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The flora of Cilento (Salerno): its past, present and future

Abstract

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The area known as 'Cilento' is located in southern Italy, south of Salerno, on the west (Tyrrhenian) coast of the peninsula. Knowledge of its flora has always been very scanty. A review on the available knowledge from the first studies by Tenore (about 1810-1840) up to the year 2000 has shown how the information has changed during two centuries and what can be its future developments.In particular, it is worth mentioning that at the time when Tenore published his researches, the number of vascular plant species listed for the Cilento was 444, whereas Lacaita, in a catalogue published in 1921, recorded for this area 934 different species. To date the number of spontaneous (or naturalized) vascular plant species mentioned for the Cilento is 1940, with the assumption that this figure is going to increase in the near future following the floristic research presently carried out in the area.However, it is remarkable how 91 species among those mentioned by Tenore have no longer been found since 1850; it is reasonable to think that many of these are actually vanished, since typical of areas (such as sandy coastal dunes, humid areas) heavily modified by the human impact during the past 100 years.The study of the Cilento flora deserves, with no doubt, an adequate investigation, since this area, because of its typical geographical position and its litological and geomorphological variety, served as a hinge in the diffusion of species between the north and the south of Italy, and between Italy and the Balcan peninsula.

The floristic composition of a given territory never remains stable in time. On the contrary, it is subject to change, which over the centuries can alter it significantly. These changes are due to a number factors, which can be divided into two fundamental types: objective and subjective.

Objective changes are a consequence of changes to the environment, due to natural or human causes. In other words, such changes are intrinsic to the plant population as a whole and therefore reflect the actual changes in the floristic composition over the years.

Changes of a subjective nature in this context refer not so much to changes in the floristic composition in itself, but to changes in the knowledge of its composition at different times. In other words, the composition of a floristic patrimony of a territory can change with the detail of knowledge at the time, or even a different taxonomic interpretation of its components, depending on when the information came to light.

There is no doubt that with more detailed research our knowledge of the floristic com-

position of an area is constantly improving and so the number of known species of an area generally tends to increase over the years.

Therefore the floristic composition of a given area is simply the synthesis of these two aspects, referred to a precise moment in time. It is therefore the result of past changes but at the same time is the starting point for future variation.

One example of how the floristic composition of a territory can change in time through objective and subjective causes can be seen from a study of the flora of Cilento, for which a catalogue is under preparation.

Cilento is situated in the Province of Salerno in southern Italy (Fig. 1) and covers and area of approximately 2,500 square kilometres from latitude 39° 58' to latitude 40° 38'. To the north it is bordered by the plains of the river Sele, to the east by the Diano Valley (a large basin of quaternary deposits running north-south), and to the south and west it is bathed by the Tyrrhenian Sea. From sea level, this mountainous area rises to a height of 1,899 m; several mountains reach over 1,500 m altitude (Mount Alburno 1,742 m; Mount

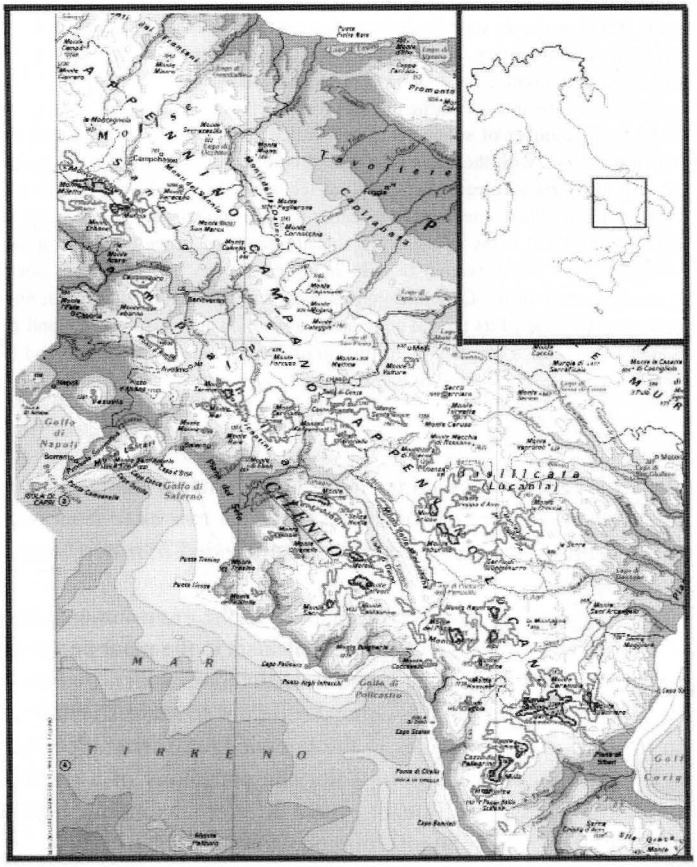

Fig. 1. Location of Cilento in Southern Italy.

Cervati 1,899 m; Mount Sacro 1,705 m, etc.) and constitute an important orographic barrier from the climatic and phytogeographical point of view. The geology of Cilento varies considerably: calcareous and dolomitic limestone massifs prevail in the eastern sector, whilst the central and western portions are characterised by abundant outcrops of calcarenites, shales and schists (the so-called Cilento "flysch").

Landscape morphology is also very varied. The coastline is predominantly characterised by rocky shores, with relatively few sandy and pebble beaches. There are several rivers and streams; the Sele and Alento form wide valleys with extensive fluvial deposits, whilst other watercourses follow a torrential regime, flowing within deep gorges (e.g. the Calore, Sammaro, Bussento etc.).

Cilento has few important inhabited centres (such as Agropoli to the north, with 13000 inhabitants, and Vallo della Lucania in the centre, with 8500 inhabitants); on the contrary, there are many small villages with 1000-5000 inhabitants, dotted more or less along the coast, in the plains and at the feet of the mountains. Nevertheless, most of the territory is still uninhabited; extensive areas lack settlements and are covered with extensive forests or grazing meadows.

Until a few years ago, Cilento had a poor communication network; for many centuries it was isolated from the main routes linking north and south Italy. The most frequented route running from Naples to Calabria was the famous "Strada delle Calabrie", state road nr. 19, which from Salerno via Eboli reaches the Diano Valley and then Lagonegro, bypassing the whole of Cilento.

Because of its wild nature and associated attractions in the fields of nature, archaeology (suffice it to mention the ancient settlements of Paestum and Velia), history, ethnology etc., the territory of Cilento has been recognised as an area of outstanding environmental interest. This has led to most of the area being declared in 1991 as part of the Cilento and Diano Valley National Park, covering an area of about 180,000 hectares.

Botanical studies of Cilento have for a long time been full of gaps. The lack of any communication network, at least until the end of XIX century, the inaccessible nature of the territory, and the presence of bandits in the area until the beginning of the XX century, meant that it was extremely difficult and dangerous to carry out any naturalistic investigations.

Apart from a few sporadic studies in the XVIII century, the first phase of botanical exploration of the area began with Michele Tenore (between 1811-1842) and his colleagues (Tenore 1811-1838; 1831-1833; 1835; 1842). However, most of their research concerned the northern part of Cilento (the Sele plain) in the eastern sector, the river Alento Valley and the coast. One important contribution to the flora of the northwestern sector came from Baron Ferdinando Giordano of Sessa Cilento, who sent Tenore several specimens he had collected on Mount Stella, which Tenore mentions in his Flora Napolitana and in his Sylloge.

During the second half of the XIX century, very few botanists visited Cilento. It was not until the early years of the 1900's that the second phase of botanical exploration began (1904-1914) with the work of Biagio Longo, Michele Guadagno, Loreto Grande and especially Carlo Lacaita, who visited several areas in Cilento, many of which were then still unexplored (Guadagno 1908; Lacaita 1911; Longo 1907). At the end of this investigation, Lacaita summarised the results of these studies, including all the floristic knowledge to that

date, and in 1921 published them in his "Catalogue of Vascular plants of the ex Principato Citra" (Lacaita 1921). This also included the Flora of Cilento known at that time as well as that of the adjacent areas (e.g. the Picentini Mountains).

After 1921, floristic studies of the territory were only sporadic but became more frequent after 1955 with a series of investigations on Mount Alburno (Moggi 1955), on Mount Cervati (Santangelo & al. 1994), in some areas of central Cilento, along the coast (e.g. Cape Palinuro), etc. This third phase brought a remarkable increase in the number of known vascular plants for the territory and allowed an analysis of the situation through a comparison with previous studies.

On the basis of floristic investigations conducted for over more than two centuries, up to the year 2001, the known flora of Cilento comprises 1940 species of wild or naturalised vascular plants (excluding cultivated species) (Moggi 2002). A comparison with the flora known at the times of Tenore (1811-1842) and with the catalogue compiled by Lacaita (1921) allows some interesting considerations to be drawn on the actual state of our knowledge of the flora of this territory and on what we can expect from the future development of this floristic patrimony (Fig. 2).

Although it goes without saying, mention must first be made of the remarkable increase

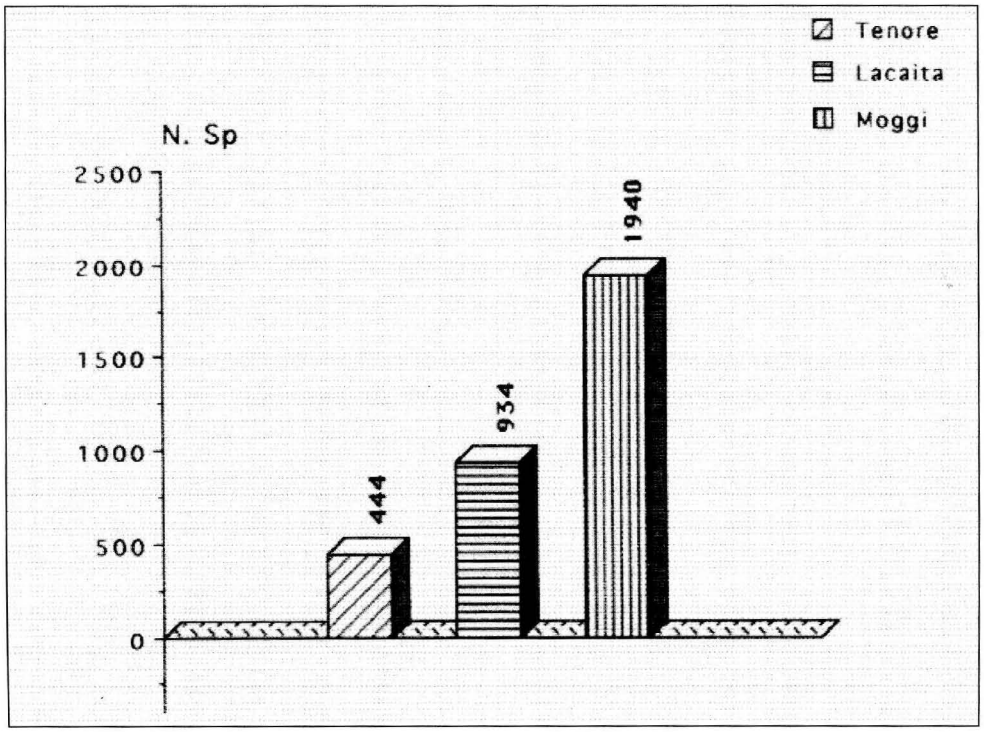

Fig. 2. Number of species of the flora of Cilento, known at the times of Tenore (1811-1842), Lacaita (1921) and at the present time.

in the recorded number of species for Cilento from the times of Tenore up to today (about four times as many). This is undoubtedly due to what we initially referred to as subjective causes of change, i.e. changes due to an increase in floristic research from the XIX century to the present. Nevertheless, this increase must be considered as highly heterogeneous, since it concerns only some areas of the territory, as we shall see, whilst any increase in other areas has been very modest.

A comparison with the number of species (934) mentioned by Lacaita and those reported to date (1940) reveal how the known flora has more than doubled over the last 80 years, suggesting that this number is destined to grow even further in the future.

However, this number is probably not exact, since it certainly does not reflect the actual state of the Cilento flora. Indeed, several factors suggest that this number could be higher or lower. On the one hand over the next few years the number could increase considerably as new, still unreported species are discovered in the area. On the other, the number of reported species could fall due to what can be defined as subjective causes, for example an incorrect report of species that do not occur in Cilento. In this respect it should be remembered that the 1940 species so far reported include at least 30 whose occurrence is doubtful or mistaken and which probably must be omitted from the territory (e.g. *Ranunculus macrophyllus, Athamanta cretensis, Pulmonaria officinalis, Digitalis lutea, Veratrum album*, etc.).

A further reason, this time definable as objective, for the fall in the number of species is the probable disappearance of species as a result of environmental changes in some areas of the territory. The unbridled building development along the coast, reclamation of marshland and consequent disappearance of some wetlands, the construction of new roads, abandonment of crop farming etc. have undoubtedly suppressed the diffusion of some species, if not even helped their disappearance. Another significant demonstration of this phenomenon comes from the examination of the 444 species reported as occurring at the times of Tenore. As many as 91 of the species mentioned in the works of Tenore and his colleagues have never been found again in Cilento since the mid XIX century. As they have not been sighted for a century and a half, in all probability they have disappeared, especially as they are generally plants associated with highly altered habitats, as mentioned above, (e.g. *Matthiola tricuspidata, Atriplex rosea, Puccinellia distans, Convolvulus lineatus*, etc. in littoral habitats; *Moenchia erecta, Nuphar lutea, Ranunculus ophioglossifolius, R. fontanus, Euphorbia palustris, Hippophaë rhamnoides* subsp. *fluviatilis, Veronica anagalloides, Triglochin bulbosum* subsp. *barrelieri, Cladium mariscus, Cyperus fuscus*, etc. in wet land areas).

With regard to the new sightings for species in Cilento over the last decades, a comparison with the Flora of Italy by Pignatti (Pignatti 1982) deserves special attention. Indeed, examination of the present catalogue for the flora of Cilento reveals that as many as 67 of the species found in the territory are not reported for Campania in the Flora of Italy. These are all species discovered in Cilento after 1982, or rather species whose occurrence in Campania was only recorded after that date. The discovery in Cilento of 67 new species for Campania in 20 years means that the known floristic contingent of the territory has increased by 3,4% of the entire flora (limited to the regional distribution of the species).

Comparison with the catalogue compiled by Lacaita in 1921, clearly shows that out of the 1940 species of the entire flora recorded to date, as many as 1006 were reported in

Cilento between 1921 and 2001, thus giving an average of 12,5 species per year. This suggests that the total number of species constituting the present flora is destined to increase further.

Similar considerations can be drawn from an examination of the floristic composition of individual areas in Cilento. The territory can in fact be divided into 18 areas, sometimes differing greatly in size, allowing examination of the floristic composition of each. For phytogeographical convenience, the criteria employed for identifying the 18 areas are based on their different morphology, altitude and geo-botanical composition. Consequently, 4 of these areas fall within the coastal belt (1A, 12, 13, 14), 6 within the main mountain massifs (3, 4, 6, 9, 10, 11), 3 lie within the main flood plains (1C, 5, 7) and 5 the remaining inland hills (1B, 1D, 2, 8, 15).

This division reveals the heterogeneneity of the floristic knowledge for the different areas (Fig. 3). For example, in similarly sized areas along the coastal belt, 759 species have

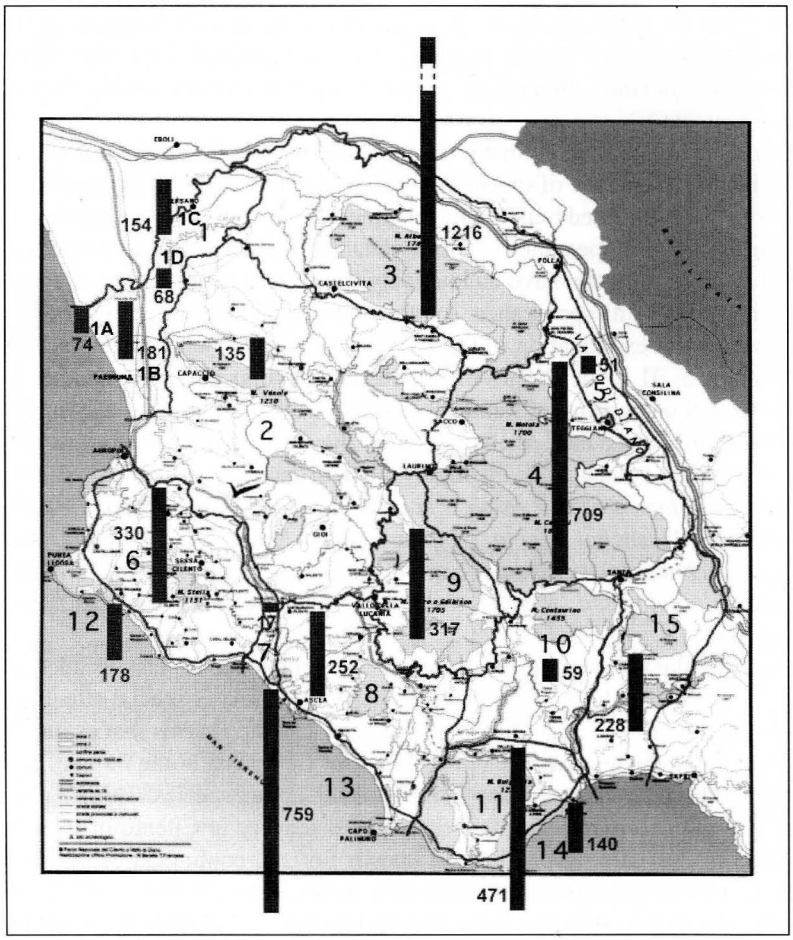

Fig. 3. Floristic knowledge of the different areas of Cilento (see text).

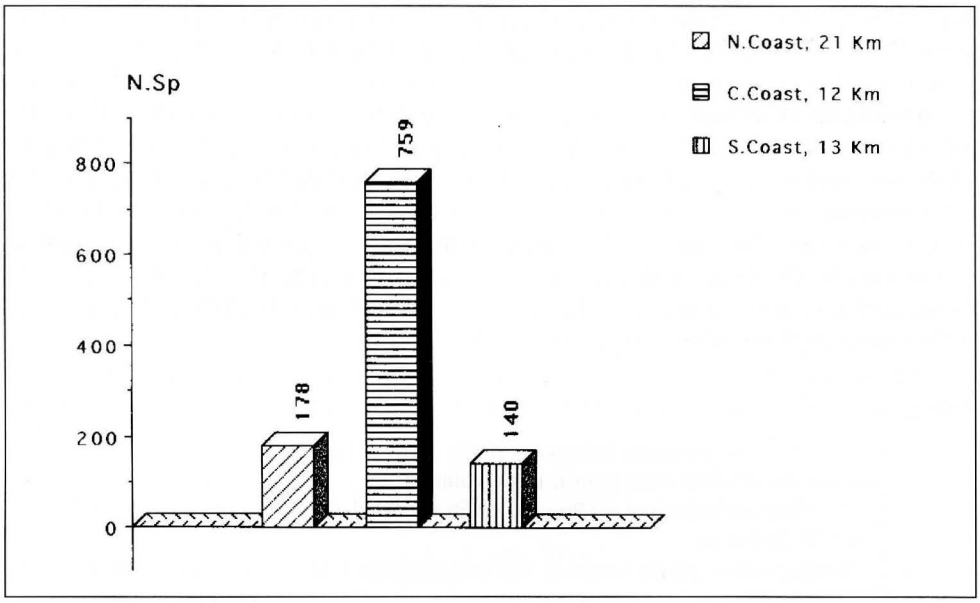

Fig. 4. Floristic knowledge of the coastal belt of Cilento (see text).

been reported for the central area (13) but only 178 for the area immediately to the north (12) (Fig. 4). Obviously, this difference could be due to different geomorphologic or lithological characteristics, but it is also clear that botanists visited the central area, which includes the famous Capo Palinuro, far more frequently than the northern sector.

Similar marked differences emerge from a comparison between the reported flora for the different mountains. Two groups of mountains similar in area, altitude and of identical lithology, Mount Alburno (3) and the Motola-Cervati complex (4), exhibit very different known floristic compositions. In fact to date 1216 species of vascular plants have been reported for Mount Alburno, but only 709 for the Motola-Cervati group. Considering that over a third of this number refers to flora occurring over 1,650 m on Mount Cervati, it can be seen how scantly our floristic knowledge is for this vast territory.

These considerations therefore suggest how the floristic composition of Cilento is still far from being sufficiently known. Bearing in mind the morphological, oro-hydrographical, lithological differences of the territory, much further investigation of the areas poorly known from the botanical point of view is needed if we are to attain complete knowledge of the flora.

It should also be remembered that this territory is of particular phytogeographical interest on account of its peculiar geographical position and morphology (La Valva 1992). It is in fact an important Tyrrhenian formation before the main Apennine Chain with remarkably high peaks (Mount Alburno 1,742 m; Mount Cervati 1,899 m, etc.). Although it is a lateral chain of the Apennine watershed, some of its peaks are just as high or even higher

than the main ridge, a phenomenon that probably has contributed in some way to the character of the floristic composition with respect to the main watershed chain.

The peculiar geographical and phytogeographical position of Cilento is confirmed by the occurrence of transadriatic species (such as *Edraianthus graminifolius*), which are absent from the main Apennine chain, as well as some interesting endemisms towards the Tyrrhenian sector, e.g. *Primula palinuri, Genista cilentina, Dianthus rupicola, Iberis semperflorens*, etc.

The recent institution of the Cilento and Diano Valley National Park is not only an instrument for safeguarding the naturally interesting landscape of Cilento (La Valva & Moggi 1996), it can also be a stimulus for the future development of floristic research in a territory of remarkable phytogeographical interest.

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