

Sessão 1

Transformação da castanha / Transformación de la castaña

CP1.01 HISTORY, PRESENT SITUATION AND PERSPECTIVE OF THE CHESTNUT CULTIVATION IN EUROPE

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ABSTRACT

This paper gives a short overview on the history of the chestnut cultivation in Europe: presumed quaternary refugia, origin of the chestnut cultivation, driving factors of its diffusion at continental scale, causes of the decline and future perspective of the European chestnut culture.

Key words: *Castanea sativa*, refugia, chestnut area, chestnut marketing

1. QUATERNARY REFUGIA OF THE EUROPEAN CHESTNUT

The Sweet chestnut (*Castanea sativa* Mill.) is the only native species of the genus in Europe. The broad diffusion and active management by man resulted in the establishment of the species at the limits of its potential ecological range, what make it nowadays difficult to trace its original range (Pitte 1986) and its autoecology (Rubio et al. 1999; Blanco et al. 2000).

Krebs et al. (2004) mapping radiocarbon-dated pollen, anthracological and macrofossil records concluded that the most likely natural range of the chestnut is delimited by six macroregions (Fig. 1): the Transcaucasian region, north-western Anatolia, the hinterland of the Tyrrhenian coast from Liguria to Lazio along the Apennine range, the region around Lago di Monticchio (Monte Vulture) in southern Italy, the Cantabrian coast on the Iberian peninsula, and probably also the Greek peninsula (Peloponnese and Thessaly) and north-eastern Italy (Colli Euganei, Monti Berici, Emilia-Romagna). As a rule, the supposed chestnut refugia areas are connected to orographic systems and are located in areas where scattered micro-environmentally favourable habitats probably allowed limited chestnut populations to survive during the main glacial events.

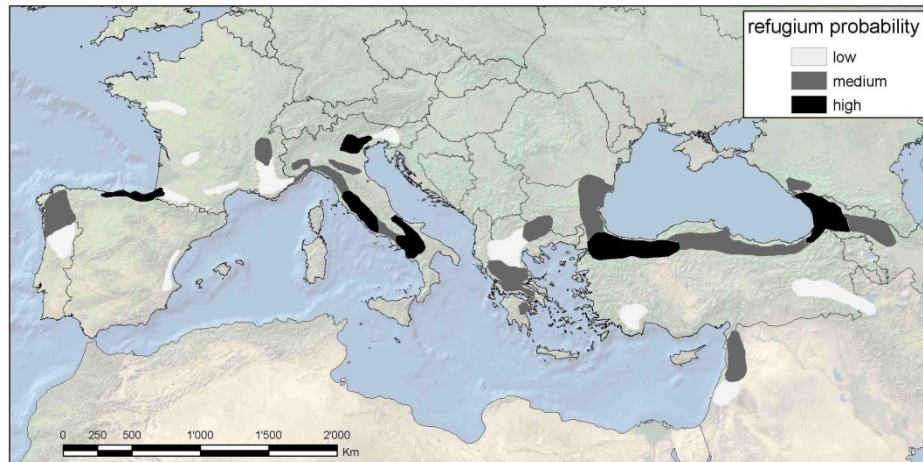


Figure 1. Main refugium areas of *Castanea sativa* Mill. according to their probability level (source: Krebs et al. 2004)

2. ORIGIN OF THE CHESTNUT CULTIVATION IN EUROPE

First unambiguous evidences of chestnut cultivation are reported in palynological data of several regions in the Anatolian Peninsula, northeastern Greece and southeastern Bulgaria and date back to around 3700 B.P. (2100-2050 cal. B.C.). The pollen assemblages representing this phase point to an advanced form of agriculture, including fruit-tree cultivation such as chestnut (*Castanea sativa*), olive (*Olea europea*), walnut (*Juglans regia*), and manna-ash (*Fraxinus ornus*), accompanied by an increase in non-arboreal pollen and Cerealia-type pollen (Bottema and Woldring 1990). Written references to the chestnut cultivation or to chestnut place names are relatively numerous also in the Ancient Greek and Latin literature (Fig. 2). Analysing both pollen data and literary citations Conedera et al. (2004a) concluded that Ancient Greeks played a fundamental role in developing the cultivation of chestnut (both for its wood and its fruit) and in transferring it to the Latin world (especially in the Italian Greek colonies, Fig. 2), even if in the ancient Greek civilization and in the pre-Christian Latin world the chestnut cultivation took only a subsidiary place.

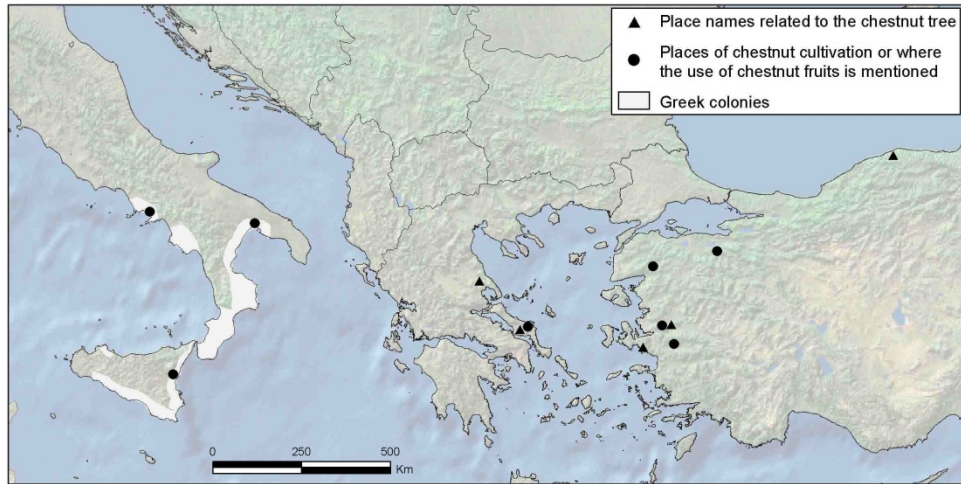


Figure 2. Place names and areas of chestnut cultivation cited in the pre-Christian Greek and Latin Literature (Source: Conedera et al. 2004a)

3. DIFFUSION OF THE CHESTNUT CULTIVATION AT EUROPEAN SCALE

The role of chestnut in the Italian territory may have changed at the beginning of the Christian era when people realized that the wood produced from chestnut coppices was so useful and versatile. Signs of this change are found first in the Post-Christian Latin literature. Authors such as Columella, Pliny the Elder, Gargilius Martialis and Palladius provide a striking amount of detail about the ecological needs of chestnut, nursery techniques, and coppice management, emphasizing the supremacy of the chestnut in the production of poles to support vines (Conedera et al. 2004a). Palynological evidences of first introduction of the species or increasing cultivation and use of chestnut timber exist starting in the first century AD, especially in the southern slope of the Alps. From this period on there is a generally increasing percentages of chestnut pollen also in the southern part of France and Germany, in northern Switzerland and, partially, in the Iberian Peninsula. In most of these regions chestnut appears in the profiles in the first centuries of the Christian period for the first time, probably in connection with the Roman conquest (Aira Rodriguez et al. 1992; Santos et al. 2000). This suggests that the use of chestnut was spread throughout the empire by the Romans, even if on the northern part of the Alps the pollen percentages remained low, rejecting the idea of a widespread cultivation of the chestnut tree. The Romans may thus have introduced the idea of cultivating the chestnut and in certain cases the tree itself, but no evidence of systematic tree planting exists (Conedera et al. 2004a).

4. THE MEDIEVAL CHESTNUT GOLDEN AGE IN WESTERN EUROPE

Contrary to the area of origin of the chestnut cultivation in Eastern Europe, a proper chestnut civilization took place in Western Europe starting in the early Middle Age (e.g. Tuscany, Quirós Castillo 1998) and flourished further in the later Middle Age (XI to XVI centuries, Pitte 1986). The cultivation of chestnut in coppices for timber production and in orchards for staple food became a widespread component of the traditional farming system in most Mediterranean and in the southern parts of Central Europe. Chestnut became an essential source of food in many mountain regions, what resulted in a wide range of cultivated varieties with different ripening periods (early, mid-season, late), types of use (fresh consumption, long-term storage, drying, flour, animal feed) and ranges of distribution (higher altitudes, lower slopes, ubiquitous, etc.).

The few regions where commercial transport routes already existed during the Middle Ages (e.g. Piedmont or Tuscany), where the only places where chestnut plantations with just one or few high-quality chestnut or marron-cultivars were started in this period. The fruits were then sold on the regional or even international markets (Pitte 1986). The marron varieties, then defined as elliptic-shaped fruits of medium to large size, with marked dark strips on the tegument, which are light to peel (no intrusion of the epispermatic pellicle in the cotyledons) and sweet in taste (Bassi 1993), have traditionally been cultivated only in Italy and a few areas in France.

In some regions of the Iberian Peninsula (northern Portugal and Galicia), double-purpose varieties (fruit and timber production) are quite common. Here the chestnut trees are topped above the grafting point, usually 2 meters above ground level (Bourgeois et al. 2004). This complex historical background makes it impossible to reliably estimate the number of chestnut cultivars or ecotypes existing in Europe, even if the inventories so far performed at the national level suggest that there are thousands more varieties (Conedera et al. 2004b).

5. THE PROGRESSIVE DECLINE OF THE TRADITIONAL CHESTNUT CULTIVATION

The decline of the traditional European chestnut culture took place at different time in different countries, but some common driving factors may be cited (Pitte 1986). The general climatic cooling of the Little Ice Age caused frost damages on chestnut orchard trees at the exposed sites. The improvement of the agricultural cultivation techniques combined with the introduction of alternative crops from abroad (maize, potatoes) allowed a greater production of calories with shorter rotation times, causing the

progressive substitution of the chestnuts as staple food. The industrial revolution also contributed to the decline of the chestnut culture, causing the exodus of the people from the mountain countryside and locally the falling of chestnut trees for charcoal production. At the end of the XIX century, the development of the industrial procedure for tannin extraction from the wood caused in many chestnut areas a systematic cut of chestnut groves for tannin production. The decline of the chestnut cultivation locally accelerated because of the introduction and spread of the two major diseases of the species: the soil-born plant pathogen *Phytophthora* spp. (ink disease) and the wound-parasite *Cryphonectria parasitica* (chestnut blight).

6. PRESENT SITUATION

Despite the described decline and in certain cases the complete abandonment of the chestnut cultivation since the last post-war period, the European chestnut area still covers in total 2.53 million hectares, of which 2.22 million hectares are chestnut forests, i.e. forests where chestnut is the dominant tree species and the remaining 0.31 million hectares are mixed forests with chestnut. The distribution area ranges from southern Europe (e.g. Crete) to the North (southern England, Belgium). The European chestnut forests are concentrated in just a few countries with a long tradition of chestnut cultivation: France and Italy together account for 79.3% of the whole chestnut forest area; Spain, Portugal and Switzerland account for a further 9.7%. The remaining 11.0% are dispersed in the other countries (Conedera et al. 2004b).

Most of the chestnut-growing area (1.75 million ha - 79.0%) is devoted to timber production both as coppice system (1.48 million ha) and high forests (0.29 million ha). The chestnut-growing area devoted to fruit production is nowadays reduced and accounts only for 0.43 million hectares (19.3% of the total chestnut-growing area). Many ancient orchards abandoned at the beginning of the last century have been in fact coppiced because of the high incidence of the chestnut blight and of the demand for chestnut wood for tannin, mining and - especially in Spain - for barrels (Pitte 1986).

7. FUTURE PERSPECTIVES

Since 1990s, people have become more aware of the value of chestnut orchards as a multifunctional landscape element. In many countries they have begun to revitalize chestnut orchards as they see them as having aesthetic and ecological value, acting as tourist attractions, and serving as fire-breaks (Bounous et al. 1992). Besides the revitalisation of traditional orchards in marginal chestnut-growing areas, new plantations

(or even re-grafted old orchards) with high-quality varieties (marrons and similar) or large-size Euro-Japanese varieties have been cultivated in several countries (mostly in France, Spain and Italy). In addition, the increasing demand for natural and environmentally friendly products in Europe and the recognition of the aesthetic, cultural and ecological value of managed chestnut ecosystems have led to more interest in the chestnut.

As a consequence, traditional chestnut products have now more opportunities on the market (poles for land consolidation work or playgrounds, logs for flooring, chestnut flour for pasta production, certification of local cultivars, etc.) and new products (chestnut parquet, chestnut-laminated veneer boards, chestnut pasta, chestnut beer, etc.) have been launched. Some of these new products and new applications, such as finger-jointed beams, and shingles from the wood, and pasta, biscuits, beer from the fruit are particularly interesting because it is possible to produce them from small-sized chestnut timber or fruit.

Despite this historical background, chestnut cultivation is thus at a turning point, being confronted with changing needs of a society that has moved from being rural to becoming industrial and urban-oriented. The development of the chestnut market in recent decades confirms the potential of this resource for both traditional products and new services and goods related to organic food and environmentally friendly products, especially in marginal and mountain areas. This allow us to conclude with an optimistic statement about the future of the European chestnut cultivation.

8. REFERENCES

- Aira Rodriguez, M.J., Saa, P., Lopez, P., 1992. Cambios del paisaje durante el Holoceno: Analisis de polen en Turberas (Galicia, España). *Revue de Paléobiologie*, 11, 243-254.
- Bassi, D., 1993. Castagno da frutto: valorizziamo la qualità. *Riv. frutticoltura*, 55, 12: 39-41.
- Blanco, A., Rubio, A., Sánchez, O., Elena, R., Gómez, V., Graña, D., 2000. Autoecología de los castaños de Galicia (España). *Invest. Agr.: Sist. Recur. For.*, 9, 2: 337-361.
- Bottema, S., Woldring, H., 1990. Anthropogenic indicators in the pollen record of the Eastern Mediterranean. In: Bottema, S., Entjes-Nieborg, G., van Zeist, W. (eds): *Man's role in the shaping of the eastern Mediterranean Landscape*. Balkema, Rotterdam, 231-265.
- Bounous, G., Bouchet, M., Gourdon, L., 1992. Ricostituzione del castagneto a frutto tradizionale: interventi in Piemonte e nel Sud della Francia. *Informatore Agrario*, 9: 155-160.
- Bourgeois, C., Sevrin, E., Lemaire, J., 2004. *Le châtaignier: un arbre, un bois*. 2nd revised edition, Institut pour le Développement Forestier, Paris.
- Conedera, M., Krebs, P., Tinner, W., Pradella, M., Torriani, D., 2004a. The cultivation of *Castanea sativa* (Mill.) in Europe: from its origin to its diffusion on a continental scale. *Vegetation History and Archaeobotany*, 13, 3: 161-179.

- Conedera, M., Manetti, M.C., Giudici, F., Amorini, E., 2004b. Distribution and economic potential of the Sweet chestnut (*Castanea sativa* Mill.) in Europe. *Ecol. Med.* 30, 179-193.
- Krebs, P., Conedera, M., Pradella, M., Torrioni, D., Felber, M., Tinner, W., 2004. Quaternary refugia of the sweet chestnut (*Castanea sativa* Mill.): an extended palynological approach. *Vegetation History and Archaeobotany*, 13, 145-160.
- Pitte, J.R., 1986. *Terres de castanide. Hommes et paysages du châtaignier de l'Antiquité à nos jours.* Librairie Arthème Fayard, Paris.
- Quirós Castillo, J.A., 1998. Cambios y transformaciones en el paisaje del Apenino toscano entre la Antigüedad Tardía y la Edad Media. *El castaño. Archeologia Medievale*, 25, 177-197.
- Rubio, A., Elena, R., Sánchez, O., Blanco, A., Sanchez, F., Gómez, V., 1999. Autoecología de los castañares catalanes. *Invest. Agr.: Sist. Recur. For.*, 8, 2: 387-405.
- Santos, L., Vidal Romani, J.R., Jalut, G., 2000. History of vegetation during the Holocene in the Courel and Queixa Sierras, Galicia, northwest Iberian Peninsula. *Journal of Quaternary Science*, 15, 621-632.