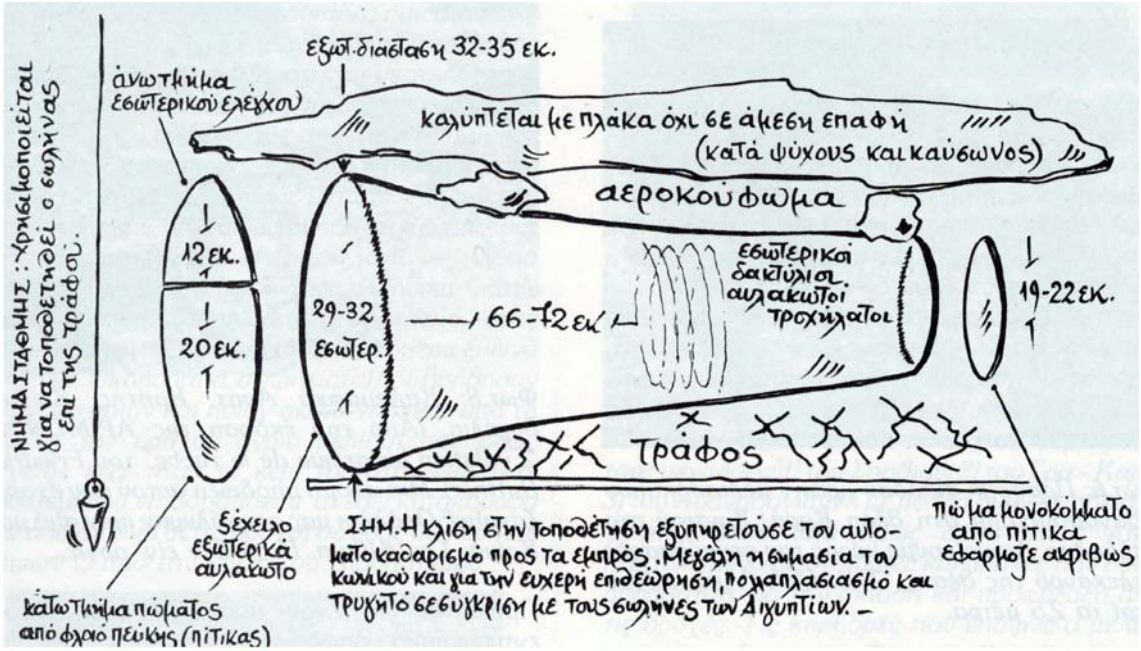

Fig. 14. The "dypseli" and its covering in a drawing by Th. Bikos

6 For the "dypseli" see mainly: Zymbragoudakis 1979, 48; Ruttner 1979, 211-220; Karydis 1983, 162; Crane 1983, 48 & 1999, 192-193; Savvakis 1994, 179; Bikos 1994, 225-228 & 2012a, 167-171; Rammou & Bikos 2000, 428; Bikos & Rammou 2000, 22; Kontzias 2005, 40-41.

Fig. 15. An “ordini” of “dypseli” hives (Th. Bikos Archive; photographer unknown).

hives from the elements and mainly from the summer sun.[7] Each row of hives in this formation (Fig. 15) was called an “ordini”.

The beekeepers who used “dypseli” hives knew how to multiply their hives with artificial swarming and how to force the bees to build their combs vertically to the axis of the hive. They took a round piece of comb which contained brood from a hive and placed it in the centre of an empty one with the help of a cross made from thin sticks (Fig. 16). The same was done when they captured a swarm, i.e. they placed a piece of comb as a guide for the bees (Bikos 2012a, 168).[8] This formation of the combs helped harvesting a lot and the combs were removed in alternation, once from the front opening and once from the back up to the point where the cross had been placed.

Although the “dypseli” was not the most suitable kind of hive for transportation, this was done on occasion in order to take advantage of remote flowering plants. They were transported by mules or other pack animals that were loaded with two or three “dypselia” in sacks or by the beekeeper himself, who would lift one hive on his shoulder (Kontzias 2005, 41; Bikos 2012a, 168). A stick from a *Quercus coccifera* tree called a “melissoverga” was often used to counter-balance the weight of the hive on the other shoulder.

Fig. 16. The cross in the middle of the “dypseli” (photo E. Vassilakis).

Besides the aforementioned types of hive, other types, non typical for Crete, have been recorded but their use was very rare. As such we can mention:

[7] An experiment was recently conducted with a “dypseli” to determine if the view of Latin authors that ceramic hives were the worst of all types because they do not offer sufficient insulation was correct (Francis 2012, 153-157). However, the fact that these hives were always used covered was not taken into account (see Mavrofridis 2015, 352-353).

[8] This practice of creating combs parallel to the opening was first described by the Arab Ibn Al-΄ Awwam in the 12th century (see Harissis & Harissis 2009, 19). However, it seems that it was also known in ancient Greece, otherwise the existence of short extension rings, which were then in use, does not make sense (see Mavrofridis 2009, 202-203).

horizontal hives made from hollowed out plane tree trunks in Eastern Crete (Crane 1999, 192), horizontal cylindrical hives with one opening in Lasithi (Vallianos & Padouva 1986, 25) and some hives carved in natural rock in the village of Komitades in Chania (Crane 1998, 14).

Fig. 17. Traditional beekeeping tools, smoker and mask of the Cretan beekeepers (Zymbragoudakis Collection; photo V. Sellianakis).

Regardless of their type, hives in Crete were usually placed in protected, enclosed areas called "melissokipi" (bee gardens) for protection from thieves, animals, wind and… even the evil eye (Fig. 6, 7, 10). In Eastern Crete, their walls often exceeded a height of 2 meters, and as an added deterrent for thieves, *Aspalathus* bushes were placed on top (Mavrofridis 2016, 199). In fact, the walls of one such circular enclosure in the area of Gouves in Heraklion were over four meters high (Baritakis, 2012)! The building of bee gardens probably has a long tradition in Crete. In Sphakia, in the area of Xerovothonas, an ancient water reservoir and parts of ancient hives have been found in an abandoned bee garden (Price & Nixon, 2005, 675). It seems quite probable that there had been a bee garden on that site since ancient times. In any case, similar constructions were in existence not only in antiquity but also in the middle ages.[9]

A Cretan beekeeper's tool kit included a clay smoker ("kapnouchos") with two openings: a large one through which he blew and a smaller elongated one through which the smoke was directed towards the bees (Fig. 17).[10] Dry cow or horse dung was used as burning material in the smokers (Loukaki 1964; Papadopoli 2007, 189).

A metal tool with which combs were cut or lifted was necessary for a traditional beekeeper. There were many variations but the basic characteristic was a set of prongs (rudimentary forks) on one of the ends (Fig. 17). They were significantly longer than today's scrapers, reaching 40-50 cm. The names that have been recorded for this tool are: "dichali", "katsounas", "kelperi", "pirouni"/"pirouna", "tsakos" and "tsertseto".[11]

Of course, there was also a mask called a "mouritha" made from curved, parallel metal wires (Fig. 17) or very thin linen cloth. The Cretan bee (*Apis mellifera adami)*, which has most likely

9 In Columella (De Re Rustica, IX, 5, 3) and Geoponika (XV, 2, 9) the construction and use of similar bee pens is put forward. For relevant references from Byzantine hagiography see Anagnostakis 2017.

10 Similar smokers seem to have been in use on the island since Minoan times, see Tyree, Robinson & Stamataki 2012, 223-224.

11 For these names and the variants of the traditional Cretan "xestro" (scraper): Loukaki 1964; Perakis 1973; Zymbragoudakis 1979, 51; Mavrogenis 1979b, 245; Karydis 1983, 164; Kontzias 2005, 41; Bikos 2012c, 318.

Fig. 18. A “melopitharo” with a “saliera” on top (Zymbragoudakis Collection; photo V. Sellianakis).

Fig. 19. A “melokouroupa” (Zymbragoudakis Collection; photo V. Sellianakis).

become extinct due to inter-breeding with other species, was considered “extremely aggressive” (Harizanis 1996, 3) and so the use of the “mouritha” was probably obligatory.

In Crete there was usually only one harvest after the 15th of August. But there are reports of two harvests: one in spring and one in September (Bikos 2012a, 169). Papadopoli (2007, 189) in the 17th century also talks about two harvests: one in May, which gave a honey “as white as paper” and one in September when the honey had the colour of “a freshly-minted gold ducat”.

The honey was extracted from the harvested combs by compressing them by hand in a basket placed on another container, such as a basin, to drain the honey. Sometimes the combs were just cut in small pieces and left to strain in the basket. In Eastern Crete they used a special vessel for straining the combs called a “vraskaki” (small “vraski”) (Vallianos & Padouva 1986, 41). In some cases, instead of another container, under the basket was placed a clay “saliera” with a hole in its centre and elevated supporting legs, which was placed on the opening of a special, large clay jar used for storing the honey, called a “melopitharo” (Fig. 18), (Loukaki 1964; Bikos 2012c, 319). This “melopitharo” had a wide groove around the rim that was filled with water to prevent ants from reaching the honey (Zymbragoudakis 1979, 51; Blitzer 2004, 162). This jar was usually placed on ash for insulation and protection from moisture. Sometimes instead of a “melopitharo” they used a “melokouroupa” (Fig. 19), which had the same use but the shape of a “kouroupa” jar (Vallianos & Padouva 2016, 45).

The material left over from draining the combs was then sprayed with warm water so that the last remnants of honey would dissolve and was boiled in order to harden into a second-rate sweet substance called “houmeli”. This substance could also be used to produce the alcoholic beverage raki (Bikos 2012c, 318). The dirty wax was also boiled and put into the “kerosakoulo” (waxbag), which was pressed over an inclined board with a piece of wood (Fig. 20) so that the water and melted wax passed through the holes of the cloth. The material left in the wax bag was called “kasokera” (Zografakis 1891).

Fig. 20. Harvesting receipt for the wax from the "kerossakoulo" (photo E. Vassilakis).

The main enemies of the bee in Crete were wasps (*Vespula germanica*) and "svouroi" (hornets – *Vespa orientalis*), which could cause serious damage to the apiaries under certain circumstances. The measures taken by beekeepers against them included traps (Pelekanakis 1964) and the killing of these insects. In the village of Moustakos in Chania they would lure the hornets using the froth of "houmeli" spread over a rock and then kill them with tree branches ("foundes") (Perakis 1973).

Other enemies were: "melissofades" bee eaters (*Merops apiaster*), swallows and even "arkaloi" (badgers) which were kept at bay using traps called "arkaloplakes". Certain passageways leading to a baited trap were left open and when the badger entered to eat the treat, a stone slab fell on him and "stoned" him (Perakis 1973).

The evil eye was also considered a serious threat for the bees and measures were taken against it. For example, in a conspicuous place they put the skull of a horse, mule or jackal, an "askeletoura" squill bulb (*Scilla maritima*), a cracked black clay pot and eggshells (Perakis 1973; Zymbragoudakis 1979, 51). Also, when they saw that something was not going well with their bees, they summoned those who knew how to undo the evil eye with spells or a priest to conduct a holy blessing (Pelekanakis 1964).

The knowledge of traditional Cretan beekeepers regarding bees was limited. Papadopoli (2007, 191), in keeping with the spirit of his time, did not know the gender of the queen and referred to her as the king.[12] A survival of this incorrect view is found in the name "protos" (the first male) that was used in reference to the queen by beekeepers on the island up until a few decades

12 The female gender of the queen became known at the end of the 16th and especially in the 17th century (Crane 1999, 569-570). For the beekeeping knowledge of Papadopoli see Harissis & Mavrofridis 2012, 271; Mavrofridis 2014, 411-412.

ago (Loukaki 1964). Traditional Cretan beekeepers also believed that the wax was collected by the bees from certain plants like the myrtle (Loukaki 1964) or that it was made by the bees from the "kerathos" (Zografakis 1891), i.e. the pollen they carried to their hive. Of course, they did not know that this pollen was meant as food for the brood, nor did they know about royal jelly. They did know about propolis and called it "keropolis". As for the drones, they called them "argoi" (the idle ones) and believed that they led the worker bees to their work stations and supervised them (Zografakis1891).

But despite his lack of knowledge regarding bees, which was after all common to all traditional beekeepers, the Cretan beekeeper using hives with movable combs, practiced beekeeping with sophisticated methods and practices, in the most rational and effective way that has ever been recorded prior to the invention of the modern frame hive. After all, it is through the principles of movable combs and under their undisputed influence that we arrived at modern beekeeping as it is practiced today, both in the developed and the developing world.[13] But even users of horizontal, fixed comb hives in Eastern Crete, with their practice of creating combs parallel to the hive openings and alternating harvest, practiced beekeeping in a clearly more rational way than their counterparts in the Aegean Sea and generally in the Eastern Mediterranean.

Finally, traditional beekeeping in Crete began to be abandoned in the 1930s, with governmental encouragement and with the subsidy of the modern hive. This downhill trend was completed in the 1980s with the "help" of the Varroa mite (*Varroa destructor*), a parasite of bees from Indochina that could not be successfully combated within the limitations of traditional beekeeping.

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13 For the influence of traditional Greek movable comb hives on the development of beekeeping worldwide see: Crane 1983, 209-212 & 1999, 414-424; Mavrofridis & Anagnostopoulos 2012, 484-485; Mavrofridis 2017a, 310-316 & 2017b, 190-193.

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