Ref. Ares(2025)10057413 - 20/11/2025

**SPECIFICATION**

**1. Country**

Türkiye

**Responsible Department in Türkiye**

Name: Turkish Patent and Trademark Office

Address: Hipodrom Caddesi No:13 (06560) Yenimahalle/ANKARA TÜRKİYE

Phone Number: +90 312 303 10 00

E-mail : cidb-ab@turkpatent.gov.tr

**2. Applicant Group**

Muğla İli Ari Yetiştiricileri Birliği (MAYBIR) (Beekeepers Association of Mugla Province)

Address: Muslihittin Mah. Cemal Karamuğla Sok. No:100 Menteşe / MUĞLA TÜRKİYE

Phone Number: +90 252 212 64 85

Fax : +90 252 213 16 92

E-mail : maybir@maybir.org.tr

URL: www.maybir.org.tr

Muğla İli Ari Yetiştiricileri Birliği (MAYBIR) (Muğla Province Beekeepers Association) is the applicant group for this application, while the Muğla Chamber of Commerce and Industry (MCCI) serves as the assisting party, providing support and coordination.

MAYBIR, founded in 2002, is the registrant of the national registration of ‘Muğla Çam Balı’. All districts of Muğla are affiliated with MAYBIR, and the association represents approximately 4,500 beekeepers, all of whom are producers. When these producers wish to engage in export activities, they become members of MCCI.

MCCI, established in 1884, operates as the assisting party in this application. Covering seven provinces under its jurisdiction, MCCI has a diverse membership profile spanning various sectors, from agriculture to tourism, due to the region’s distinct geographical features. The chamber has approximately 9,000 members from different branches of industry and economic activity. In this process, MCCI provides institutional support to MAYBIR, leveraging its experience and network to facilitate and strengthen the application.

**3. Name**

‘Muğla Çam Balı’

**4. Type of product**

Class 1.4. Other products of animal origin (eggs, honey, various dairy products except butter, etc.)

## 5. Description of the product

'Muğla Çam Balı' is a pine honey that produced with the secretion of “pine cotton cochineal” (*Marchalina hellenica*) by the basra beetle which lives on the Turkish pine (*Pinus brutia*).

Table 1. Organoleptic features of ‘Muğla Çam Balı’ (*Honey wheel* was also utilized.)

| | |
|---|---|
| Visual Evaluation | Color Density: from dark to very dark color<br>Color Tone: Normal honey color with greenish fluorescence color (greenish dark brown) |
| Odour Evaluation | Odor Intensity: Middle<br>Odour Description: Woody, resinous and fresh pine odour |
| Taste Evaluation | Sweetness: Middle<br>Acidity: Low<br>Intensity: Middle<br>Bitterness: None<br>Aroma Intensity: Middle<br>Description of the aroma: Woody, fresh, highly aromatic, and balmy<br>Taste: Mild and uncertain taste.<br>Fragrance: Resin and Pine scented<br>Persistence / Aftertaste: Middle |
| Physical Characteristics | Crystallization Rate: Slow<br>Other Features: It has a high consistency due to its low water content. |

Table 2. Physicochemical Features and Aromatic Profile of ‘Muğla Çam Balı’

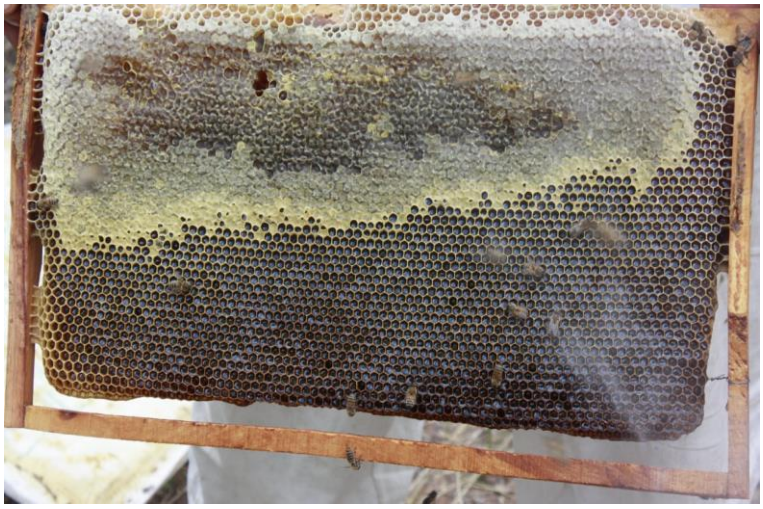
| Physicochemical Parameters | Unit | Quantity |
|---|---|---|
| Humidity (maximum) | % | 18,0 |
| Sucrose (maximum) | g/100g | 3,5 |
| Fructose + Glucose (minimum) | g/100 g | 47,0 |
| Fructose / Glucose | - | 1,0-1,3 |
| Maltose (maximum) | % | 4 |
| Free acidity (maximum) | meq / kg | 36 |
| pH | - | 4,0-5,55 |
| Electric conductivity (minimum) | mS /cm | 0,9 |
| Number of diastates (minimum) | - | 8,5 |
| HMF (maximum) | mg/kg | 15 |
| Proline (minimum) | mg/kg | 400 |
| The value of delta C13 in honey | - | -22,5 and more negative |
| The amount of potassium (minimum) | mg/kg | 1.900,00 |
| The amount of phosphorus (minimum) | mg/kg | 50,00 |
| The amount of magnesium (minimum) | mg/kg | 30,00 |

| Distinctive Aromatic Profile | Unit | Quantity |
|---|---|---|
| α-pinene (The minimum amount of aroma components) | % | 0,40 |
| β-pinene (The minimum amount of aroma components) | % | 0,15 |

'Muğla Çam Balı' is put upon to the market in three forms: honeycomb pine honey, karakovan-honeycomb pine honey and filtered pine honey.

**Honeycomb Pine Honey:**



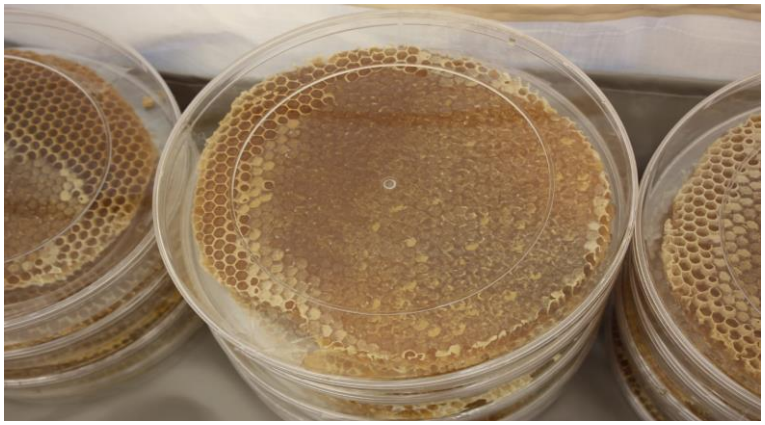




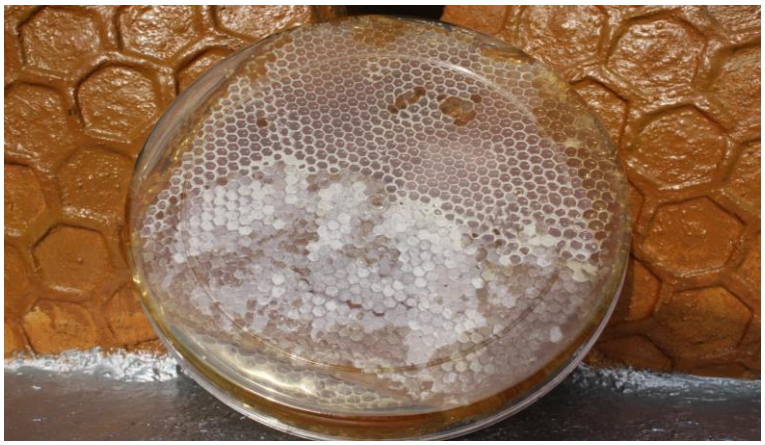


**Karakovan-Honeycomb Pine Honey:**













**Filtered Pine Honey:**



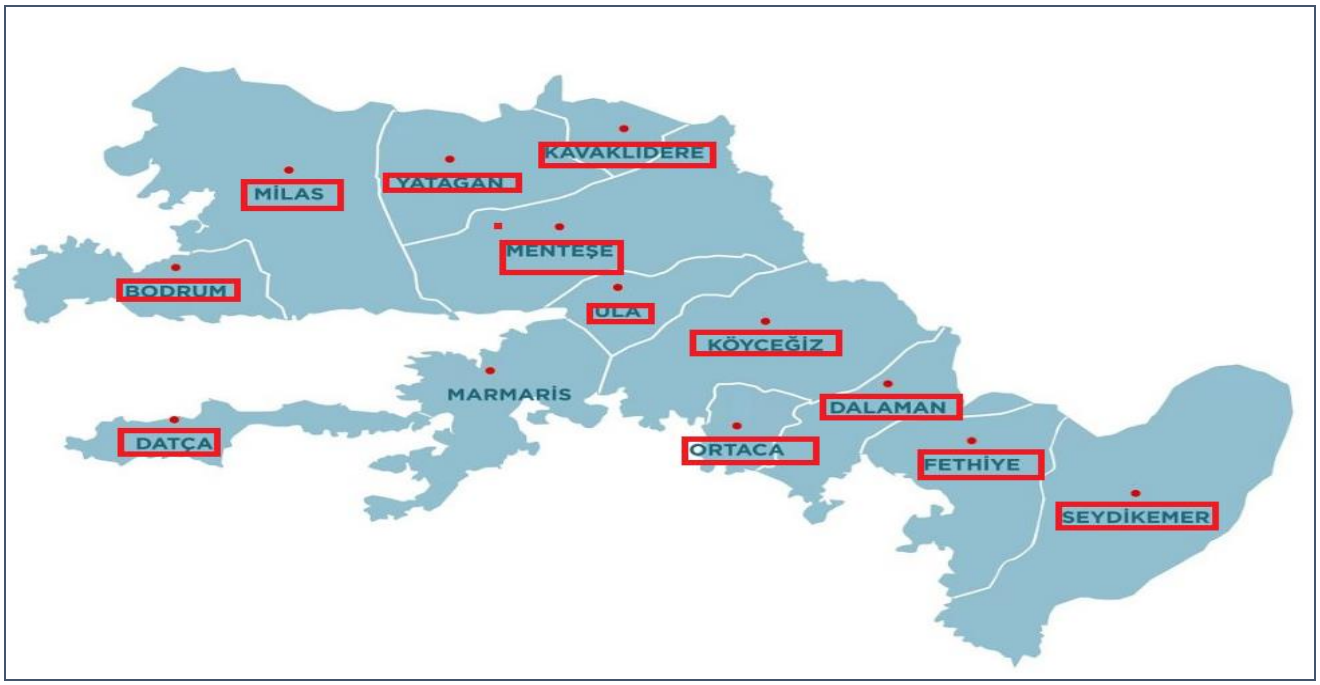




'Muğla Çam Balı', offered in these three forms, is consistent both in terms of the organoleptic characteristics listed in Table 1 and the physicochemical properties listed in Table 2.

## 6. Definition of the geographical area

The demarcated geographical area covers Bodrum, Dalaman, Datça, Fethiye, Kavaklıdere, Köyceğiz, Menteşe, Milas, Ortaca, Seydikemer, Ula and Yatağan districts in Muğla province in Southwest Anatolia of Türkiye.




**7. Proof of origin**

‘Muğla Çam Balı’ inspections are carried out by the inspection board consisting of 5 people (2 specialists from Muğla Provincial Directorate of Ministry of Agriculture and Forestry, 1 academic member from Muğla Sıtkı Koçman University, 1 person from the Beekeepers Association of Mugla Province, and 1 person from Muğla Chamber of Commerce and Industry) under the coordination of Beekeepers Association of Muğla Province (MAYBIR).

Beekeepers Association of Mugla Province keeps a record of 'Muğla Çam Balı’ producers. Producers are registered in the Beekeeping Registration System of the Republic of Türkiye Ministry of Agriculture and Forestry.

Inspections are carried out as follows:

1. Audits are carried out twice a year. The first audit is carried out for producers and takes place between September and November, The second audit is for those who place the product on the market and is carried out in December. Audits are carried out when necessary, in case of complaints from both (producers and those who put the product on the market.)
2. It is checked whether the inspected product fulfills the distinctive physical and chemical features of ‘Muğla Çam Balı’.
3. The use of the 'Muğla Çam Balı’ name, its logo and the Turkish Designation of Origin Emblem and are controlled.
4. When deemed necessary during the inspection, 2 samples are taken, one of which is a witness sample. The analysis fees of the samples in question are covered by the inspected producer, wholesaler and retailer.

The analysis fees of the samples in question are covered by the inspected producer, wholesaler and retailer. In inspections on complaint, analysis fees are covered by Beekeepers Association of Muğla Province.

The inspection board may make use of or purchase services from public institutions or private institutions or real or legal persons who are experts in them during the execution of the inspection. The inspection board carries out the legal processes for the protection of rights.

1- Accommodation documents will be requested from producers and from agricultural provincial and district directorates.
2- During the milking stage, batch numbers are assigned to the produced products/cans, and these numbers are recorded. This batch number will also be recorded. Records will include details such as the production location of the honey, product quantity, producer information, and to whom the producer sold the product. (Information about who the honey was sold to will be obtained and recorded.)
3- Additionally, the individuals who purchase the product will be inspected. Those who purchase the product will be requested to present the price of the purchased product, seller information (from whom it was purchased), and documents related to the purchase transaction (such as the bill of lading).
4- This system is defined to ensure traceability. Traceability will be achieved through this system.
5- Some producers also act as packagers. In this case, relevant producers will be notified that they will be inspected separately as packagers at a different date after packaging.
These steps are measures taken to ensure the traceability of geographical origin information of products and to ensure the quality of products.

**8. Description of the method of obtaining the agricultural product or foodstuff**

Production process of ‘Muğla Çam Balı’:

- 'Muğla Çam Balı’ is the honey produced by *Marchalina hellenica* which lives on pine tree species, by taking the sap of the tree and changing it in its own body in order to maintain its life. In other words, 'Muğla Çam Balı’ is a honey produced by honeybees from the secretion of *Marchalina hellenica*, which feeds on the sap of the pine.
-*Marchalina hellenica* lives almost all its life by settling on the pine tree and sucking the sap.
- *Marchalina hellenica* begins to feed on the sap of the pine tree after the second nymphal stage of its life.
-Approximately 80% of the sap of the pine tree is carbohydrates, and 20% of it is protein.
- *Marchalina hellenica* uses the protein part for its own nutrition, secreting the increased carbohydrate compound.
-The honeydew secreted by *Marchalina hellenica* is ingested by the honeybees.
-Honeybees modify the honeydew with enzymes and store it in the honeycomb cells.
- The moisture of the honey stored in the cell is blown away by the honeybees in the hive and the honey is matured. Then, by harvesting the three-quarters glazed honeycomb, honeydew honey is obtained.

'Muğla Çam Balı’ is harvested by beekeepers between August 15 and November 30. The production of 'Muğla Çam Balı’ shows high dependence on climatic conditions. Namely, during the 'Muğla Çam Balı’ production period, if there is high temperature and low humidity, the production decreases. In the opposite situation, ‘Muğla Çam Balı’ can be harvested 2 to 3 times depending on the weather conditions and the strength of the bee colonies. Generally, the first milking is done in September, the second milking in October, and the third milking in November. In the production of pine honey, producers can harvest intensive honey without any feeding as well as preparing their colonies for wintering by having realized the honey stock. In the specified geographical area, producers can produce 25-35 kg/hive of honey depending on the colony condition and climatic conditions during the pine honey production periods.

'Muğla Çam Balı' is offered to the market in the following 3 ways.

1. Honeycomb pine honey: It is the honey that is stored in the cells of basic combs prepared from pure beeswax that has not been used for incubation purposes or of combs made by bees and offered for sale as completely or mostly glazed. In honeys with combs, at least 80% of the comb must be glazed.
2. Karakovan-honeycomb pine honey: It is the honey produced by the bees together with its karakovan- honeycomb (traditional honeybee hive) without using a basic comb. Karakovan-honeycomb pine honey cannot be supplied to the market as filtered honey.
3. Honeydew honey: It is the honey obtained by centrifugation from broodless combs whose glaze is taken.

**9. Link**

'Muğla Çam Balı' is a honeydew honey produced from the excretions of the Marchalina hellenica (pine cotton cochineal), which feeds on the sap of red pine trees (*Pinus brutia*) located within the demarcated geographical area. Additionally, about 12.03% of the red pine forests (equivalent to 66,560 hectares) are infested with this insect, ensuring abundant and consistent honeydew availability. Commercial production takes place between September and November, when climatic and environmental conditions are most favorable. The commercial harvest period aligns with the peak secretion window, maximizing yield and quality.

The originality of 'Muğla Çam Balı' derives from its physicochemical and organoleptic features result from a unique combination of environmental and human factors in the designated area:

- **Climatic Suitability:** The geographical area experiences hot, dry summers (30–50°C) and mild, rainy winters (0–25°C) and seasonal rainfall (15-264 mm), along with substantial floristic biodiversity and microclimates shaped by rapid elevation changes. The orographic effects and proximity to the Aegean Sea create high humidity levels essential for the secretion activities of *Marchalina hellenica*.
- **Slow Crystallization Rate:** 'Muğla Çam Balı' exhibits a significantly slower crystallization rate due to a fructose/glucose ratio greater than 1. This ratio increases as the production season progresses, especially in the unique autumn conditions of the region, resulting in delayed crystallization and a smoother texture.
- **Higher Electrical Conductivity:** With no annual flowering plants present during the production period (September to November), bees collect honeydew exclusively from pine trees. As a result, 'Muğla Çam Balı' has an electrical conductivity of at least 0.9 mS/cm, compared to the minimum 0.8 mS/cm found in other honeydew honeys.
- **Distinctive Aromatic Profile:** "Muğla Pine Honey" contains aromatic compounds such as α-pinene (average, 3.18±2.08%) and β-pinene (average, 0.66±0.42%)., which are significantly higher than those found in pine honeys from nearby regions such as northern Aegean (1.97±1.55% and 0.43±0.25%) and Antalya (1.49±0.35% and 0.55±0.40%). These compounds, derived from dense red pine forests and influenced by the region's milder climate, impart a characteristic resinous forest aroma
- **Enhanced Mineral Content:** 'Muğla Çam Balı' contains high levels of potassium (1900–4800 mg/kg), phosphorus (50–180 mg/kg), and magnesium (30–85 mg/kg), attributed to the mineral-rich soils of the region. This high mineral content contributes to the honey's darker color and richer taste.
- **Sugar and Proline Profile:** Compared to the Turkish Food Codex (TGK 2020/7) standards, 'Muğla Çam Balı' contains at least 47 g/100 g of fructose + glucose (min. 45 g in TGK), a maximum of 3.5% sucrose (TGK max. 4%), and at least 400 mg/kg of proline (TGK min. 300

mg/kg). The demanding terrain and extended foraging distance increase enzymatic activity in bees, resulting in higher quality sugar profiles.

- **Traditional Beekeeping:** Skilled beekeepers transport colonies to pine forests between August and November, ensuring honey purity by avoiding floral contamination. Practices are overseen by beekeeping associations and veterinary experts.
- **Cultural Continuity:** Beekeeping in Muğla dates back to the Ottoman era. The province established Turkey's first honey cooperative in 1951 and hosts an annual International Pine Honey Congress, underlining its cultural and economic relevance.

These natural and cultural elements endow Muğla Çam Balı with distinctive characteristics that are inherently tied to its region of origin.

**10. Name and address of the authorities or bodies verifying compliance with the provisions of the specification [Article 11/R.510];**

Control Authority

Name: Muğla İl Tarım ve Orman Müdürlüğü (Muğla Provincial Directorate of Ministry of Agriculture and Forestry)

Address: Muslihittin, Hasat Sk., 48000 Muğla Merkez/Muğla TÜRKİYE

Phone Number: +90 252 214 12 50

Fax: +90 252 214 12 42

Email: mugla@tarimorman.gov.tr

**11. Labelling**

The below given logo of the 'Muğla Çam Balı' must be found on the packaging of the product.




**12. Proof of Protection In The Country of Origin**

'Muğla Çam Balı' was registered as PDO on 15.08.2018 to be protected from 24.09.2007 within the scope of the Industrial Property Law No. 6769.

(https://ci.turkpatent.gov.tr/Files/GeographicalSigns/508707c6-1bc6-4498-98a9-382af8510aef.pdf)