



Ethnobotany and mining heritage: The case of Aljustrel

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Notes on Ethnobotany

Abstract

Aljustrel is a mining town located in southern Portugal, within the Iberian Pyrite Belt and since the Antiquity the local geological resources have been exploited. As in most human communities, plants sustained the miners' health, diet, and labor. Plants helped to address the hard conditions of mining life, because respiratory illnesses and wounds were very common and were treated with local medicinal plants. Besides healing, local flora was used in traditional soups and stews, providing nutrition. These practices revealed a deep interdependence between miners and plants who helped them in a demanding and harsh profession and were also seen as cultural elements of their community. In this study, miners and their families selected the plant species they considered most significant, both for their utilitarian functions and their cultural value, during periods of active labour and close engagement with the mining environment.

Keywords: Miners and plants, Aljustrel, material culture, traditional knowledge, medicinal plants

Mining in Aljustrel

Aljustrel, located in the Baixo Alentejo in southern Portugal (Figures 1–2), has a long mining tradition, which constitutes the main economic driving force of the municipality. This town lies within the Iberian Pyrite Belt (approximately 300 km long and between 30 and 60 km wide), a vast geographical area in the south of the Iberian Peninsula, where several mines exploit pyrite, also known as “fool's gold”, due to its metallic luster and yellow-golden hue, which resembles gold.

Pyrite is a compound associated with various types of minerals, the most predominant being copper, zinc, and lead, and it may also contain small amounts of gold or silver, though only in residual quantities. Evidence of mining activity in Aljustrel dates back to the Chalcolithic period (between 3300 BC and 1200 BC), but the most substantial remains are from the Roman period, when the settlement of Vipasca (modern-day Aljustrel) was founded and, for about four centuries, became one of the main mining centers of the Iberian Peninsula (Viana *et al.* 1954).

Mining activity declined after the Roman occupation, only to be revived in the 19th century. In 1898, the mine was concessioned to a Belgian-owned company, which retained control until 1973 (Figures 3–4), when a partial nationalization took place. From then on, the mine was operated by several state-owned entities until 2001, when it was acquired by a Canadian company. In 2009, it was sold to a Portuguese economic group, which continues its operation to the present day.

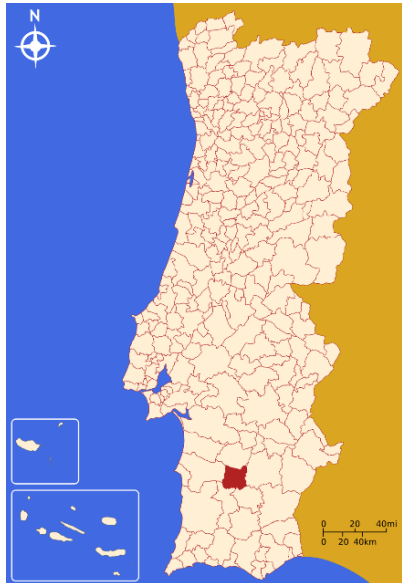


Figure 1. Location of Aljustrel on a map of Portugal. ©Wikimedia Commons.



Figure 2. Aljustrel (1814). Series: Observations on Portugal, George Thomas of Landmann. ©The Trustees of the British Museum.



Figure 3. General view of the mine of Aljustrel. © Luís Matias and Aljustrel Municipality.



Figure 4. Wagon loaded with ore. © Luís Matias and Aljustrel Municipality.

The miners of Aljustrel carried out demanding work within a challenging technical and geological system, in a profession marked by repetition, risk, and continuous adaptation, characterized by physical strain and technical specialization (Figures 5–9).



Figure 5. Miner from Aljustrel. © Luís Matias and Aljustrel Municipality.



Figure 6. Miner from Aljustrel. © Luís Matias and Aljustrel Municipality.



Figure 7. Work inside the mine. © Luís Matias Aljustrel Municipality.



Figure 8. Water table inside the mine. © Luís Matias and Aljustrel Municipality.



Figure 9. Miners' changing rooms. © Luís Matias and Aljustrel Municipality.

Ethnobotanical Heritage

The integration of ethnobotanical knowledge into projects of heritage education, sustainable tourism, and social innovation constitutes a significant strategy for economic diversification, the enhancement of local identity, and the ecological sustainability of territories. In rural contexts, this approach assumes particular importance in the educational domain, especially in the construction of community identity. Ethnobotany plays a central role in this process by mediating the intergenerational transmission of knowledge and cultural practices. The preservation of such knowledge contributes to safeguarding the memories of older generations, while simultaneously promoting sustainable development and community resilience (Rocha *et al.* 2015, Oliveira *et al.* 2025).

Within this framework, the concept of ethnobotanical memory (Faria 2020) proves fundamental, as it incorporates reflections on the use of plants in the daily lives of populations. This form of memory is intrinsically linked to subsistence strategies, particularly in contexts of scarcity, highlighting the role of traditional knowledge in resource management and in the affirmation of territorial identity.

In his study on the use of wood in mining and metallurgy in Portugal during the roman period, Martins (2017) emphasizes the crucial role of wood in mining activities, despite the scarcity of archaeological remains due to its perishable nature. Wood was indispensable for the shoring of galleries, the manufacture of tools, the construction of infrastructures, and metallurgical processes. In Aljustrel, the predominant use of holm oak (*Quercus rotundifolia* Lam.) demonstrates an empirical understanding of the properties of local species, later reinforced in the nineteenth century through the planting of trees intended to support mining activity.

The present-day Aljustrel Mining Park is an example of the integrated valorization of mining heritage, articulating educational, technical, and cultural dimensions. Community involvement, through the mobilization of collective memory and local knowledge, proves decisive in strengthening the sense of belonging and in constructing a distinctive territorial identity (Gomes 2018, Município de Aljustrel 2026). The ethnobotanical knowledge associated with mining communities presents pedagogical and touristic potential, particularly through the development of interinstitutional educational projects and interpretive routes that incorporate botanical practices and everyday labor contexts. The recognition of this heritage as a living legacy contributes to the social valorization of the territory and to the deconstruction of stigmas associated with rural and mining environments, especially when grounded in participatory methodologies that integrate oral testimonies from different generations and social groups.

This study is part of a project dedicated to documenting the memories of the cultural use of plants in the Aljustrel region, with particular emphasis on species considered culturally significant by miners and their households during the period between 1960 and 2000; a timeframe still accessible to living memory, although referring to practices that are now, in some cases, no longer in use.

Materials and Methods

The study adopted a qualitative, exploratory approach within an ethnobotanical framework, with the aim of identifying culturally significant plants in the context of collective memory associated with mining activity. Data collection was carried out through semi-structured interviews with nine male participants, aged over 65 years, selected based on a non-probabilistic sampling strategy combining convenience and intentional criteria (purposive sampling). Priority was given to individuals locally recognized as potential holders of knowledge regarding the traditional uses of plants, particularly in medicinal and food-related contexts. This procedure reflects a common practice in ethnobotanical studies, in which knowledge is often preserved among older generations, with sample size constrained both by the accessibility of informants and by the progressive erosion of active memory (Martin 1995, Pardo-de-Santayana 2007, Berkes 2012).

Results

Former miners attributed great importance to plants, particularly for their medicinal uses, which helped alleviate the physical suffering associated with arduous labor, especially in the treatment of skin and respiratory conditions. This utilitarian value was further complemented by references to species with strong cultural and identity significance within the context of regional food traditions. The plants cultivated or gathered from the surrounding environment, selected by miners and their families as representative of their cultural identity, were as follows:

1. *Salix viminalis* L. and other species of the genus *Salix* L.

English name: basket willow

Portuguese name: vimeiro

Part used: young stems

Material use: basketry for transporting food and other goods (Figures 10–11).



Figure 10. Miners' lunch, showing traditional willow baskets used for food transport. © Luís Matias and Aljustrel Municipality.

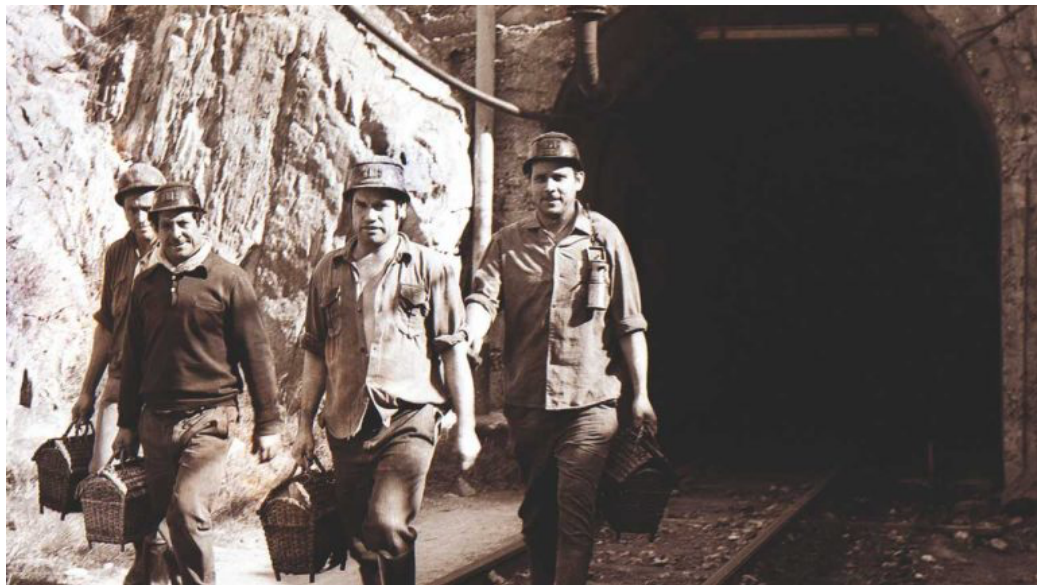


Figure 11. Miners returning home, carrying willow baskets. © Eurico Dias.

2. *Ficus carica* L.

English name: fig tree

Portuguese name: figueira

Part used: leaves

Medicinal uses: poultice used to promote expectoration and relieve respiratory conditions.

3. *Chelidonium majus* L.

English name: greater celandine

Portuguese name: quelidónia, erva-das-verrugas

Part used: aerial parts, especially the latex

Medicinal uses: latex applied to minor skin lesions.

4. *Cistus ladanifer* L.

English name: gum rockrose (Figure 12)

Portuguese name: esteva

Part used: leaves (resinous exudate, labdanum)

Medicinal uses: used externally, in the form of poultice, for the treatment of wounds and burns.



Figure 12. Gum rockrose (*Cistus ladanifer* L.). © Miguel Poro, Flora-on.



Figure 13. Bull's-head dock (*Rumex bucephalophorus* L.). © Ana Júlia Pereira, Flora-on.

5. *Rumex bucephalophorus* L.

English name: bull's-head dock (Figure 13)

Portuguese name: catecuzes

Part used: leaves

Culinary uses: leaves cooked with beans and chickpeas.

6. *Scolymus hispanicus* L.

English name: Spanish oyster thistle (Figure 14)

Portuguese name: tengarrinha

Part used: leaves (midrib) (Figure 15)

Medicinal uses: for liver disorders.

Culinary uses: soups with beans (Figure 16).

7. *Eucalyptus globulus* Labill.

English name: eucalyptus

Portuguese name: eucalipto

Part used: leaves

Medicinal uses: decoction; vapors inhaled for relief of respiratory conditions.

8. *Solanum lycopersicum* L.

English name: tomato

Portuguese name: tomate

Part used: fruits

Culinary uses: traditional soups (gazpacho).



Figure 14. Spanish oyster thistle (*Scolymus hispanicus* L.).
© Miguel Porto, Flora-on



Figure 15. Primary veins of the leaves. © Horta da Buxa.



Figure 16. Soup with Spanish oyster thistle and beans. © Sophia, Mary and Mom.

9. *Coriandrum sativum* L.

English name: coriander

Portuguese name: coentro

Part used: leaves

Culinary uses: seasoning traditional dishes, particularly soups and *açorda* (traditional bread-based dish from southern Portugal).

10. *Allium sativum* L.

English name: garlic

Portuguese name: alho

Part used: bulbs

Medicinal uses: antimicrobial agent; support for the cardiovascular system.

Culinary uses: bulb widely used in several dishes, particularly *açorda* (traditional bread-based dish from southern Portugal).

11. *Foeniculum vulgare* Mill.

English name: fennel

Portuguese name: funcho

Part used: leaves and tender stems

Culinary uses: leaves and tender stems cooked with legumes such as beans and chickpeas.

12. *Beta maritima* L.

English name: sea beet

Portuguese name: acelga-brava

Part used: leaves

Culinary uses: leaves cooked with beans and chickpeas.

13. *Olea europaea* L.

English name: olive tree (olive oil)

Portuguese name: oliveira (azeite)

Part used: oil extracted from the fruits (olives)

Medicinal uses: emollient, applied topically in skin care.

Culinary uses: staple cooking food and seasoning.

14. *Triticum aestivum* L.

English name: wheat

Portuguese name: trigo

Part used: seeds ['grains']

Culinary uses: used to make *pão de cabeça* [traditional Alentejo bread] (Figure 17), which was the staple food.



Figure 17. Traditional Alentejo bread. © alentejoaporta.



Figure 18. Pennyroyal (*Mentha pulegium* L.). © Ana Júlia Pereira, Flora-on.

15. *Mentha pulegium* L.

English name: pennyroyal (Figure 18)

Portuguese name: poejo

Part used: aerial parts, especially leaves and flowering tops

Medicinal uses: infusion used for disorders of the digestive and respiratory systems; anthelmintic.

Culinary uses: traditional dishes, particularly soups and *açordas* (traditional bread-based dish from southern Portugal).

Conclusions

The analysis of the interviews made it possible to identify a limited set of plant species and their respective contexts of use, highlighting their symbolic and functional dimensions as markers of everyday experience and of the relationship with the territory, within the context of a progressive replacement and a growing detachment from natural resources.

In this sense, the reduction of an active memory should not be interpreted as an absence of cultural relevance, but rather as an expression of processes of change that affect the continuity of knowledge systems. Absence itself is a meaningful ethnographic datum, underscoring the need to document and value ethnobotanical knowledge as intangible heritage, especially in contexts of socioeconomic transformation such as mining areas.

The miners of Aljustrel did not limit themselves to occasional use of plants, but developed a genuine adaptive system, functionally adjusted to the demands of mining activity. The selection of species reveals a correspondence between the main occupational risks, such as respiratory diseases and skin injuries, and the medicinal uses attributed to local flora, thus configuring a multifunctional model of plant resource use. This knowledge, constructed empirically and transmitted intergenerationally, went beyond the domain of mere traditional knowledge, constituting a structuring component of the cultural identity and collective memory of the mining community.

The inventory of culturally significant species not only enables an understanding of traditions of subsistence and resilience but also provides a concrete basis for their contemporary valorization. This heritage may support the creation of an ethnobotanical hub within the *Parque Mineiro de Aljustrel*, integrating educational and interpretative dimensions and contributing to a more holistic and distinctive approach to the valorization of the territory and its heritage.

Declarations

List of abbreviations: Not applicable.

Ethics approval and consent to participate: Not applicable.

Consent for publication: Not applicable.

Availability of data and materials: Not applicable.

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