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The floristic research in Italian archaeological sites*

Abstract

Domina, G.: The floristic research in Italian archaeological sites. — Fl. Medit. 28: 377-383. 2018. — ISSN: 1120-4052 printed, 2240-4538 online.

Italy is one of the richest countries in historical and artistic heritage. The occurrence of vascular plants on monuments has always been analysed with some concern about conservation issues of the buildings. In order to present a framework of floristic research done in Italy within the archaeological areas and monumental sites in the country, the list of the basic references is presented. These 97 contributions are divided by publication date, area, and main historical period or civilization to which the complex refers. The most studied archaeological areas belong to the Roman civilization and occur in Latium and Sicily.

Key words: Vascular flora, Mediterranean area, management, artistic heritage.

Introduction

The Mediterranean Basin was the cradle of several civilizations that not only have profoundly changed the landscape but left numerous remains. Italy is one of the richest countries in historical and artistic heritage. The Central Institute for Catalogue and documentation of Italy (Istituto Centrale per il Catalogo e la Documentazione) lists 781 archaeological areas or parks and 622 main monumental complexes (<http://www.catalogo.beniculturali.it>); the number of individual monuments would exceed several thousand. Natural flora in monumental areas is seen with some concern because plants can damage monuments with their roots, can give the appearance of neglect, obstruct site access for visitors or conceal the monuments (Kanellou & al. 2017). In some case, trees or shrubs grown on ancient monuments have to be prudentially kept in the site as they provide stability to the structures and their removal could be dangerous. In the past (Romantic era) or in some peculiar situations (archaeological area of Angkor, in Cambodia, or Tikal, in Guatemala), they are considered to characterize the archaeological excavation, giving the visitor the idea that the site is still unexplored.

*Extended and enriched version of the oral presentation given at the International Symposium "Botany at the intersection of Nature, Culture, Art and Science", Selinunte, 28-30 June 2018.

The interest on the flora of archaeological sites in Italy dates back to the XVII Century. Panaroli (1643) reports 337 different plants (identified at species or genus level) growing on the Flavian Amphitheatre in Rome. The scope of floristic inventories can more focus on biological features of the plants growing into archaeological areas (e.g. Ceschini & al. 2006) or the list can be accompanied by the indication of their dangerousness for the monument with the indications for their management (Signorini 1995).

A first account of floristic references on archaeological areas is given in Caneva & Ceschin (2012). The aim of this paper is to present an updated framework of floristic research done in Italy within the archaeological areas and monumental sites in the country.

Material and Methods

The list of basic references concerning the flora (Higher plants, Bryophytes or Lichens) of archaeological sites located in Italy is presented as Electronic Supplementary File (ESF1). Each record includes authors, title, publication date, geographic area with geographical coordinates, main historical period or civilization to which the complex refers, the nature of the contribution (abstract, article, a chapter of Book or an entire book) and its editorial collocation (national or international). Thesis, doctoral thesis and unpublished research have been excluded. The main historical periods or civilizations considered are Greek (from 800 BC to 296 BC), Etruscan (from 800 BC to 396 BC), Punic (from 800 BC to 238 BC), Roman (from 753 BC to 476 AC), Medieval (from 476 to 1350), Renaissance (from 1351 to 1600), and Modern (from 1600 to today). Basic analysis is presented in figures 1-3.

Results

Overall 97 references have been collected: 13 conference abstracts, 73 full articles, 10 book chapters and 1 complete book. The period in which the largest number of contribu-

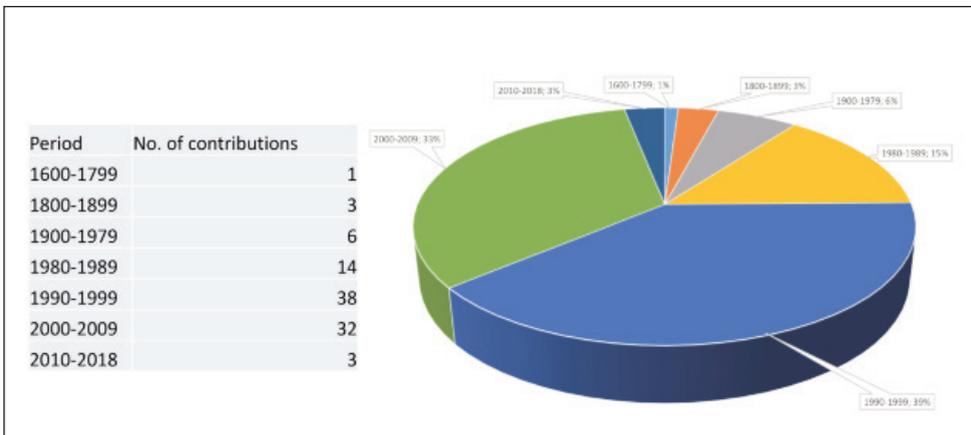


Fig. 1. Chronological distribution of the considered publications.

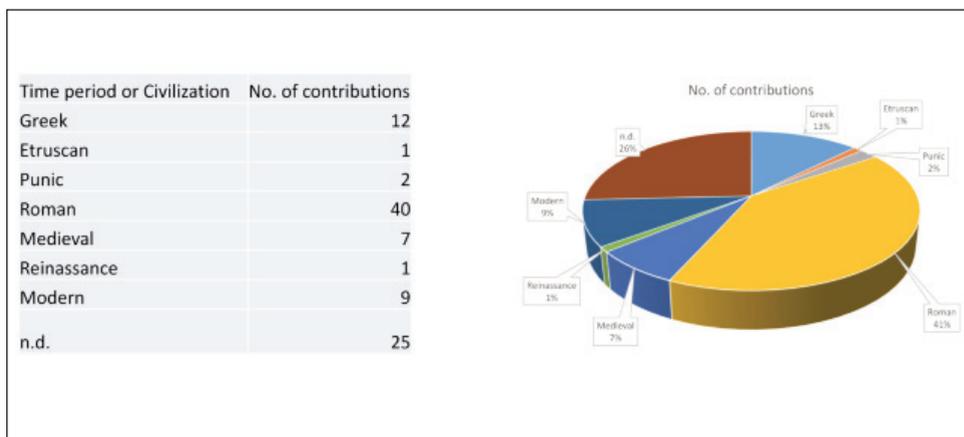


Fig. 2. The main historical periods or civilizations considered.

tions (38) was published was between 1990 and 1999. In the following decade (2000-2010) there was a slight decrease (32 contributions). In the last eight years (2011-2018) only 3 articles have been published. This is probably due to the limited interest by high ranked scientific journals in floristic research. Similar considerations can be deduced from the low number of contributions (only 21) published in international journals or international conference proceedings.

The most investigated regions are Lazio, with 42 contributions and Sicily with 31. However, in Sicily the studied sites are widespread in the region; in Latium the large part of contributions is focused on the area of Rome. Campania, Tuscany, Sardinia, Basilicata and Liguria have between one to five contributions. The resting 13 regions completely lack this kind of studies (Fig. 4).

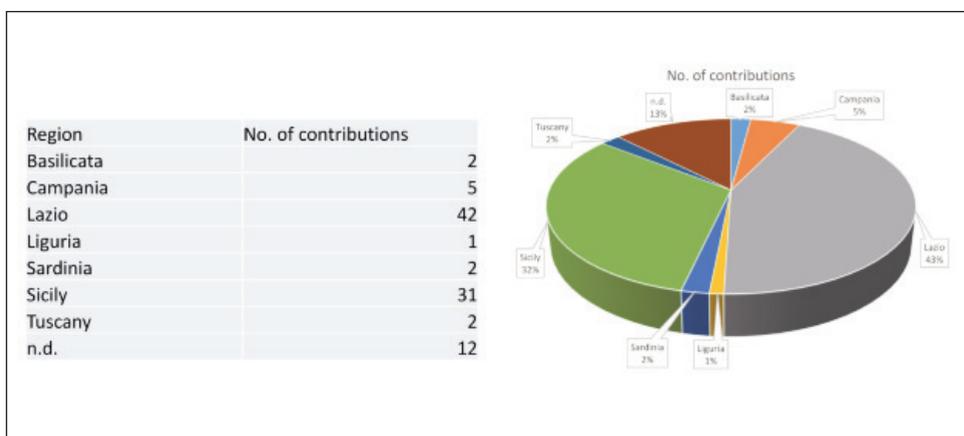


Fig. 3. Geographical distribution of the considered publications.



Fig. 4. Map of the studied sites, in yellow are marked the Italian administrative regions lacking of studies.

The most studied archaeological areas or single monuments belong to the Roman civilization. Even if, in many cases, it is not easy to attribute a monument to a precise historical epoch because different buildings, over time, have been re-adapted and used by the civilizations that have succeeded each other. A significant example is the castle of Milazzo in Sicily. It stands on a hill that, since 4000 AC, saw the flowering of different civilizations. The castle was built in 829 by the Arabs and was modified by the Swabians, the Angevins, the Aragonese, the Spanish, the Austrians, the British, the Bourbons, everyone has built or modified parts of the building that, over time, was used as noble residence, fortress or prison (Micale 1982). Hence the difficulty of considering the monumental complex belonging to one of the different civilizations that have followed.

With the exception of the single Flavian Amphitheatre in Rome (the Colosseum), which has become a case study with 8 published contributions from the XVII Century to nowadays, there are no studies published on most of the sites and monuments in Italy.

The floristic lists of species found in archaeological sites indicate that these florulas are subsets of the floras growing in the surroundings. There are few but interesting cases of species that spread from historical human settlements. *Poterium spinosum* L. (*Rosaceae*) occurs in Eastern and Central Mediterranean (Kurtto 2009). This species is widespread and abundant in East Mediterranean and occurs only near historical Greek settlements in Peninsular Italy, Sardinia, Sicily and Tunisia (Caruso 2013). This distribution and the traditional use as a medicinal plant (Bachrach 2007) would justify a deliberate spread of this plant that then naturalized in the areas close to human settlements. From the biological point of view, the florulas of archaeological areas are influenced by environmental factors and land use. The climate affects the archaeological areas in the same way as the surroundings, but the microclimate due to the buildings and the maintenance of the site can lead to variations on the biological spectrum. For example, by comparing the biological spectrum presented for the area of Neapolis in SE Sicily by Corbetta & al. (2002) with that of the whole Sicilian flora (Raimondo & Spadaro 2011) there is a higher percentage of therophytes than other forms. This can be explained with the periodical mowing in this area that favours the spread of plants typical of arid grasslands and of weeds of crops.

Discussion and conclusions

Knowledge and management of the flora on cultural heritage is a phenomenon affecting the entire globe. Botanical studies on archaeological areas should be not only limited to the protection of monuments but have to give the guidelines for the introduction of new plant elements to support the current fruition of the areas compatible with the original landscape (Caneva 1999). The study of flora occurring in the archaeological area and in its surroundings allow to select which species can be maintained or planted without excessive management costs.

This review can be a stimulus for scholars and managers in order to undertake targeted campaigns of prospecting of the biological component occurring in these areas and of deepening knowledge on its management in order to preserve this historical and artistic heritage. Researchers should send the results of their research to international journals with a large pool of readers. From what has been stated above it is evident that the botanical

prospecting in archaeological areas is still very limited, lacking entirely in several regions. On the contrary, the botanical researches in archaeological sites including the analyses of pollen, palynomorphs, seeds/fruits, wood, charcoals and other plant remains may be used to deepen the history of past vegetation, land cover, land-uses; indeed, archaeobotany is a still growing field of research. As reported by Mariotti Lippi & al. (2018) all the Italian regions have recent studies in archaeobotany. Each year about 45 articles have been published on this field and their number has constantly grown from in the last decades.

Acknowledgements

My warmest thanks to Marta Mariotti Lippi for the critical reading of the text.

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