

# The 1638 earthquakes, migratory phenomena and geolinguistic consequences in Calabria

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## Abstract

Two disastrous earthquakes occurred in Calabria (Southern Italy) in 1638: on March 27th the first one had a destructive damage area on the Tyrrhenian side of Mid-Calabria, the second one hit the east side of the same region on June 9th. In historical times they are the most intensive seismic events in their respective epicentral areas, so that the reconstruction of their effects is very important for the analysis and assessment of seismic risk. They strongly influenced, moreover, the development of the economy and socio-cultural status of many urban communities. A study of these shocks has been carried out and has implied a thorough re-evaluation of the historical sources of information already known and the exploitation of possible new sources. The two macroseismic fields have been reconstructed; in particular that of the second seismic event, the strongest one in its epicentral area, stimulates a thorough revision of the seismotectonics of the Middle-eastern Calabria. Moreover the reconstruction of the historical facts accompanying and following the earthquakes has furnished elements that help to explain observed anomalies in the spatial distribution of Calabrian dialect phenomena.

**Key words** Calabria – historical seismology – migration

## 1. Introduction

As is well known, owing to the relatively low frequency of major earthquakes, the study of such seismic events that have occurred in historical times plays an important role both in the identification of significant seismotectonic features of a territory and in the analysis and assessment of natural hazard. In such processes it is necessary to reconstruct the spatial distribution of the seismic effects on the basis of available historical information. The detail and overall quality of the results depend of course on those of the data utilised. Existing catalogues have consequently to be updated continuously in order to rectify possible errors, to fill in gaps in our knowledge and to take new in-

formation found in historical sources into account. With this in mind a new study has been carried out that implies the revision and integration of data available on the two earthquakes of 1638 in Calabria.

Earthquakes, however, affect different aspects of human life and in many cases they have conditioned habits and characteristics of the populations involved and even provoked migratory phenomena. The historical scenery reconstructed by the study of the events accompanying and following strong earthquakes, that is necessary for an accurate evaluation of seismic intensities, can therefore be used to explain other human phenomena.

In this paper our study of seismicity in Calabria in the 17th century has also been used to explain dialectological anomalies and strange similarities in a general picture or scheme where classification and isogloss plotting are determinable.

## 2. The 1638 earthquakes and migratory phenomena

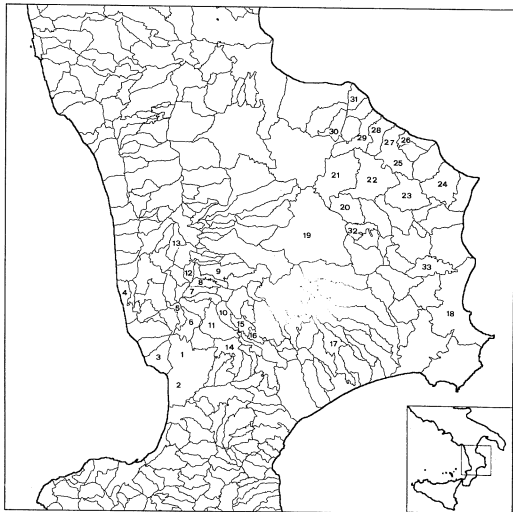
Information on seismic activity in Calabria dates back to the first years of the Christian era (Baratta, 1901), but the first data useful from the standpoint of seismotectonic and seismic risk analyses refer to events occurring in the 17th century. In particular, many sources provide a great deal of material for the 1638 earthquakes.

Macroseismic data on the seismic events of 27th March and 9th June, 1638, are already to be found in Mercalli (1897) and Baratta (1901). For almost a century the works of both these authors have been fundamental landmarks in studies on historical seismicity and

they still have inestimable value as starting points for further investigations. However, the search for details necessary for setting up seismotectonic correlations and recent methodological progress (Stucchi, 1990, 1991) have encouraged a general revision of the original sources of information on historical earthquakes. This effort was promoted by the «Macroseismics» Working Group of the Italian National Group for Protection against Earthquakes: starting out from earthquake catalogues, the original sources for the most significant seismic events were identified, carefully examined and critically sifted and compared in order to extract data on the various earthquake effects in the sites mentioned. This activity led to the perusal of a wide variety of information found in printed chronicles, archive documentation, travellers' diaries, official reports, epigraphs, etc. Some archives not yet quoted in seismological literature, both ecclesiastic as well as private, have also been identified and explored.

The re-evaluation of data collected on the March 27th 1638 earthquake produced as a result the intensity map shown in fig. 2a, which becomes the starting point for further seismological and geological studies. The numbers on the map indicate the seismic intensity according to the MCS macroseismic scale. The maximum intensity of XI MCS was experienced in several inhabited centres aligned along the Savuto Valley (localities 1, 5, 6, 7, 8 and 9 in the position map of fig. 1), making this structure seismotectonically important.

Information gathered on the subsequent earthquake of June 9th is reported in the intensity map of fig. 2b. In this case the mesoseismal area is less well-defined due to the smaller number of points; however, it appears strongly elongated in the NS direction and may indicate a possible seismogenetic structure separating the Sila highland from the sedimentary basins along the Ionian coast (Moretti, 1993). Other earthquakes with a comparable intensity in the central and northern parts of this mesoseismal area are not known and therefore the event of June 9th, 1638 is deemed to be the master event for the assessment of seismic risk in that particular subregion.



**Fig. 1.** Position map of the localities mentioned in the text. Thin lines are administrative boundaries of the municipalities: 1 - Nicastro; 2 - S. Eufemia; 3 - Gizzeria; 4 - Amantea; 5 - Martirano; 6 - Conflenti; 7 - Scigliano; 8 - Carpanzano; 9 - Rogliano; 10 - Soveria Mannelli; 11 - Decollatura; 12 - Belsito; 13 - Dipignano; 14 - Serrastretta; 15 - Carlipoli; 16 - Cicala; 17 - Sersale; 18 - Crotona; 19 - S. Giovanni in Fiore; 20 - Savelli; 21 - Bocchigliero; 22 - Campana; 23 - Umbriatico; 24 - Cirò; 25 - Scala Coeli; 26 - Cariati; 27 - S. Morello; 28 - Mandatoriccio; 29 - Pietrapaola; 30 - Cropalati; 31 - Crosia; 32 - Castelsilano.



**Fig. 2a,b.** Distribution of intensity (MCS) for the earthquakes of the 1638, 27th March (a) and 9th June (b).

These, however, are not the only results the research produces: the reconstruction of events accompanying and following the 1638 earthquakes affords an in-depth knowledge of the geographical and economic situation existing at the time and can also be used to explain ensuing effects at these levels. This overall knowledge of a particular situation, in all its historical aspects, can also be utilised, as we shall demonstrate, to explain other otherwise inexplicable phenomena such as the serious anomalies and gaps we find in setting up meaningful bundles of isoglosses.

The relevant history of the year 1638 has been reconstructed as follows. Earthquakes were first recorded on the 18th January (Di Somma, 1641) and continued daily up to the 31st of January. However, on the 27th of March, the day before Palm Sunday, with populations busy with their church rituals, a disastrous earthquake (degree XI MCS) completely destroyed buildings in the area between Nicastro and the Crati Valley: its epicentre was between Conflenti and Scigliano (Moretti *et al.*, 1991). There was a zone of total or major damage stretching from Rogliano to Nicastro (fig. 2a). Here and in the whole *county* of Aquino

the dead have been calculated as ca. 1200 out of 1100 hearths (= pop. 5500), *i.e.* a fifth of the total population: these and the following figures are found in the official report compiled by Capecelatro, later published as an appendix to the D'Orsi (1640) chronicle. At Scigliano, Capecelatro (1638) reports 753 deaths out of 1025 hearths (= pop. 5125), corresponding to 15% of the local population. In this period Scigliano was a flourishing post-medieval township, almost a city, extremely rich and culturally endowed (even a printing works), as was Nicastro. It is currently reduced to a small, backward village, economically underdeveloped. On the other hand, Nicastro is still a flourishing centre, as it was in 1600.

In this same zone the diocesan area of Martirano («Martirano Antico») reduced its population, after the earthquakes, by about half to 6500 souls, as reported by the then bishop Cellesio in his *Relationes ad limina* published by Bonacci (1971). This drastic population reduction is only partially due to the deaths of earthquake victims: after the earthquakes internal migrations were actively encouraged by the bishop Cellesio and account for a large part of the population absences in this diocesan area.

The migratory population moved essentially to hill districts, but in some cases even set up nearby plain villages such as Decollatura and Soveria Mannelli (the «Amato Plain»), not even very far from the disaster zone. Migration took place, however, not only within the diocesan area but some elements were encouraged to emigrate even longer distances. Groups originating from Scigliano and Carpanzano, mainly male population, crossed the Sila Highlands and reached the eastward diocesan area of Umbriatico, whose bishop, Mons. Ricciulli, a native of Rogliano, who had lost a number of relatives in the same earthquake (Recupito, 1638), encouraged their settlement in this area, to be precise in the locality named Pelleca not far from Umbriatico.

From the official report compiled by Capecelatro the incidence of female deaths in the earthquake zones is remarkable (table I). One might be tempted to ask: why a migration of a basically male population? We should stress that social and work structures in the period 1600-1700 implied that male workers employed in agriculture normally worked at substantial distances from built-up areas and urban

centres. Women, instead, concentrated in such areas and on these particularly meaningful days in the Christian cult (the week before Easter) were also concentrated in churches, buildings which did not withstand the shock of this particularly intense earthquake. The refugees from the above areas, reduced by extreme poverty, had taken to thieving to survive and were eventually expelled from Pelleca; they appealed to the wife of Scipione Spinelli II, the then Prince of Cariati, Carlotta Savelli, who subsequently gave them territory and homes in an agricultural area then called Scalzaporri, an extremely small village consisting up to that date of 6 hearths. The new village, now expanded and censused as 67 hearths (= pop. 335), was then given the name of this Princess in her honour, *i.e.* her family's surname *Savelli*. In fact, in the original Latin text of Barrio (1571) *De antiquitate et situ Calabriae*, Savelli is not mentioned. In the version revised by Aceti (1737) and translated into Italian by Mancuso (1975), we find *Sabellia, prima villaggio, ora cittadella abbastanza abitata, costruita intorno al 1640 da Carlotta Sabellia Romana, onde prese il nome; prima*

**Table I.** Death in the epicentral area of the 27th March 1638 earthquake (from Capacelatro, 1638); note that female deaths prevail.

Deaths	Male	Female	Children	Other	Total
Altilia	132	191	332	–	655
Belsito	43	25	48	–	116
Conflenti	103	182	–	5	290
Motta S.	39	186	289	18	532
Martirano A.	189	328	–	–	517
Nicastro	538	647	–	15	1200
Sambiase	271	487	9	–	767
S. Eufemia	51	89	–	3	143
Carpanzano	154	223	118	–	495
Grimaldi	37	84	113	–	234
Rogliano	158	274	79	–	511
Scigliano	150	434	157	16	797
S. Stefano	23	69	124	–	216
Mangone	39	76	28	–	143

*infatti questo luogo era comunemente detto Scalzaporri*» (Sabellia, first village and now small town, was founded by Carlotta Sabellia Romana in 1640, the place (formerly Scalzaporri) was named after her).

Other refugees coming from the same area, viz. Scigliano and Carpanzano, were invited by the then Duke of Crosia to settle in his fief, in an area now part of the present day commune of Mandatoriccio. Further complications ensue: refugees from one earthquake immediately encounter, and become victims of, another major earthquake in the zone where they had just settled on the 9th June 1638.

There are fewer historical sources on this second earthquake than on the preceding one, so that the area involved is less precisely defined; however, the mesoseismal area presents a N-S elongated shape corresponding to the eastern border of the Sila Highlands from Crosia to Mesoraca (Moretti, 1993), touching both of the new villages of Savelli (formerly Scalzaporri) and Mandatoriccio (unnamed areas of Crosia, probably the later Casalenuovo di Crosia). Survivors from the two earthquakes were then presumably mixed with incoming populations from nearby villages.

### 3. Dialects and isoglosses in Central Calabria

Traditionally, Calabrian dialects have been divided into two main complexes (Rohlf, 1962, 1980): following a particular *archaeological* point of view, this author takes his divisions to be dependent on a basic discontinuity in the ancient world between a Magna Graecia Calabria and a swiftly latinized Oscan Calabria. To set up this basic duality he uses traditional isogloss concepts, i.e. isophones such as the «gamba, quando» / «gamma, quannu» line (progressive nasal assimilation versus its absence), the presence of which both Rohlf (1974) and Alessio (1954) had associated with maximal expansion of the Oscans in Ancient Italy. This line is closely associated with other possible isoglosses such as lines based on the presence/absence of the «Passato Remoto» or on the presence/absence of infinitival strate-

gies in syntax, a famous isotax which links Calabrian Romance dialects with Balkan Romance (Roumanian) and other Balkan languages. These last two isoglosses tend to coincide (Rohlf, 1974): «... i limiti del territorio in cui il passato prossimo – sostituito dal passato remoto coincidono nel modo più perfetto con i limiti del territorio privo di infinito» (the boundaries in which the present perfect is replaced by the past tense perfectly coincide with the boundaries without the infinitive) and serve to cement boundaries established by the nasal assimilation isogloss, even though a sizeable transitional area remains. Apart from the fact that we find a large transition area, in which, as in archaic dialects, there is an aspect opposition between «Passato Remoto» and «Passato Prossimo», stretching from Scigliano through Decollatura to Serrastretta and Carlipoli, we feel it necessary to stress that the isogloss according to this use of the concept is static and its main function seems that of support to a possible ethnic and cultural opposition in the Ancient World of more than 2000 years ago.

A recent contribution by Trumper *et al.* (1994) corrects and redefines errors in plotted national isoglosses in Pellegrini (1977) as well as possible isoglosses in Trumper and Maddalon (1988). The observations, based on 18 linguistic phenomena compared in the dialects of 91 urban and rural municipalities, can be summarized as a complex isogloss bundle represented by two major isoglosses in fig. 3, that also reports the space distribution of three of the phonetic characters analyzed. The results by Trumper *et al.* (1994) show the existence of a unique isogloss complex that moves from West to East in a compact corridor from the Amantea-Gizzeria area to the «Marchesato» of Crotone (the Cirò-Crotone area), with a fairly large transition zone; the municipality of Savelli is strangely isolated; Rocca di Neto presents transition problems, breaking the isogloss line; an obvious transition area includes the municipalities of Scigliano, Carlipoli and Cicala. It is noteworthy that the same characters of this area are founded in other three municipalities, one not too distant (Sersale), two extremely distant (Savelli and Mandatoriccio). Linguistically speaking, then;

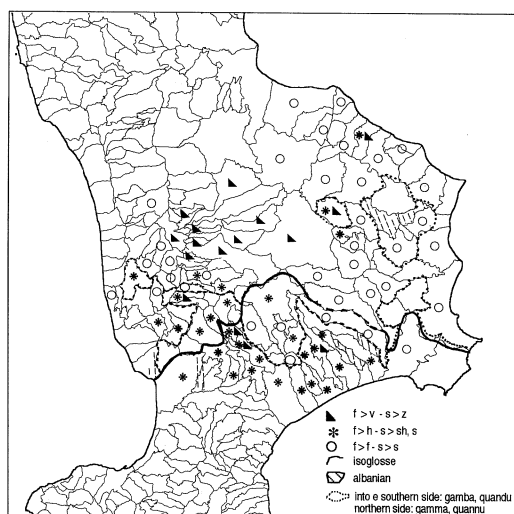


Fig. 3. Spatial distribution of some glottological characters of Middle-Calabria dialects.

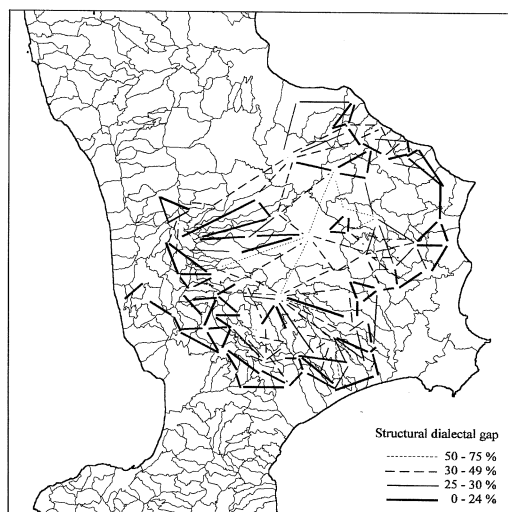


Fig. 4. Linguistic differences in percentages between the municipalities of Middle Calabria.

Sersale, Savelli and Mandatoriccio represent anomalies that cannot be accounted for in terms of the isogloss bundles set up and actually disturb them.

To further test the incompatibility of the above three municipalities from the dialectological standpoint, in the present work we have also applied the usual dialectometry tests. Variable scores have been attributed to phonological, phonetic, morphological and syntactic contrasts, by comparing the same 18 phenomena as Trumper *et al.* (1994). Lines joining up each municipality with abutting municipalities in fig. 4 indicate percentage groups of systematic differences. Dialectometry does not appear to give us more readable data or results than the traditional isogloss bundle. Savelli is pinpointed as being relatively unconnected with abutting municipalities: relationships with nearby S. Giovanni in Fiore and Castelsilano are fairly tenuous. Sersale is relatively separate from adjacent groups. Mandatoriccio is, on average, unconnected with nearby villages. We might also say that Savelli seems to be the

most isolated and anomalous village dialect in a linguistically typical sense.

We have also compared in this same sense Savelli, Mandatoriccio and Sersale between themselves and with Scigliano and Carlopoli. Results are surprising, for, although Sersale and Mandatoriccio are relatively homogeneous (25% difference), the structural connections between the three isolated villages are generally weak. On the other hand, all three of the isolated sets are strongly connected with both Scigliano and Carlopoli (difference < 25%), and these latter are strongly interconnected (ca. 0% difference). Scigliano and Carlopoli seem thus to be the only homogeneous dialect unit that can relate Savelli, Mandatoriccio and Sersale with it and between themselves.

The above noted characteristics are easily explained by reference to new settlements set up by earthquake victims originally inhabiting epicentral areas of the 27th of March earthquake of 1638, while the weak connections of Savelli and Mandatoriccio to the abutting villages may well be the result of new population mixing in the period immediately succeeding 1638.

#### 4. Conclusions

The reconstruction and re-evaluation of the effects of the Calabrian earthquakes of 1638 leads to a better knowledge of their sources. In particular, the intensity map of the seismic event of June 9th points to the possible existence of a major seismogenetic structure that separates the Sila highland from the eastern sedimentary basins.

On the other hand the study of the space distribution of the phonetic, syntactic and morphological characteristics of Calabrian dialects points out some features that can be attributed only to the migratory phenomena and to the population mixing provoked by the earthquakes.

Thus it can be convincingly demonstrated that collaboration between two apparently unrelated subjects such as seismology and geolinguistics can bridge significant gaps and explain otherwise inexplicable anomalies in linguistic patterns.

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