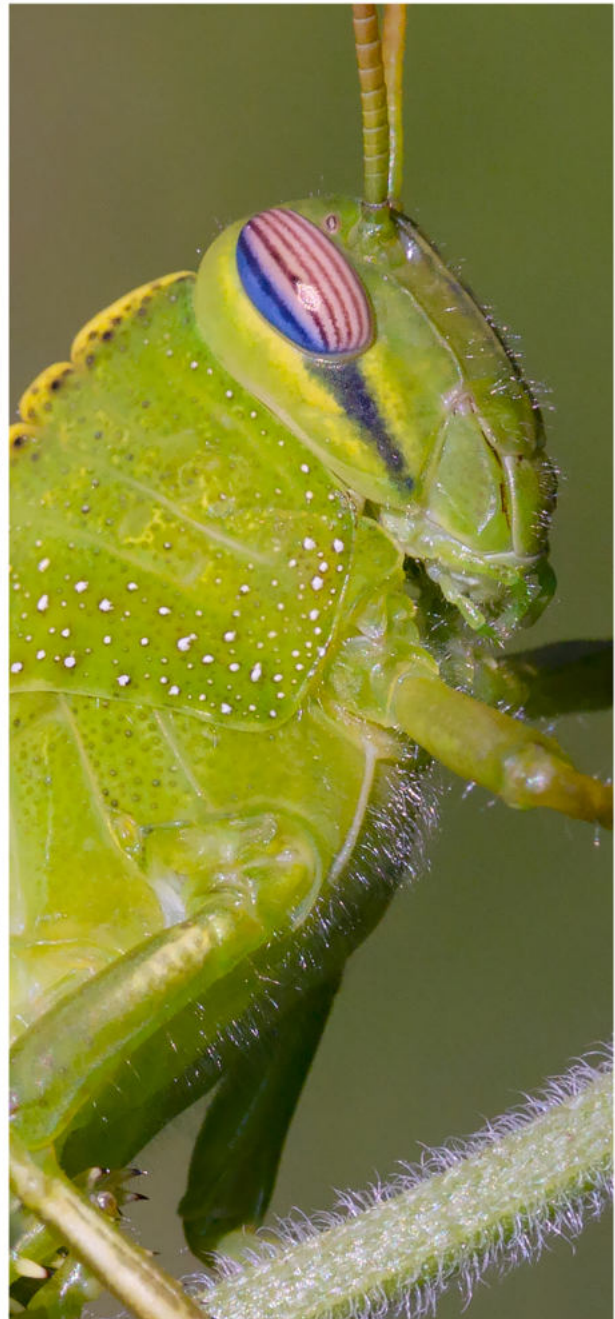
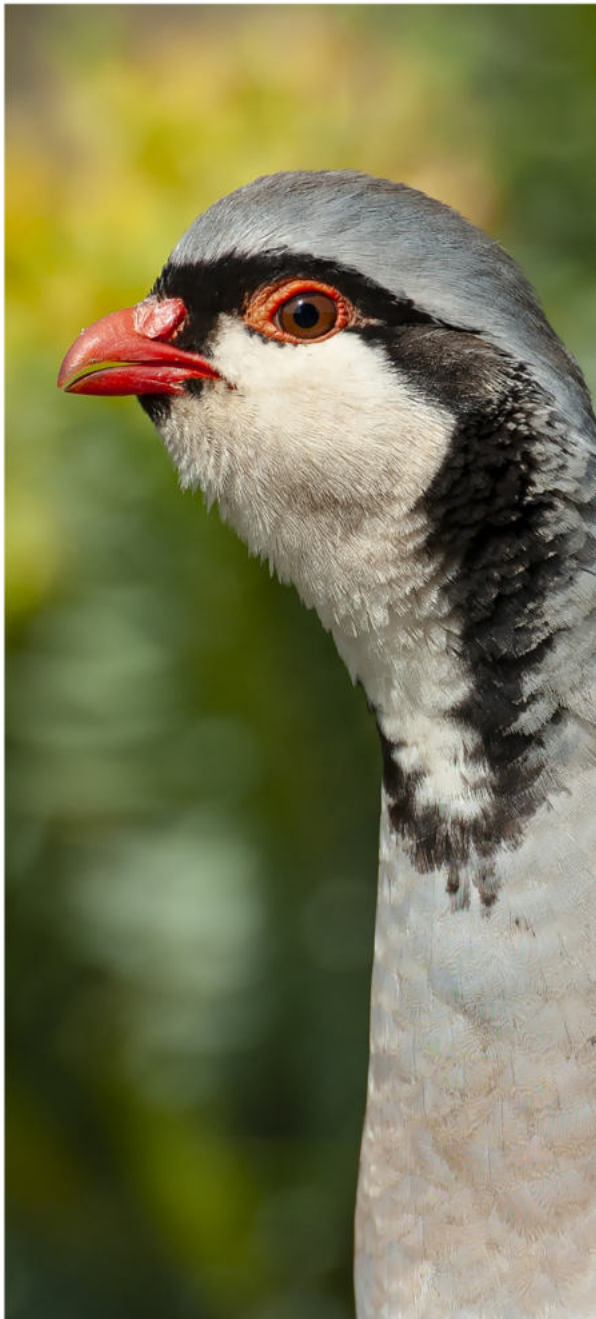


LIFE ON ISLANDS

BIODIVERSITY IN SICILY AND SURROUNDING ISLANDS

Studies dedicated to **Bruno Massa**



edizioni danaus

Tommaso La Mantia, Emilio Badalamenti, Attilio Carapezza,
Pietro Lo Cascio & Angelo Troia (Editors)

LIFE ON ISLANDS. 1

Biodiversity in Sicily and surrounding islands

Studies dedicated to Bruno Massa



edizioni danaus

On the front cover a Sicilian rock partridge, *Alectoris graeca whitakeri* Schiebel, 1934 and an Egyptian locust, *Anacridium aegyptium* (Linnaeus, 1764); on the back cover a summer image of Linosa Island (photos T. Puma).

Recommended citation for this volume
Citazione consigliata del volume

La Mantia T., Badalamenti E., Carapezza A., Lo Cascio P. & Troia A. (Eds.) 2020. Life on islands. 1. Biodiversity in Sicily and surrounding islands. Studies dedicated to Bruno Massa. Edizioni Danaus, Palermo, 492 pp.

Recommended citation for an article in this volume
Citazione consigliata di un contributo

Carapezza A. 2020. The heteropterological exploration of Sicily, pp. 125-150. In: La Mantia T., Badalamenti E., Carapezza A., Lo Cascio P. & Troia A. (Eds.), Life on islands. 1. Biodiversity in Sicily and surrounding islands. Studies dedicated to Bruno Massa. Edizioni Danaus, Palermo.

© Tutti i diritti riservati
© *All Rights Reserved*

Edizioni Danaus
Via Vincenzo Di Marco, 43 – 90143 Palermo
www.edizionidanaus.com
edizionidanaus@gmail.com

Progetto e Impaginazione Grafica
Loredana Greco, Ignazio Sparacio - Palermo

ISBN 978-88-97603-26-9

TRADITIONAL USE OF WOOD IN SICILY

GIOVANNA SALA¹, SALVATORE PASTA², CONCETTA MAGGIORE¹ & TOMMASO LA MANTIA^{1*}

¹ Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Università di Palermo, viale delle Scienze Ed. 4, I- 90128 Palermo, Italy, giovanna.sala@unipa.it, tommaso.lamantia@unipa.it

² Istituto di Bioscienze e BioRisorse (IBBR), Consiglio Nazionale delle Ricerche (CNR), Corso Calatafimi 414, 90129 Palermo, Italy, e-mail salvatore.pasta@ibbr.cnr.it

*Corresponding author

SUMMARY: The results of a multidisciplinary survey on the use of wood in Sicily are presented here. This research, based on a thorough review of the information available from numerous sources, mostly related to Socio-economic Sciences and Humanities, sheds light on the lasting, widespread and diversified use of many tens of woody species - native and cultivated - growing on the island. This work represents an initial contribution to a topic largely overlooked the national and regional literature concerning forest sciences and wood technology. Contrariwise, the very precise information available on the specific uses of wood from certain Sicilian woody species clearly testifies to the profound knowledge and high level of skills acquired not only by local craftsmen's associations (carpenters, cabinet-makers, shipwrights, etc.) but also by local farmers and other woodworking sectors. Moreover, the use of several woody plants points to the probable impact that past use of forest resources had on the distribution of a number of tree species, many of which now rarely occur on a regional level, namely large-leaved lime trees (*Tilia platyphyllos*), common ashes (*Fraxinus excelsior*), yews (*Taxus baccata*) and black alders (*Alnus glutinosa*).

KEY WORDS: wood technology, traditional knowledge, forest biodiversity, logging, history, folklore, handcraft

RIASSUNTO: Vengono qui presentati i risultati di un'indagine multidisciplinare sull'utilizzo del legno in Sicilia. Tale ricerca, basata su un'attenta rivisitazione delle informazioni riportate su numerose fonti, per lo più afferenti al settore umanistico e socio-economico, ha fatto luce su un uso antico, diffuso e diversificato di numerose decine di specie legnose - autoctone o coltivate - presenti sull'isola. Questo lavoro costituisce un primo contributo su un argomento trascurato dalla letteratura nazionale e regionale del settore forestale e tecnologico. Di contro, le informazioni talora estremamente precise sugli usi specifici del legno di determinate specie legnose siciliane testimonia l'approfondita conoscenza e la notevole padronanza acquisita non solo dalle maestranze artigiane (falegnami, ebanisti, maestri d'ascia) ma anche dai contadini e da altre categorie artigiane. Inoltre, l'utilizzo di diverse specie legnose pone in risalto il probabile impatto dell'uso passato delle risorse forestali sulla distribuzione di specie arboree che oggi risultano rare su scala regionale quali il tiglio nostrano (*Tilia platyphyllos*), il frassino maggiore (*Fraxinus excelsior*), il tasso (*Taxus baccata*) e l'ontano nero (*Alnus glutinosa*).

PAROLE CHIAVE: tecnologia del legno, sapere tradizionale, biodiversità forestale, utilizzazioni forestali, storia, folklore, artigianato

INTRODUCTION

The purpose of this study is to trace the history of past and recent uses of wood in Sicily. The impetus for this paper sprung from the observation that - contrary to common belief - the island has a long tradition in the use of wood, as testified by the immense though still poorly explored body of literature on the subject. Italian texts focusing on timber wood almost never make reference to Sicily (Giordano 1988). By contrast, however, the largest Mediterranean island is frequently cited for its reduced forest cover. The lack of awareness of the importance of wood in Sicily is largely due to a distorted view of the past. In fact, the scarce regional forest cover prior to large-scale reforestation started in the 1950s (La Mantia 2009, 2013), led to an underestimation of the central role

played by wood in the history of local communities. One of the few exceptions to this is illustrated by de Danilowicz (1942), who wrote "*Woodworking is very extensive, even though Sicily is very poor in forests*". This author also provides a highly detailed list of products obtained from woodworking (unfortunately with no reference to the species used); in his "Topographic map of the rustic art and rural handicraft of Sicily" (the original title of this map is "*Carta topografica dell'arte rustica e dell'artigianato rurale della Sicilia*") he lists many places on the main island and the satellite islets where wood is worked. The works of Cappellani (1958) also document the high number of craftsmen working wood in Sicily.

To date, there is no literature specifically focusing on the use of wood in general in the daily lives of Sicilians. In the only monograph available

on Sicilian rural civilization, Uccello (1972) referred solely to the customs and techniques of wood use among the rural communities of the Hyblaean area. In his work, he describes the tools used in daily work (e.g. ploughing, harvesting), often made by the farmers themselves, but he does not provide any information on the wooden artifacts made by carpenters and turners. Valuable clues on the local use of wood are provided by the many agricultural museums (Vibaek & D'Onofrio 1984; La Mantia 2015) and other private and public collections of farming tools (Magnino 1934) dotted throughout the region.

On careful re-reading of the Sicilian chronicles and humanistic literature, it becomes clear how the use of wood permeates the tangible cultural heritage of the island. Since much of this information continues to be overlooked and is still largely unknown amongst local foresters and botanists, one of the main aims of this paper was to collect and share less known data on this topic.

The extensive use of wood also emerges from literature on handcrafts and arts. As Pugliatti (2012) emphasized: *“the number of works on wood carving is considerable, even though ignored in art studies for a long time; this is likely because they are considered, let us say, a genre of lower quality: palanquins (called vare in the original text), pulpits, sacristy furniture, altar frontals, polyptych altarpieces (called “macchine da altare” in the original text, frequently showing a complex wooden frame), valuable carved choirs and statues”* (Pugliatti 2012). As Liotta (2007) wrote *“wood (and its derivative products, such as paper) is most represented in cultural heritage in the form of structures (roofs, ceilings, artefacts, furniture), accessories (frames, rosettes, shelves) or supports for works of art (altarpieces, panels, painted statues)”*. Often, however, as pointed out by specialists (e.g. Pugliatti 2012) there is no accurate knowledge of the identity of the woody species used. In this regard, Termotto (1998-2000) underlined the importance of the information contained in notarial deeds related to single artifacts. The use of wood in the creation of artworks and sacred buildings will be the subject of a forthcoming paper in which the historical uses will also be discussed. Also examining the woody species used in the ceiling construction of Norman churches, authentic masterpieces requiring extraordinary workmanship.

In the present paper, a number of wood uses have been deliberately excluded, either because there is already a large amount of literature on the matter or because they deserve far more detailed analysis and we plan to discuss them in future studies. This is the case, for instance, for the wood used in charcoal production, a topic already discussed in several reference works, such as Bresc

& Pescarmona (1983), D'Onofrio (1996a) and Lo Castro (2009). We will, however, turn our attention to the wooden instruments used by charcoal burners.

Despite having been the site of conflict on several occasions over the past three millennia (Greeks vs. Phoenicians, Carthaginians vs. Romans, Byzantines vs. Arabs, for example), the impact of wood consumption for military purposes is not dealt with in this work as poorly documented. We simply report an interesting detail pertaining to its possible repercussions. According to classical historical sources, during the Second Punic War (2nd century BC), Scipio and his soldiers overwintered in Palermo. As the ships in his fleet were built of green wood, he had them hauled out of the water into the local port to allow them to dry. In this regard, Scotti (1788) wrote *“Ancient people used ordinary firs while we use oaks, they used wood which was still green, while we use dry wood”*. The perceptive remark of this author reminds us of just how fast and indiscriminate the exploitation of the forest resources once available near the battlefields must have been. Therefore, the hypothesis should not be ruled out *a priori* that the large-scale use of fir tree trunks for military/war purposes was the main reason behind the rarefaction of the Sicilian firs (Pasta *et al.* 2019).

Other uses of wood not taken into consideration here are those of fuelwood for furnaces and lime kilns (called *calcare* in vernacular Sicilian), traditionally used for the extraction of quicklime, wood used to gather and store ice at the top of the main mountain systems and in the transport of large ice blocks down to the main coastal cities, wood used in the firing of terracotta in the villages of Burgio, Sciacca, Caltagirone, Scicli and Santo Stefano di Camastra, in the making of bells in Burgio and to support the mining activities in the sulphur mines of central-southern Sicily, etc.

Moreover, although the use of fuelwood for domestic heating and cooking is an obvious use and would not ordinarily deserve further discussion, a number of details on the use of wood from certain plant species burnt for specific reasons will be provided.

We also decided not to include the use of other wood resources, i.e. *“wood chips and wood wool [...] brooms [...] cork”*, to cite some of the categories listed by Banco di Sicilia (1927). The rational exploitation of these resources boasts such a long and rich tradition (Passanante 1987) that it deserves to be treated in a separate publication.

As regards the uses and woody species used in pre- and protohistoric times, we decided to leave this fascinating topic out of our work. For further information see Pasta *et al.* (in press), and references therein.

Due to the complete lack of written evidence, data on the wood used to build the boat and ship reliefs which line the seabed along the Sicilian coast were also ruled out as it cannot be established with any certainty that the hulls of these sailing vessels were built using local wood resources.

In addition, we plan to write further papers dealing with some specific issues, such as the history of the Sicilian manufacturing and furniture industry between the 19th and 20th centuries, and the woody species and the traditional knowledge and techniques adopted in the construction of boats and carts. All these topics deserve further study, also in view of the fact that the vast body of literature available for consultation contains very little information on the botanical identity of the wood used.

Finally, the use of chestnut wood and the history of the introduction, diffusion and decline of the chestnut tree on the island will also be the focus of a separate publication.

MATERIAL AND METHODS

Some of the data presented here are previously unpublished as they arise from the authors' personal interviews with farmers, charcoal burners or craftsmen (Fig. 1). However, the paper is mainly based on a critical analysis of a vast bibliographic repertory and represents the result of decades of careful collection of sources and useful indications. Given the almost total absence of explicit reference to 'forest logging' and local uses of wood in Italian and Sicilian texts concerning wood technology and silviculture, most of the information here reported issues from ethno-anthropological and historical literature.

Following Baldini (2008), "*The term Forest uses refers to work carried out in a forest involving the removal of wood*". Since work in the forest commonly consists of cutting trees and the subsequent removal of wood, whether the main - but never the only - purpose of the intervention



Figure 1. The sequence of images shows (from left to right and from top to bottom) the stages in the construction of a hoe handle by G. La Mantia, father of one of the authors. Sicilian farmers knew how to build various wooden tools on their own (photos T. La Mantia).

is the harvesting of wood, or the cultivation of stands in the strictest sense, the term *Forest uses* can be considered a synonym of “work in the forest”. Accordingly, our contribution focuses on the history of Sicilian forest uses and forestry species, and provides numerous insights into the particular uses of wood in Sicily.

The literature we consulted contained many vernacular Italian or Sicilian woody plant names and a plethora of obsolete, technical and/or vernacular Italian or Sicilian terms borrowed from the world of forest management, woodworking and handicrafts. The vernacular names found in the original texts referring to jobs and tools connected to forest use, woodworking, rural life and handicraft are reported in the text as ‘VN’ (vernacular name). To help readers, we also prepared a synthetic glossary (Table 1) which includes all the woody species mentioned in this contribution. As for their vernacular names, all those found in the original literature we consulted are reported here together with a selection of those terms most commonly used in Sicily according to Penzig (1924). The Italian and scientific names of the plants listed in Table 1 can be found in Pignatti *et al.* (2017-2019).

RESULTS

Timber production and last steps of Sicilian forest disruption (10th - 19th centuries AD)

Data obtained from paleo- and archaeobotanical surveys carried out in Sicily demonstrate that forest cover on the island underwent substantial change starting from 6000-5000 BC. With the exception of the top of the north-eastern mountain ranges, forest cover was already heavily compromised by the first centuries of the Common Era due to the intense and rapid deforestation perpetrated by the Greeks and Romans between the 5th century BC and the 2nd - 3rd centuries AD (Pasta *et al. in press*, and references therein).

Although wood was undoubtedly one of the most important materials for mankind until a few centuries ago, it is not always easy to interpret findings which date back to very ancient times correctly. The reconstruction of past vegetation is often based on simple conjecture and may be biased by the preconception that present day vegetation should be identical to that of the past in terms of floristic composition, structure and dynamics. The environmental reconstruction of the landscape of the Plain of Palermo during the Punic-Roman era proposed by Tamburello (1981), for example, is based on hypotheses that are somewhat difficult to prove. Regarding the few objective data currently available, based on wood

samples of wooden objects collected in the area of Piazza Marina (centre of Palermo), Terranova (2012) reported the use of evergreen and deciduous oaks, *Ulmus* sp., chestnut, beech and probably *Abies nebrodensis* between 891 and 1153 AD.

The systematic use of Sicilian forest resources for timber production dates back to Greek colonization. In particular, according to Diodorus Siculus (s.d.) in 399–398 BC, Dionysius I the Elder, tyrant of Syracuse, “*Having obtained the right to export timber from Italy, sent half of [his, Authors’ note] woodcutters to Mount Etna, rich at that time in precious pines and firs; he sent the other half to Italy [...] and then began to build more than two hundred ships simultaneously and to repair the pre-existing one hundred and ten*”.

On the basis of the few generic descriptions provided by Greek authors, it can be inferred that other parts of the island were also covered by forests (Beloch 1889). An accurate description of the building of a ship during the tyranny of Hieron I (late 5th century BC), provided by Polybius, is transcribed by Di Berenger (1863). Quoting Cicero, Di Berenger (1863) wrote that “*Every town of Sicily, as of the other Maritime Provinces, will have to supply one or more equipped ships to the Roman navy*”, then supply the timber necessary for the construction of the entire boat. Similarly, in the centuries that followed, nobles and vassals were enforced to provide timber for the fleet of their rulers.

A larger amount of information is available on the use of wood in the Arab era, when wood was mainly used in the shipbuilding industry. It seems, in fact, that it was the growing shortage of timber in the Maghreb countries that essentially prompted the Arabs to carry out frequent raids on the island of Sicily from the 8th century AD and induced them to conquer the island (Lombard 1958, 1959). Based on the interpretation of texts by al-Idrisi, geographer at the court of the Norman kings from the 11th to the 12th century AD, Amari & Schiaparelli (1883) identified the Kalsa district of Palermo as “*the arsenal for the construction [of the ships, Authors’ note]*”. Part of the cut trees were exported even far from the island for other purposes; for instance, during XII century AD Pope Innocent II used Sicilian timber to repair the Lateran Basilica (Mack Smith 1983). On the basis of available historical sources, however, Corrao (1988) hypothesized that local forest resources were depleted by “*daily consumption in order to make charcoal and fuelwood, to build carts, ploughs, barrels and even shop signs, provoking continuous damage to the forest*”, rather than by the need for timber to build ships. As Tramontana (1983) writes, forest land in Sicily would have closely surrounded the towns and villages, and Corrao (1987a) highlights the fact that the de-

Status	English	Italian	Sicilian/Local	Scientific
W	Alder	Òntano nero	Avornu, Arvaneddu	<i>Alnus glutinosa</i> (L.) Gaertn.
C	Almond	Mandorlo	Mènnulu	<i>Prunus dulcis</i> (Mill.) D.A. Webb
C	Apricot	Albicocco	Pricòcu, Varcòcu	<i>Prunus armeniaca</i> L.
W/C	Ash	Frassino	Fràscianu, mannu, Muddiù	<i>Fraxinus</i> sp. [incl. <i>F. angustifolia</i> Vahl, <i>F. excelsior</i> L. s.l. and <i>F. ornus</i> L.]
C/N	Azerole, Medlar	Azzeruolo	Azzaloru	<i>Crataegus azerolus</i> L.
C/N	Bead Tree	Albero dei Rosari	Pacienza	<i>Melia azederach</i> L.
W	Beech	Faggio	Fau	<i>Fagus sylvatica</i> L.
W	Birch (Etna's)	Betulla dell'Etna	Vitùdda	<i>Betula aetnensis</i> Raf.
C	Box	Bosso, Bossolo	'Usciu	<i>Buxus sempervirens</i> L.
W	Bramble	Rovo	Ruvettu, Runza	<i>Rubus</i> spp.
W	Broom	Ginestra, Citiso	n.a.	<i>Rosaceae</i> tribe <i>Genisteeae</i> [e.g. genera <i>Cytisus</i> , <i>Genista</i> , etc.]
W	Broom (Giant Aeolian)	Citiso delle Eolie	Sgurbiu	<i>Cytisus aeolicus</i> Guss.
W	Broom (Giant Etna)	Ginestra dell'Etna	'Inistredda	<i>Genista aetnensis</i> (Raf.) DC.
W	Broom (hairy)	Citiso trifloro	Muddacchina di Voscu	<i>Cytisus villosus</i> Pourr.
W	Broom (spiny)	Sparzio villoso	Alastru	<i>Cytisus infestus</i> C. Presl
W	Broom (Tyrrhenian)	Ginestra delle Eolie	Sciàcculi	<i>Genista tyrrhena</i> Vals.
N/C	Carob Tree	Carrubo	Carrubbu	<i>Ceratonia siliqua</i> L.
Err	Cedar	Cedro	n.a.	<i>Cedrus</i> sp.
W	Chaste Tree	Agnocasto	Lignu castu, Làganu	<i>Vitex agnus-castus</i> L.
W/C	Cherry	Ciliegio	Ciràsu	<i>Prunus avium</i> L.
C/N	Chestnut	Castagno	Castagnu	<i>Castanea sativa</i> Mill.
C	Citrus	n.a.	n.a.	<i>Citrus</i> spp.
W	Cork Oak	Sughera	Sùvaru	<i>Quercus suber</i> L.

C/N	Cypress	Cipresso comune	Cipressu, Gadda- redda, Nuci cattiva	<i>Cupressus sempervirens</i> L.
C	Date-plum	Loto, albero di Sant'Andrea	Lignu Santu	<i>Diospyros lotus</i> L.
W	Downy Oak	Roverella	(V)uscigghiu, Rùvulu, Cersa	<i>Quercus pubescens</i> Willd. s.l. [incl. <i>Q. amplifolia</i> Guss., <i>Q. congesta</i> C. Presl, <i>Q. dalechampii</i> Ten., <i>Q.</i> <i>leptobalanos</i> Guss. and <i>Q.</i> <i>virgiliana</i> (Ten.) Ten.]
W	Durmast	Rovere	Rùvulu, Cersa	<i>Quercus petraea</i> (Mattuschka) Liebl. s.l. [incl. subsp. <i>austrotyrrhenica</i> Brullo et al.]
W/C	Elder, Elderberry	Sambuco	Sambucu, Saùcu	<i>Sambucus nigra</i> L.
W	Elm	Olmo	Urmu, Ulmu	<i>Ulmus</i> spp. [incl. <i>U. minor</i> Mill., <i>U. canescens</i> Melville and <i>U. glabra</i> Huds.)
C/N	Eucalyptus	Eucalitto	Calipsu	<i>Eucalyptus</i> spp.
W/C	Fig	Fico	Ficu, Ficara	<i>Ficus carica</i> L.
n.a.	Fir	Abete	Abbitu	<i>Abies</i> spp., <i>Picea</i> spp.
W	Fir (Sicilian)	Abete dei Nebrodi	Arvulu cruci cruci, Arvulu 'i San Filippu	<i>Abies nebrodensis</i> (Lojac.) Mattei
W/C	Hackberry	Bagolaro	Càccamu, Mili- cùccu, Minicùccu, Favaràggiu	<i>Celtis</i> spp. [incl. <i>C. australis</i> L. and <i>C. tournefortii</i> Lam. s.l.]
W	Hawthorn	Biancospino, Lazzerino	Brizzulìnu, Gazzerino	<i>Crataegus</i> spp. [incl. <i>C. monogyna</i> Jacq., <i>C. laevigata</i> (Poir.) DC., etc.]
W/C	Hazelnut	Nocciolo	Nucidida, Nocella	<i>Corylus avellana</i> L.
W	Heather (flower-rich)	Erica multiflora	Alichèddi	<i>Erica multiflora</i> L.
W	Heather (Tree-)	Erica arborea	(G)alència, Alichì	<i>Erica arborea</i> L.
W	Holly	Agrifoglio	Addàuru fogghiu	<i>Ilex aquifolium</i> L.
W	Holm Oak	Leccio	Ìlici	<i>Quercus ilex</i> L.
W	Hop-Hornbeam	Carpino nero	Càrpanu, Cròpanu?	<i>Ostrya carpinifolia</i> Scop.
Err	Hornbeam	Carpino	n.a.	<i>Carpinus betulus</i> L.
W	Ivy	Edera	Arèddara	<i>Hedera helix</i> L.
C/N	Judas Tree	Albero di Giuda	Chiàppara Cavaddina	<i>Cercis siliquastrum</i> L.

W	Juniper	Ginepro	Anìpru, Inìpru, Savina	<i>Juniperus</i> spp. [incl. <i>J. communis</i> L. s.l., <i>J. turbinata</i> Guss. and <i>J. oxycedrus</i> L. s.l.]
W/C	Laurel	Alloro	Addàuru	<i>Laurus nobilis</i> L.
C	Lemon	Limone	Lumiùni, Limiùni	<i>Citrus medica</i> (L.) Osbeck
W	Lime, Linden	Tiglio	Tigghiu	<i>Tilia</i> spp. [incl. <i>T. platyphyllos</i> Scop.]
C	Loquat	Nespolo del Giappone	Nèspulu	<i>Eriobotrya japonica</i> (Thunb.) Lindl.
W	Maple (field)	Acero campestre	Occhiu, Acinu/Aggiru	<i>Acer campestre</i> L.
W	Maple (Norway)	Acero riccio	Occhiu rizzu, Acinu/Aggiru rizzu	<i>Acer platanoides</i> L.
W	Mastic Tree	Lentisco	Stincu, Listincu	<i>Pistacia lentiscus</i> L.
C	Mulberry	Gelso	Cèusu/Cènsu	<i>Morus</i> spp.
C	Mulberry (black)	Gelso nero	Cèusu/Cènsu niuru	<i>Morus nigra</i> L.
C	Mulberry (white)	Gelso bianco	Cèusu/Cènsu biancu/jancu	<i>Morus alba</i> L.
n.a.	n.a.	n.a.	Autani	a Conifer?
W	Oak	Quercia	Cersa, Rùvulu	<i>Quercus</i> spp. (deciduous)
W/C	Oleander	Oleandro	Lànnaru	<i>Nerium oleander</i> L.
W/C	Olive	Olivo	A(u)livu, Agghiastru	<i>Olea europaea</i> L. s.l. [incl. var. <i>sylvestris</i> (Mill.) Lehr.]
C	Orange (bitter)	Arancio amaro	Aranciu amaru, Aranciu cartasu	<i>Citrus aurantium</i> L.
C	Orange (sweet)	Arancio	Aranciu	<i>Citrus sinensis</i> (L.) Osbeck
W	Palm (Dwarf)	Palma nana	Giummarra, Ciafagghiuni	<i>Chamaerops humilis</i> L.
W/C	Pear	Perastro	P(i)ràinu, Pirastru	<i>Pyrus</i> spp. [incl. <i>P. communis</i> L., <i>P. spinosa</i> Forssk., etc.]
W/C	Pine	Pino	Pignu, Zappinu	<i>Pinus</i> spp.
W	Pine (Corsican black)	Pino laricio	Ddeda (Zappinu)	<i>Pinus laricio</i> Poir. s.l. [incl. <i>P. calabrica</i> Hort. ex Gordon]
W	Pine (maritime)	Pino marittimo	Ddeda	<i>Pinus pinaster</i> Aiton s.l.
C/N	Pine (stone)	Pino domestico, Pino da pinoli	Pignu	<i>Pinus pinea</i> L.
W?	Plane, Sycamore	Platano orientale	Durbu	<i>Platanus orientalis</i> L.

W	Poplar	Pioppo	Chiuppu	<i>Populus</i> spp.
W/C	Poplar (black)	Pioppo nero	Chiuppu (niuru)	<i>Populus nigra</i> L.
W/C	Poplar (white)	Pioppo (bianco)	Àrvanu, Àlvanu	<i>Populus alba</i> L.
C/N	Quince	Melo Cotogno	Cutugnu	<i>Cydonia oblonga</i> Mill.
W	Rockrose of Montpellier	Cisto di Montpellier	Rusidda di camiarì furni	<i>Cistus monspeliensis</i> L.
C/N	Service Tree	Sorbo domestico	Zorbu	<i>Sorbus domestica</i> L.
W	Shaggy sparrow-wort	Passerina irsuta	Muffulena	<i>Thymelaea hirsuta</i> (L.) Endl.
W	Strawberry Tree	Corbezzolo	'Mbriacula, 'Mbriacheddi, Acùmmaru, Armulinu	<i>Arbutus unedo</i> L.
N	Sumac	Sommacco	Summaccu	<i>Rhus coriaria</i> L.
W	Tamarisk (African)	Tamerice maggiore	Bruca, Vruca	<i>Tamarix africana</i> Poir.
W	Terebinth	Terebinto	Scornabeccu, Fastucazzu, Ascinu	<i>Pistacia terebinthus</i> L.
N	Tree of Heaven	Ailanto	Summaccu a 'broru, Summaccu arboreu, Summaccu 'miricanu	<i>Ailanthus altissima</i> (Mill.) Swingle
W	Turkey Oak	Cerro	Cièrru	<i>Quercus cerris</i> L. s.l. [incl. <i>Q. gussonei</i> (Borzi) Brullo]
C/N	Walnut	Noce	Nuci	<i>Juglans regia</i> L.
W/C	Willow	Salice	Gurra, Urra	<i>Salix</i> spp.
W/C	Willow (white)	Salice bianco	Gurra, Urra	<i>Salix alba</i> L.
W	Willow (red)	Salice rosso	Gurra, Urra	<i>Salix rubra</i> L.
W	Yew	Tasso	Tassu	<i>Taxus baccata</i> L.

Table 1. Synoptic table including the English, Italian and Scientific names of all the wild (W), cultivated (C), and naturalized (N) woody species mentioned in the text. A selection of Sicilian (or local) vernacular names (from the most to the less commonly used at regional scale) referring to these plants is also provided. The list of species follows the alphabetic order of the English name to help readers check for correspondences. Err = erroneously reported as growing wild in Sicily; n.a. = not available/assessed. N.B.: when talking about single individuals of fruit-trees and/or isolated trees, Sicilians would often use 'pedi/peri di' (foot, stump of) before their vernacular name.

struction of forest resources and thus the “*creation of what is today’s farmland occurred at a much later date than Normans and Swabians*”.

Further evidence comes from direct sources such as that of al-Idrisi (in Amari & Schiaparelli 1883) writing on Aci (a village located on the eastern slopes of Mt. Etna): “*From here, pitch, tar, wood and other commodities are exported in large amounts*”, while the people of Randazzo harvested large amounts “*of wood, which is exported to many countries*”. Regarding the composition of the woods on Etna, al-Idrisi refers to “*woods, most of which are chestnut, hazelnut, pine and cedar*” (all records concerning cedar and/or fir occurrence on Mt. Etna in medieval times are, in all probability, erroneous and refer, rather, to other tall conifers, as argued by Pasta *et al.* 2019), while concerning the territory of Cefalù, he mentions a “*great forest that produces various species of timber for building ships*”. Peri (1978) wrote “*In the middle of the XII century, the shipbuilding industry was concentrated in the triangle San Marco [d’Alunzio, Authors’ note] - Messina - Mascali, these latter ones being the headquarters for the construction and repair of the royal fleet and of big ships*”. Moreover, Peri (1978) referred to the pact signed in the 11th century AD between the Norman King Roger II and the Zirites (the Berber Muslim dynasty that ruled Tunisia and part of Algeria in the 10th - 12th centuries AD), “*to whom he assured supplies of food and timber*”. This century-long overexploitation of local forest resources, however, caused a severe shortage of raw wood material. On this matter, Corrao (1987b) acutely remarked that “*the disappearance in the following century [14th, Authors’ note] of the shipyards of Licata, Syracuse and Trapani, and the reduction in shipbuilding in Palermo is likely to be related to the distance from sources of wood, iron and pitch supply; in Sicily, only the forests of the Nebrodi and Etna were able to supply adequate quantities and, it was, in fact, in Messina, during this subsequent period of crisis in shipbuilding and fleet, that the remaining activity in Sicilian shipbuilding was to be concentrated*”. The shrinkage of wood availability in western Sicily was confirmed by Bresc (1986); on this purpose, based on documents dating back to the period between 1300 and 1450, he pointed out that Trapani was too far from wood resources.

A number of studies focusing on the use of wood in north-eastern Sicily during the late Middle Ages (Bresc-Bautier 1976; Rugolo 1980; Dentici Buccellato 1994) highlighted the sharp contrast between a vast portion of the island, already almost devoid of forest cover, and the wide and still ecologically functional woodlands of the district of “Valdemone” (including the Nebrodi Peloritani mountain ranges and Etna), which was

able to support the activities of local communities and foster further improvements in the techniques of wood-resource exploitation. With reference to the district of Valdemone, in fact, Dentici Buccellato (1994) stated, speaking of the time, “*we can speak of an original ‘civilization of wood’, created by the many carpenters and craftsmen who are well acquainted with woodworking techniques: work tools, household utensils, barrels and casks are manufactured there and, from the mid-14th century, craftsmen work to cover the market demand for western Sicily. The master craftsmen (VN: magistri barillari) of Messina are renowned and their fame is equalled on the island only by those of Trapani, where the craftwork is highly valued in order to cover the needs of the local fish-salting industry [...]*”.

Citing a document dating back to 1577, Giuffrida (2001) reported that the first signs of crisis in the Sicilian sugar cane industry were triggered by the lack of wood. In fact, there is an extensive body of literature on the devastating effects of intensive sugar cane cultivation on Sicilian forests (see Termotto 2012 and references therein). Large quantities of firewood were required for sugar distillation; however, in accordance with the choices specified in our introduction to this paper, these aspects are not dealt with here.

By the end of the Norman and Swabian reigns, forest cover over large parts of the island appeared significantly reduced. Relating to the period between the 13th and 15th centuries AD, Bresc & Pescarmona (1983) showed that the lack of forest resources mainly affected the western part of the island; this fact has been confirmed by recent pollen investigations which point to a major collapse of forest cover around 12th century AD (Tinner *et al.* 2009, 2016). Wood resources in the remnant forests underwent increasing exploitation throughout subsequent centuries; in this regard, Bresc & Pescarmona (1983) wrote of the time: “*The forest is, in fact, subjected to the pressure of carpenters: Valdemone experiences an original wood civilization (at that time many houses in Messina are still made of wood), a world of forests and lumberjacks: high-forest woods persist only on the inaccessible ridges, far from the roads devoted to wood transport. [...]. Messina has become the core of forestry activity: seat of the Arsenal, it is supplied with timber wood from Valdemone and from nearby Calabria. Etna, an incomparable forest domain for the diversity of tree species, provides the pine and fir boards*”. On the other hand, on the basis of the sources consulted, Bresc & Pescarmona (1983) deduced that north-eastern Sicily was still home to vast forested areas, as “*it supplies Palermo with boards, tools, barrel*

staves, various wood-turned objects, in particular wooden flasks and carafes, from Nicosia, San Marco [d'Alunzio, Authors' note] (yokes and soup spoons), while the carpenters of Palermo founded a brotherhood to exploit the high-forest woods of San Fratello and Caronia".

Referring to the sugar factory (the so-called *trappeto*) and the crusher equipment components, Bresc & Pescarmona (1983) reported that "With the development of the sugar factory, Valdemone obtained the pieces needed for the sugar crusher from enormous logs: the 2.60 m to 3.50 m long screws (VN: *scrufini*) were made of holm oak wood, whilst the large planks into which the screws were inserted, as well as the large beams on which the press was fixed, were made of cork oak or holm oak wood. This technical specialization, which involved a rational management of the forest, represents a trait typical of the Nebrodi and Peloritani Mountains".

The lack of information available on both the use and the real extent of Sicilian forest cover between 15th and 18th centuries may depend on the absence of adequate investigations carried out on documentary and archive sources.

Without a doubt, forest cover underwent the last drastic shrinkage at the end of the 18th century (La Mantia 2009) following the end of feudalism and the proclamation of a number of laws regulating public and private forest management (see Ventura 2002).

Forest disruption is clearly emphasized by Balsamo's reference (1800) to the "almost unbelievable scarcity of wood of all kinds that we have been experiencing in Sicily in recent years". Based on his profound knowledge of Sicily, this agronomist also denounced the absolute lack of appropriate initiatives, such as (urgent and feasible) reforestation activities aiming at restoring the extant fragmented and degraded forests. Some decades later, the worrying state of the island's forest heritage is underlined by Calcara (1848), who wrote: "All things considered, the woods of Sicily today are enough to satisfy the basic needs [...]. And, as a matter of fact, the forests also provide wood for the construction of towns, ships, rural tools and for almost all the craftsmen and manufacturing industries; however, woods also provide firewood and charcoal fuel". In the same period, several Bourbon forestry provided well-argued reports regarding Pantelleria, Lampedusa and Linosa, clearly explaining how to ensure sustainable use of local woodlands. Despite their recommendations, all these circum-Sicilian islets underwent rapid deforestation, which in turn triggered dramatic

and irreversible damage to local environmental and soil characteristics (Pasta & La Mantia 2003 and references therein). Nevertheless, local people learned to cope with wood shortage to produce handmade tools useful for their daily lives (Fig. 2).

As a consequence of wood shortage, in the early decades of the 19th century, the House of Bourbon was obliged to reduce taxes on timber imports - with specific reference to fir boards - to Sicily (Anonymous 1836).

Wood imported from other regions and countries, including non-European countries, became a factor which increasingly affected the local economy, to an even greater extent by the end of the 19th century. However, Sicilian mountainous areas were still home to large wooded zones. For example, in 1823, Barons Turrisi wrote a letter to the Holy Royal Majesty (Francis I of Bourbon) to explain that the decision to construct two paper mills in the territory of Castelbuono was based on the availability of "enough wood to log from nearby woods" (Cicero *et al.* 1993).

It may serve to underline here that forest management and wood processing systems were part of the farmers' cultural heritage in mountainous areas of the island. The proverb "cut chestnuts and oaks with a tramontane wind and waning moon" (the original text of the proverb from the Madonie area is *'ntra lu minimu di la luna e cu ventu di tramontana tagghia castagni e cersi*: Minà Palumbo 1853-1855), documented in the Madonie area, provides emblematic evidence of the strict connection between montane resources and montane human communities.

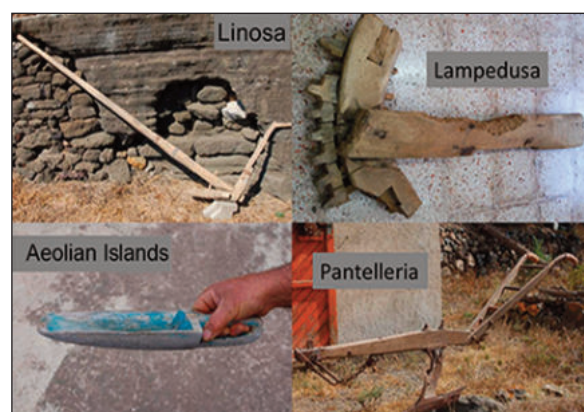


Figure 2. In the circum-Sicilian islands, there was often a use of the little wood available to make a variety of tools which was unique to the islands, such as black mulberry to build a plough on Linosa, the cogwheel of a mill in Lampedusa, a wooden spoon for processing capers made of broom on the Aeolian Islands and a holm-oak plough on Pantelleria (photo T. La Mantia).

Coal and charcoal burners, firewood and fire

According to D’Onofrio (1996a), the tools used by charcoal burners on the Nebrodi Mts. were made of beech wood, Turkey oak (*Quercus cerris*) wood or the wood of other deciduous oaks because they are easier to work. D’Onofrio (1996a) also emphasized the skills of charcoal burners “belonging to some municipalities in the Nebrodi, like Alcara Li Fusi, who may replace the carpenters (VN: *mastri d’ascia*) in the making of ploughs and other tools needed by farmers for their manual labour: yokes (VN: *iuvi*), malaxers (VN: *màngani*), tridents (VN: *trirenti*), barnyard shovels (VN: *pal’î l’aria*), troughs (VN: *maiddi*) and similar” (Fig. 3).

It goes without saying that charcoal burners had profound knowledge of the fuel properties of wood and could distinguish the product quality perfectly according to the species used to produce charcoal (D’Onofrio 1996a). A comprehensive review of the data available relating to the number and distribution of Sicilian charcoal piles in the past, on the forest species used to produce charcoal and on the trade/export of Sicilian coal to Italy and North Africa is still lacking. Studies on these topics (e.g. Di Pasquale & Garfi 1989) would undoubtedly help to reconstruct the historical evolution of forest cover on the island. For example, regarding Porta Carbone (= ‘Coal Gate’),

one of the ancient gates of the city wall of Palermo, Di Marzo (1869-1886) wrote: “It was built [...] around 1550 to host the wood and charcoal coming daily to the city from the sea for public provision”. Porta Carbone was built very close to - or had replaced - another gate called ‘Porta delle Legna’ or ‘Porta de’ Legni’ (= ‘Wood gate’), where, according to a manuscript dating back to the 17th century, “timber and coal come with large boats from Caronia, Cefalù and other places” (Di Giovanni in Mongitore 1732).

The wood of a number of shrubs was favoured to heat ovens for cooking purposes. For example, Pitrè (1889) reported that the best bread is obtained by burning broom (VN: *alastru*, corresponding to *Cytisus infestus* = *Calicotome infesta*). Another broom species, *Genista tyrrhena*, was collected by Aeolian islanders for the same purpose. Furthermore, based on the vernacular name reported by Cupani (in Calcara 1848), the use of *Cistus monspeliensis* for ovens was already well-known in the 17th century (VN: *rusedda di camiarì furnu* = rockrose to heat the oven), while Gussone (1832-1834) reported a similar use for *Thymelaea hirsuta*.

The vernacular name *ddeda*, still used up to 19th century for *Pinus calabrica* and *Pinus pinaster* growing on Mt. Etna and Pantelleria Island, respectively (Gussone 1832-1834, 1842-1845),

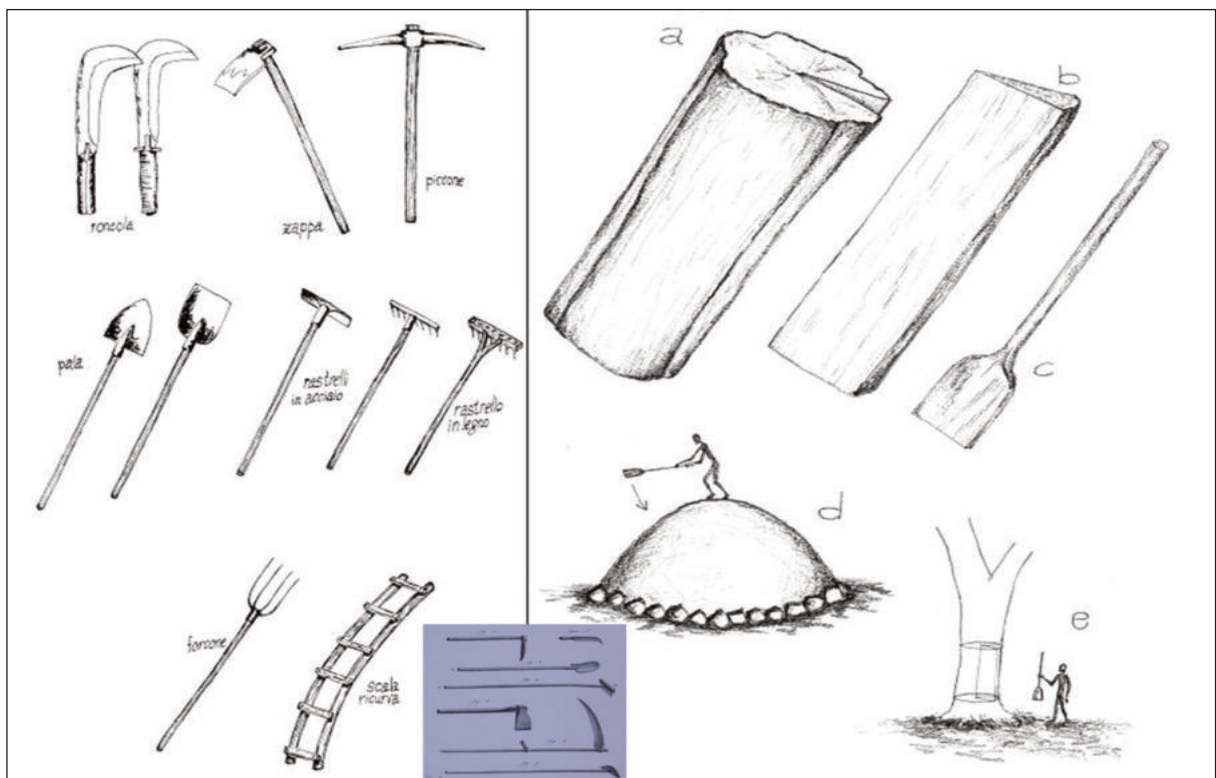


Figure 3. Tools used by charcoal burners (on the left) and stages in making the shovel (on the right); tools used to produce charcoal in the Madonie Mts as recently as 20 years ago (from Costanza 2001) are still strikingly similar to those used for the same purpose at the end of 18th century illustrated by Diderot & D’Alembert (1751-1780) (below).

comes from the Latin for torch (*taeda*). In fact, their highly resin-rich branches and roots were used to obtain rudimental torches.

Carpenters without wood

As already mentioned, the available pollen data (Noti *et al.* 2009; Bisculm *et al.* 2012; Calò *et al.* 2013; Tinner *et al.* 2009, 2016) confirmed that the forests of western and southern Sicily underwent reduction and fragmentation more intensely and at an earlier date than those of the Tyrrhenian and north-eastern sector of the island. This remarkable imbalance in terms of wood availability was acutely highlighted by Bresc (1971) in his data analysis on the diffusion of Sicilian wooden houses between 13th and 15th centuries AD. Based on other data, Coppola (2014) reaches the same conclusion and writes: “*The city [Palermo, authors’ note] hosted a well-equipped arsenal, which remained fully operational whilst able to take advantage of local mineral wealth and timber from local high-forest woods. Resources were adequately widespread at that time to supply the flow of trade to the Maghreb from the 8th century. With the progressive depletion of resources and with the need to import raw materials from other sites, however, the arsenal gradually declined, to the advantage of the flourishing City of Messina. In fact, the city of the Strait began to play a leading role first within the county and then within the kingdom, acting as an intermediate stopover along the route between the West and the East of the Mediterranean. It became a point of connection between the island and the continental part of the Kingdom, favoured by ships carrying goods and pilgrims. The new shipbuilding centre could rely on iron from mines in the hills above the city, timber from the woods of Randazzo, Etna, the Caronie and Nicosia, and pitch from Mascali and nearby Calabria.*”

Dentici Buccellato (1994) confirmed that, in the late Middle Ages, timber from neighbouring woods was no longer sufficient to cover the needs of the main cities in western Sicily: “*Timber in the form of beams, plante [planks, boards, Authors’ note] or barrels arrived at maritime customs in Palermo*” and timber also arrived in Trapani both by sea and by land. During the Norman period Falkenhausen (1980) confirmed this and writes that the right to cut wood was given to “*build or repair churches and houses, and produce poles for vines and ploughs*”. Based on archive data concerning western Sicily between 1298 to 1460, Bresc-Bautier & Bresc (1980) provided a long list of work carried out and objects produced by “*shipwrights and carpenters together*” (e.g. houses, ships, wheels for hydraulic machines) and define it as “*a multi-faceted job requiring*

universal skills, which also included wood carving, under the same name”. Considering the widespread diffusion of the so-called *senie* and *norie* (hydraulic machines used to pump water from the underground), no doubt a conspicuous amount of timber was needed to build and repair them (Fig. 4).

As for the wood used for these machines, Todaro (2006) reported that medieval notarial deeds often mention *rùvulu* [i.e. durmast, *Quercus petraea*, according to Todaro, but could also be downy oak, *Q. pubescens*, Authors’ note].

In Trapani the specialization of woodworkers reached excellent levels. Since the 16th century, the names *fabri lignarij* (literally ‘woodsmiths’) and *mastri d’ascia* (shipwrights) have been used to indicate specialized personnel with different skills and tasks (Corso, 1990). At that time much of the timber used in local workshops was imported, as the trade tax records clearly testify. Corso (1990) mentioned the use of various species of trees such as pines, firs, beeches, walnuts, chestnuts, poplars, *autani* (probably pines or junipers according to Pasta *et al.* 2019) and ash trees. In the 17th century, the number of professionals specialized in this sector increased further. As pointed out by Gallo (1990), in fact, *mastri di galbo* [the ancient shipwrights, Authors’ note], *mastri di noce* (literally ‘walnut masters’, i.e. carpenters specialized in walnut woodworking), *mastri d’ascia seu casigiaturi* (woodworkers who built different wooden elements of a house structure), *carrozzeri* (coachbuilders), *intagliaturi* (carvers), *turnari* (wooden lathe makers), *molinari* (millers “who build or repair mills both to grind cereals and to transfer water, namely salt pans”), *trom-*

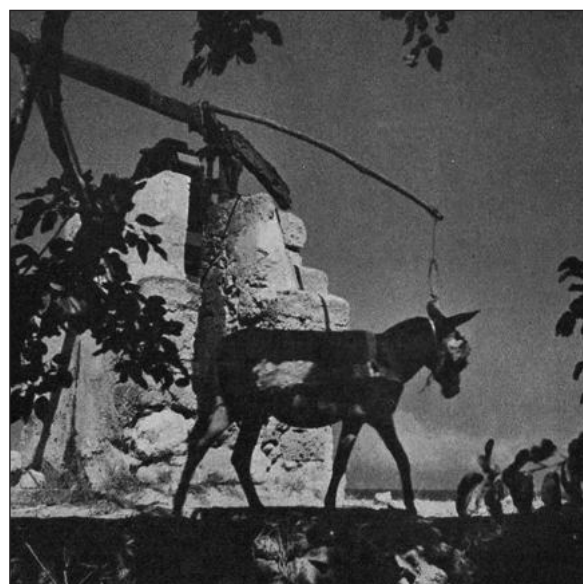


Figure 4. The so-called *norie* (hydraulic machine) photographed by Fosco Maraini in western Sicily in the 1940s-1950s (from Cruciani 1953).

mari (horn workers) and *rimari* (oar makers). All these figures played different roles in the hierarchy of the specialized personnel of the local workshops (Lombardo 2001). Similar names referring to the different specializations are reported for the carpenters of Palermo, whose local workers guild (the so-called “maestranza”) was founded in 1499 (Di Marzo in Palazzotto 2001).

Giacomarra (2000) provided further details which help to better understand the different role of *lignamari* and *mastri d’ascia*: the former went into the forests to choose and personally collect the wood they had to work (in the Madonie mostly walnut, chestnut, almond, beech and mulberry), the latter instead directly worked semi-finished wood products.

Wood use and wood technology in Sicily: data from the (few) regional writings on this topic

Sicilian agronomic treatises written before the beginning of the 20th century mostly deal with agricultural and forestry crops, and focus on the techniques of forest propagation (Balsamo, 1851), whilst very few of them contain references of any interest to the uses of wood. For example, Nicosia (1735) reported that oak in general “*is the best for woods*”; he specifies, however, that holm oaks provide the best coppices for fuelwood and charcoal while their high-forest woods may provide high acorn production and timber for factories. He also mentions the cultivation of chestnut both for fruit and timber production.

In his famous “*Trattato dei boschi dell’Etna*” Scuderi (1828) eloquently illustrated the centuries-old tradition of using Etna trees to produce timber. For each species, the author indicates the characteristics of the wood and often elaborates on the description of specific uses. In the lines below we briefly report some information concerning the single species listed in this precious text: *Acer campestre* (“*its wood is white, compact, excellent for work, and used by woodturners and arquebus makers. The wood of the roots is elegantly white stained*”); *Acer platanoides* (used for “*the frame of arquebuses*”); *Ilex aquifolium* (“*The wood is white and very solid. Where the trunk grows, the heartwood shows a black colour similar to ebony*”); *Celtis australis* (“*The wood is dirty-white, compact and hard with tenacious and supple fibres. And it is also so elastic that it bends easily without breaking. As a result, it was widely used in Sicily for barrel hoops and, for this purpose, it is grown to obtain long and tender branches. Hackberry hoops are not susceptible to woodworm, unlike those of chestnut, and prove to be stronger and more durable. Its green branches are used by farmers for binding, its dry wood is used for wagon wheels and for large sledges used*

in the fields [in the original text the Italian term *tregge* is used, Authors’ note] *and its long and knotty sticks are mainly used for making whips and the like. Elsewhere, when hackberry branches reach the height of six to eight palms* [approximately 155–206 cm, Authors’ note] *they are pollarded so that, within a given time lapse, the newly sprouted branches can be cut down and used as firewood. The trunk then sprouts again and the new sticks will be cut down again and again*”); *Betula aetnensis* (“*Our farmers use birchwood to make the barrel circles with a capacity of approx. 1100–2200 L. And these, having no knots or tortuosity, are clearer and more regular than the hackberry ones, but not as long-lasting. They also make charcoal, which is less valuable with respect to that obtained from oaks, although some prefer it in the production of cannon powder.*”); *Carpinus betulus* “*Hornbeam wood can be used in all jobs which require a strong and compact wood. The coal is used in cannon powder factories.*” [as hornbeams do not grow in Sicily, Scuderi probably refers to *Ostrya carpinifolia*, Authors’ note]; *Castanea sativa* (“*Chestnut wood is strong, tenacious, long-lasting, and resists damp and rain. We use its boards for the external doors of buildings, for ceilings, barrel staves and the like. There is no better wood to replace its both large and small beams in the load-bearing structure of house roofs, positioning them with having to saw them in the middle and having removed their bark to avoid woodworm attacks*”); *Quercus cerris* (“*The wood is hard, but burning may cause headaches due to its vapours*”); *Quercus ilex* (“*Its wood is very hard, strong and heavy, hence it is preferred to [downy, Authors’ note] oak for artefacts which require great strength, such as clamps, malaxers and printing presses. The ancients used it to make water channels and gutters, as reported by Virgil [...] Holm oak coal gives a very lively fire, and does not offend the head with the vapours.*”); *Fagus sylvatica* (“*The wood is dense and easy to work. [...] However, we did not exploit as much as we could. Except for the use we make of wood for a few pieces of furniture, namely for summer residences and yokes for ploughs, we set aside the rest as useless.*”); *Quercus pedunculata* [old synonym of *Q. robur*, which does not occur in Sicily; also in this case Scuderi probably refers to other common deciduous oak species growing on Etna, such as *Quercus congesta* or *Q. dalechampii*, Authors’ note]; “*Its stems grow straight, regular and high, thus providing the best main beams to support floors and roofs. Local people are also wont to choosing themselves the large pieces of wood to build their own winepress*” (Fig. 5). “*In-deed, its wood can be even harder, stronger and more indestructible if the tree is left standing to dry gradually after having peeled off the bark at*

the foot of the tree or if the trunk is put into water and left for several months. In these cases, its duration is unmatched”; *Fraxinus* sp. [it is better here to attribute the information on ‘ashes’ reported by Scuderi to *Fraxinus sensu lato* as he cites both ‘*F. excelsior*’ - very rare in Sicily and currently occurring only on Nebrodi Mts. – and ‘*F. humilior*’ (an obsolete synonym of *F. angustifolia*) and elsewhere in text he also mentions the harvest of manna, which is obtained from both *Fraxinus angustifolia* and *F. ornus*, the latter rather common on Etna, Authors’ note]. “The ash was used for numerous purposes. It also serves to make hoops, poles, perches and rods”; *Juniperus communis* (“when burned its wood has a pleasant smell, it is so compact and strong it can be used successfully in construction works and lasts for several centuries.”); *Genista aetnensis* (Scuderi reports its use as firewood); *Laurus nobilis* (“its branches are used to make staves”); *Crataegus azarolus* (“From its large trunks, boards are obtained; [considering] its compactness, its beautiful yellow-red colour and the brightness it acquires after cleaning, it could be used to make furniture, replacing mahogany, which is imported. Its production should be encouraged, especially considering that hawthorn, on which it may be grafted, thrives in the middle of lava fields, on the harshest stream-sides, and is happy with very little soil”); *Pistacia lentiscus* (“firewood”); *Corylus avellana* (“straight, flexible and knotless branches; these are used for

barrel staves, carpet beaters, etc.”); *Juglans regia* (“Walnut wood is strong, veined, the best available for furniture. Cabinet makers, turners, carpenters and wood sculptors prefer to work with this wood as it can be easily chiselled, it has no pores, it acquires a good shine, and, after heat treatment, it takes any shape we want”); *Ulmus minor* (“The reddish shoots, thin and flexible, are used for baskets. The wood is tenacious, strong and long-lasting: it is well suited for artefacts such as clamps, desks, machines and more”); *Pinus pinea* (“The wood is strong, compact, resistant to damp, and therefore must be used in the construction of ships”); *Pinus calabrica* (“In the meantime we are currently using those of our pines which are not used to make coal, teda [pitch, tar, Authors’ note] and boards; In this regard, water saws have already been used in the pine forests located on the western slopes [of Mt. Etna, Authors’ note]. Wild pine boards are less compact, less durable, and less easy to clean than fir boards, but they may be used appropriately for a larger number of purposes. And none of us have forgotten that when Sicily could not import fir boards from the continent, due to the embargo [here Scuderi probably refers to the consequences of some previous conflicts between the Spanish and the English, Authors’ note], our boards replaced them in many cases, even in the construction of our fleet”); *Populus* sp. (“The poplar wood is white, but fragile, and not suitable for making objects that are ex-



Figure 5. The remarkable size of a single part of a traditional winepress underlined the need for large trees to produce wine in the Etna area. The main lever (the “key”) was probably made of downy oak or durmast wood, while the vertical screw was probably made of hackberry wood (photo G. Sala).

posed to damp and rain. It should not be used but for the making of room doors, furniture, and for certain turning and carving activities"); *Platanus orientalis* ("The wood is not very hard, but it is easy to clean, and shows a beautiful reddish colour with many scattered colourful dots; that is why it is used by turners" [plane trees have never been observed growing wild in the Etna region: Scuderi recommends its diffusion but does not clarify if it occurs somewhere on the volcano, Authors' note]. About *Quercus* sp., Scuderi [who probably refers to deciduous oaks in general, Authors' note] writes: "The oaks of Etna, after the pinewoods, have been the most important and useful woods for the populations of Sicily. When the Saracens ruled the island, the big oaks of Etna were felled and, subsequently, the boards were placed in water for a while and then used to make external house doors, which proved to be impregnable. During his brief lordship, Vittorio Amedeo [the Kingdom of Sicily passed from Philip V of Spain to the Duke of Savoy between 1713 and 1720, Authors' note] [...] built several ships for his fleet with the oaks of Mount Concilio [near Nicolosi, Authors' note], and used them during his battles against the English. The wood and the charcoal of these oak woods have always been sufficient, as they are today, for the needs of the numerous communities of Etna"; *Salix alba* ("the white willow is rich in shoots [...], with them [people] make baskets and with the wood they make unrefined furniture"); *Erica* sp. ("Rarely does the stem of the heather reach a size suitable for lathe work"); on *Taxus baccata* [no longer occurring on Mt. Etna, Authors' note] Scuderi reports "The wood is strong and heavy and becomes very shiny after cleaning; due to its flaming reddish-brown colour it is highly valued in lathe work and in furniture making"). Finally, referring to lime tree [currently absent on Etna, Authors' note] wood, the author defines it as "among the most useful to the local community for its manifold uses".

A few decades after Scuderi, Celesia Setaiolo (1872) also provided detailed information on the characteristics and uses of Sicilian woods. In a paragraph from his work entitled "The oaks of supreme usefulness for craft and industry" he reports the use of oak wood [probably both durmast and downy oak, Authors' note] "in the construction of ships, together with resinous woods to mitigate its weight, [...], it resists water without deteriorating and, consequently, besides being used for ships, it is highly valued in crafting doors, water saws, water mill wheels, hydraulic machines, mining tunnels, etc. Still further, it is used to make pillars and columns; to build bridges, barrels and clamps". On the Turkey oak, Celesia Setaiolo (1872) wrote that its wood is less valuable and is used "to build barrels and casks"; further

on he reports "The wood of beeches is used by turners and carpenters. After painting and varnishing, beech boards can be crafted to look like walnut. It is used for tables, screws, trays, chairs, cylinders, presses, oars, shovels, spoons; for the frame of pack-saddles; for slippers, cannon wagons, rudders, oxen yokes, boxes, etc.", and continues by describing the resistance of beechwood to water and its use in historical periods. Celesia Setaiolo (1872) also reported a little-known fact about the wood of hazels: "Its wood is white in colour; harder than willow, poplar, and lime. [...] after being buried for a few weeks underground it is used to make boxes. Its trunks provide staves for barrels, bundles, and other small tools. Additionally, its suckers are used to make staves and bows". To emphasize the multiple uses (e.g. to make boards, pedestals, etc.) of hornbeams [misidentified, probably *Ostrya carpinifolia*, Authors' note] the author states that "The wood of hornbeams is useful for turners, carpenters and coach makers (named *carrozzajo* in the original text)"; regarding *Betula aetnensis*, after mentioning the main local uses of birch wood (barrel circles, chairs, etc.) he writes "with the root they make tobacco boxes, pipes, cups, spoons". The author remarks that maples provide a very versatile wood. Moreover, besides listing the many uses of holm oak wood, Celesia Setaiolo (1872) also underlined its hardness; the uses of laurels ("poles; very easy to fold, the branches are used to make staves") and carob trees ("good for furniture, and for fire"), however, are quite limited. As for the use of brooms [called *citisi* in the text; this Italian vernacular name may refer to either *Cytisus spinosus* or *Cytisus villosus*, Authors' note] Celesia Setaiolo (1872) wrote: "It is used to make knife handles and barrel staves; as it is also good for fire". Finally, he talks about the uses of the wood of an introduced tree species, *Cercis siliquastrum* ("Its wood is hard, white with black and greenish veins after being cleaned, and suits quite well to furniture making") and also provides information on the different uses of coal obtained from different species.

Besides the numerous native and cultivated tree and shrub species whose wood uses have been explicitly indicated in the consulted literature (Tab. 1), the local exploitation of many other woody species may be supposed, as in the case of *Arbutus unedo* (Di Lorenzo 1835).

Carpenters, wood and territory

Besides the origin of the wood they use (Sicilian or not), cabinetmakers and carpenters have long represented an important social category on the island. The central role of carpenters in Sicilian civil society endured over centuries and has lasted

until the present day. For example, in the city of Mazara del Vallo (as well as in Trapani, *pers. obs.*), carpenters were the first to found brotherhoods (Napoli 1932).

Wood represented the main raw material for the building of objects and tools, an essential resource and a real natural capital for the economy of small craftsmen's workshops and farmers able to prepare various tools for common use (Cusumano 1988). Indeed, the most part of everyday objects (e.g. means of transport, tools, furniture, etc.) were made of wood. Some sources indicate the type of wood used for each purpose, other authors, such as Bianca (1878), simply used the generic term "*hardwood*", usually referring to oak wood. Numerous craftsmen were involved in woodworking, and some of them procured raw material such as trunks or sawn logs, while others worked on wood already shaped to boards or at least semi-finished. The former were called *mastri d'ascia* (literally 'axe masters') *d'òpira rossa* (shipwrights), the latter were carpenters or *mastri d'ascia d'òpira fina* (Vella 1980). The work of these two groups of craftsmen was based on different techniques and procedures and gave rise to very different skills. For example, the *carradori* (= cart makers), ship carpenters, the craftsmen specialized in making ploughs and agricultural tools were part of the first group, they prevalently used an axe and took care of the harder work, going personally to the woods to select the trees and actively purchase (cut and transport) the raw material, while the second group included cabinetmakers, carvers, and window- and door manufacturers (Vella 1980; Cusumano 1988).

The wide spectrum of activities relating to woodworking was further segmented into specialized professional figures, so that each member of the staff of the workshop was specialized in producing a particular product (e.g., coopers, chair- or basket makers, etc.).

Local craftsmen were able to obtain the best results complying with the locally available material. For instance, the 'axe masters' of Caccamo mostly used ash and sumac wood, but also worked with walnut, chestnut, almond, olive and mulberry when available (Giacomarra 1988), and local peasants cultivated on purpose black poplars to cut their wood and use it to make roof beams (S. Anello, *pers. comm.*).

Similarly, Cusumano (1983) wrote "*In the territory of Belice [South-Western Sicily, authors' note], in modern times, there is no trace of wooded areas, but only scattered nuclei of walnut trees near Salemi, and elms and hackberry near Partanna along the streams*" [in the original text *a parti di ciumara*, Authors' note]; the wood obtained from these trees was used to build the tools and ploughs needed by local countrymen.

Local craftsmen could also exploit the wood of the trees cultivated in the surrounding areas, such as almond, lemon, olive and mulberry trees or - more often - wood from distant areas, such as poplar, ash, beech and fir trunks, largely used to build carts. The import of wood from remote areas (the nearest Sicilian stands of beech and fir are over 100 km away, whilst those of Calabria are located at least 300 km far from the Belice area) highlights both the broad use and the shortage of this key material. In the Belice Valley territory (T. La Mantia, *pers. obs.*), as well as elsewhere in Sicily (Badalamenti *et al.* 2012), the poor wood availability forced local people to use also the Tree of Heaven (*Ailanthus altissima*).

The choice of type of wood to be used for a specific purpose was a critical phase of the entire production process; indeed, good knowledge on the characteristics (e.g. physical and mechanical properties, flaws) and the possible fields of use of each wood type was the core of a craftsman's skills and the key to his success. As Vibaek & D'Onofrio (1984) wrote, carpenters selected and bought the trees directly in the wild [in the original text *accaparràrisi l'arvulu* = to purchase the tree for themselves, Authors' note]. The task of craftsmen, as reported by many authors, was to obtain the most suitable type and amount of wood to be crafted, as from October to March they would be preparing the different parts of the ploughs and carts and then assembling them.

Our analysis highlighted the deep relationship between the carpenters' activity and the availability of forest resources. For instance, Casarrubea (1984) wrote: "*The wood, from Nocella to Calatubo [two watersheds, Authors' note], characterized house building in Partinico [a town located c. 20 km west of Palermo, Authors' note] until the eighteenth century, and wood was, until the beginning of the twentieth century, the fundamental raw material for furnishings (with a local guild of woodworkers), the load-bearing structure of ceilings and vaults [...]*".

In the following lines we try to summarize the main information obtained from sources concerning the use of wood and forests by carpenters. This overview may also provide some indication of the changes which have recently affected the largest woodlands in Sicily (located on Nebrodi Mts. and on Mt. Etna) and of the much smaller wooded areas on the circum-Sicilian islets.

Thanks to the availability of many tree species providing timber with different technical characteristics, the forests of Nebrodi Mts., subject in the past to rights of civic use, have been continuously exploited for centuries. Among the deciduous oaks, the most valued were downy oak and durmast (VN: *rùvulu*) due to their hardwood, and Turkey oaks

(VN: *cierru*), which provided straight, tall, robust trunks, easy to split lengthwise. Beeches have a softer wood, mainly used for burning and for making domestic objects, while elms provided wood with an excellent, hard and heavy fibre. Poplars, black alders [*Alnus glutinosa*, currently rare on Nebrodi Mts., Authors' note] - or linden [*Tilia platyphyllos*, locally extinct, Authors' note], were used for the tenderness of their fibres for indoor wooden artefacts or for carving or turning, while maples and cypresses (the latter usually planted near the villages) were valued for their hardness, rigidity and resistance to woodworm. Walnuts, chestnuts and 'pines' also provided excellent working material not only due to the technical properties of their wood, but also to the size that the trees of these species could reach. Finally, also pear (*Pyrus* spp.), cherry, carob and olive trees were used, as well as yews (*Taxus baccata*, nowadays rare on the Nebrodi Mts. and absent elsewhere in Sicily: Mazzola & Domina 2006), whose aesthetic characteristics (e.g. shape of the branches, colour of the grain) were exalted by the skilled hands of local cabinet-makers (Lo Castro 2009).

On Mount Etna, excellent timber wood was obtained from the forests of *Pinus calabrica*. The use of Etna pines for the construction of ships, also reported by Antonelli (1928), probably dates back to ancient times. In this regard, Balsamo (1851) wrote "since the most advantageous use of pine wood is that of making masts for ships and, as their stems need to be beautiful, long, and straight, it is useful to gently prune the lower branches of their canopy from the age of five or six up to fifteen years, and - if possible - to underpin them with poles". Several interviews to local, elderly lumberjacks confirmed that these practices continued until tree-cutting was forbidden (i.e. approximately half a century ago). To obtain straight trunks, older plants were also underpinned by tying long ladders to their sides (T. La Mantia, pers. obs.). Concerning adult pines, Balsamo (1851) informed us that tar harvesting started when the trees were thirty years old (see also Russo *et al.* 2019), and they were cut down at the age of 60 years (Fig. 6).

With the exception of Pantelleria Island, timber wood has long been an extremely limited resource on most of the circum-Sicilian islands. This is due to a long-lasting and almost complete deforestation process which started in prehistoric times and ended towards the end of 19th century (Pasta *et al.* in press, and references therein). In these tiny insular territories, local people adapted both to the timber wood shortage and to exploiting the few wood resources available. This is the case of *Cytisus aeolicus*, a remarkable tree-like 'giant' broom endemic to the Aeolian Archipelago (Zaia *et al.* 2020).

As described by Lo Cascio & La Mantia (2013), from its wood "the farmers of Stromboli and Vulcano obtained excellent material to make agricultural tools and poles to support the vines, as observed by the traveller Jean Houel, who visited both islands at the end of the 18th century. The need for wood, including firewood, and the spread of agriculture between the 18th and 19th centuries caused its gradual rarefaction and even its extinction on some islands of the archipelago. [...] Today, on this island [Vulcano, Authors' note], they grow almost exclusively in the few areas where agriculture is still practised and in private gardens, testifying to the close link between the broom and agricultural activity". The elderly farmers of Stromboli also report that the larger trunks of *Cytisus aeolicus* were used to build the frame of rudimentary sledges to transport wood and bundles of branches collected on local steep sandy slopes and used as firewood (R. Zaia, pers. comm.).

Wood, the authentic 'pivot' of rural communities: ploughs and other tools useful for everyday life in the fields

The most common tool used on arable land was the ard plough. Peasants were able to build these ploughs themselves (Tropea 1979); however, they were often quite rudimentary tools, as underlined by Balsamo (1845).

For the territory of Avola, Bianca (1878) wrote: "It is an ancient plough (VN: *perticale*) entirely made of wood (usually of elm, oak or ash)"; the same information is faithfully reported by Pitrè (1889): "all made of wood (usually of elm, oak or ash)". Bianca (1878) specified that ash wood was used "to obtain the share-beam (*ceppi* in Italian) and plough-beam (*buri* in Italian) for our ploughs"; he further adds that the plane tree (*Platanus orientalis*) "is also used to make various parts of our



Figure 6. Most of the trees growing in the Corsican black pine forest of Linguaglossa still bear the incisions from tar extraction carried out in the past. Pine trees were subsequently felled when they reached the age of 60 years (photo T. La Mantia).

plough" (this particular use of this latter species was confirmed in the Hyblaean area 125 years after by Uccello 2003). Moreover, Bianca (1878) specifies that the wood of the yoke had to be hardwood; in this regard, the wood of *Fraxinus angustifolia* was still used to build parts of ploughs in Bianca's time. However, its use by carpenters was diminishing as it grew only at the bottom of local 'Cave' (canyons), and transport upstream was particularly labour-demanding. Concerning the island of Ustica, Habsburg Lothringen (1898) wrote: "Ploughs are made of ash imported from Sicily. The incisions made in order to collect the resin [more correctly, the 'manna', Authors' note] are still visible. There are 150 ploughs". Some old ash trees still grow on Ustica and probably descend from the same ash trees mentioned by the archduke, introduced for this purpose after the establishment of the colony under Bourbon rule at the end of the 18th century (S. Pasta, *pers. obs.*). Based on evidence collected on the island of Favignana, local people used the wood of the alien tree *Melia azedarach* to build ploughs (and not boats, as previously reported by Badalamenti *et al.* 2013).

As remarked by Uccello (1972), the wood needed to build the plough had to be resistant and knotless. For this reason, wild pear trees (*Pyrus* spp.), as well as any woody species yielding fragile wood should be avoided. Hence, the only suitable trees were downy oaks, holm oaks and hackberries (*Celtis australis*), which provided wood which was compact, resistant and easy to work with. Moreover, in order to ensure its sturdiness, the plough had to be crafted directly from the trunk, and not from the branches, and the trunk needed to be naturally shaped to form an obtuse angle. The size of the ploughs varied according to the size of the animals that were required to pull them: the largest ploughs were intended for oxen, gradually decreasing in size for cows, mares and donkeys (Uccello 1972). The stilt, 12 palms long (i.e. approximately 3 metres), was predominantly made of white poplar or hackberry wood and less frequently of downy or holm oak as the wood of these latter species is too heavy and their stems are seldom straight. The yoke, 6 palms (c. 1.5 m) long, was made from a single piece of light wood, to prevent weighing the animal down excessively. White poplar or willow (*Salix alba*) wood was used for this. Another tool used to work in the field was the harrow (called *frangizolle* in Italian), the cylindrical body of which was made from a cherry trunk, while the teeth (fixed by interlocking) were made of holm oak, wild olive or mastic tree, all very hard woods capable of withstanding frequent mechanical shocks (Uccello 1972). Lastly, the so-called *tirante* beam was made of knotty and resistant wild olive wood. Discussing the social and econ-

omic changes which caused the replacement of animal traction with motor vehicles, Uccello (1972) wrote: "Ploughs, for example, usually made of carob wood, are used only on parcels with shallow soils, or to plough vegetable gardens, where it is not possible to use a tractor".

In a study focusing on wheat cultivation practices, Nicosia (1980) defines the plough as "the undisputed lord of the fief" and he specifies that it was usually made from "oak wood [VN: *vuscigliu*, probably downy oak], or holm oak, or other resistant trees" and subsequently he reports "the ard plough is made near to rich woodlands and it is purchased by farmers in the raw state [VN: *bbastardu*], i.e. only its single components, during the village fairs. The blacksmith [...] prepares the iron parts [...] the carpenter [reported as *lu mastru d'ascia* in the original text] puts them together properly".

The different steps assembling plough components are described by Cusumano (1988). The construction took from two to three days; the choice of the type and shape of wood to be used for the construction of the sole or share-beam was particularly important (VN: *puntali*), i.e. the piece on which the ploughshare was attached, generally made of elm but also of hackberry or almond.

Other elements of the plough were the plough-beam, made from poplar or chestnut as the wood of these species is resistant and durable, and the yoke, made from light and resistant beech or elm wood. Cusumano (1978) wrote that the yoke (VN: *iuvu*) was made of beech wood, the stilt (VN: *percia*) made of chestnut wood, the sole (VN: *rintali*) was made of oak wood, the handle (VN: *manuzza*), i.e. the upper part of the stilt, made of beech wood and the plough-beam made of ash wood. As remarked by Cusumano (1983), in several towns in the Belice area, such as Gibellina or Santa Ninfa, the packsaddle maker (VN: *vardaru*) actually "replaced the carpenter (*mastru d'ascia*) in the making of hard ploughs".

In the territory of Messina, parts of the plough were built with beech or holly wood because of their resistance (Arcidiacono *et al.* 2007); the handle (Fig. 7) could also be made from maple (*Acer campestre*) wood because of its hardness.

Downy oak wood, instead, was used in Bronte to build the *stragura*, a special sledge used to transport bundles of hay, grass and timber (Arcidiacono *et al.* 2003). In the area surrounding Messina, this sledge and a forked sledge, used to transport materials, were made of Turkey oak (Arcidiacono *et al.* 2007; Lo Castro 2009).

A very widespread object intimately connected to cattle breeding was the collar for oxen, cows, sheep and goats (Fig. 8).

The ideal wood for collars, especially for cattle collars, was that of hackberry (Arcidiacono *et al.* 2003; Lo Castro 2009): compact, flexible and with

a warm yellowish colour. At Alcara Li Fusi and Milietello Rosmarino (Nebrodi Mts.) Turkey oak was used, however (Arcidiacono 2007) and, according to traditional knowledge, it would be cut between January and February with the waning moon. The traditional practise of tree-felling according to lunar rhythms was a widespread and common practice among woodcutters in different countries. Interestingly, recent studies (Zürcher *et al.* 2010) have confirmed that moon phases interfere with some properties of the wood. Uccello (1972) wrote that wood cut following the phases of the moon is safe from woodworm damage. A wooden strip of optimal size for the animal would be cut and placed in hot water or whey, bound and dried until it took the desired shape (Uccello 1972; Arcidiacono 2016).

Besides their practical function, collars were once the craftsmen and farmers' favourite artefact. It was a vehicle through which to express and show off their artistic talent and very much a matter of pride for both the craftsman and the owner. The curved part of the collar was often engraved or even embellished with coloured decorative motifs or drawings illustrating scenes of everyday rural life.

In western Sicily, collars were also made of chestnut wood (D'Agostino 1992). In the Peloritani area, however, they were made of red mulberry wood. If no hackberry wood was available, the collars could be made of maple, ash, elm, willow, black and white mulberry wood (Uccello 1972; Arcidiacono *et al.* 2007). In addition, to the practical function of signalling the position and the movement of a grazing cow, the decorated collars also showed the ownership of the livestock (Ricobono 1992). A number of craftsmen from Montemaggiore Belsito still possess these ancient technical skills and use this knowledge to make collars (T. La Mantia, *pers. obs.*).

Hackberries were also used in the orchards (the so-called *jardini* = gardens) of the Conca d'Oro (the Plain of Palermo) to make hooks for baskets and handles for saws and whips (Giordano 1988). Due to their multiple uses, hackberries were mostly planted at the edge of farm properties and along roadsides in order to use their branches and stems (La Mantia 2007). The integrated use of wood resources in the orchards of the Conca d'Oro represents a remarkable example of agroforestry system (La Mantia *et al.* 2019). For instance, the wood of Loquat (*Eriobotrya japonica*), one of the main tree species cultivated in local orchards (La Mantia 2016), was used to make hooks to hang baskets or long rods used to beat walnut trees to gather their fruits; additionally, the biggest trees were sold to local artisan factories to make fruit boxes.

Several other wooden work tools were built by farmers themselves (Uccello 1972). For

example, the pitchfork (VN: *trarenta*), used for threshing, and the rake (VN: *rrastrieddu*) now made of iron, were once made of hackberry wood, often obtained from a single stump. A peculiar tool called a *truccituri*, made with a stick of wild olive and a string fixed on its top, was used to grasp the muzzle of less docile animals. Furthermore, the handles of numerous rural tools



Figure 7. An unfinished handle of a plough, obtained from a trunk of deciduous oak wood (photo T. La Mantia).



Figure 8. A cow with its collar (belonging to the Calabrian bell-type, *campana calabbrisa*, Sottile 2002) feeding on oakwoods in the Madonie area: an example of integrated forest exploitation (photo T. La Mantia).

(e.g. hoes, axes, picks, etc.) were made of hard holm oak or wild olive wood or - in the areas devoted to citrus cultivation - lemon or bitter orange wood. The whip for animals was generally made of hazelnut wood, light and flexible. Another tool of various sizes and used for different purposes was the fork (VN: *furcedda*), a stick with a forked end used to move to one side thorny and spiny plants, such as brambles. These plants were cut down by holding the fork in the left hand and a sickle (mostly made of strong wood, such as terebinth, mastic or hackberry) in the right hand. A shepherd's stick, however, was generally made of hard and knotty almond wood. A robust bar of wild olive was used to lock the house door at night (Uccello 1972).

Highly characteristic were the wooden crates that were fastened to horses, mules or donkeys to transport manure (often produced during the night by the animals kept in the stable) to the countryside as soil fertilizer.

Regarding citrus wood, still used to produce wooden tools in the Etna area (F. Ancona, *pers. comm.*), it is worth mentioning what Alfonso Spagna (1875) wrote: "*The most useful products of citrus trees are, with no doubt, the wood, the leaves, the flowers and the fruits*". The importance and widespread use of citrus wood is clearly illustrated in a chapter of the famous "Treatise" by this same author, undoubtedly the greatest specialist on citrus cultivation of the 19th century, entitled "About citrus wood", where he celebrates the use of orange wood. "*A specific use of orange wood was for marquetry, polishing furniture without varnish*"; further on he reports "*citrus wood [...] by turners, who use it to make spinning tops, balls, handles for cutting tools, horse combs and so many other tools which are useful for everyday life and too numerous to list [...]*" and moreover, "[citrus wood, Authors' note] has the singular advantage of being compact, homogeneous and tender when cut [...]. *I have seen orange chests made in Palermo, in the style of modern coffers, of such a rare elegance to beat the beauty of the French works of the same kind*".

Carpenters made most of the work tools common used by countrymen, such as pickaxes, shovels, hoes and hatchets, handles (VNs: *picu, pale, zzappi, 'ccetti, marruggi*, respectively), sticks to beat the fruit trees during harvest, lids for food jars, boxes, poles for fences, as well as small tanks used as removable drinking troughs (Lo Castro 2009). The Turkey oak in the Nebrodi area was also used to produce rural tools such as hoes and shovels (Arcidiacono *et al.* 2007).

Magnino (1934) acutely pointed out the intimate relationship between the two distinct (metal and wooden) components of the hoe "*which cannot be completely separated one from the other*".

In fact, the characteristics of the wood (elasticity, hardness, etc.) were as important as the quality of the metal used in some of the work tools used daily in the fields (Fig. 9).

For many centuries and until a few decades ago, flax and hemp were cultivated in Sicily to obtain textile fibres used to produce linens, bags and basic cloths. Many tools related to flax processing were made of wood, such as the willower machine, made of oak wood (in Nebrodi Turkey oak, Lo Castro 2009), carob or hackberry. In contrast, the so-called *spatola*, a wooden box where flax or hemp fibres were beaten and hackled, was mostly made of holm oak (Uccello 1972). Pitrè (1889) also mentioned tools used in flax process (i.e. the flax break called *lu mànganu* and the hackle named *spàtula*) made from hard wood.

Beekeeping, another traditional activity, involved numerous tools used during the different steps of honey and wax harvesting and processing. In the Hyblaean villages these tools - the most important being the press and the beehives - were made of wood. The press was made by carpenters with walnut or oak wood (Uccello 1972). In the same area, a century earlier, Bianca (1878) mentioned the use of ash or *Tamarix africana* for the construction of hives.

In his review of traditional crafts from the Belice Valley, Cusumano (1978), when describing the tools used by various professionals, at times explicitly mentions the type of wood used for specific purposes. For instance, he reports the use of olive wood to make whips. As for the Nebrodi area, Lo Castro (2009) reported the use of beech or maple wood to make whips, while screw



Figure 9. Hoe handle made of wild olive wood on Pantelleria (photo T. La Mantia).

presses (VN: *arbitriu*) were made of ash wood; peels, used to slide bakery products into and out of the oven, were made of beech wood.

Concerning sheep-farming and cheese production, Cusumano (1978) wrote that a shepherd's stick or crook was usually made of olive tree wood; the vat, used to collect milk, was made of mulberry wood, while the sieves were made of ash wood. Almond wood was used to make the broomstick for a rudimentary broom. Interestingly, the fronds fixed to the top of this broomstick, used to mix the boiling milk during the preparation of ricotta cheese and before separating it from the whey, varied according to the plants available locally. This is why, in the mountainous area of the Madonie, the upper part of the stick was made with Sicilian fir wood (Sottile & Genchi 2001 published a drawing of this tool), while, near the coast, the so-called *curina* fixed to the top was made with intertwined dwarf palm leaves. This latter 'model' was still in use at the end of 1980s in the rural village of Scopello near Castellamare del Golfo (S. Pasta, *pers. obs.*). On the Madonie, the wood of tree heathers was also used to make brooms (Raimondo & Lentini 1990).

Cusumano (1978) reported that in the Belice area rope makers used different tools made with ash wood, such as a large comb (VN: *rascatura*), a studded board (VN: *cardu*), etc. They used a working table made of fir wood, while another tool used for ropemaking, called a *misura*, was made of ash and fir wood. The *conzalemme*, i.e. craftsmen specialized in repairing broken terracotta and porcelain objects, such as jars, jugs, dishes, etc., used a hand drill made of ash wood (Cusumano 1978).

As already remarked, packsaddle makers were versatile craftsmen who were able to work with both wood and leather in order to produce all the objects needed to harness the animals and fasten them to the vehicle they were pulling (Cusumano 1978). "*Craftsmen procured wood directly from trees growing in the hills near Partanna, Salemi, Montevago and Castellammare [del Golfo, Authors' note]. Tree felling was usually carried out in January and February, before the plant sprouted, to reduce the risk of an early wormhole attack. The trunks were cut by means of a hand saw (VN: *lu sirruni*) and transported downhill on the back of mules. They were left to mature for about six months*". Packsaddles (VN: *vardedda*, plural: *vardeddi*) were formed by two arches connected in series and covered with leather; a wide spectrum of wood types could be used to make them, such as hackberry, elm, poplar, mulberry (Cusumano 1983) [in the original text called *càccamo*, *urmu*, *chiuppu* and *cèusu*, respectively] or ash wood (Giacomarra 1988).

In the past, a number of factories in Caltanissetta and Agrigento, specializing in the production of sieves, used beech wood mainly from the Catania

area (IRCAC 1988). In the Belice Valley also, (Cusumano 1983) sieves were built using beech wood from Palermo, while large sieves for wheat straw were placed on a tripod made of three ash sticks.

Bianca (1878) wrote on the use of willows and poplars to make "*press benches, and boards and beams for many rural uses*", whilst oaks, downy oaks and holm oaks were used for "*the manufacture of various rural tools, and sometimes to produce charcoal*".

A wooden hook (VN: *croccu*) was commonly used to pull branches closer when harvesting ripe fruits in orchards throughout Sicily. In the Nebrodi area, this wooden tool was usually made of holly wood (*Ilex aquifolium*), while the wood of *Quercus dalechampii* was used both for cabinet-making and to build large mousetraps (Arcidiacono *et al.* 2007).

Barrels, casks and buckets

Small factories devoted to the construction of barrels, casks and other wooden containers were widespread throughout the whole region. As shown in the previous paragraphs, barrels were widely used in Sicily and not only for wine. For example, coopers were an important guild in Trapani, where the barrels were also used for the conservation of salted fish (Benigno 1988; Gallo 1990).

Barrel construction techniques are the topic of two important monographs published by Cusumano (1977) and Cusumano (1980). The first author provides information on open-air seasoning of the wood and he reports that "*The wood used for the construction of the barrels almost exclusively comes from wild chestnuts that do not bear fruit*" (i.e. varieties selected just for wood production). Less frequently, more expensive durmast wood from "*Slavonia*" [today's north Slovenia and Croatia, Authors note] was used. Cusumano (1980) did not provide specific information on the type of wood used, however, he reports the use of cork to plug the barrel. In another of his works, Cusumano (1978) wrote that barrels were made in durmast wood, while vases and other wine containers were made of chestnut wood. Drago (1996) mentioned an agreement for the supply of a large quantity of chestnut barrels signed in 1780 by the marquis of Rudini Don Vincenzo Starrabba and the barrel makers Consobrini de Cali of Acireale; relative to the same period, the same author quotes a "*master craftsman Corrado Ferrante, a cooper from Noto*".

During the Middle Ages, the production of these wooden containers was already very important. The main centres of production were Trapani, which covered the demand for western Sicily, and Messina, which played the same role in eastern Sicily but also exported barrels to the continent (Cancila 1995).

In the province of Trapani the most commonly used wood was downy oak, Turkey oak, chestnut and beech, partly from Sicily but mainly imported from Calabria, Campania via Naples, from the Balkan Peninsula via Trieste and even from North America (IRCAC 1988).

Small barrel making factories occurred in many other places as barrels were the best tool to conserve and transport not only wine and oil, but also many other products (lemons, leather, meat, etc.) especially for long sea journeys. This is why the barrel was a commonly used unit of measurement, as the tonnage of ships was conventionally calculated by the number of barrels of wine they could carry (Rugolo 1980).

In the 19th century, most barrels were made for local wine and oil producers and/or to export these products. IRCAC (1988) reported the existence of factories in the territory of Riposto, where chestnut wood from Etna and other types of wood from Calabria and Campania were used. A company producing barrels with “*durmast and chestnut from the renowned Etna, Calabria, Palermo and Romagna*” took part to the 4th Italian National Exposition, an exhibition of factory products and craftsmanship held in Palermo in 1891 (Bontempelli & Trevisani 1903). Chestnut wood from Calabria and Romagna was also used for the construction of barrels in the Messina area, while people from Novara di Sicilia (Peloritani Mts.) mainly used local wood. In the province of Syracuse there were no barrel, cask or tub factories because of the scarcity of wood. Also in Milazzo, wine barrels were made of chestnut or Turkey oak wood (Zirilli 1869).

Until recent times, barrels from Alcara Li Fusi and Militello Rosmarino (Nebrodi Mts.) were also made with the wood of *Q. dalechampii* (Arcidiacono *et al.* 2007).

On Pantelleria, D’Aielli (1978) reported that from 1783 to 1830 “*the Municipality still enjoyed the exclusive right [...] to use the pruned branches and unusable trees [...] to make barrels to transport raisins to the continent*”. In all likelihood, mostly holm-oak trees were used for this purpose. *Quercus ilex* has long been the most common (today the only) oak species growing on the island, with some remarkable individuals still occurring today (Sala *et al.* 2016). However, chestnut trees, introduced in historical times and rather widespread in the past on the island, could also have been used, as could downy oaks. These latter grew on the island up to the 19th century, as testified by technical reports from foresters (Pasta & La Mantia 2003) and confirmed by pollen surveys carried out at Lago di Venere (Calò *et al.* 2013).

Until the second half of last century, wooden buckets (VN: *cischi*) with a 10-litre capacity were used to collect milk. A quick estimate of the quantity of milk produced was calculated by immersing soft (usually sumac) wooden sticks (VN: *ntacche*)

into the bucket; these sticks were engraved with cuts to measure the level, hence the volume of milk. Many other wooden tools and utensils were used during the different phases of cheese production, such as various ladles (VN: *cuppini* or *busunetti*), vats made of wooden staves, and some parts of the strainer (VN: *fiscelle*) for ricotta cheese (Lo Castro 2009). During milk processing, various types of wood were used; for instance, willow was used to support the reeds to build the strainer for ricotta cheese (the bottom of which was made of wood or cork) (Lo Castro 2009) and various other instruments to mix the milk (VN: *rutela*, see Fig. 10 of Sottile 2002). Recent research has shown that the Sicilian vats made of chestnut wood improve the quality of local dairy products (Cruciata *et al.* 2018). Besides citing most of the above-mentioned tools used for dairy production, Anonymous (1869, 1870) reported that knives had ‘hardwood’ handles and that although most of the buckets used for milking had chestnut staves and beech wood or iron hoops, other porous material could be used to make the mas well, the most suited of all being the wood obtained from Turkey oaks which had been cut down and dried since long time (“*fra tutti quello della quercia cerro, e procuralo di albero reciso da molto tempo, e bene disseccato*” in the original text) (Fig. 10).

Mills and Crushers

Mill building also required the skilled use of wood. Bresc (2001) wrote: “*The presence of mills implies the development of other activities within the territory: [...] the exploitation of the forest*”. Interestingly, the oldest documented case of tree plantation in Sicily is directly connected with water mill activity: in fact, Bresc (2001) described a document dating back to 1434 concerning the watershed of the Oreto River near Palermo “*[...] the miller, master Pietro Russu, must plant one hundred white poplars [VN: *chuppi àlbani*]*”.

Mills were built with wood from different species until the beginning of the 19th century, after which many components started to be made of iron. Data gathered from a considerable number of documents concerning the mill at Nadaro near the town of Bivona (Agrigento province) between 17th and 18th centuries (Di Salvo 2001) tell us about the almost uninterrupted and labour-intensive work needed to repair or substitute the wooden components of artefacts used in the mill, e.g. spindles (VN: *fusto* or *fuso*), wheels (VN: *rote*), fins (VN: *pinnelli*), blades (called *coltelli* in the original document), feet supporting the grinding wheels. These pieces were mostly made of oak, elm (VN: *urmo*) and black or white poplar (in the original document called *chiuppo* and *alvano*, respectively)



Figure 10. Vats (*tini*) are made of wood following a number of articulated steps (upper), the milk is accumulated inside the vats (lower left image), and to stir milk we use special wooden tools such as those seen inside the vats (lower center). On the right is a detail of the *rutela* (Sottile 2002), wooden spoon used during cheese making (photos T. La Mantia).

wood. For the same purpose, some nearby mills quoted by Di Salvo (2001) also used wood obtained from other tree species, such as walnuts and pines.

Crushers were also made of wood (Fig. 11). Bianca (1872) stated, on the topic of olive mills, that farmers in Avola used almond tree wood to make the “press screws (called ‘*chiocciolate pei torchi*’ in the original text), which prove to be resistant, although not as strong as those of walnut, carob, hackberry or oak, which are the most used in our community”, while Pitrè (1889) reported that “hardwood screws” were made of olive wood.

Common utensils

The most common daily utensils are cutlery (Pitrè 1892). The use of wooden forks is sporadic, as these utensils were mostly substituted by a spiny hawthorn twig or a sharp cane stick. In contrast, spoons of various sizes and with various uses were very common and the most common woods used to make them were hawthorns or wild pears, both compact, easy to carve and without knots (indeed, not always, *pers. obs.*) and veins. The wood of olive, carob, lemon (Uccello 1972), boxwood, beech and orange tree (Pitrè 1892) were also used to make spoons. In the Etna region, wild pear wood was also used to make a special tool (VN: *cazza*) used to pour ricotta cheese (Arcidiacono 2016).

In the Hyblaeen area planes were also used to build chairs (Bianca 1878).

According to a national inventory of the manufactures devoted to the production of small wooden objects for local markets and domestic use (Anonymous, 1883) mentions Alcara li Fusi as the only Sicilian place of some importance for such products (spoons, *sassoli* (?), yokes, poles, barrel staves, spins, candle sticks, etc.) mostly obtained from beech and Turkey oak wood illegally logged in the woodlands of the Nebrodi Mountain range.

Red mulberry was preferred in the manufacture of kegs (VN: *buttacci* or *barila*) used to transport the daily dose of wine to the countryside in the Nebrodi area (Lo Castro 2009). The making of kegs in Messina was quite unusual: instead of being built by assembling staves, as is the case for barrels secured by hoops, they were made by carving out a single block of wood, then the two wooden cheeks were stuck together and tightened by means of wooden or metal bands (Riccobono 1992).

The wood of wild pear trees, particularly robust, was used for sticks and spoons; hackberries and chestnuts were used to make collars and spinning wheels, ashes for sticks, beeches for looms and tree heathers for bowls (Lo Castro, 2009). In the Nebrodi, Madonie and Peloritani areas, spoons and ladles made of wild pear or chestnut wood dating back to the beginning of the 20th century have been found (D’Agostino 1992).

Small flour sieves (VN: *criveddi*) were made with hackberry wood due to its supple nature; beech wood, in contrast, due to its strength, was used to make the frame of shepherd huts (VN: *pagghiara*),



Figure 11. Some examples of oil mills used in Sicily (photos T. La Mantia).

to build chair frames and other domestic utensils, such as mallets (VN: *magghiu*) used to beat cloth and *maidda*, i.e. a flat tray used to knead flour when preparing bread and pasta (Arcidiacono 2007). In some areas of the Belice Valley, instead, *maidda* were made with fir wood, while beech wood was used to make large tables to knead dough (VN: *scannaturi*) (Cusumano 1978). Cusumano (1978) also informs us about the crafting of cork dishes and wild olive whips in the Belice Valley.

Bianca (1878) wrote that “*the hackberry is highly appreciated by carpenters, and supple branches also benefit the farmer for various tools*”.

In Sicily, dishes were usually made of terracotta; however, in the Hyblaean countryside, a wooden bowl (VN: *scutiddaru*) of various shapes was once in common use for the storage of rennet paste; this was usually made of strong (downy or holm) oak wood. For the same purpose, in the area surrounding Buccheri, shepherds used cork wood, a resource still widely available on the top of the Hyblaean Plateau (Uccello 1972).

At the end of the 19th century, in the Peloritani and Madonie, distaffs (used with spindles) were made of walnut, chestnut and ash wood. Olive, hazelnut, service tree and oak wood were also used in the Madonie for the same purpose. Some components of the spinning wheel, such as the spindle, balance scale and swift were made of chestnut and/or walnut wood (D’Agostino 1992).

In his work on the almond tree, Bianca (1872) reported that almond wood was used to “*make stools, potter’s wheels and other furniture, and, at the very least, it is always good for burning. The wood of the bitter almond, more compact, harder, and more reddish in colour, is used by cabi-*

net-makers for marquetry and for rural tools [...]”. Some years later, he also provides (Bianca 1878) a long list of the uses of wood in the territory of Avola, reporting the specific uses of each species (e.g. oaks, poplars, walnuts, hackberries) as well as the use of reeds and branches of *Vitex agnus-castus* to make baskets to transport grapes.

The production of spoons and kitchen utensils was very widespread in the small shops on the island, and, even more important, was the production of baskets and the like, mostly made from wicker [*Salix* spp., mostly *Salix alba*, Authors’ note] and rushes (*Juncus* spp.) and/or young leaves of the dwarf palm. Elms were also used on occasion in Sicily to make baskets (Cangemi & Miceli, s.d.), while until 2000s the last elderly peasants of Ustica Island filled in the basket frame using young olive and young white willow twigs (S. Pasta, *pers. obs.*). Concerning the Madonie area, Giacomarra (2000) reported the use of wild olive, elm, ash and red willow to make baskets. Branches of hackberry were bent to create the top to cover the brazier (VN *braceri*: Arcidiacono 2016). In the Plain of Palermo, the hard wood of *Diospyros lotus* was used to make bowls (La Mantia *et al.* 2019) (Figs. 12, 13).

Sicilian shepherds and the ‘poetry of wood’

Sicilian shepherds made extensive use of wood for their needs (Giacomarra 1983). This is largely confirmed by images of tools reported in a monograph on the vernacular names of these tools used in their daily activities (Sottile 2002). In particular, this work provides information on a tool used to stir whey and milk made from a fig-wood stick. More information is given by Giacomarra

(2000), who wrote: “The items of pastoral handicraft represent a well-defined typology, which could be framed into four groups according to the material employed, i.e. wood (ash, elm, beech, chestnut), cane, horn and pumpkin rind. The first group includes collars for cattle, sheep and goats; bowls and spoons used to eat ricotta cheese in the workplace; sticks; distaffs and spinning wheels; bust sticks for clothes”.

A century earlier, Salamone Marino (1897), while providing detailed information on the identity of the wood used, emphasized the large amount and variety of tools that shepherds once crafted during the long time spent driving the grazing livestock. In fact, they made spoons, sticks, bowls, boxes, wallets, snuffboxes, glass hangers (published images of these objects can be admired in Pitrè 1892) by carving and crafting hard and seasoned wood pieces.

Shepherds even made the splints used in corsets, usually prepared with skilfully carved ash wood (D’Agostino 1992). These objects were sometimes gifts for their wives, relatives and friends, or tools for common use made for themselves or for animals (e.g. collars). The shepherds’ handicraft was sometimes of such a high level as to prompt Burgaretta (2007) to entitle a chapter of one of his books on the matter “*The poetry of wood*”. The choice of the best wood to use for specific purposes depended on the availability on site and on the experience of the woodcarver, carving the inner part of ivy logs to obtain bowls (VN: *cuppi*) of the same diameter as the logs, for

example. For the same purpose, the shepherds of the Peloritani Mts. used logs (lignotubers) from tree heather due to its hardness and wide availability (Fig. 14). Under Bourbon Rule, the extraction of heather logs became such a profitable activity that it led to the construction of a road devoted to the transport of raw materials along the Peloritani ridge, a road that still exists.

The raw materials extracted from the Peloritani and Aspromonte mountain ridges were stored in the port of Messina (Riccobono 1992) and from there exported mainly to England for pipe production (La Mantia *et al.* 2006, 2007). The people of the Madonie also produced pipes using heather (Raimondo & Lentini 1990).

One of the most significant products of the shepherds’ art were the collars. In the catalogue of an ethnographic exhibition dedicated to these artefacts Pitrè (1892) reported numerous examples from all over Sicily, emphasizing the outstanding beauty of those produced in the province of Syracuse. This local heritage is illustrated in a monographic publication on the wood art of shepherds (Uccello 1967); unfortunately, this publication does not contain any information on the plant species used to make these artefacts, the enormous diversity of which (chairs, spoons, loom sticks, matchboxes, statuettes, drawers, easels, decorative bands for furniture, caskets, stoups) and whose diffusion throughout the region (Randazzo, Mineo, Avola, Agrigento, etc.) confirm, however, the exceptional ability of Sicilian shepherds in wood crafting.



Figure 12. Hackberry wood was among the most valued not only by carpenters and cabinet makers but also by farmers. Here the different steps required to prepare the handle of a hand saw used by the farmers of Conca d’Oro (right) by bending a branch until it takes the shape required. Figure 13. Hook used to hang baskets (right); to make them, hackberry branches are forced to grow as already illustrated in Fig. 12 (photos T. La Mantia).

Wood and leisure: musical instruments, “pupi” marionettes, toys and games

Regarding Sicilian shepherds, Di Berenger (1863) stated that from as early as the time of Plutarch (1st century BC–1st century AD) their poetic inspiration [similar to other regions of the ancient world, Authors’ note] “has been associated with vocal and instrumental music”. Well-known indeed is the shepherds’ ability to make a wide range of musical instruments. For instance, the shepherds of Valdemone spent their free time making small musical instruments by making careful cuts, incisions and holes with a knife.

An example of this is the reed or double flute made of a reed cane segment and a piece of softwood crafted to obtain the mouthpiece (Lo Castro 2009).

For the production of bagpipe reeds (VN: *ciarameda*), either almond, apricot, olive or, more usually, heather wood was used (Lo Castro 2009). Black mulberry, however, was favoured for the block where the reeds were fixed; finally, due to its peculiar characteristic of having a “soft soul” (hollow stem) and therefore easily drilled along the central axis, elderberry was used to obtain the blow pipe (Riccobono 1992).

Pitrè (1889) wrote “With rods of oleander, the boys make some instruments, which they call fill-àuti (those of cane: *fillaùti*), which produce a very sweet sound”; writing on how to craft them he

reports “They also make them with chestnut rods (*Naso*)”. A wide range of wood types was used to craft various traditional musical instruments (tambourines, bagpipes, etc.; Naselli 1951).

The core structure of the so-called *pupi*, traditional Sicilian marionettes, was made of beech and fir wood and “carpenter’s skills” (Pasqualino 1980). The same author describes the production phases of a *pupo*: the head was carved by carvers or even by the *pupari* (the puppeteers) themselves. They seemed to prefer the light and resistant cypress wood to beech wood, which was more subject to insect attack so that “after about twenty years it [the puppet] was almost completely eaten by woodworm” (*a una ventina d’anni è già camuluto* in the original text). Walnut wood was also used to make the *pupi*, as well as lemon wood, which was very resistant but difficult to carve (Pasqualino 1988).

Some snuffboxes were made of olive wood in Syracuse (Uccello 1972). Obviously, wood was also used to make various games and toys. For example, the versatile wood of elders (*Sambucus nigra*) was used in Alcara Li Fusi and Militello Rosmarino to construct rudimentary air guns and rifles, quite similar to those crafted for the same purpose and with the same wood in northern Italy until approx. 60–70 years ago (E. Bellini, *pers. comm.*). The handle of a stick used to roll a metal hoop by small children was crafted from elder wood; this rudimentary toy was called ‘*u ruddu*



Figure 14. Heather logs represented an important resource for Sicilian mountain communities. From upper left to lower right: a) a heather log before unearthing, b) a mound of heather logs in a sawmill, c) the tool used to assess the heather log category, d) a craftsman making a heather cane, e) two caskets and a box made of heather wood (see La Mantia *et al.* 2006, 2007) (photos T. La Mantia).

(Arcidiacono *et al.* 2007). This game was also mentioned by Pitrè (1892, 1883) under a variety of names (for instance *scupittuni* in Palermo, *sambuca* in Cefalù and *savcu* in Avola). Twenty years later, Pitrè (1912) described another game where elder wood was used: “*the crossbow and the arrows of Albanian* [more correctly Arbëreshë, Authors’ note] *shepherds from Contessa* [today’s Contessa Entellina, Authors’ note] *and Piana dei Greci* [today’s Piana degli Albanesi, Authors’ note], *made with a stem of ferula* [= *Ferula communis*, a tall forb belonging to the Apiaceae family which commonly occurs in pasturelands, Authors’ note] *and a solid cane bow (sling), whose tension and sudden release flung a small piece of elder or a nail*”. Pitrè (1912) wrote about a number of wooden games although generally he did not include the type of wood used.

Spinning tops were made of hackberry wood [VN: *tuppètturu*] or olive wood, while a small piece of stone pine wood was used to make whistles (Arcidiacono 2016).

The farmers of Conca d’Oro made bowls by carving the very hard wood of *Diospyros lotus* (La Mantia *et al.* 2019), locally called “holy wood” (VN: *lignu santu*), while on the Madonie, bowls were made using the wood of *Erica arborea* (Raimondo & Lentini 1990).

Finally, “*a straight wooden stick (olive or lemon or other hardwood)*” was used to play *a li scanneddi*, a children’s game played at Partinico until the mid-1900s (Cipolla 1984).

Further uses of Sicilian wood: an unachieved epilogue for an endless list

The authors are fully aware that their list of wooden artefacts produced and used by Sicilians is far from complete. In truth, it is an arduous task to list all the wooden tools produced by men. It is easier to keep in mind that until two centuries ago, almost every object used by farmers and craftsmen in their daily life (e.g. pulleys: see Fig. 15) was made of wood. For instance, D’Onofrio (1996b) reported how the potter’s wheel, “*until a few decades ago, made entirely of wood*”, was equipped with “*a pierced knob of hardwood* [VN: *lignu forti*], *generally olive*”.

Pitrè (1889) quoted a rhyme (“*Cu li scardi a cuntinara cu li virghi di cutugna*” in the original text) recorded by Salomone Marino (1880) in the area of Carini, and explains that this proverb refers to “*torture instruments used to make criminals confess their misdeeds: wood splinters (VN: scardi) were stuck under the nails, whilst green quince rods were used to whip their naked shoulders*”.

Until 19th century, fishermen from villages near Palermo would go up to the hills of San Martino

delle Scale to collect stems of *Erica peduncularis* (an older synonym for *Erica multiflora*); the wood was then used to make “*waterproof and extremely hard needles used to sew and mend their fishing nets*” (Inzenga in Pitrè 1899).

Another unusual wooden tool, called *sagnaturi*, is still conserved in the collection of the Museo Pitrè in Palermo (Chiaramonte 2001). Its lower part is a hoe handle or a simple ash stick that was used to practice bloodletting in horses.

Pitrè (1889) mentioned the traditional and ancient use of orange wood to make rosaries and informs us of another introduced species, the boxwood (*Buxus sempervirens*), which was used to make “*dandruff combs*”.

Concluding remarks and perspectives

Up to the second half of the 20th century, Sicilian wooded areas were basically natural forests. Large scale reforestation activities, promoted after the Second World War, were largely for social purposes (slowing down emigration), soil protection (La Mantia 2013) or dune consolidation (La Mantia 2011). At the same time, massive *eucalyptus* planting was mainly aimed at cellulose pulp production (La Mantia 2013).

Although during recent decades a number of interventions have been carried out in order to increase timber production by implementing various laws, to date, these activities have not brought about the desired results in terms of increase in usable timber. For a general overview and a critical analysis of current silvicultural problems in Sicily, see also La Mantia (2002), La Mantia *et al.* (2004) and references therein.



Figure 15. Pulley made of holm oak wood (Etna) (photo T. La Mantia).

The analysis of the historical use and the decreasing availability of timber indirectly informs us about the gradual shrinkage of entire wooded areas or the fast decline of certain forest tree species. Therefore, the study of forest uses prompts us to focus our attention on the virtuous cases of forest management. These have allowed the permanence and gradual evolution of a man-wood-forest relationship up to the present day where these forests have survived. Other cases, on the other hand, unfortunately tell us stories of 'unsustainable management' of local wood resources, as in the case of the Lampedusa forest cover (Pasta & La Mantia 2003) or the gradual disappearance of alders, lime trees and yews (probably present in various mountain ranges in northern Sicily until the 18th century and today extremely localised on the Peloritani and Nebrodi Mts., respectively). An extreme case in this regard is represented by the Sicilian fir, currently represented by few individuals growing on the Madonie Mts., which probably dominated the mountain forest ecosystems of other Sicilian mountain ranges until 2000 years ago and experienced a final collapse just a very few centuries ago (Pasta *et al.* 2019).

Finally, the present contribution highlights the need to valorise traditional knowledge on the uses of local forest resources as an important, yet neglected, part of Traditional Ecological Knowledge (Heckler 2012), following the example of similar initiatives started elsewhere in Southern Italy (Cipparone 2013).

ACKNOWLEDGMENTS

A heartfelt thanks goes to Alfonso Agrò and Giovanna Varrica for their contribution during the bibliographic research, to Andrea Cozzo (Dipartimento Culture e Società of the University of Palermo) for his continuous and precious help with classical Greek and Latin works. This research would not have been possible without the support of the libraries of the University of Palermo and the people who work there, to whom we would like to express our gratitude. In particular, we would like to thank Danila Patti, Francesca Tignola, Valeria Tardo and all the staff at the "Biblioteca Interdipartimentale di Discipline Umanistiche. Section I and II", and, in particular, the Section "Antichistica (formerly 'Bruno Lavagnini - Giusto Monaco') e Facoltà di Lettere", whose support - even in times of limited access to books due to anti-Covid19 measures - allowed us to finish this paper. We also thank Francesco Ancona (Siracusa), Francesco Brignone (Pantelleria) and Renzo Zaia (Stromboli), Salvatore Anello (Caccamo) and many other informants for providing interesting data reported here for the first time, as well as Pietro

Corrao for his support and for accepting to revise the Italian version of the manuscript. Most of the information reported here concerning the traditional knowledge of farmers from the Conca d'Oro (the Plain of Palermo) issues from the life experiences shared by one of the authors with his father, Giovanni La Mantia. We wish to dedicate this work to his beloved memory. Thanks are due to Broni Hornsby for the revision of the English.

LITERATURE CITED

- Alfonso-Spagna F. 1875. Trattato sulla coltivazione degli agrumi. Pedone Lauriel, Palermo, 533 pp.
- Amari M. & Schiaparelli C. 1883. L'Italia descritta nel 'Libro del Re Ruggero' compilato da Edrisi. Testo arabo pubblicato con versione e note da M. Amari e C. Schiaparelli. Atti della Reale Accademia dei Lincei, Anno CCLXXIV, 1876–77, Serie II°, Vol. VIII, 156 pp.
- Anonymous 1836. Sul cabotaggio tra le due Sicilie. Tipografia Flautina, Napoli, 109 pp.
- Anonymous 1869. Studi sul caseificio siciliano. Capitolo secondo: Utensili della cascina. Annali di Agricoltura Siciliana, (n.s.) 1: 253–269.
- Anonymous 1870. Studi sul caseificio siciliano. Utensili del burrificio. Annali di Agricoltura Siciliana, (n.s.) 2: 3–12.
- Anonymous 1883. Le piccole industrie forestali in Italia. Ministero di Agricoltura, Industria e Commercio, Direzione Generale dell'Agricoltura. Annali di Agricoltura. Roma, Tipografia Eredi Botta, 50 pp.
- Antonelli G. 1928. Saggio di selvicoltura. Vol. II parte speciale. Paravia & Co., Torino, 380 pp.
- Arcidiacono S. 2016. Etnobotanica etnea. Le piante selvatiche e l'uomo. Danaus, Palermo, 150 pp.
- Arcidiacono S., Napoli M., Oddo G. & Pavone P. 2007. Piante selvatiche d'uso popolare nei territori di Alcara Li Fusi e Militello Rosmarino (Messina, N-E Sicilia). Quaderni di Botanica Ambientale e Applicata, 18: 103–144.
- Arcidiacono S., Napoli M. & Pavone P. 2003. Piante selvatiche d'uso popolare nel territorio di Bronte (Catania). Quaderni di Botanica Ambientale e Applicata, 14: 151–172.
- Badalamenti E., Barone E., Pasta S., Sala G. & La Mantia T. 2012. *Ailanthus altissima* (Mill.) Swingle (fam. Simaroubaceae) in Sicilia e cenni storici sulla sua introduzione in Italia. Il Naturalista siciliano, 36: 117–164.
- Badalamenti E., Cusimano D., La Mantia T. & Pasta S. 2013. The recent spread of the invasive woody alien plant, *Melia azedarach* L. (*Meliaceae*), in Sicily. Il Naturalista siciliano, 37: 505–513.
- Baldini S. 2008. Le utilizzazioni forestali. Portale della Ricerca Forestale. <http://www.ricercaforestale.it/index.php?module=CMpro&func=printpage&pageid=757&scope=all>
- Balsamo P. 1800. Memoria terza, pp. 84–90. In: Memorie inedite di pubblica economia ed agricoltura. Salvatore Sciascia Editore, Caltanissetta-Roma 1983.

- Balsamo P. 1845. Memorie inedite di pubblica economia ed agricoltura dell'abate Paolo Balsamo. Vol. I. Palermo, Tipografia Antonio Muratori.
- Balsamo P. 1851. Corso di agricoltura teorico-pratica. Opera postuma di Paolo Balsamo. Palermo, Natale Biondo.
- Banco di Sicilia 1927. Notizie sulla economia siciliana, pp. 949-951. In: Banco di Sicilia (Ed.), Osservatorio economico. Palermo.
- Beloch G. 1889. La popolazione antica della Sicilia. Archivio Storico Siciliano, 14: 1-83.
- Benigno F. 1988. Fra mare e terra: orizzonte economico e mutamento sociale in una città meridionale. Trapani nella prima metà dell'Ottocento, pp. 847-865. In: Massafra A. (Ed.), Il Mezzogiorno preunitario: Economia, Società e Istituzioni (a cura di A. Massafra). Dedalo, Bari.
- Bianca G. 1872. Monografia del mandorlo comune, sua storia e sua coltivazione in Sicilia. Stamperia di G. Lorscheider. Palermo.
- Bianca G. 1878. Monografia agraria del territorio di Avola. Tipografia Ricci, Firenze. Ristampata nel 1985 dalla Pro Loco di Avola, 189 pp.
- Bisculm M., Colombaroli D., Vescovi E., van Leeuwen J.F.N., Henne P.D., Rothen J., Procacci G., Pasta S., La Mantia T. & Tinner W. 2012. Holocene vegetation and fire dynamics in the supra-mediterranean belt of the Nebrodi Mountains (Sicily, Italy). Journal of Quaternary Science, 27: 687-698.
- Bontempelli M. & Trevisani E. 1903. Rivista industriale, commerciale e agricola della Sicilia. Milano, 1903. Ristampa anastatica, Grifo, 1984.
- Bresc H. 1971. Case di legno in Sicilia, pp. 5-7. In: G.R.A.M. (Gruppo Ricerche Archeologia Medioevale). Notiziario del 20 agosto 1971: 5-7.
- Bresc H. 1986. Un monde méditerranéen: économie et société en Sicile, 1300-1450. Ecole Française de Rome-Accademia di Scienze, Lettere e Arti, Roma-Palermo, 2 voll., 981 pp.
- Bresc H. 2001. Mulini e paratori nel medioevo siciliano, pp. 33-48. In: Bresc H. & Di Salvo P. (Eds.), Mulini ad acqua in Sicilia. I mulini, i paratori, le cartiere e altre applicazioni. L'Epos, Palermo.
- Bresc H. & Pescarmona P. 1983. 'Disfari et perdiri li fructi et li aglandi': economie e risorse boschive nella Sicilia medievale (XIII-XV secolo). Quaderni Storici, 54(3): 941-969.
- Bresc-Bautier G. 1976. Pour compléter les données de l'archéologie: le rôle du bois dans la maison sicilienne, pp. 435-440. In: Atti del Colloquio Internazionale di Archeologia Medievale (Palermo - Erice, 20-22 settembre 1974), Palermo, vol. 2: 435-440.
- Bresc-Bautier G. & Bresc H. 1980. Lavoro agricolo e lavoro artigianale nella Sicilia medievale, pp. 91-139. In: Marchetta E. (Ed.), La cultura materiale in Sicilia, Quaderni del Circolo semiologico siciliano, 12-13.
- Burgaretta S. 2007. Sicilia intima. Viaggio nella cultura popolare siciliana. E. Romeo Ed., Siracusa.
- Calcara P. 1848. Sui boschi della Sicilia. Dalla Stamperia Solli, Palermo.
- Calò C., Henne P.D., Eugster P., van Leeuwen J.F.N., Gilli A., Hamann Y., La Mantia T., Pasta S., Vescovi E. & Tinner W. 2013. 1200 years of decadal-scale variability of Mediterranean vegetation and climate at Pantelleria Island, Italy. The Holocene, 23: 1477-1486.
- Cancila O. 1995. Storia dell'industria in Sicilia. Editori Laterza, Roma-Bari, 493 pp.
- Cangemi G., & Miceli P. (not dated). L'uso tradizionale delle piante nel territorio di Buseto Palizzolo. Regione Siciliana, Assessorato Agricoltura e Foreste, Servizi allo Sviluppo, Sezione Operativa, 85, 68 pp.
- Cappellani S. 1958. L'artigianato in Sicilia. Scuola salesiana del libro, Catania.
- Casarrubea G. 1984. Il tramonto dei mestieri, pp. 153-155. In: Casarrubea G. & Cipolla G. (Eds.), Quotidiano e Immaginario in Sicilia. Burgisi, santi e poveri diavoli nel partinicese. Vittorietti Ed., Palermo.
- Celesia Setaiolo G. 1872. Degli alberi da bosco, e dell'utile che apprestano. Giornale Atti Regia Commissione Agricoltura Pastorizia Palermo, 4: 301-305, 341-364.
- Chiaromonte Z.G. 2001. Un "sagnaturi" per cavalli. Il Pitirè - Quaderni del Museo Etnografico Siciliano, 7: 40-42.
- Cicero D., Mitra M. G. & Prestigiovanni M. 1993. I Borboni e le vecchie cartiere del Palermitano. Rivista Mineraria Siciliana, 4 (166) (Luglio-Agosto): 37-46.
- Cipolla G. 1984. Un antico gioco è Scanneddi, pp. 64-69. In: Casarrubea G. & Cipolla G. (Eds.), Quotidiano e Immaginario in Sicilia. Burgisi, santi e poveri diavoli nel partinicese. Vittorietti Ed., Palermo.
- Cipparone A. (Ed.) 2013. Il legno. Provincia di Cosenza, Museo delle arti e dei mestieri, Ministero per i Beni e le Attività Culturali, 240 pp.
- Coppola G. 2014. I Normanni e il mare. Notazioni sulla flotta, sugli arsenali e sulle battaglie, pp. 445-464. In: Gianandrea M., Gangemi F. & Costantini C. (Eds.), Il potere nell'arte del Medioevo. Studi in onore di Mario D'Onofrio. Campisano Ed., Roma.
- Corrao P. 1987a. Boschi e Legno, pp. 135-164. In: Uomo e ambiente nel Mezzogiorno normanno-svevo. Atti delle ottave giornate normanno-sveve Bari, 20-23 ottobre 1987. Centro di Studi normanno-svevi, Università degli Studi di Bari, Edizioni Dedalo.
- Corrao P. 1987b. Arsenali, costruzioni navali ed attrezzature portuali in Sicilia (secoli X e XV), pp. 33-50. In: Concina E. (Ed.), Arsenali e città nell'Occidente europeo, Venezia.
- Corrao P. 1988. Per una storia del bosco e dell'incolto in Sicilia fra XI e XII secolo, pp. 351-368. In: Andreolli B. & Montanari M. (Eds.), Il bosco nel Medioevo, Bologna [reproposed in Corrao P. 1994. Per una storia del bosco e dell'incolto in Sicilia fra XI e XII secolo, pp. 75-94. In: D'Onofrio S. (Ed.), La cultura del bosco, Regione Siciliana, Assess. BB. CC. AA. e della Pubbl. Istruzione].
- Corso S. 1990. "Fabri lignarii": la *mastranza* a Trapani nei secoli XVII-XVIII. La Fardelliana, Rivista di Scienze Lettere ed Arte, 8-9 (1989-1990): 39-58.
- Costanza M. 2001. La carbonificazione sulle Madonie: Aspetti storici e selvicolturali. Università di Palermo, Tesi di Laurea in Scienze Forestali ed Ambientali.

- Cruciani A. 1953. Viaggio in Sicilia. Le vie d'Italia - Rivista mensile del Touring Club Italiano, 2/1953: 185-195.
- Cruciata M., Gaglio R., Scatassa M.L., Sala G., Cardamone C., Palmeri M., Moschetti G., La Mantia T. & Settanni L. 2018. Formation and characterization of early bacterial biofilms on different wood typologies applied in dairy production. *Applied and Environmental Microbiology*, 84:e02107-17. <https://doi.org/10.1128/AEM.02107-17>.
- Cusimano A. 1980. Viticoltura e vinificazione tradizionali nel palermitano, pp. 373-392 In: Marchetta E. (Ed.), *La cultura materiale in Sicilia*, Quaderni del Circolo semiologico siciliano, 12-13.
- Cusumano A. 1977. Dal legno alla botte. "Uomo e cultura" *Rivista di Studi antropologici*, 10/11 (19/22): 68-92.
- Cusumano A. 1978. Mestieri e lavoro contadino nella Valle del Belice. Studi e materiali per la storia della cultura popolare. Associazione per la Conservazione delle Tradizioni popolari, 5: 3-34.
- Cusumano A. 1983. Arti e mestieri nella Valle del Belice: il cuoio, il legno, il ferro. Studi e materiali per la storia della cultura popolare, 13. Edizioni Stass, Palermo, 70 pp.
- Cusumano A. 1988. I maestri d'ascia, pp. 226-230. In: Buttitta A. (Ed.), *Le Forme del lavoro. Mestieri tradizionali in Sicilia* Flaccovio S.F., Editore, Palermo, (previously published as Cusumano A. 1985. *Il Legno*. 1. Mastru d'ascia d'òpira rossa, pp. 28-45. In: "Le forme del lavoro. Mestieri tradizionali della Sicilia". Quaderni del Servizio Museografico della facoltà di Lettere e Filosofia dell'Università di Palermo, 1).
- D'Agostino G. (Ed.) 1992. *Arte Popolare in Sicilia le tecniche i temi i simboli*. Flaccovio S.F. editore, Palermo 1991-1992, 428 pp.
- D'Aiotti A. 1978. *Il libro dell'isola di Pantelleria*. Trevi Editore, Roma.
- De Danilowicz C. 1942. Carta topografica dell'arte rustica e dell'artigianati rurale della Sicilia. *Lares*, 4: 198-221.
- D'Onofrio S. 1996a. I Carbonai, pp. 57-130. In: *La mano di Prometeo*. Argo, Palermo (previously published as D'Onofrio S. 1994. *I carbonai*, pp. 179-221. In: D'Onofrio S. (Ed.), *La cultura del bosco*, Regione Siciliana, Assess. BB. CC. AA. e della Pubbl. Istruzione, and before as D'Onofrio S. 1984. *I carbonai dei Nebrodi: il mestiere e il gioco*, pp. 469-510. In: AA.VV., *I mestieri Organizzazione Tecniche Linguaggi*, Quaderni del Circolo Semiologico Siciliano, Palermo, 17-18 and D'Onofrio S. 1984, *Le arti del fuoco*. *I Carbonai dei Nebrodi*. Studi e materiali per la storia della cultura popolare. Associazione per la conservazione delle tradizioni popolari 16, 64 pp).
- D'Onofrio S. 1996b. I Ceramisti, pp. 131-187. In: *La mano di Prometeo*. Argo, Palermo.
- Diderot D. & D'Alembert le Rond J.B. 1751-1780. *Encyclopédie. Recueil de planches sur les sciences, les arts libéraux et les arts mécaniques, avec leur explication*. Agriculture. Inter-Livres, Paris.
- Dentici Buccellato R.M. 1994. Il bosco nella Sicilia del basso Medioevo, pp. 115-122. In: D'Onofrio S. (Ed.), *La cultura del bosco*. Regione Siciliana, Assess. BB. CC. AA. e della Pubbl. Istruzione, Palermo.
- Di Berenger A. 1863. *Studi di archeologia forestale*. G. Longo, Venezia. (Ristampa a cura dell'Accademia Italiana di Scienze Forestali e Direzione Generale dell'Economia Montana e delle Foreste, Firenze, 803 pp, 1965).
- Di Lorenzo G. 1835. Lettera dell'avvocato Giuseppe Di Lorenzo al Signor Giuseppe Merlo Jannelli Marchese di S. Elisabetta sulla coltivazione del corbezzolo in Sicilia e suoi usi economici. *Giornale di Scienze Lettere e Arti per la Sicilia*, 15(49): 127-188.
- Di Marzo G. 1869-1886. *Biblioteca storica e letteraria di Sicilia, ossia Raccolta di opere inedite o rare di scrittori siciliani dal secolo XVI al XIX*. L. Pedone-Lauriel, Palermo.
- Di Pasquale G. & Garfi G. 1989. Risorse e prelievo pastorale nei boschi di Buccheri (secc. XVIII-XX). *Quaderni Storici*, 72: 901-909.
- Di Salvo P. 2001. L'evoluzione del mulino siciliano, pp. 49-117. In: Bresc H. & Di Salvo P. (Eds.), *Mulini ad acqua in Sicilia. I mulini, i paratori, le cartiere e altre applicazioni*, l'Epos, Palermo.
- Diodorus Siculus, not dated. *Biblioteca Storica. Libri XI-XV*. Sellerio, Palermo, 1988.
- Drago G. 1996. *Gli Starrabba di Rudinì*. Flaccavento, Siracusa, 256 pp.
- Falkenhausen V. 1980. La foresta nella Sicilia normanna, pp. 65-74. In: Marchetta E. (Ed.), *La cultura materiale in Sicilia*, Quaderni del Circolo semiologico siciliano, 12-13.
- Gallo M. 1990. Imposizione tributaria agli inizi del sec. XVIII a Trapani: Indice dei nomi per categorie di arti, mestieri e professioni. Con annotazioni di Corso S. (1989-1990). *La Fardelliana*: 101-167.
- Giacomarra M. 1983. *I pastori delle Madonie: Ambiente, Tecniche, Società*. Archivio delle Tradizioni popolari siciliane, Palermo.
- Giacomarra M. 1988. *Caccamo: mestieri e lavoro contadino*. Cassa rurale ed artigiana "San Giorgio", Caccamo, 189 pp.
- Giacomarra M. 2000. *Le Madonie culture e società. Ente Parco delle Madonie*. Tipografia Bonfardino, Palermo, 152 pp.
- Giordano G. 1988. *Tecnologia del legno. I legnami del commercio*. Vol. III, Seconda Edizione. Unione tipografico-Editrice torinese, Torino.
- Giuffrida A. 2001. Fonti di energia nella Sicilia rinascimentale. Motori umani, animali, a vento e idraulici, pp. 9-15. In: Bresc H. & Di Salvo P. (Eds.), *Mulini ad acqua in Sicilia. I mulini, i paratori, le cartiere e altre applicazioni*, l'Epos, Palermo.
- Gussone G. 1832-1834. *Supplementum ad Florae Siculae Prodromum, quod et specimen florae insularum Siciliae ulteriorum adjacentium*. Neapoli, ex Regia Typographia, 2 fasciculi.
- Gussone G. 1842-1845. *Florae Siculae Synopsis exhibens plantas vasculares in Sicilia insulisque adjacentibus hucusque detectas secundum systema Linnæum dispositas*. Neapoli, Typ. Tramater, 3 voll.
- Habsburg Lothringen L.S. 1898. *Ustica*. H. Mercy, Praha, 132 pp., 2 tav. [reprint by Edizioni Giada, Messina, 1979].
- Heckler S. 2012. *Landscape, Process and Power: Re-Evaluating Traditional Environmental Knowledge*.

- Studies in Environmental Anthropology and Ethnobiology. New York, NY: Berghahn Books, New York.
- IRCAC 1988. L'Economia Siciliana a fine '800. IRCAC, Istituto Regionale per il Credito Alla Cooperazione. Edizioni Analisi, 519 pp.
- La Mantia T. 2002. L'arboricoltura da legno nel paesaggio siciliano. Rimboschimenti e piantagioni nelle trasformazioni del paesaggio. Quaderni IAED, 15: 135–153.
- La Mantia T. 2007. Il paesaggio della Conca d'Oro. Frutti di Demetra, 14: 25–36.
- La Mantia T. 2009. La biodiversità delle formazioni naturali e seminaturali in Sicilia: cambiamenti e ipotesi di gestione, pp. 199–204. In: Accademia Italiana di Scienze Forestali (Ed.), Atti del Terzo Congresso Nazionale di Selvicoltura. Taormina (ME), 16–19 ottobre 2008. Accademia Italiana di Scienze Forestali, Firenze.
- La Mantia T. 2011. I rimboschimenti delle dune, pp. 97–109. In: Ientile R., Rühl J., La Mantia T. & Massa B. (Eds.), I cambiamenti nell'ecosistema della Riserva Naturale di Vendicari e gli effetti sull'avifauna, Edizioni Danaus, Palermo.
- La Mantia T. 2013. Storia dell'eucalitticoltura in Sicilia. Il Naturalista siciliano, 37: 587–628.
- La Mantia T. 2015. (Recensione). Li Vigni V.P & Sciortino C., 2014. Viaggio nei piccoli musei della Sicilia. Kalós Edizioni D'Arte, Palermo, 126 pp. Il Naturalista siciliano, 39: 82–83.
- La Mantia T. 2016. La coltivazione del nespolo del Giappone (*Eriobotrya japonica* Lindl.) in Sicilia: da un lontano passato a un incerto futuro. Il Naturalista siciliano, 40: 201–216.
- La Mantia T., Cutino I., Fioravanti M., Maggiore C., Origgio A. & Spampinato R.G. 2006. Lo status della castanicoltura da legno e possibili interventi per la salvaguardia: il caso studio dell'Etna, pp. 318–320. In: Atti del "IV Convegno Nazionale Del Castagno 2005", Montella (AV) 20–22 Ottobre 2005: 318–320.
- La Mantia T., Cutino I. & Maggiore C. 2004. Limiti e prospettive dell'arboricoltura da legno in Sicilia, pp. 87–105. In: Atti del Convegno "La selvicoltura da legno strumento di rilancio del territorio e dell'economia montana", Borgetto (Pa) 20 aprile 2004, (<https://iris.unipa.it/retrieve/handle/10447/22312/67890/LaMantiaMaggioreCutinoBorgetto2004-2004.pdf>).
- La Mantia T., Giaimi G., La Mela Veca D.S. & Pasta S. 2007. The role of traditional *Erica arborea* L. management practices in maintaining northeastern Sicily's cultural landscape. Forest Ecology and Management, 249: 63–70.
- La Mantia T., Giaimi G., La Mela Veca D.S. & Tomeo A. 2006. La scomparsa dell'utilizzazione dell'erica: un esempio di cancellazione di un paesaggio culturale e dei suoi valori naturalistici (The cessation of utilization of *Erica arborea*: an example of cancellation of a cultural landscape and its naturalistic values), pp. 58–65. In: International Conference on Cultural Heritage and Sustainable Forest Management: the role of traditional knowledge, held on 8–11 June, 2006 in Florence, Italy.
- La Mantia T., da Silveira Bueno R. & Quatrini P. 2019. The ancient urban agroforestry systems of the Conca d'Oro (Palermo, Italy) need protection to defend the city, p. 549. In: Dupraz C., Gosme M. & Lawson G. (Eds.), Book of Abstracts, 4th World Congress on Agroforestry. Agroforestry: strengthening links between science, society and policy. CIRAD, INRA, World Agroforestry, Montpellier.
- Liotta G. 2007. Agli insetti piacciono le opere d'arte. Degrado, difesa e conservazione. Editore Edimed, Palermo, 213 pp.
- Lo Cascio P. & La Mantia T. 2013. Sgubbio *Cytisus aeoilicus* Guss, p. 31. In: Frutti dimenticati e biodiversità recuperata. Il germoplasma frutticolo e viticolo delle agricolture tradizionali italiane. Casi studio: Isole della Sicilia, Lombardia, Quaderni Natura e Biodiversità n. 5, ISPRA, ARPA Emilia Romagna, ERSAF, Università degli Studi di Palermo, Regione Siciliana.
- Lo Castro N. 2009. Nei boschi di Dafni. Aspetti della cultura silvo-pastorale e contadina nel Valdemone. Ente Parco dei Nebrodi, 163 pp.
- Lombard M. 1958. Arsenaux et bois de marine dans la Méditerranée, VIIe–XIe siècles, pp. 53–106. In: Mollat M.M. (Ed.), Travaux du deuxième colloque international d'histoire maritime "Le navire et l'économie dans la Méditerranée musulmane" (Paris, 17–18.05. 1957).
- Lombard M. 1959. Un problème cartographié: le bois dans la Méditerranée musulmane (VIIe–XIe siècles). Annales. Economies, Sociétés, Civilisations, 14: 234–254.
- Lombardo G. 2001. Tra politica ed economia: le corporazioni di mestiere nella Sicilia moderna, pp. 326–345. In: Meriggi M. & Pastore A. (Eds.), Le regole dei mestieri e delle professioni: secoli XV–XIX, Franco Angeli, Milano.
- Mack Smith D. 1983. Storia della Sicilia medievale e moderna. Editori Laterza, Roma-Bari.
- Magnino C. 1934. Una raccolta di attrezzi agricoli siciliani. La conquista della terra, 3: 21–27.
- Mazzola P. & Domina G., 2006. Distribution, ecology and conservation of *Taxus baccata* (Taxaceae) in Sicily. Bocconea, 19: 209–215.
- Minà Palumbo F. 1853–1855. Studj agrarj sulla campagna settentrionale delle Madonie. Proverbi Agrari. Annali di Agricoltura Siciliana (anastatic reprint Editori del Grifo, Montepulciano, 1999, 229 pp.).
- Mongitore A. 1732. Le porte della città di Palermo al presente esistenti descritte da Lipario Triziano palermitano (anastatic reprint Editori del Grifo, Montepulciano, 1988, 119 pp.).
- Napoli F. 1932. Storia della città di Mazara. Anastatic reprint A. Forni Editore, Sala Bolognese.
- Naselli C. 1951. Strumenti da suono e strumenti da musica del popolo siciliano. Archivio storico per la Sicilia orientale, 4, 2–3: 251–280.
- Nicosia F. 1735. Il podere fruttifero e dilettevole. Angelo Felicella, Palermo.
- Nicosia S. 1980. La coltivazione tradizionale del frumento nei latifondi del "vallone", pp. 204–273. In: La cultura materiale in Sicilia. Atti del I Congresso internazionale di studi antropologici siciliani (Pa-

- Iermo, 12–15 gennaio 1978). Quaderni del Circolo semiologico siciliano, 12–13.
- Noti R., van Leeuwen J.F.N., Colombaroli D., Vescovi E., Pasta S., La Mantia T. & Tinner W. 2009. Mid- and Late-Holocene Vegetation and fire history of Biviere di Gela, a coastal lake in southern Sicily. *Vegetation History and Archaeobotany*, 18: 371–387.
- Palazzotto F. 2001. Per uno studio sulla maestranza dei falegnami di Palermo, pp. 678–689. In: Di Natale M.C. (Ed.), *Splendori di Sicilia. Arti Decorative dal Rinascimento al Barocco*. Charta ed., Milano.
- Pasqualino A. 1980. Come costruire un pupo, pp. 533–553. In: Marchetta E. (Ed.), *La cultura materiale in Sicilia, Quaderni del Circolo semiologico siciliano*, 12–13.
- Pasqualino A. 1988. I pupari e i costruttori di pupi pp. 400–414. In: Buttitta A. (Ed.), *Le Forme del lavoro. Mestieri tradizionali in Sicilia*. Flaccovio S.F. Editore, Palermo.
- Passanante I. 1987. *La corda, la canna, l'intreccio: arti e mestieri tradizionali*. Quaderni della Coop. Uomo e Territorio, 1. Palermo.
- Pasta S., Di Maggio C., Di Pasquale G., D'Amore G., Forgia V., Incarbona A., Madonia G., Morales-Molino C., Rotolo S.G., Sineo L., Speciale C., Sulli A., Tinner W. & Vacchi M., *in press*. The impact of climate, resource availability, natural disturbances and human subsistence strategies on the Sicilian landscape dynamics during Holocene. In: Polizzi G., Ollivier V. & Bouffier S. (Eds.), *Actes du Colloque Interdisciplinaire 'Watertraces: De l'hydrogéologie à l'archéologie hydraulique en Méditerranée antique'*. Archaeopress, Oxford.
- Pasta S. & La Mantia T. 2003. Note sul paesaggio vegetale delle isole minori circumsiciliane. II. La vegetazione pre-forestale e forestale nelle isole del Canale di Sicilia: dalla ricostruzione storica alla gestione futura. *Annali dell'Accademia Italiana di Scienze Forestali*, 51: 77–124.
- Pasta S., Sala G., La Mantia T., Bondì C. & Tinner W. 2019. The past distribution of *Abies nebrodensis* (Lojac.) Mattei: results of a multidisciplinary study. *Vegetation History and Archaeobotany*, 29: 357–371.
- Penzig O. 1924. *Flora Popolare Italiana. Opera Botanica*. Museo Tridentino di Scienze Naturali, 2 voll. Ristampa anastatica del 1972, Edagricole, Bologna.
- Peri I. 1978. *Uomini, città e campagne in Sicilia dall'XI al XIII secolo*. Laterza, Roma-Bari.
- Pignatti S., Guarino R. & La Rosa M. 2017–2019. *Flora d'Italia, 2ª Edizione*. Edagricole, Edizioni Agricole di New Business Media, Bologna.
- Pitrè G. 1883. *Giuochi fanciulleschi siciliani*. Reprint Arnoldo Forni Editore, Bologna, 460 pp.
- Pitrè G. 1889. *Usi e costumi, credenze e pregiudizi del popolo siciliano. Vol III*. Reprint by A. Rigoli (Ed.), published by Il Vespro, Palermo, 1978.
- Pitrè G. 1892. *Esposizione nazionale di Palermo 1891–92. Catalogo illustrato della Mostra Etnografica Siciliana*, Stabilimento Tipografico Virzi, Palermo, 95 pp.
- Pitrè G. 1912. *La famiglia, la casa, la vita del popolo siciliano*. Reprint by A. Rigoli (Ed.), published by Il Vespro, Palermo, 1978.
- Pugliatti T. 2012. La scultura lignea in Sicilia, pp. 23–31. In: Pugliatti T., Rizzo S. & Russo P. (Eds.), *Manufacere et scolpire in lignamine. Scultura e intaglio in legno in Sicilia tra Rinascimento e Barocco*. Giuseppe Maimone Editore, Catania.
- Raimondo F.M. & Lentini F. 1990. *Indagini etnobotaniche in Sicilia I. Le piante della flora locale nella tradizione popolare delle Madonie (Palermo)*. Il Naturalista siciliano, 14: 77–99.
- Riccobono F. 1992. *L'arte dei pastori: tra Peloritani e Nebrodi*. Pungitopo Editrice, Marina di Patti, 149 pp.
- Rugolo C.M. 1980. *Maestri bottai in Sicilia nel secolo XV*, pp. 109–120. In: *I mestieri Organizzazione Tecniche Linguaggi. Quaderni del Circolo semiologico siciliano*, 17–18.
- Russo D., Marziliano P.A., Macri G., Proto A.R., Zimbalatti G., Lombardi F. 2019. Does thinning intensity affect wood quality? An analysis of Calabrian pine in Southern Italy using a non-destructive acoustic method. *Forests*, 10: article 303, doi:10.3390/f10040303
- Sala G., La Mantia T., Brignone F. & Battipaglia G. 2016. Primi dati sugli alberi monumentali di Pantelleria, p. 46. In: Schicchi R., Amato F., Geraci A. & Bazan G. (Eds.), *Riassunti Relazioni e Poster "1° Convegno Nazionale Alberi Monumentali Conoscenza, Conservazione, Valorizzazione"* (Parco dei Nebrodi – Parco delle Madonie, 18–19 Giugno 2016).
- Salamone Marino S. 1897. *Costumi ed usanze dei contadini di Sicilia*, Palermo. Reprint by A. Forni, Sala Bolognese, 335 pp.
- Scotti M.E. 1788. *Catechismo nautico o vero de' doveri particolari della gente marittima*. Edito dal Pio Monte de' Marinai, Napoli. Reprint by Scotto di Carlo N. (Ed.), La Tipolitostampa, Napoli, 2001, 191 pp.
- Scuderi S. 1828. *Trattato dei boschi dell'Etna. Da' Torchi della R. Università degli studi*, 142 pp.
- Sottile R. 2002. *Lessico dei pastori delle Madonie. Materiali e Ricerche dell'Atlante Linguistico della Sicilia (ALS)*. Centro di Studi Filologici e Linguistici Siciliani, Dip. di Scienze Filologiche e Linguistiche, Università di Palermo, 11, 222 pp.
- Sottile R. & Genchi M. 2011. *Lessico della cultura dialettale delle Madonie 2. Voci di saggio*. Centro studi filologici e linguistici siciliani, L'ALS per la scuola e il territorio, 2, 339 pp.
- Tamburello I. 1981. *Palermo punico-romana: la lavorazione del legno e dei prodotti vegetali*. *Sicilia Archeologica*, 14(45): 35–42.
- Terranova F. 2012. Diagnosi delle specie legnose, pp. 23–36. In: Ampolo C. (Ed.), *Sicilia occidentale. Studi, rassegne, ricerche, Atti VII Giornate Internazionali di Studi sull'area elima e la Sicilia occidentale nel contesto mediterraneo* (Pisa, 12–15 ottobre 2009).
- Termotto R. 1998–2000. *Pittori, intagliatori lignei e decoratori a Collesano (1570–1696)*. Nuove acquisizioni documentarie. *Bollettino Società Calatina di Storia Patria e Cultura*, 7–9: 1–298.
- Termotto R. 2012. *Contratti di lavoro e migrazioni stagionali nell'industria zuccheriera siciliana*. *Mediterranea, Ricerche storiche*, 9 (25): 253–284.

- Tinner W., van Leeuwen J.F.N., Colombaroli D., Vescovi E., van der Knaap W.O., Henne P.D., Pasta S., D'Angelo S. & La Mantia T. 2009. Holocene environmental and climatic changes at Gorgo Basso, a coastal lake in southern Sicily, Italy. *Quaternary Science Reviews*, 28: 1498–1510.
- Tinner W., Vescovi E., van Leeuwen J.F.N., Colombaroli D., Henne P.D., Kaltenrieder P., Morales-Molino C., Beffa G., Gnaegi B., van der Knaap W.O., La Mantia T. & Pasta S. 2016. Holocene vegetation and fire history of the mountains of Northern Sicily (Italy). *Vegetation History and Archaeobotany*, 25: 499–519.
- Todaro P. 2006. Sistemi di captazione e gestione dell'acqua nella piana di Palermo nel Medioevo. Atti Seminario internazionale Giardini Islamici (12–14 ottobre 2006). *Architettura del paesaggio (allegato)*, 16, 33 pp.
- Tramontana S. 1983. La monarchia normanna e sveva, pp. 496–499. In: *Il Mezzogiorno dai Bizantini a Federico II*. In "Storia d'Italia" vol. II, Torino.
- Tropea G. 1979. La costruzione dell'aratro nelle parlate gallotaliche di Aidone, Nicosia e Sperlinga, *L'Italia Dialettale*, 42: 25–39.
- Uccello A. 1967. *Sull'arte lignea dei pastori*. Ente provinciale per il turismo, Siracusa, 15 pp.
- Uccello A. 1972. *La civiltà del legno in Sicilia*. Vito Cavallotto editore, 237 pp.
- Uccello P. 2003. *Pantalica. La montagna sacra e il culto della dea madre*. Nuova Zangara, Siracusa.
- Vella F. 1980. Mastri d'ascia a Troina, pp. 509–512. In: Marchetta E. (Ed.), *La cultura materiale in Sicilia*, Quaderni del circolo semiologico siciliano, 12–13.
- Ventura D. 2002. La questione forestale in Sicilia nella pubblicistica di metà Ottocento, pp. 232–293. In: Lazzaroni A. (Ed.), *Disboscamento montano e politiche territoriali. Alpi e Appennini dal Settecento al Duemila*, Franco Angeli.
- Vibaek J. & Onofrio S. 1984. Il museo civico di Bisacchino. Studi e materiali per la storia della cultura popolare, 15. Associazione per la conservazione delle tradizioni popolari, 47 pp.
- Zaia R., Pasta S., Di Rita F., Laudicina V.A., Lo Cascio P., Magri D., Troia A. & Guarino R., 2020. Staying alive on an active volcano: 80 years population dynamics of *Cytisus aeolicus* Guss. (Fabaceae) from Stromboli (Aeolian Islands, Italy). *Ecological Processes*, 9: 64.
- Zirilli S. 1869. La viticoltura e l'enologia in Milazzo. *Annali di Agricoltura Siciliana*, (n.s.) 1: 180–189.
- Zürcher E., Schlaepfer R., Conedera M. & Giudici F. 2010. Looking for differences in wood properties as a function of the felling date: Lunar phase-correlated variations in the drying behaviour of Norway Spruce (*Picea abies* Karst.) and Sweet Chestnut (*Castanea sativa* Mill). *Trees*, 25: 31–41.

LIFE ON ISLANDS

Studies dedicated to Bruno Massa



"In Sicily lies the key to everything"
Goethe

"In Sicilia si trova la chiave di tutto"
Goethe

ISBN 978-88-97603-26-9

