

Chemical composition and chemical variability *Senecio cineraria* essential oil



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Senecio genus is one of the biggest of the Asteraceae family and includes more than 1500 species worldwide [1]. In Corsica 10 species were reported which including 8 natives (3 endemic species) and 2 exogenous species [2].

Senecio cineria syn. *Jacobea cineraria* is a shrub of 1-1,5 m with silver stems and leaves powder to the touch. It blooms from may to august and exhibits florals stalks of 10-30 flowerhead arranged in highbush [2]. *Senecio cineraria* is commonly widespread in the whole littorals of Corsican Island. It is a serpentine and halotolerant plant which roots grow directly implanted on the rock exposed to the sea spray [3]. Numerous studies described the presence of pyrrolizidine alkaloids as Hieracifolin, Senecionine and Seneciophyline [4] but also some polyphenol components as tannins, flavonoids and coumarines [5]. Biological properties have also reported, some publications [6-7] described the beneficial properties of *Senecio cineraria* extract to cure cataract [6], hypertension [7] and their anti-oxidant activities [6]. However, to the best of our knowledge only one study was performed on the essential oil of the plant [8].

CHEMICAL COMPOSITION

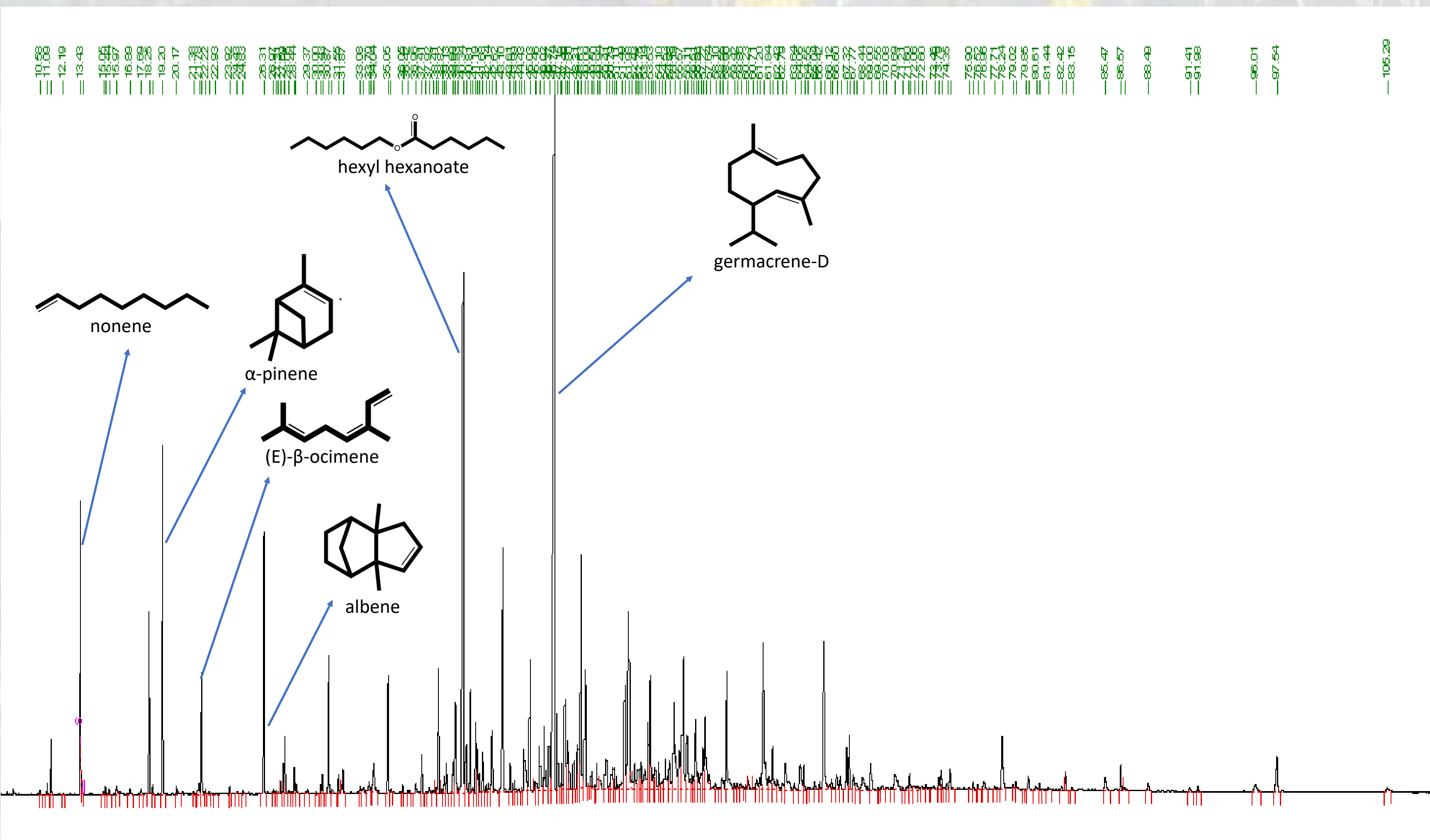


Figure 1 : CPG-FID Chromatogram and main components of *S. cineraria* essential oil

CHEMICAL VARIABILITY

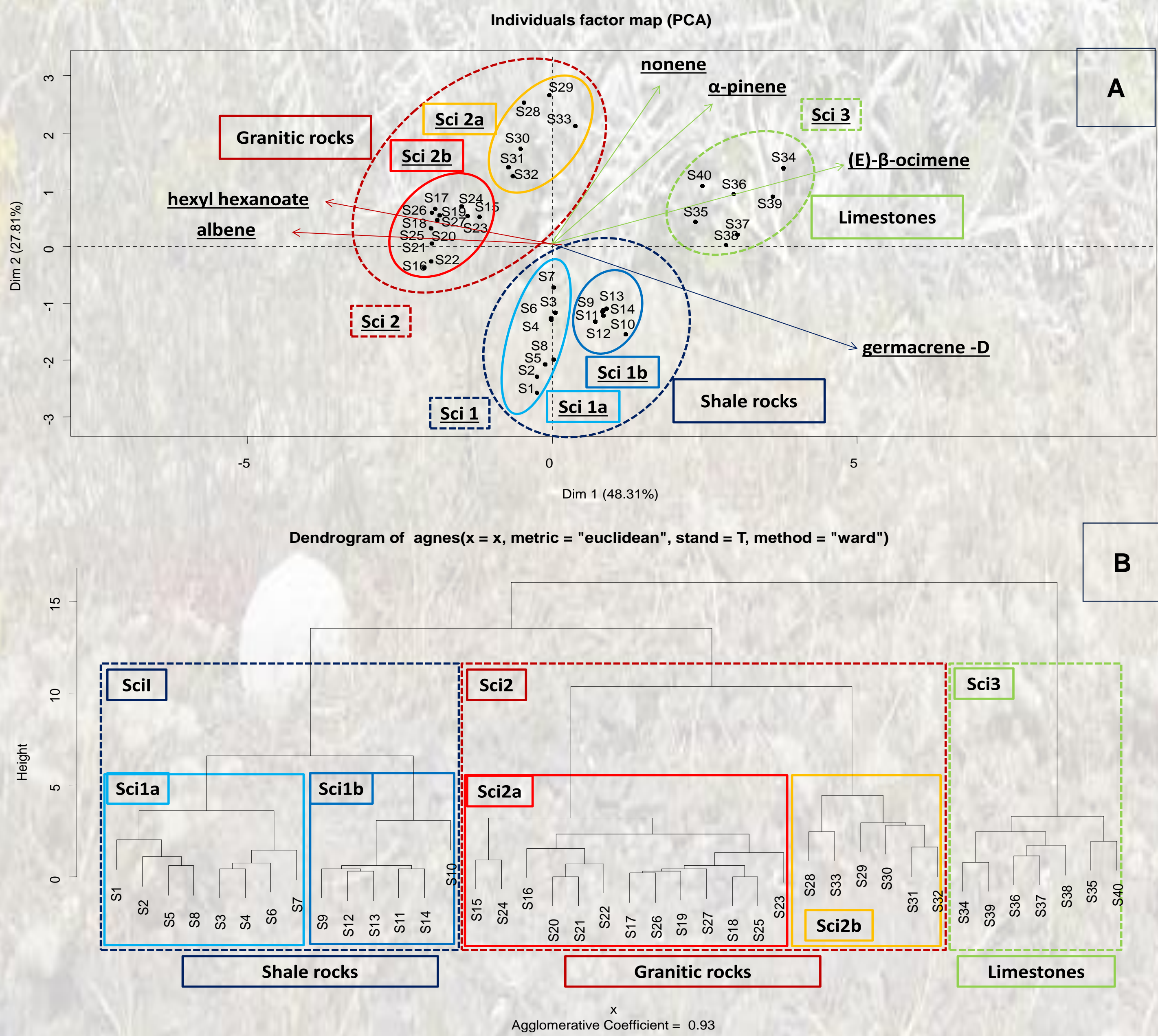


Figure 2 : Statistical analysis PCA (A) and CA (B), performed on *S. cineraria* sample oils

In addition, statistical analysis using PCA and CA analysis of the chemical set of data provide the discrimination of three clusters called Sci 1-i3. Cluster Sci1 included 14 samples dominated by germacrene-D (6.3-10.2%) and nonene (5.3-6.3%). Cluster Sci2 included 19 samples dominated by hexyl hexanoate (11.2-19.8%) and albene (11.2-19.8%). Then Sci3 included 7 samples with the highest rate of α -pinene (10.7-19.9 %) and (*E*)- β -ocimene (12.0-19.6%). Our results seem to expose a correlation between secondary metabolites production and the composition of soils. Cluster Sci1 grouped the whole samples growing in shale soil. Cluster Sci2 included plant specimens implanted in granite rock and Cluster Sci3 the whole specimen living on limestone soil. Our results have gained more knowledge about the secondary metabolite production that occurs during the plant life, they could be interesting in order to manage the future commercialization of *S. cineraria* essential oil.

The chemical compositions of *S. cineraria* essential oils from 40 Corsican locations were investigated using gas chromatography (GC-FID) and gas chromatography-mass spectrometry (GC-MS). One hundred and fourteen components which accounted for 95.3% to 98.2% of the total amount were identified. Among them, nonene (0.3-12.7%), α -pinene (1.3-19.4%), (*E*)- β -ocimene (2.5-19.6%), albene (0.2-14.9%), hexyl hexanoate (4.3-19.8%) and germacrene-D (1.5-10.2%) have been described as main components. In comparison to the literature, corsican essential oils contain a large amount of terpenes (70%) while for sicilian and croatian samples, its represent 26,1-42,3% of the total composition, in benefit of non terpenic hydrocarbons components and organic acid more about 50% . Moreover, *S. cineraria* from Corsica showed atypical chemical profiles with nonene, hexyl hexanoate and albene totally absent of the other essential oil. However even within the corsican samples, strong qualitative variations have been observed that led us to further investigation on the chemical variability.

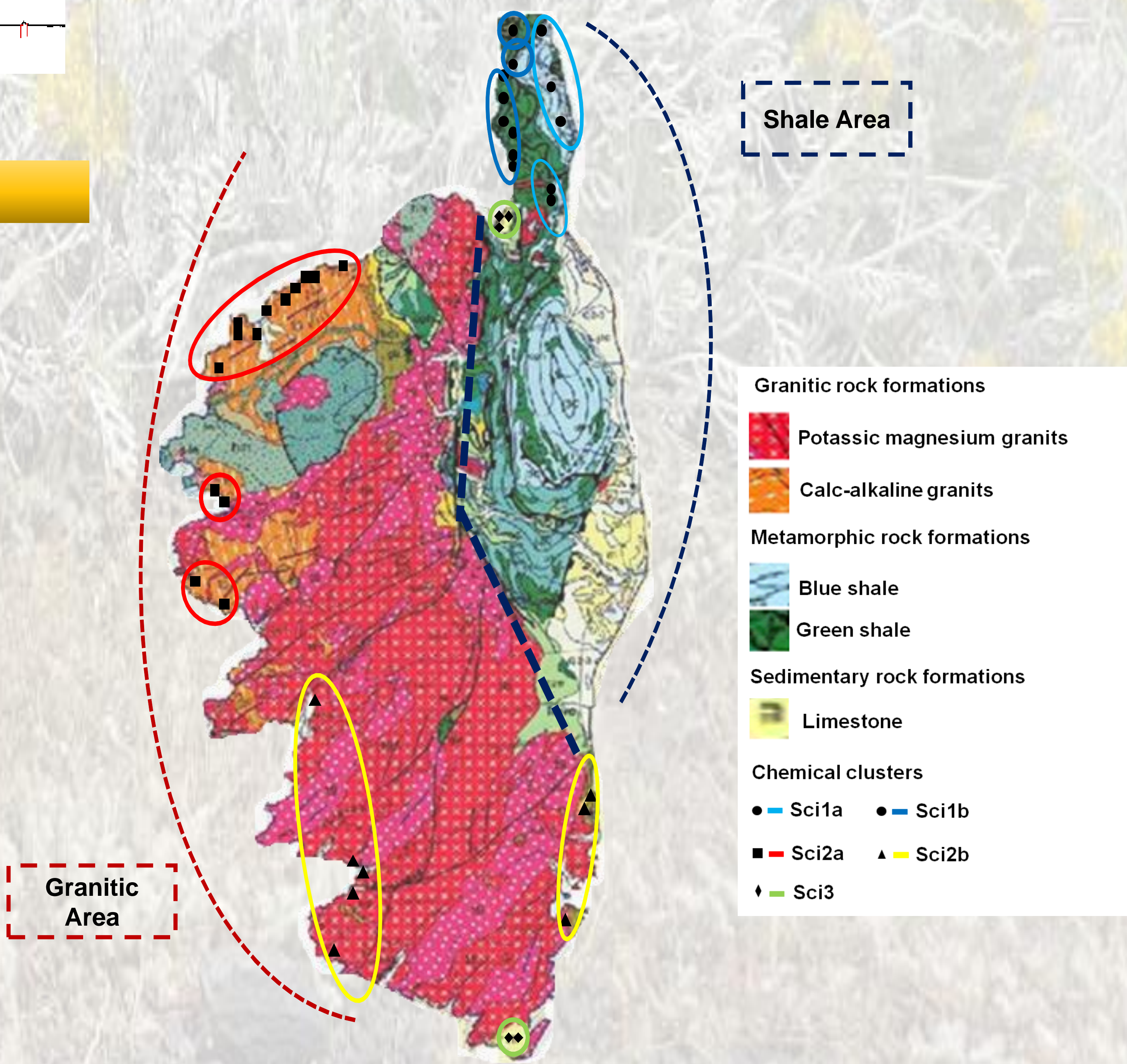


Figure 3 : *S. cineraria* sample oils localisation and simplified geological map of Corsica

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