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NOTES AND COMMENTS



Bee brood as traditional human food on Andros Island, Greece

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ABSTRACT

Entomophagy, the consumption of insects by humans, is a traditional practice in many countries around the world. In the northern part of Andros Island in Greece, a significant number of the inhabitants used to include bee brood in their diet. In this scientific note, results are presented from conducted interviews of field research during 2020 and 2021. The consumption varied greatly regarding the way bee brood was prepared (raw to well-cooked) and was abandoned ca. 60 years ago.

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Entomophagy, the consumption of insects by humans, is a traditional practice in at least 113 countries around the world, and more than 2,100 species of insects are known to be edible (Jongema, 2017). The nutritional value of insects is important because of the considerable amount of protein contained which varies from 20 to 76% on dry matter depending on the type and development stage of the insect (Kouřimská & Adámková, 2016). Bee brood is rich in proteins, fatty acids, vitamins and minerals, contents that make it a first-class food for humans. To be added to the above, bee brood has a pleasant taste and versatility in culinary preparations (Jensen et al., 2019).

The bee brood (larvae, pupae) of the genus *Apis* is consumed in several parts of the world. Traditional eating of such food has been documented in Asia (Japan, China, Vietnam, Myanmar, Thailand, Philippines, Malaysia, Nepal, India), in Sub-Saharan Africa (Sierra Leone, Nigeria, Ethiopia, Congo, Uganda, Kenya, Tanzania, Angola, Zambia, Malawi, Zimbabwe, Botswana, South Africa) and in America (Mexico, West Indies) (Crane, 1999, pp. 551–552; DeFoliart, 2002; Jongema, 2017; Ramos-Elorduy, 2006).

Until recently, traditional bee brood consumption has never been documented in Europe. A relevant mention, however, appeared earlier in a book by the ethnographer George Speis (Speis, 2016, pp. 150–151) referring to one of his informants from Andros Island, Cyclades, Greece, albeit without any comment. Speis' reference does not seem to have received much attention, perhaps because it was included in a chapter regarding honey harvest. During our field research all over the same island

(Figure 1) concerning traditional beekeeping and the bee houses which were used in its northern part, we documented the consumption of bee brood which was not uncommon there until about sixty years ago. It should be noted that traditional beekeeping played an important role in the local economy of Andros, which is also the case today, albeit apiculture is conducted with modern methodologies.

The research included interviews with elder beekeepers and younger ones being aware of the subject and originating from the entire island. For the interviews, we used an ad hoc questionnaire based on a pre-existing one (Society for the Preservation of Beekeeping Records) to make it more consistent with the purposes of this research. A total of 29 interviews were conducted. Nine interviewees, all from the northern part of the island, reported on the fact of brood consumption. The interviews were conducted by the first author (G.M.) during his several consequent trips to Andros during the years 2020 and 2021, while the second author (T.P.) had the general supervision of the whole research.

Bee brood, both of male and female provenance, was consumed only in villages of the northern part of the island populated by Arvanites (Albanian-speaking Christians) who settled there probably during the first half of the 15th century (Giohalas, 2010, pp. 17–18; Polemis, 1981, p. 102). In the southern part of the island, where Greek speakers live, no bee brood was consumed nor are these people aware of brood consumption by Arvanites. Besides, the two communities did not interact much in the past. It is certain that the Arvanites beekeepers did not practice beekeeping specifically

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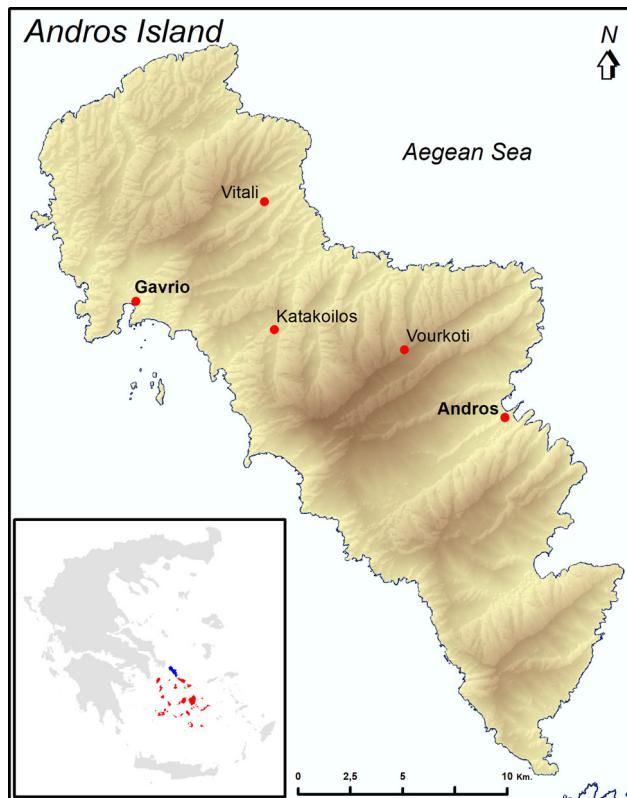


Figure 1. Map of Andros Island showing the locations appearing in the text. Inlet shows the location of Andros Island (blue) within the Cycladic complex (red).

for the production of bee brood, as their activity targeted mainly honey.

The northern part of Andros is stony and relatively barren. In the past, the Arvanite peoples of the region were isolated in their villages and lived from agriculture, small-scale livestock and beekeeping (Polemis, 1981, p. 97). Any food source was of great importance to the local population, let alone a source of protein, such as the bee brood. The inhabitants of the villages in northern Andros since long had realized that bee brood was a valuable food and, according to our informants, they pressured their children to consume it, considering it as a "particularly strengthening" nourishment. In fact, the consumption of bee brood was not associated with any ritual practices or beliefs. Even though not all the inhabitants of northern Andros consumed bee brood, the actual consumers including a great number of beekeepers and others who were able to obtain it from the producers. For all of them, the consumption was performed on a more or less regular basis.

Depending on the area within northern Andros, brood was harvested from the hives together with honey, either once (in summer, after the flowering of thyme – *Thymbra capitata*) or twice (once in summer; and again in autumn, after the flowering of heather – *Erica manipuliflora*). In some cases, brood harvesting was facilitated by the type of hives used: Compared to the southern part of the island, in the

northern part built cupboard-hives were widely used, which were unknown in the south.

The brood was consumed in various ways. A simple way was to be eaten raw along with the comb, which often contained honey as well as pollen (bee bread). Our informant Nikolaos Mandarakas, from the village of Vourkoti, stated that "as a child I was pushed by my parents to eat the brood embedded to the honeycomb considered to be strengthening, however against my wish; so, finally, my parents themselves did consume it". A similar way of bee brood consumption has been recorded in countries of Africa (Sierra Leone, Kenya, Tanzania, Zambia, and Angola), in the West Indies, in Japan, in Thailand, and in Nepal (Crane, 1999, p. 552; DeFoliart, 2002).

A second way of consuming raw bee brood was by squeezing the relevant combs by hand and drink, especially the children, the white liquid resulting from the mashed brood which also contained a quantity of honey and pollen. As far as we know, such a bee brood consumption type has not been recorded elsewhere.

In northern Andros the bee brood was also cooked. Our informants testified that in the village of Vourkoti the bee larvae were fried. This is similar to what was known as practice in China, Thailand, Malawi, and Zambia (DeFoliart, 2002). According to Jensen et al. (2019), the methods of dry heat (frying,

roasting, baking, drying) create crispy and crunchy textures and can bring out "meaty", "bacon-y", "liver", and "mushroom" flavors in bee larvae due to the caramelizing Maillard reactions that give toasty flavors and brown colors.

In the village of Vitali, according to our informant Stavros Katsikis, "the bee larvae were little-sautéed in a pan and then cooked with rice, as pilaf, to which grated tomato was added". Dishes containing bee larvae with rice, but not as pilaf, are popular in Japan and Thailand (DeFoliart, 2002).

Another way of consuming bee brood in Andros was as a soup, but we do not know how it was exactly prepared. The beekeeper who conveyed the information to us had not tried or seen the soup in question herself; she had heard, however, her father, also a beekeeper, saying that some other people in the area, not his family though, used to make such a bee larvae soup. Similarly, bee brood soup is also a dish encountered in Asia, specifically in Japan, Myanmar and Thailand (DeFoliart, 2002). According to Jensen et al. (2019), the use of wet heat methods (steaming, simmering, poaching) at the appropriate temperature for cooking the bee larvae, gently coagulate its proteins yielding a plump and soft but solid texture and bring out "herbal", "vegetal" and "nutty" notes, as well as a light but distinct savouriness.

Finally, there was another way of consuming bee brood in Andros, which is related to the second way mentioned above. The combs with brood, which also contained some honey and pollen, were squeezed and the resulting white liquid was then boiled until thickened. Boiling of this liquid was considered a necessary step to avoid turning sour. The viscous liquid produced, a kind of broth, was considered particularly strengthening and was consumed in a dosage of one spoonful every morning, along with drinking a glass of water.

As mentioned above, it was George Speis who first mentioned the consumption of bee brood as broth, which was spoken to him by an informant from the village of Katakolos in the late 1990s. Speis' informant, a beekeeper at that time, used to produce 3-4 okas (3.84-5.12 kilograms) of bee brood "broth" each year for the needs of his family.

Common elements of the above practice of bee brood consumption are found in Nepal. Gurang honey hunters of this country have been documented to squeeze the white fluid from the larvae of *Apis laboriosa* into a small pot of heated honey. The resulting mixture was considered to be tonic (DeFoliart, 2002).

We do not know when the consumption of bee brood began in northern Andros and whether the Arvanite inhabitants of the region brought this practice with them when they settled on the island in

15th century. However, it seems more likely that they started eating bee brood on the island as a protein supplement in an attempt to fill the protein gap in their diet due to the difficult conditions in which they lived. The consumption of bee brood was gradually abandoned in Andros around the middle of the 20th century. The last relevant reports refer to the 1950s and 1960s. The reason for abandoning the eating of bee brood should probably be related to the easy access to high-quality protein food by the inhabitants of northern Andros, as a result of economic development and subsequent change in lifestyle. In this course, a large number of the inhabitants abandoned primary production to pursue different métiers, such as shipping and services, the latter mainly in the tourism industry.

At this point, it is worth mentioning that under the current novel foods legislation of the European Union, "novel food" is defined as "any food that was not used for human consumption to a significant degree within the Union before 15 May 1997" (Regulation EU 2015/2283, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2283>). The present research is the first to document that bee brood was consumed regularly before 1997.

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