Notes on the history and uses of thistles and *Cynara cardunculus* L. in Portugal

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Notes on Ethnobotany

Abstract

This paper presents and discusses some of the historical applications of thistles in the Portuguese heritage, such as in art and in culinary, since Roman times. Nowadays, the use of thistles is almost limited to the manufacture of cheese, where an aqueous extract of *Cynara cardunculus* L. dried flowers is added to milk for the coagulation process.

Keywords: Thistles, Cardoon, Cheese, Cookery, *Cynara cardunculus* L.

Romans and Thistles

In Portugal, thistles were never a primary resource on which humans could rely on for their food needs, nevertheless, thistles found their way to culinary uses and to other applications, such as cheese manufacture (*Cynara cardunculus* L.), medicine [*Silybum marianum* (L.) Gaertn., *Cnicus benedictus* L. and other species] or even to card wool (*Dipsacus fullonum* L.).

During the Roman period, the current Portuguese territory was part of two provinces. The north of the country belonged to Hispania Tarraconensis, and the central and southern part belonged to Lusitania. In Portugal, there are countless Roman archaeological remains and the Roman heritage is still present in many traditions of intangible culture. The most notable is the language, as Portuguese derives from the Latin spoken by the Roman soldiers, settlers, and merchants, who built cities and villages, mostly of them near the pre-Roman settlements.

The only Roman cookbook [*De re coquinaria*] that survived up to our days, is a compilation made in the fifth century, of recipes recorded by an unknown author, although tradition identifies him as Marcus Gavius Apicius, a Roman gourmand that lived during the reign of emperor Tiberius, in the first century AD. In this book, thistles are referred in several recipes, such as [112] *Cardui* [thistles] prepared with salted gravy, olive oil and hard-boiled eggs; [113] *Aliter cardui* [other thistles] prepared with herbs, and [114] *Aliter cardous elixos* [other boiled thistles] prepared with pepper, cumin, gravy, and olive oil (Conceição *et al.* 2018, Dias 2022).

In the agricultural treatise *De re rustica*, wrote by Columella [Lucius Junius Moderatus, c.4-c.60 A.D.], the author refers [Book 7; Chapter 8] the use of thistles as milk coagulants in the manufacture of cheese: *Cheese should be made of pure milk which is as fresh as possible, for if it is left to stand or mixed with water, it quickly turns sour. It should usually be curdled with rennet obtained from a lamb or a kid, though it can also be coagulated with the flower of the wild thistle or the seeds of the safflower, and equally well with the liquid which flows from a fig-tree if you make an incision in the bark while it is still green* (Columella 1954).

We also find references to thistles in *De Materia Medica*, a plant-based treatise written by Dioscorides, a Greek physician to the Roman armies that lived during the first century AD. In 1555, an editor in Antwerp published an illustrated translation, with comments, made by the Spanish physician and botanist, Andrés Laguna (1499-1559), which records many uses of plants in the Iberian Peninsula during the sixteenth century. In the Book 3: Chapter 14 (Figure 1), the health benefits of the thistle were described, as well as several methods to prepare them, especially the young and tender plants. The author differentiates thistles from artichokes, referring the latter as luxuriant food that should be consumed by newlyweds couples. He also wrote that artichoke flowers could curdle raw milk and that young plants partially covered with soil would become whiter (etiolated), more tender and tastier (Dioscorides 1555).

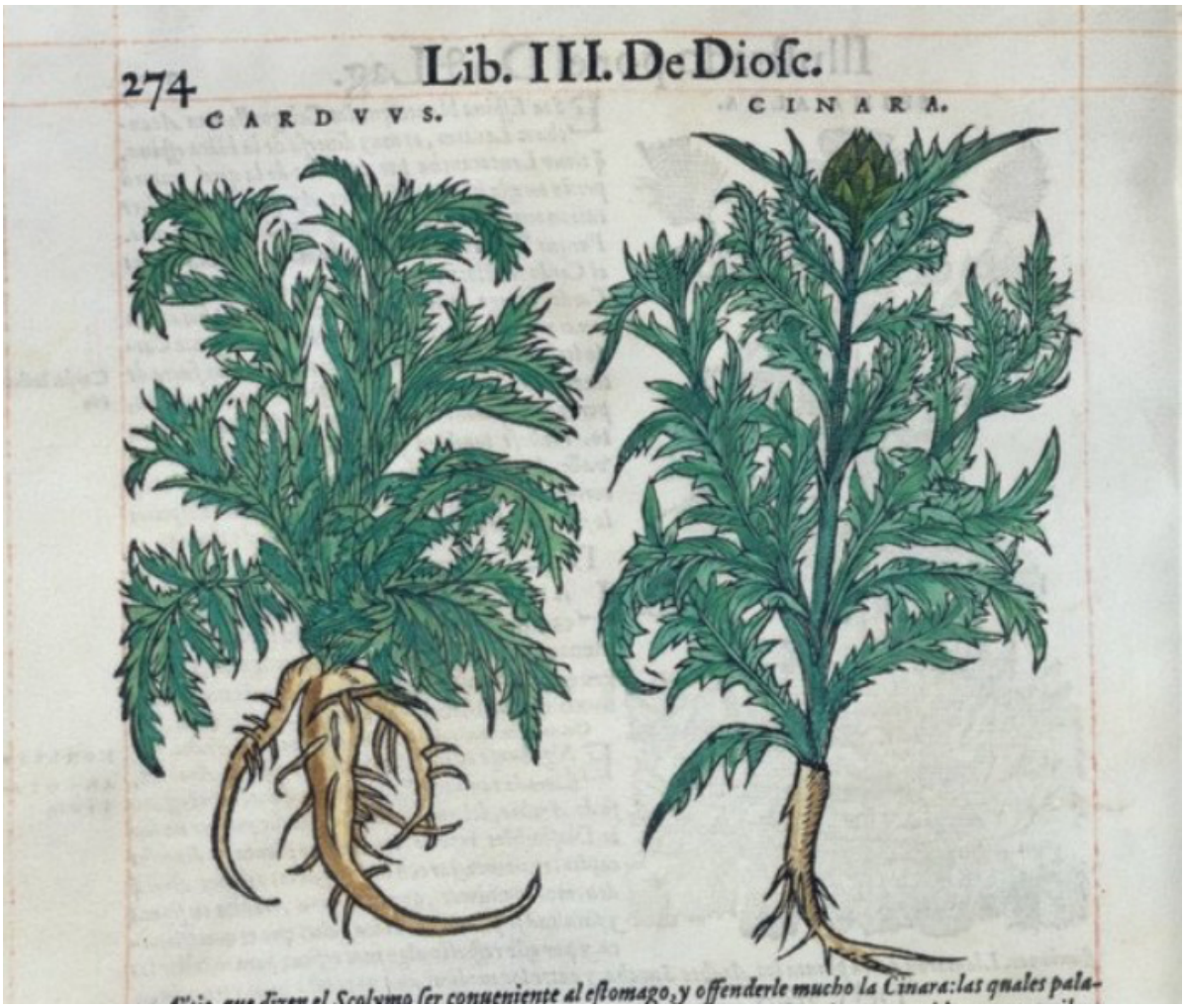

Figure 1. Gravures of thistles in the 1555 edition of Dioscorides, translated by Andrés Laguna and published in Antwerp. Library of Congress Control Number 2021666851.

Thistles in Portugal

A late XVI century manuscript from the library of Tibães Monastery (in north Portugal), the mother house of the Benedictine order in Portugal and Brazil, includes recipes with '*wild*' and '*tame*' thistles. The botanical differences between such thistles are uncertain, but the culinary preparation of each one was different: '*wild thistles*' required a pre-cooking phase and were

seasoned with vinegar, salt, and olive oil, while '*tame thistles*' were simply boiled and seasoned with garlic and honey (Barros, 2014).

The cultivation or preparation of tender and etiolated thistles for food does not exist in contemporary Portugal, although its memory is still present in works of art, such as the painting created, in an uncertain date, by Josefa de Óbidos (1630-1684), a rare example of an independent female painter in Portugal during the seventeenth century. In her painting [*Still life with thistle, quince, and orange* ME 1429] (Figure 2), now at the Frei Manuel do Cenáculo National Museum (former Évora Museum), we can see an edible etiolated thistle, like the ones still cultivated in Spain.

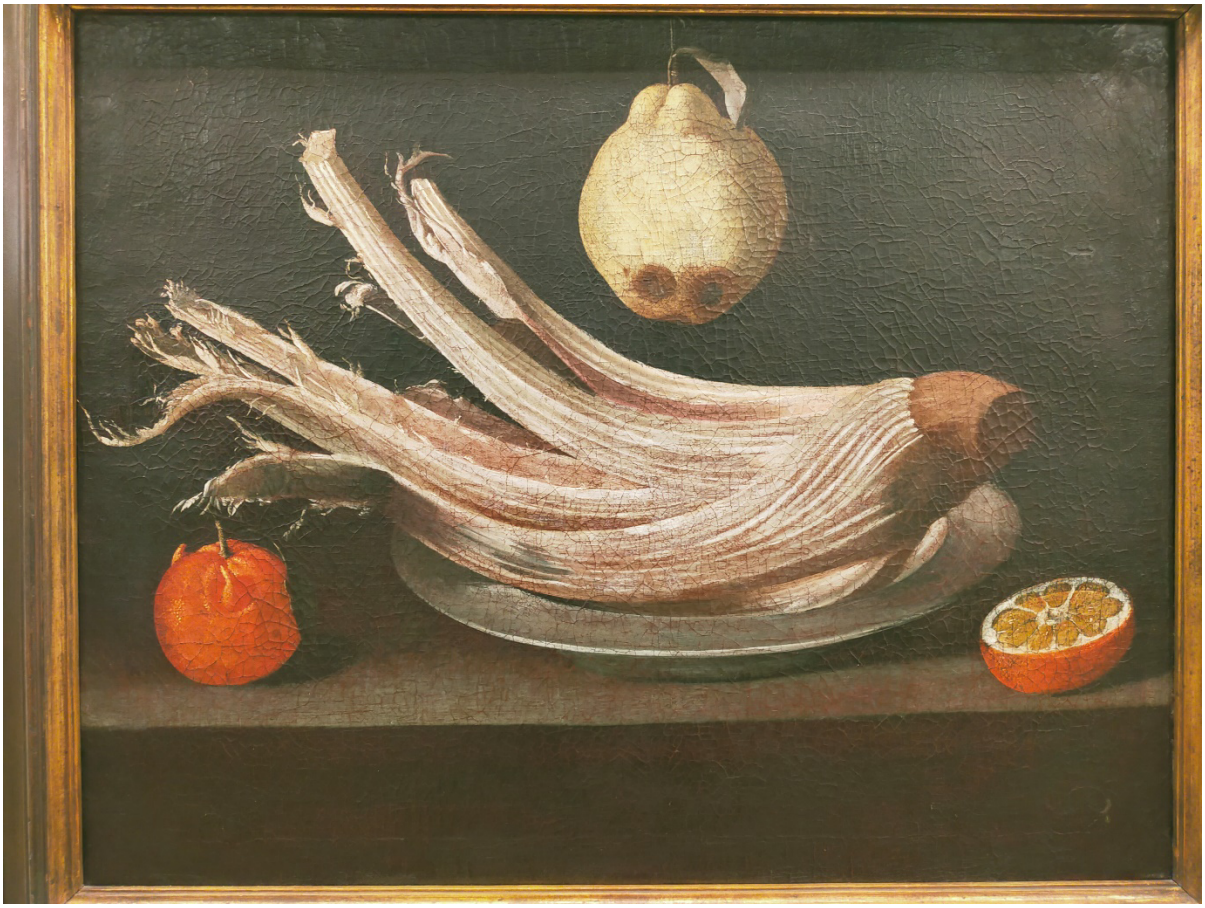

Figure 2. '*Still life with thistle, quince, and orange*' by Josefa de Óbidos (1630-1684), Frei Manuel do Cenáculo National Museum (former Évora Museum). INV. ME 1429.

Images of thistles can also be seen in carved stones that decorate ancient Portuguese churches, monasteries, and tombs, such as in the Monastery of Batalha (Figure 3), a Dominican convent erected to commemorate the Battle of Aljubarrota (1385) and that served as burial church for the fifteenth century Portuguese Avis Dynasty. Similar stone carvings are found in the Monastery of Alcobaça, the main house for the Portuguese branch of the Cistercian Order (Figure 4), established in 1153, by Dom Afonso Henriques, the first Portuguese king, and that became the richest and most influential monastery in Portugal. In this context, thistles were probably used as private heraldic elements or Christian symbols that evocated the Passion and Death of Jesus Christ (Barreira 1622, Ancona 1977).

The first Portuguese printed cookbook (1680) was the *Art of Cookery Divided in Two Parts* [*Arte de cozinha dividida em duas partes*] written by Domingos Rodrigues (1637-1719), (Rodrigues 1680). Most of the author's experience was certainly acquired at the kitchens of the Count of Vimioso and at Portuguese Royal House, during the reign of king Dom Pedro [Peter] II (Ferro, 1996). For a century, this was the only printed Portuguese cookbook, and although it represented more the culinary preferences of the noble houses then the people's food, it included recipes with ingredients that certainly were also peasant's food, such as cheese from Alentejo [a province located in southern Portugal] (Dias 2022). In the chapter devoted to banquets to be served in April, we find references to dishes that use thistles, such as '*thistles curdled with eggs*', '*bundle of thistle garnished with the same thistle'*, '*Italian-style thistle garnished with cream*', '*boiled thistles*', among others.

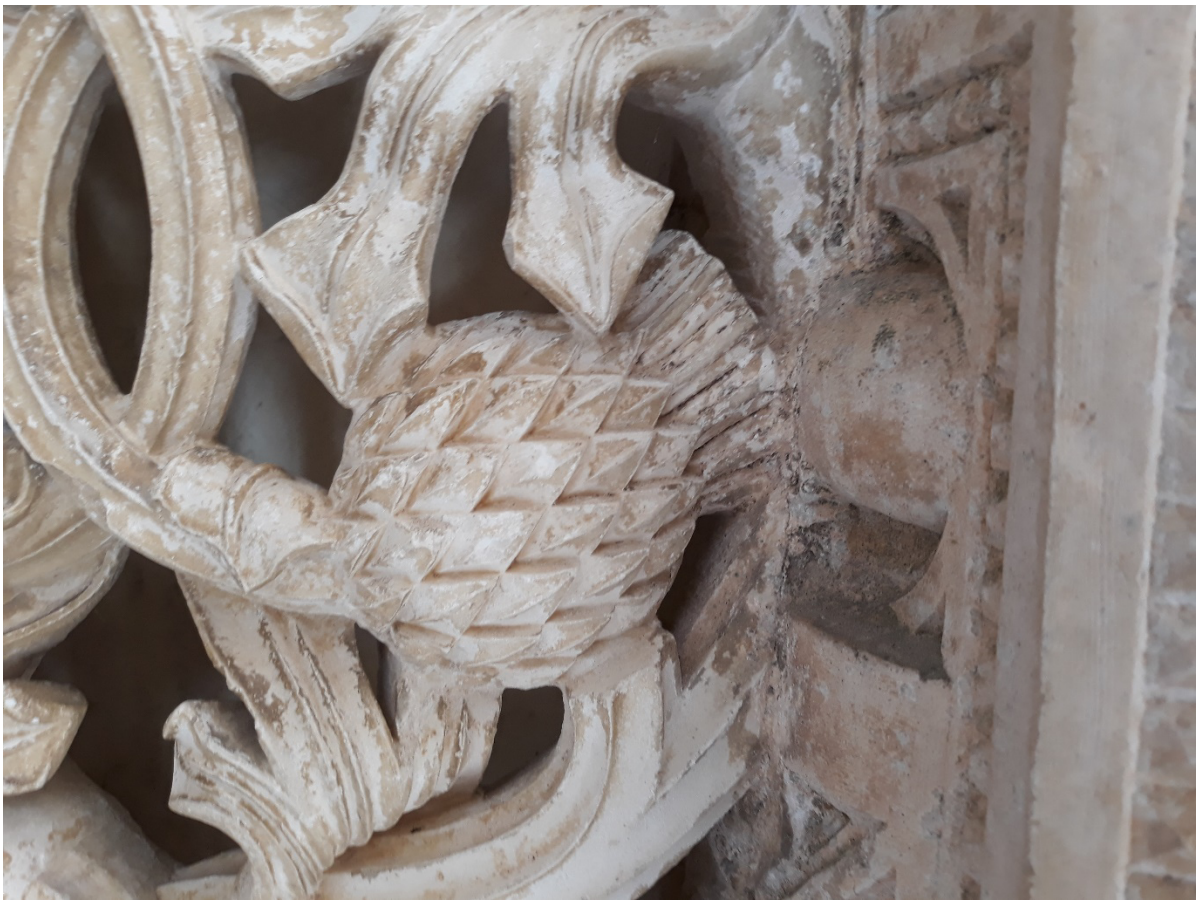

Figure 3. Carved limestone thistles at Monastery of Batalha (fifteenth century).

In 1780, Lucas Rigaud (fl.1780) published, in Lisbon, the *Modern Cook or the New Art of Cooking* [*Cozinheiro Moderno ou Nova Arte de Cozinha*], with more than seven hundred recipes, many of them with a ubiquitous presence of the French cuisine, consequence of his background as cook at other European royal houses. In this book, we also find recipes with thistles, such as '*thistles with Parmesan cheese*' (Rigaud 1780, Gomes 2016).

The thistle in cheesemaking

After the eighteenth century, the use of thistles in culinary became rare. Now, none of the traditional Portuguese recipes use them. Even the use of artichoke is rare and more linked to contemporary international trends. The sole traditional use of '*thistles*' in food is indirect because the dried flowers of the species *Cynara cardunculus* L. are commonly used in the manufacture of cheese, some of them qualified with Protected Designation of Origin.

In the past, there were many transhumance routes used by shepherds to lead their flocks across Portugal. This practice ended long ago but its memory still lives on in villages where the flocks used to pass, and which now maintain prestigious cheese dairies, which are an important part of the Portuguese heritage. Although animal rennet could be used to curdle milk, shepherds used the dried flowers of the thistle (*Cynara cardunculus* L.) a strong perennial species (Figure 5) native to the Western and Central areas of the Mediterranean Basin. This species can grow up to 3 meters high and 1,5 meter wide and the etymology of the genus *Cynara* probably derives from the Greek *kýōn* (*kynós*) = dog; alluding to the thorny structures that resemble the teeth of a dog, as Sébastien Vaillant (1669-1722) wrote in *Histoire de l'Académie Royale des Sciences* [*Mémoires de Mathématique et de Physique Tirés des Registres de l'Académie Royal de Sciences de l´Année* 1718] 156 (1741): '*Κυνάρα comes from κύων, κυνός, dog, as if we say dog's thistle. The name Cinara was given to this genus because the prickly structures* [leaves and bracts] *of its species resemble the fangs of the dogs*'. This opinion was shared by Linnaeus, who wrote, in the book *Philosophia Botanica* (third edition) page 180 (1790) [corrected and augmented edition by Carl Ludwig Willdenow (1765-1812), first edition 1751]: '*ANIMALIA plantarum vocabula suppeditantia* (…) *Cynanchum Canis κύων*'. The epithet *cardunculus* comes from the Latin c*arduus* (*cardus*) [= thistle] with the suffix *-unculus* [= diminutive]. So, *cardunculus* means '*small thistle'*, an allusion to the thorny leaves, as emphasized by Linnaeus in the protologue of this species [Species Plantarum 2: 827-828 (1753)], where he wrote '*foliis spinosis*'.

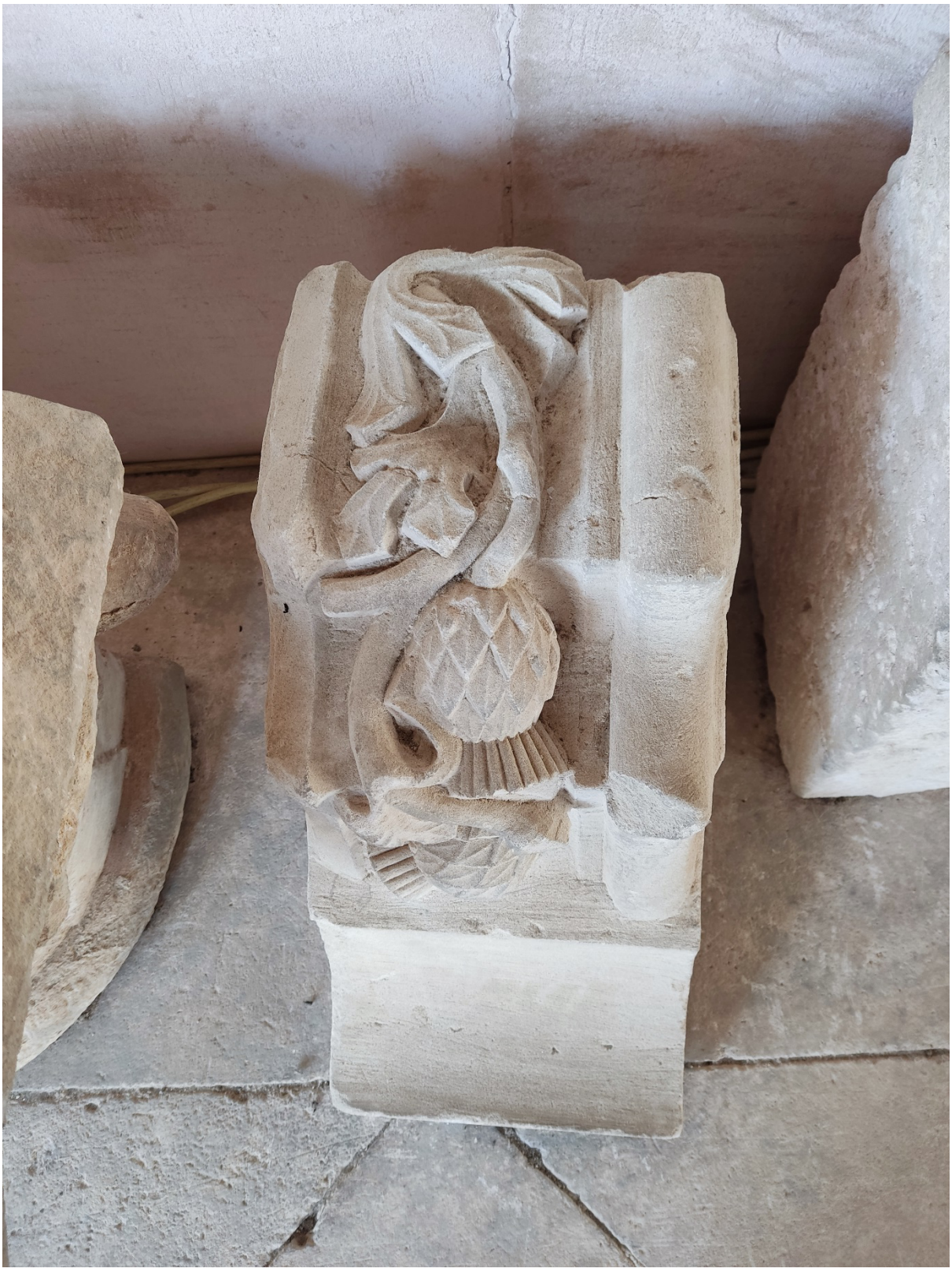

Figure 4. Fragment of carved limestone thistles at Monastery of Alcobaça (uncertain date). Photo by Luis Mendonça de Carvalho

Figure 5. *Cynara cardunculus* L. inflorescences and leaves.

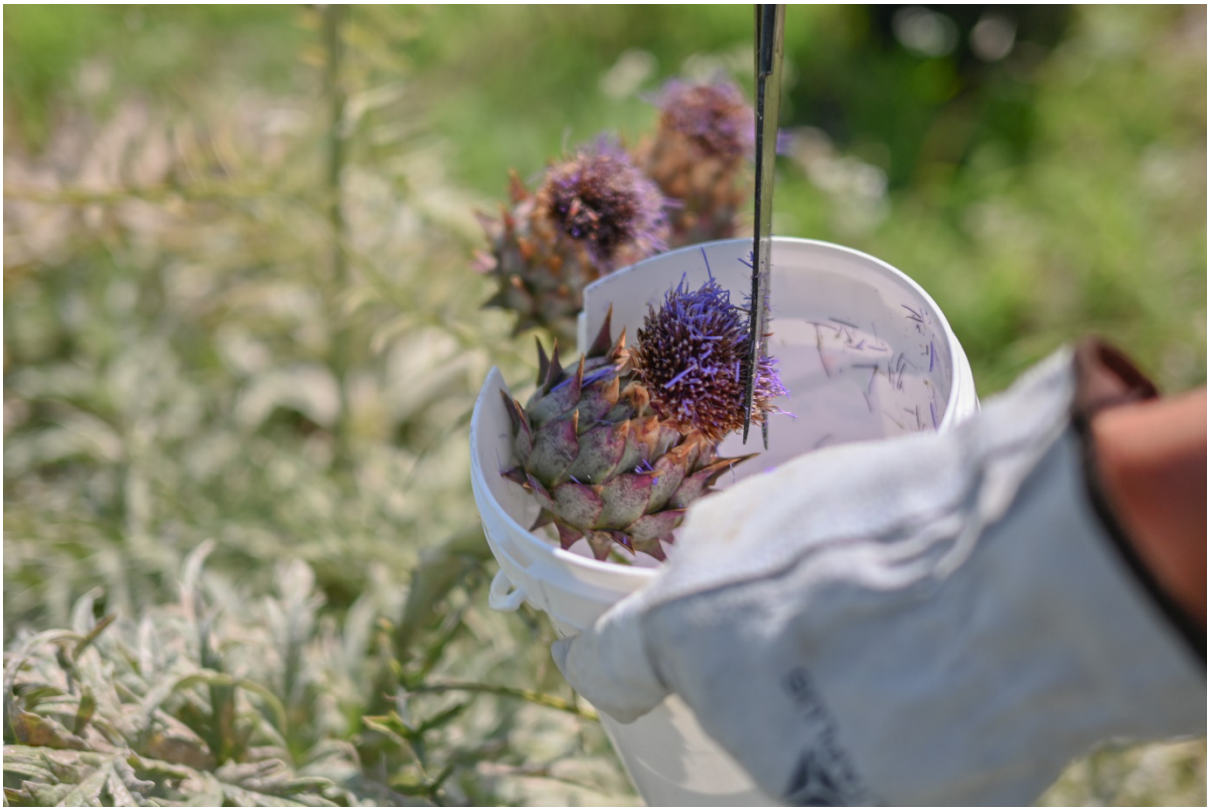

Figure 6. Harvesting *Cynara cardunculus* L. flowers.

The flowers obtained from the inflorescences of *Cynara cardunculus* L. are the source of cardosins, aspartic proteases responsible for curdling the milk. The ecological role of cardosins is still unknow but it is possibly linked to a defense role or to pollen-pistil interactions. The flowers are harvested in late June and July (Figure 6), and the best flowers have a bright

purple-blue colour (Figure 7). The drying process occurs at room temperature, as July is one of the hottest and driest months in Alentejo, together with August (portaldoclima.pt).

Figure 7. *Cynara cardunculus* L. bright purple-blue flowers (inflorescence).

At cheese dairies, the preparation of the aqueous extract is made daily and follows ancient methods. The dried flowers (Figure 8) are grinded, mixed with water, macerated in a mortar, and left to rest overnight; sometimes salt is added to help the extraction of the enzymes. This mixture is filtered to obtain a purple-brown solution (Figure 9) that is added to milk to coagulate casein. Besides this primary function, the extract from the *Cynara* flowers also contributes to the development of a specific flavour to cheeses that is partially responsible for part of their organoleptic characteristics.

Figure 8. Dried flowers of *Cynara cardunculus* L.

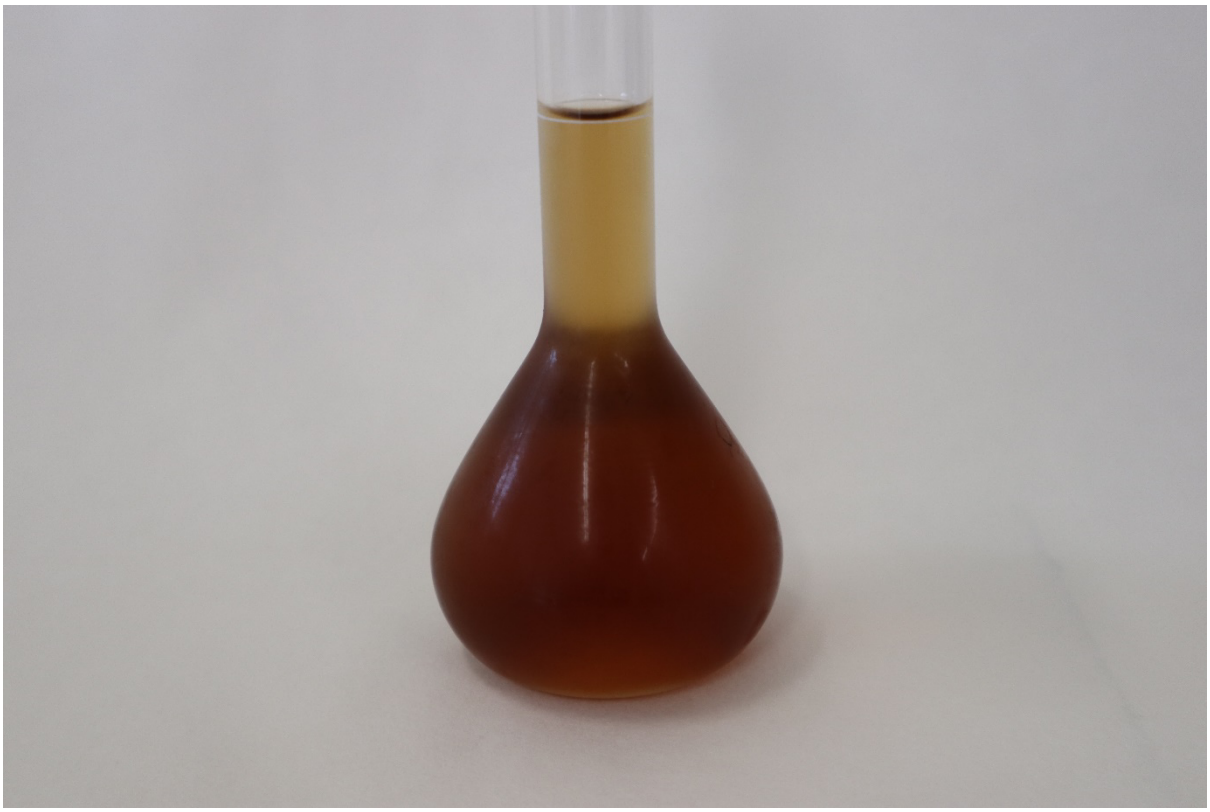

Figure 9. Aqueous extract of *Cynara cardunculus* L. dried flowers that will be mixed with milk.

During the production process, traditional cheese dairies use an extensive array of cotton fabrics (*Gossypium* sp.), and this is the reason why they are called *rouparias* [places with abundant fabrics and cloth]. Cotton cloths are used as filters (Figure 10-12), and to make the lateral belt that prevents the deformation of semi-soft cheeses, during maturation stage and transport (Figure 13). In the past, some cheeses were maturated in shelves made with giant reed (*Arundo donax* L.) to facilitate the air flow, such as in the Serpa PDO cheese, but these are no longer used due to the new health and safety food standards.

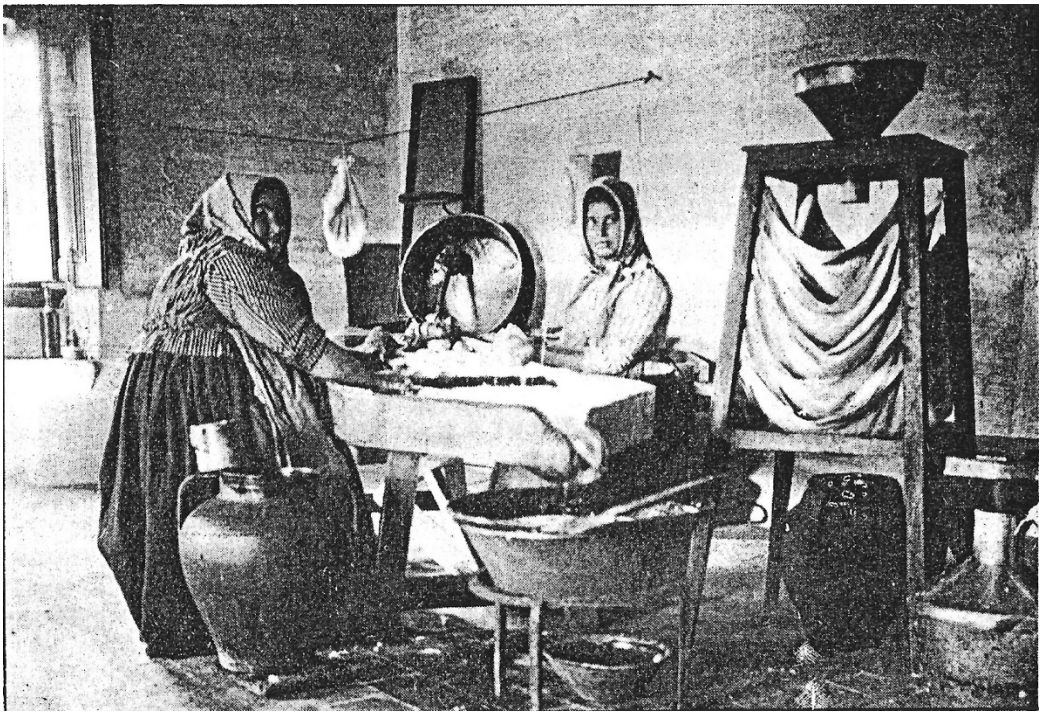

Figure 10. Manufacturing cheese in Alentejo (1903), public domain photo.

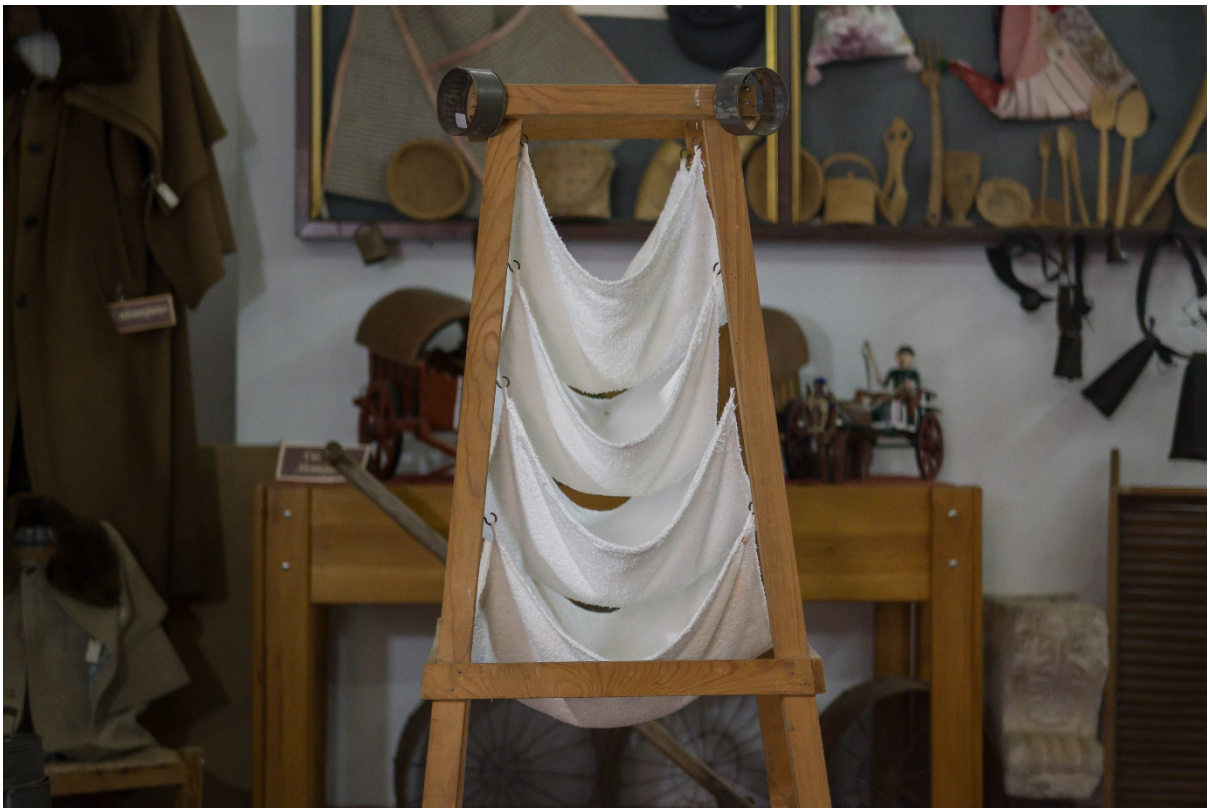

Figure 11. Reconstruction of an ancient filter apparatus for cheese manufacture, made with wood and cotton fabrics, at Friends of Montemor-o-Novo Museum.

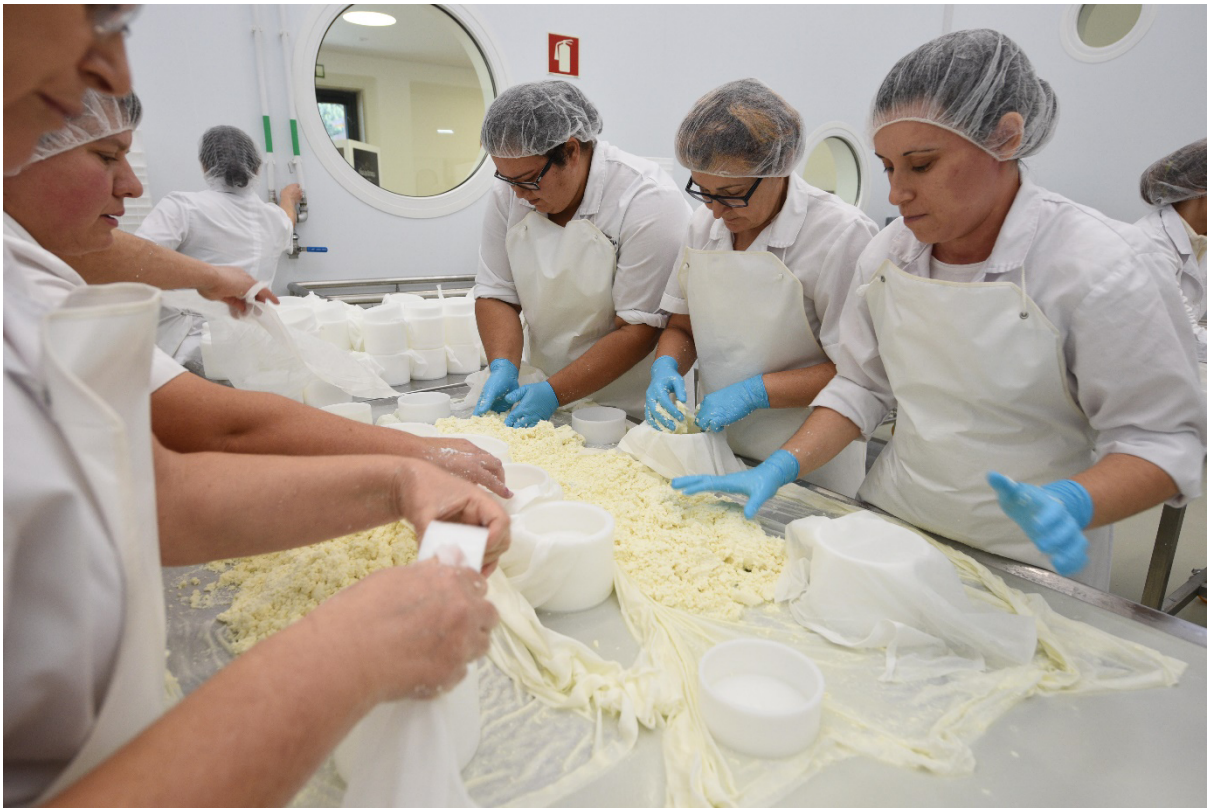

Figure 12. Contemporary cheese manufacture in Serra da Estrela. Photo by Sérgio Azenha.

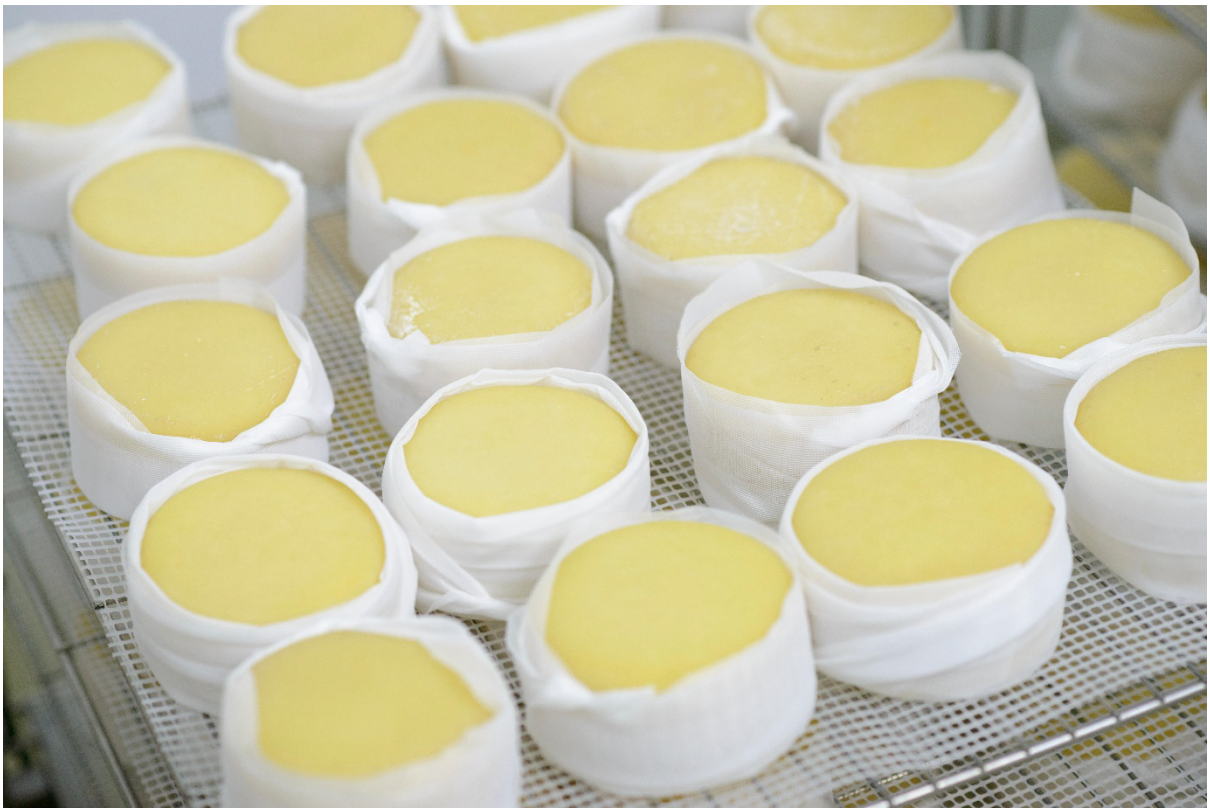

Figure 13. '*Serra da Estrela*' cheese with lateral cotton belt to prevent deformation. Photo by Sérgio Azenha.

Declarations

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Photo credits All photos belong to João Dias (author), except when stated otherwise.

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