



# Queen Rearing in Sardinia

## A Visual Ethnography of Beekeeping

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**Abstract:** Drawing on an ethnography of beekeeping in Sardinia, Italy, this paper examines the challenges of conducting visual ethnography with non-humans. Inspired by silent books – a genre of wordless illustrated children’s literature – the author explores how a multispecies approach can inform visual ethnographic methods, proposing the concept of visualizing non-humans through a silent ethnography. By exploring the theories that shaped the series of drawings depicting the *chaîne opératoire* of queen bee rearing in Sardinia, the paper interrogates the possibility of crafting a visual ethnography without verbal language. Rather than adopting the conventions of a graphic novel, these drawings seek to render the intimate relationships between humans and non-humans, resisting the hegemony of written text. Finally, the contribution proposes that drawing can be a fruitful learning process to see non-humans in anthropology.

**Keywords:** Visual ethnography; Multispecies ethnography; Visualizing non-humans; Beekeeping; Sardinia

## Introduction

About a year ago, I moved from Italy to Austria with my toddler. Almost immediately, I hired a *Leihoma*, that is, a paid granny, to help my toddler (and me) with the language.<sup>1</sup> Since reading is one thing she likes, my toddler urged

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<sup>1</sup> This paper grew from an ongoing stimulating debate that I had with different colleagues and friends. I thank Sanderien Verstappen for her encouragements in pursuing my interests in drawing as a visual ethnographic method. I thank Francesco Zanotelli, Fabio Malfatti, and other members of the Centro Ricerche EtnoAntropologiche for their kind comments to the initial draft of the series. I am especially grateful to Paul Katterl who helped me to organize the final set-up of the Queen Rearing series. I thank my beloved “book dealer” Michela Calleda from the independent bookshop *La Giraffa. Libri e altre meraviglie* for providing me with the newest and marvelous illustrated children books that

the lady to read her books. However, she could not read Italian books. I have a public library just downstairs. A very fortunate coincidence, because borrowing books helped me refresh my German skills and my toddler acquired a new vocabulary.

Nevertheless, my toddler expected the same stories in Italian *and* German, which was not always possible. Thus, I started looking for illustrated books that the *Leihoma* and I could read in our respective languages. This is how I came across the book *Le roman noir du Jardin* (2024) by French illustrator Thierry Dedieu. This black-and-white, ink-illustrated book narrates the “dark side” of what happens to small critters whose lives and deaths occur on the ground of a garden. It begins with the image of a flower and a dragonfly approaching it. The insect falls at the base of the flower and its death activates a series of chain reactions from ants, a spider, a mantis, other flying insects, a toad, a big snake, and an owl. The non-humans in the book are not drawn into stereotypes shapes. Instead their bodies’ silhouettes are illustrated from reality. It is a marvelous visual representation of a garden brimming with life (and death). Most importantly, this is a silent book; no written text accompanies the images. The more I unfolded the pages, the more I realized how the narrative is not fixed in specific words but generates knowledge from the pictures. The story depends on how much the reader *knows* about the lives in a garden.

I was acquainted with Dedieu’s work because I already had two more of his books: *The Carnet de voyage autour de mon étang: Le cahier naturaliste d’une grenouille* about the frog Marie-Louise Dumarais (2023) and *Carnet de voyage auprès de mon arbre: Le cahier naturaliste d’un lapin* about the rabbit Edmond de Garenne (2022). The illustrator designed them as fieldwork notebooks, combining photography, ink, watercolors, and pencil sketches to illustrate what the two animals may see around their home. All the images are real-life representations of non-humans, with a few pages focusing on color, hues, and shapes. From a multispecies ethnography standpoint, these books are a remarkable attempt to tell a story visually from the perspective of non-humans, from the ground. While Dedieu’s books don’t strive to speak for the animals, I consider them an outstanding example of the possibilities that visual ethnography offers in exploring multispecies environments. They represent inspirational mediums for my work.

Anthropologists who have attempted to investigate human and non-human relationships with visual methods have faced the challenge of telling the story

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inspire my drawings. The current paper was improved with the precious comments of the anonymous reviewers. Finally, I am grateful to the kind comments of Jacob Jansen who helped me in the final stage of this paper.

of silent beings (Abbot 2020). On the one hand, the audio-visual equipment can boost the ethnographer's senses and help them better engage with tiny critters (Meloni 2018). On the other hand, how we tell those stories involves ethical responsibilities concerning how we (humans) *speak for* non-human beings without the risk of reinforcing a colonizing gaze on them. Hence, despite the genuine efforts to *take seriously* the non-humans in our research, we can't entirely avoid the risk of objectifying non-humans by reproducing humans' understanding of them. This problem recalls the debate about subaltern voices and how anthropologists speak for them (Spivak 1988); the risk of misrepresenting non-humans from a colonizing perspective is tied to how Western societies have built knowledge about non-human species. After all, ecological knowledge in Western societies is closely tied to the European history of colonization and capitalism. This is particularly true for beekeeping.

Simply consider that *Apis mellifera* is commonly referred to as the *Western honey bee* or the *domestic honey bee*, which already indicates the close link between beekeeping and colonization and domination (Ingold 2000). Before Europeans' "discovery" of America, *A. mellifera* was absent from the American environment. In 1620, European settlers successfully imported European honeybee colonies to North America (Horn 2006). Along with them, they also imported and distributed various plant species, for instance, the *Malus domestica*, the apple tree. Likewise, European settlers imported the *Prunus dulcis*, the almond trees, during the 1800s. All three species have had a substantial cultural, social, and political impact on the present-day economic configuration of the North America. The colonial-era introduction of the European honeybee facilitated the expansion of monoculture agriculture and disrupted native ecosystems through competitive interference between species. However, the attempted colonial commitment to control "nature" produced a kind of ecological blow-back, as some species escaped imposed hierarchies. Today, pollinator decline threatens the USA's food security and the very core of the capitalist industrial system, but it also reflects the larger systemic backlash – a consequence of the same system that privileged certain species over native ones (Nimmo 2015; Suryanarayanan and Kleinman 2013; Kleinman and Suryanarayanan 2020).

But even when the awareness of the colonial history involving non-human species would inform visual anthropologists' practices in the field, an obvious fact remains problematic and to be fixed: non-humans do not talk back, meaning "interviewing" non-humans does not involve verbal communication (Hartigan 2017). In previous contributions, I have argued that the audio-visual equipment boosted my human senses, allowing me to "see" and "listen" more than my human eyes and ears could do (Meloni 2018; 2023). Here, I contend that, nevertheless, from a purely visual anthropology perspective, filming *with*



non-humans necessarily posits limits in engaging with the kind of attunement that allows the ethnographer to visualize the multispecies world in their ethnographic inquiry.

This contribution discusses the series of drawings *Queen Rearing in Sardinia: A Visual Ethnography* (Meloni 2025). It is a series of nineteen digital drawings disguised into the structure of silent books, which describe my interpretation of queen rearing practices based on the ethnography of beekeeping I conducted in Sardinia (Italy) between 2016 and 2022 (Meloni 2023). The drawings are not intended to be accurate, realistic pictures of events. They also do not claim to represent reality in any objective way (Dix et al. 2019). Instead, they combine participant observation and interviews with different Sardinian beekeepers and the analysis of multiple moments before, during, and after fieldwork. It is an attempt to visually describe the *chaîne opératoire* (Leroi-Gourhan 1964; It trans. 1977), highlighting how humans and non-humans reciprocally make each other in flesh and hemolymph. In what follows, I discuss how I developed the concept by combining multispecies theories with debate in visual anthropology.

## Visualizing non-humans in anthropology

Drawing is not a new practice in anthropology. Beyond how drawings have been used when cultural anthropology emerged as a discipline, the way anthropologists use drawings nowadays is manifold. There is a growing body of literature that utilizes comics and other forms of storytelling to convey complex stories to a broader public beyond the academic community. In many cases, these “graphic” ethnographies result in anthropologists engaging in a form of collaboration with artists who visually translate the written text (Hamdy et al. 2017; Sopranzetti and Fabbri 2021; Haapio-Kirk 2022; Fiske and Fischer 2024). Some anthropologists use drawings as fieldwork notes to collect non-verbal aspects of the field (Hendrickson 2008; 2019; Taussig 2011; Bonanno 2019), or they draw to engage into a deep way of seeing (Kuschnir 2016; Causey 2017). Anthropologists also use drawings to explore the communities’ perceptions of territories (Tallè 2023), and traumatic experiences (D’Onofrio 2019; Povinelli 2021; Rumsby and Thomas 2022). The variety of artistic styles and techniques that anthropologists choose to convey their work visually is only partially represented in the online exhibition *Illustrating Anthropology*, curated by Laura Haapio-Kirk and Jennifer Cearn, <sup>2</sup> All these works advocate for en-

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<sup>2</sup> <https://illustratinganthropologycom.wordpress.com>

gaging in the emerging subfield of “graphic anthropology” as a way to challenge the disciplinary borders to embrace diverse modes of collaboration to produce anthropological knowledge (Haapio-Kirk 2022; Theodossopoulos 2024; Theodossopoulos, Dimitrios 2022).

My approach to drawing non-humans resonates with Kashanipour’s (2021) interest in cultivating the ethnographic gaze by engaging in a heuristic practice. I consider drawing as a process of learning how to “see” the non-human participants in my research, by training my eyes and my senses to take them seriously. To me, drawing is another form of visual ethnography that was triggered by the necessity to adjust the methods to the research partners.

To Anna Grimshaw, ‘visualizing anthropology’ involves a fundamental reorientation of perspective such that the world is not primarily approached through language, explanation, or generalization, but through a re-embodiment of the self as the foundation for renewed engagement with everyday life (Grimshaw 2002, 11). She explains that an “ethnographic eye” must be cultivated by fostering a different sensitivity to the non-verbal and material aspects of the world (*Ibid.*), developing a “skilled vision” (Grasseni 2007). Doing visual ethnography with non-humans requires a profound attentiveness to the non-verbal sensorial nature of non-human beings and an awareness of the ontological positionality of our gaze (Favero and Lehmuskallio 2025).

I argue that filming non-humans is imbued with the Western ontology dichotomy between “nature” and “culture” (see Latour 1994; Haraway 2008; Kohn 2013; de Castro 2015). Simply put, when we look at non-humans through the camera-eye, we are taking an exact position, that is, the non-humans before us, and the rectangular frame shows what’s in front of us like a landscape. In other words, the camera physically and symbolically separates the viewer from the viewed, giving the former the impression that they have full control over the latter because they can embed it into a fixed frame.

In sum, we take the binocular standpoint of a hunter who holds a gun and points at the prey before them. The process and the final result are very similar to the work of the Italian Vedutists, in which beautiful landscapes are shown in a rectangular frame organized according to the rules of perspective (Grimshaw 2001; Favero and Lehmuskallio 2025). Furthermore, notwithstanding some successful efforts to generate alternative ways of doing anthropological cinema are based on a sensorial dimension, or the attempt to break the cinematic narrative canon, the hegemony of a word-based structure that gives importance to the voice of the subjects poses tensions in present-day visual ethnography production (MacDougall 1998; Grimshaw 2022). This tension reflects on the hegemony of scientific textual research in the academic environment. Besides, the relationship between *doing* anthropology and *writing* ethnography has ani-

mated a heated debate until very recently. Tim Ingold (2014, p. 3), one of the prominent voices in this debate, argued that anthropology studies with people and learns about them to move forward in reflecting on one's previous experiences. In contrast, ethnography is the study of something built upon looking back over the information collected. The goal is descriptive, to write about people (literally the 'description of the people' from *ethnos* = 'people' and *graphia* = 'description'). I refer here to Ingold's arguments not because I agree with his view. The recent debate within the discipline has highlighted the limitations of Ingold's interpretation. I report here Ingold's distinction between ethnography and anthropology because his ideas, along with the subsequent response by many anthropologists, accompanied my thoughts during fieldwork, forming part of my reflections on my positionality and methodology.



Figure 1: A beekeeper takes a bee larva with the grafting tool and puts it into the artificial queen rearing cell. (Credits: Greca N. Meloni 2025)

Ingold's distinction between anthropology and ethnography was problematic for me in multiple ways, which I will discuss below.

To begin with, since I belong to a family of Sardinian beekeepers, I was initiated into beekeeping knowledge as soon as I could take my first steps. This means

that I *knew* bees and how they behave, but most importantly, I had embedded knowledge in many aspects, such as queen rearing. I cannot remember when I developed the skills to gently take larvae from a frame with the grafting tool and put them into an artificial queen cell to make new queen bees (Fig. 1). This does not mean I was not in the field to learn with the beekeepers. To embody the *skilled vision* of research partners could have put me at risk of not taking their voices seriously. Nevertheless, through a deep process of self-reflection on my positionality (Meloni 2018), I embraced the opportunity to learn with my body on how to “dance” with the bees, together with the beekeepers from the Sarrabus. I learned from them to take seriously what flowers tell about the ecosystem’s functioning, and I learned how global and national perceptions of biodiversity may affect local multispecies assemblages.

My second element of tension with Ingolds’ concept is that I conducted field-work with a camcorder. I filmed beekeepers working with bees and the reactions of bees to beekeepers’ gestures. Using a professional camcorder helped boost my senses: I could “see” better and “listen” more accurately to the different bees buzzing around me (Meloni 2018; 2023). But as I progress toward an anthropological career, the supremacy of the “graphic” in this job is unmistakable. I should write. I *must* write.

The process of writing the dissertation and revising it made something utterly clear to me: Despite my efforts to engage in a multispecies approach and turn my gaze on the non-human encounters, and notwithstanding the possibilities to transcend my human body’s limits with the help of audio-visual equipment, I was still “plant-blind” (Hartigan 2017; 2019). I lacked the expertise that would allow me to acknowledge the difference between plant species relevant to the lives of bees and their keepers. While I could notice their agency (Bennett 2010; Tsing 2015) in shaping perceptions of the Sardinian identity and in what I called the Human-Bee-Environment relationship (Meloni 2023), I could still not *see* them.

In my understanding of Bennett’s concept of “small agency” (Bennett 2010) and Tsing’s notion (Tsing 2015; 2023), practicing the “art of noticing” non-human species means acknowledging their presence, paying attention to their agency, and analyzing how they might impact human lives and social relationships.

However, *seeing* them is something somewhat different. It means developing the expertise to distinguish the differences among families in colors, shapes, functioning, and blooming. That is, see them as beings, and to know how they work and behave. In practice, it means developing the ability to see the fundamental difference between a *Pyrus amygdaliformis* and a *Pyrus plaster*.

This is not a meaningless difference in Sardinia. Sardinians’ sense of belonging is deeply entangled with environmental issues, which inform policies for

managing autochthonous vs. allochthonous species (Meloni 2021). The mainstream notion of the Sardinian identity, which I explored in my research, pivots around the idea that the wild appearance of the island's landscape is fundamentally connected to the inhabitants' alleged wilderness and untamed temper (Meloni 2023).

Thus, *noticing* the agency of non-human species is one thing; however, *seeing* non-human species allows me to analyze at a deeper level how Sardinians' sense of belonging and identity claims are built in intimacy with the environment. Most importantly, it enables me to shed light on the intimate exchange between humans and non-humans and how they mutually constitute each other. Returning to the difference between the *Pyrus pyraeaster* and the *Pyrus amygdaliformis*, I must point out that both species are of bee interest and are considered to characterize the Sardinian landscape. However, according to botanist Ignazio Camarda, the "real" wild pears (*Pyrus pyraeaster*) are only present in the mountains, whereas *Pyrus amygdaliformis* is the most widespread on the island. Given how beekeepers' narrative about the "wilderness" of their bees and themselves was often described *in relation* to the presence of these trees in the landscape, I needed to develop the ability to *see* plant species in my field.

But how to do it?

Social anthropologist John Hartigan Jr. faces a similar problem in his ethnography on botanical gardens in Spain (Hartigan 2017). In seeking a way to "interview" the plants in the botanical garden in Madrid, he then embarked on the attempt to draw as a method to conduct ethnographic fieldwork with silent beings (Hartigan 2017). Moving from Holdrege's urge to take the plant seriously by *looking* at it (Hartigan 2017, 255), Hartigan began questioning his notion of "interview" and started drawing plants. However, his lack of confidence in drawing made the process somehow hard. On the other hand, I learned drawing and painting techniques at the Artistic High School, which was designed to prepare students for admission to Art Academy. There, I spent a substantial part of my teenage years portraying human figures and still life. Thus, when I began drawing the first plants (Fig. 2), it came natural to look at them, focusing on the peculiar lines that make an *Arbutus unedo*'s leaf different from that of a *Pistacia lentiscus*. I did not *start* to draw *in* the field but did so *after*. Further, I did not focus on *capturing* in drawings (instead of writing) my experience during fieldwork (Taussig 2011; Causey 2017; Bonanno 2019). I gathered all the books I had about Sardinia flora, spread them on my desk and worked in conjunction with my laptop, constantly switching between *Sardegna Foreste* website<sup>3</sup> and the

<sup>3</sup> See: [https://www.sardegnaforeste.it/flora\\_fauna/flora](https://www.sardegnaforeste.it/flora_fauna/flora)

*Dryades project database.*<sup>4</sup> I felt I was not interviewing the plant in Hartigan's sense; instead, I was portraying the plants like I used to portray human beings.

## A silent ethnography of beekeeping



Figure 2: Modditzi (*Pistacia lentiscus*). (Credits: Greca N. Meloni 2022).

In my dissertation, *Making Honey-Making Identity. Policies and Beekeeping in Sardinia* (2023), I contend that honey bees are beekeepers' *companion species* (Haraway 2003) and *gatekeepers*. By engaging in a daily relationship with a stinging insect whose community's dwelling and thriving intertwines with that of plant species communities, human keepers are drawn into the intricate multispecies

<sup>4</sup> See: <https://dryades.units.it/home/index.php>

interdependence of ecosystem functioning. Beekeepers develop an intimate attunement to the intra-action and co-actions of various organisms that together co-create the environment (Meloni 2023, pp. 216-218). For pollination affects the environment, and beekeepers participate in the co-creation of the landscape by practicing nomadic beekeeping and by doing regular beekeeping practices. In this multispecies exchange, beekeepers develop their sense of belonging and understanding of Sardinian identity. I must point out that from a native Sardinian standpoint, environment does not merely belong to the “natural” world. Instead, following anthropologist Cosimo Zene’s interpretation of *su connotu* (Zene 2007), the environment can be inherited, handed down from the ancestors, and it is the duty of living people to *keep* it, to take care of it. However, there is no unique understanding of how an environment should be *kept* or cared for (Pitzalis, Zerilli 2013). From the standpoint of beekeepers, protecting the environment means participating in the multispecies relationship that enables the ecosystem to *continue* thriving. Thus, beekeeping is a way of leaving a human trace in the landscape.

However, environment and honeybees are by no means passive subjects of this relationship.

Attempting to reflect on this crucial aspect of my argumentation, I felt frustrated about the limits of text in showing this complexity. I wondered if and how I could tell my ethnography otherwise. Thus, thinking about my ethnographic experience, my embedded knowledge, and my interpretations, I started drawing.

I questioned myself about what I had to offer regarding knowledge that differs from any beekeeping handbook, more than a mere description of information collected in the field.

Further, what makes my ethnography stand out compared to any other description of beekeeping practices?

In an effort to move forward in reflecting on my experience with Sardinian beekeepers, I virtually returned to the field, visualizing in my mind moments of the “involutionary momentum” (Hustak and Myers 2012) of the Human-Bee-Environment relationship in Sardinia.

I mentally divided a year of the beekeepers’ and bees’ lives into the segments of a *chaîne opératoire*. At this point, I did not use the footage, photographs, or notes. I simply played the process in my mind. Since I could/wanted not to make a visual treaty about beekeeping, I needed to focus on one “segment” of beekeeping practices that comprises the mutual interaction with bees and other non-humans, but that can be somehow “isolated” from the other aspects, such as harvesting honey or moving beehives across landscapes. Eventually, I decided to begin with queen rearing, a practice often interpreted as a form of human domination over the insect’s bodies (Kosek 2010; Nimmo 2015). In contrast,

I argue that queen rearing can be seen as a crucial moment of companionship (Haraway 2003) in which humans and bees make each other in flesh and hemolymph. Queen rearing is the process that involves the selection of particular behavioral traits of bees, as well as the manipulation of bees' bodies.

The most crucial Italian most reference on beekeeping, *Le Api. Biologia, Allevamento, Prodotti* states that to begin rearing, the beekeeper must start with an "orphan" colony (a colony without a queen) with many young bees inside and proceed by preparing the artificial cells and frames for that purpose (Contessi 2021, 404, 405). This manual does not differ a lot from more detailed handbooks dedicated to queen rearing.

Keeping this in mind to reflect on the interconnectedness of multispecies agency, I mentally focused on the visual dimension of making a queen. In doing so, I combined multiple times and places into my sketchbook, which served as a base for the series. Later, I photographed my sketches and used them to create digital versions in the software Procreate. Some images result from my own gaze doing queen rearing; others condense moments of my discussions with different beekeepers, including the moments I interpreted their words. Most images are made through remembering rather than copying from footage. However, I needed to return to the pictures or the film for some of them to be more accurate. This is the case, for instance, in the second image (Fig. 3).



Figure 3: Early Spring flowers in Sardinia visited by bees. (Credits: Greca N. Meloni 2025).

This image is intended as a sort of close-up of the previous picture, which shows the blooming of almond trees, the beginning of a new seasonal cycle. In February, some species began to bloom, turning the otherwise monotonous green landscape into a colorful and scented area of buzzing life. With the help of a blooming chart provided by one of the disseminating materials of *Laore*<sup>5</sup>, I selected to draw the species noted as seasonally crucial by beekeepers – following the order of the picture and their Sardinian names: *allu de carroga* (*Allium triquetum* L.), *ollu de axedu* (*Oxalis cernua* Thunb.), *cardilloni* (*Asphodelus microcarpus*), *mendua aresti* (*Prunus amygdalus*), *murdegu* (mostly *Cistus monspeliensis*), *succiameli* (*Borago officinalis* L.), *tuvara* (*Erica arborea* L.), and *archemissa* (*Lavandula stoechas*). Some of them, such as *Oxalis cernua* Thunb., bloom during winter. This is crucial to providing nutrients for the honey bees' colonies after winter.

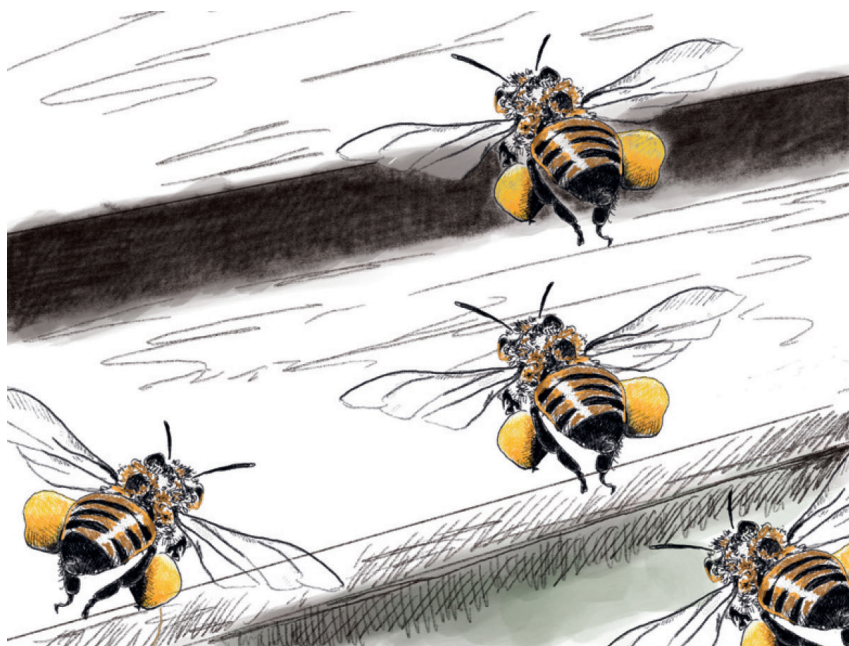


Figure 4: Foragers returning to their hive filled with pollen baskets.  
(Credits: Greca N. Meloni 2025).

<sup>5</sup> Laore is the regional agency for agricultural development.

As soon as other species bloom and the meadow sounds like a buzzing feast, beekeepers estimate which colonies have survived winter and which are particularly thriving. This is done in three steps: First, an attentive observation at the hive entrance to identify how many foragers are flying back and forth with their pollen baskets filled (Fig. 4). bring paragraph below bottom up to position here ↯Second, they measure the weight of the colony by slightly lifting the hives from the back. In winter, bee families tend to reduce the number of individuals to increase the possibilities for the colony's survival over winter with limited supers. Hence, worker bees need a high amount of food to keep the hive warm during winter. Usually, they rely on the supers that they have storage in the hive because most of the flowers bloom in Spring (Contessi 2021, p. 358). Thus, hive weight decreases over winter. As Springs begin, the weight rises according to the colony's conditions. A prospering hive weighs more because frames contain pollen, nectar to feed the growing colony, and larvae. After this is done, beekeepers open the hives to see what is happening in the frames from the inside. Beekeepers slowly unfold the brood frames, "reading" each side's composition, lifting each one carefully, and seeking the queen with their gaze. The whole process is usually done in silence.

Beekeepers are simultaneously *looking* at where and how many eggs the queen has laid. They attempt to determine whether there are enough stock-piles of nectar and pollen, *listening* to the sound of the colony, and *smelling* what comes from the hive. It is a moment of profound intimacy between humans and honey bees. When satisfied with what they have learned about the colony, beekeepers then select which brood frames to use. Usually, a frame that contains enough young larvae on both sides and looks clean and neatly organized (Fig. 5) is the ideal choice. They put the frame into a box designed for the purpose to keep brood warm and bring it where they are going to work. Often in Sardinia, there is a gender division of labor in this process (see Meloni 2023). Females clean the artificial queen cells and prepare the grafting tools and the royal jelly to do the process. Males take care of what happens before and after this moment. Once everything is ready, the beekeeper inspects the brood frames again, looking for the *right* larvae to be taken. The larvae are usually no older than three days; however, five-day-old larvae may be needed. Once the beekeeper has decided which larvae to take, they moisten the grafting tool with saliva to make it easier to lift the insect from the frame's cell to the artificial cells where there is already a drop of royal jelly to nourish it. Then again, the tiny spoon of the grafting tool goes into the beekeeper's mouth, and again into another frame's cell. This process is repeated until the queen rearing frame is completed (Fig. 6).

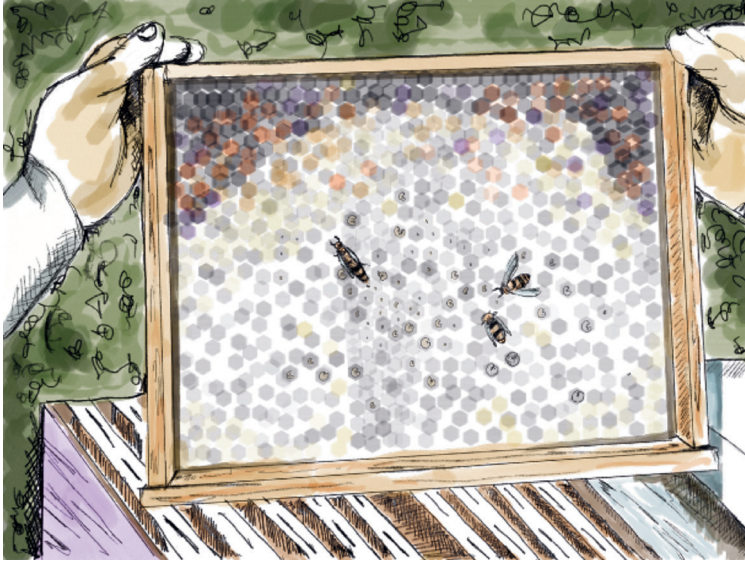


Figure 5: The beekeeper is examining the frame and evaluating the presence of the queen, stockpiles, and young brood. (Credits: Greca N. Meloni 2025).

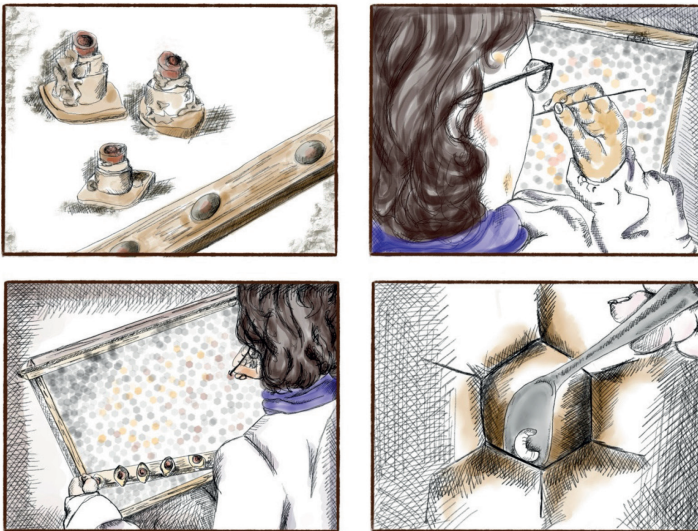


Figure 6: Composition of drawings that explain the queen rearing process. (Credits: Greca N. Meloni 2025)

I want to stress here how delicate and crucial this moment is, for it determines the future of honey bees and shapes their bodies and the environment. The saliva's moisture on the grafting tool adds the human microbiome into the queen bee's artificial cell, mixing with the colony's original microbiome carried by the larvae from the brood frame. The rearing frame is placed in the middle of a queen-rearing hive, where nursing bees from two "orphan" colonies (without a queen) take care of them for the following days, until the cell is capped with bee's wax (Fig 7a and 7b).

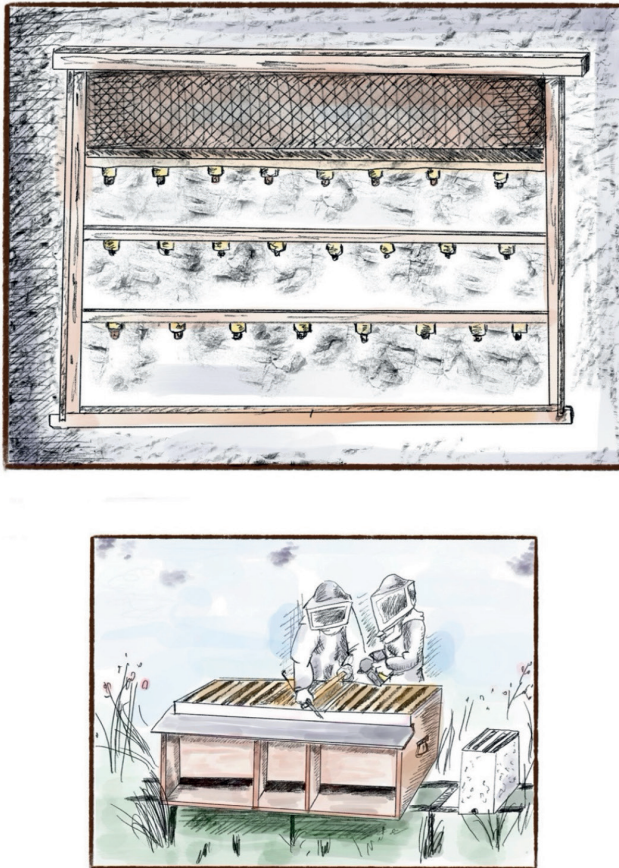


Figure 7a and 7b: Composition from the series. Above is the queen-rearing frame completed. Below two beekeepers are inserting the frame into a queen rearing hive. (Credits: Greca N. Meloni 2025).

During this time, the queen-to-be exchanges bacteria and other microorganisms that will influence her gut microbiota, which eventually will be passed down to bees when the queen begins laying eggs in a new colony. Recent studies suggest bees' microbiota mutually interrelate with the rhizomatic networks sustaining ecosystems and forests (Kakumanu et al. 2016; Hariprasath et al. 2025). The colony's microbiota and the environmental and soil microbiome will reciprocally exchange microorganisms. By bringing back to the hive the environmental microbiome carried in pollen and nectar, honeybees shape humans' bodies and microbiomes. Beekeepers are not merely exposed to the hues and humors of the hives; they also consume honey, propolis, royal jelly, and pollen from their colonies. These products are chemically and molecularly linked to the environment as much as to the bees (Utzeri et al. 2018).

Further, the beekeepers *and* honeybees feed their children and relatives with these substances, creating a circularity in the human-bees-environment microbiome. On the one hand, beekeepers manipulate the bodies of honeybees by selecting behavioral traits according to their way of beekeeping and alter pollinator-plant dynamics within ecosystems by moving beehives. On the other hand, bees and the environment are not passive subjects. Honeybees might accept less than 30% of the larvae selected by humans for the queen rearing frame. Then, after beekeepers have inserted the capped, elongated queen cells into nucs (small new families), they bring them into a secure area to let them remain undisturbed (Fig. 8).



Figure 8: Nucleus (nucs) with virgin queens in the mating area. (Credits: Greca N. Meloni 2025)

The virgin queen decides which male drones to mate with. Beekeepers can choose mating locations; drones from other beehives may fall into the mating range around this. However, the queen will decide how many and with which drones she should mate with before returning to her hive (Fig. 9). To let “nature do its course”, as beekeepers say, they do not *disturb* the hives for roughly a month. Then, the beekeeper returns to the mating area to evaluate the new colonies and determine which are strong enough to be transferred to a regular 10-frame hive. In doing so, the beekeeper “helps” the new colony by providing extra stockpiles of nectar and pollen and offering a few wax foundation frames. The latter serves as a “starter” so that “bees don’t have to do all the job alone”. The process can be considered positively completed when the queen lays eggs, the brood appears healthy, and bees actively pollinate.



Figure 9: A queen bee mates with multiple drones. (Credits: Greca N. Meloni 2025).

## Final thoughts

The series of 19 drawings *Queen Rearing in Sardinia. A Visual Ethnography of Beekeeping* is a visual representation of the *chaîne opératoire* on how different Sardinian beekeepers rear queen bees. It conjoins multiple times and experi-



ences that occurred before, during, and after fieldwork into single frames. Yet, it does not represent human actions and how they manipulate honeybees' bodies. Instead, by taking on a multispecies, ethnographic gaze, my drawings seek to stress the reciprocal relationality of beekeeping. I attempt to visualize the non-human agency in what I defined as the Human-Bee-Environment relationship.

Queen rearing represents an outstanding example of how deep human intervention is in designing non-human bodies and anthropizing the environment. However, the drawings invite viewers to *see* how deeply bees and the environment shape human bodies and, in turn, their (bio)cultural and social relationships. In this sense, drawing ethnography seems a powerful tool to disseminate ethnographic inquiry beyond language barriers and academic borders. Hence, I use the drawings for different purposes, including teaching university students and small children during dissemination activities. Through *Queen Rearing in Sardinia*, I propose that drawing is not simply a passive representation of an object/subject before our eyes. Instead, drawing is a practice of co-becoming – an embodied, sensorial dialogue that attunes us to the entangled lives of bees, plants, humans, and microbes. Drawing cultivates a situated way of seeing, one that challenges the visual hegemony of anthropocentrism and the primacy of textual ethnography.

Focusing on the *chaîne opératoire* of queen rearing unveils the shared microbial choreography of flesh, wax, and hemolymph that is hidden in the sequence of technical steps to create new queen bees. My visual ethnography thus becomes a silent yet affective mode of inquiry, highlighting how Sardinian beekeepers do not simply manipulate bee bodies but are themselves shaped – physically, culturally, and ontologically – by their intimate interdependence with non-humans and the land.

In this sense, drawing becomes a method of reciprocal recognition: of noticing and learning to *see* the subtle intra-actions that compose life in multispecies worlds. It is a way of cultivating a visual method grounded in care, companionship, and awareness of the porous entanglements of (bio)cultural and ecological life, a way of making ethnography with the bees, not just about them.

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