

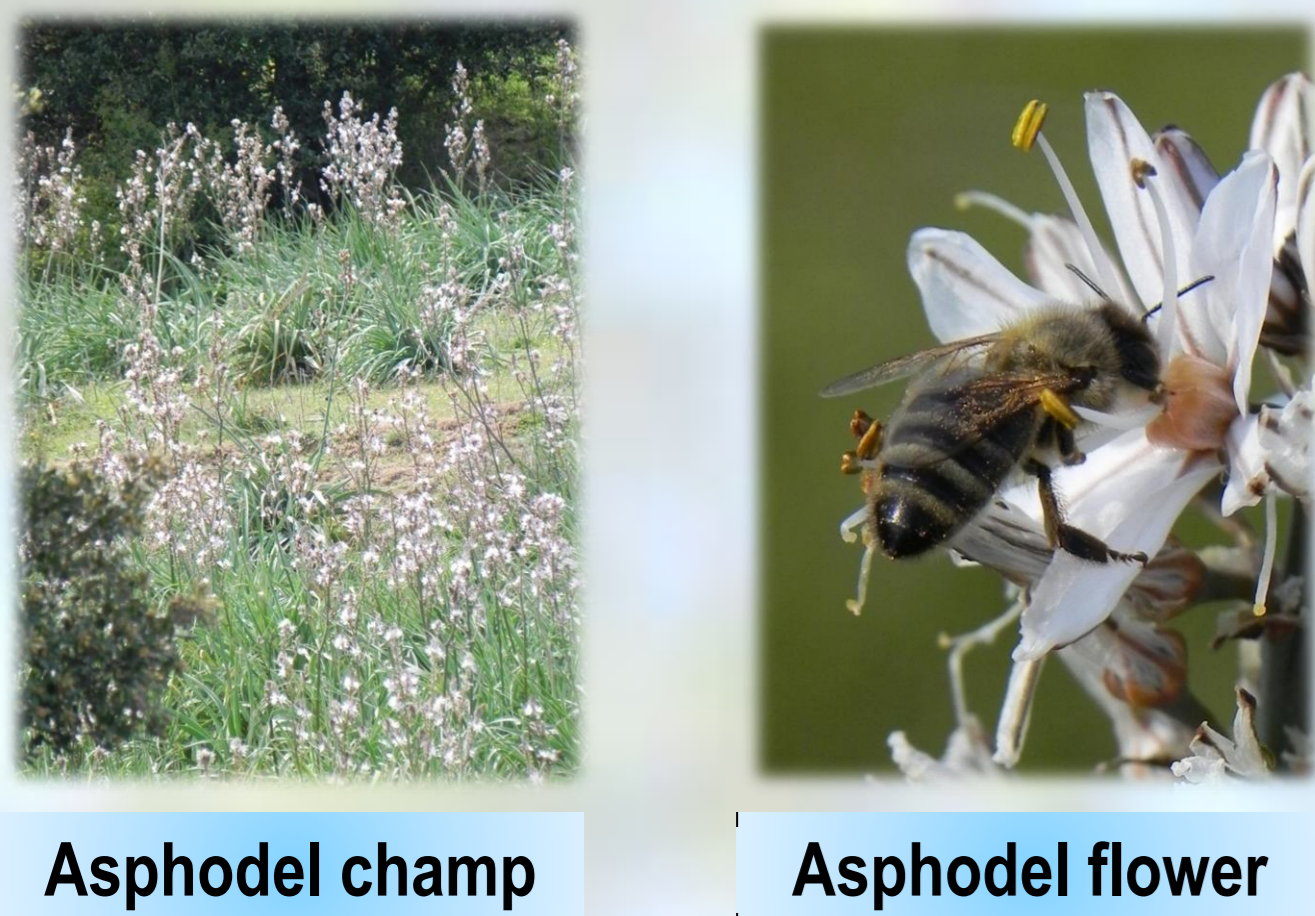
Quality assessment of Corsican spring "predominant asphodel" and "clementine" honeys using melissopalynological and volatile fraction analysis



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Introduction



Corsican honey is recognized by "Protected Designation of Origin" and "Appellation d'Origine Contrôlée" denomination, and both marked: "Miel de Corse-Mele di Corsica". The geographical and botanical origin of these honeys has been characterized by their melissopalynological and sensorial properties and distinguished into six categories [1]. In Corsica, from April to May, the richness of spring polliferous and melliferous resources provide the "spring" honeys. These products showed two predominated origins: "spring predominant asphodel honey" from coastal areas and "spring clementine honey" from cultivated area of Corsican oriental plain [1, 2]. Both of them have low values of color and electrical conductivity and low aromatic intensity with floral and fruit aroma characteristics.



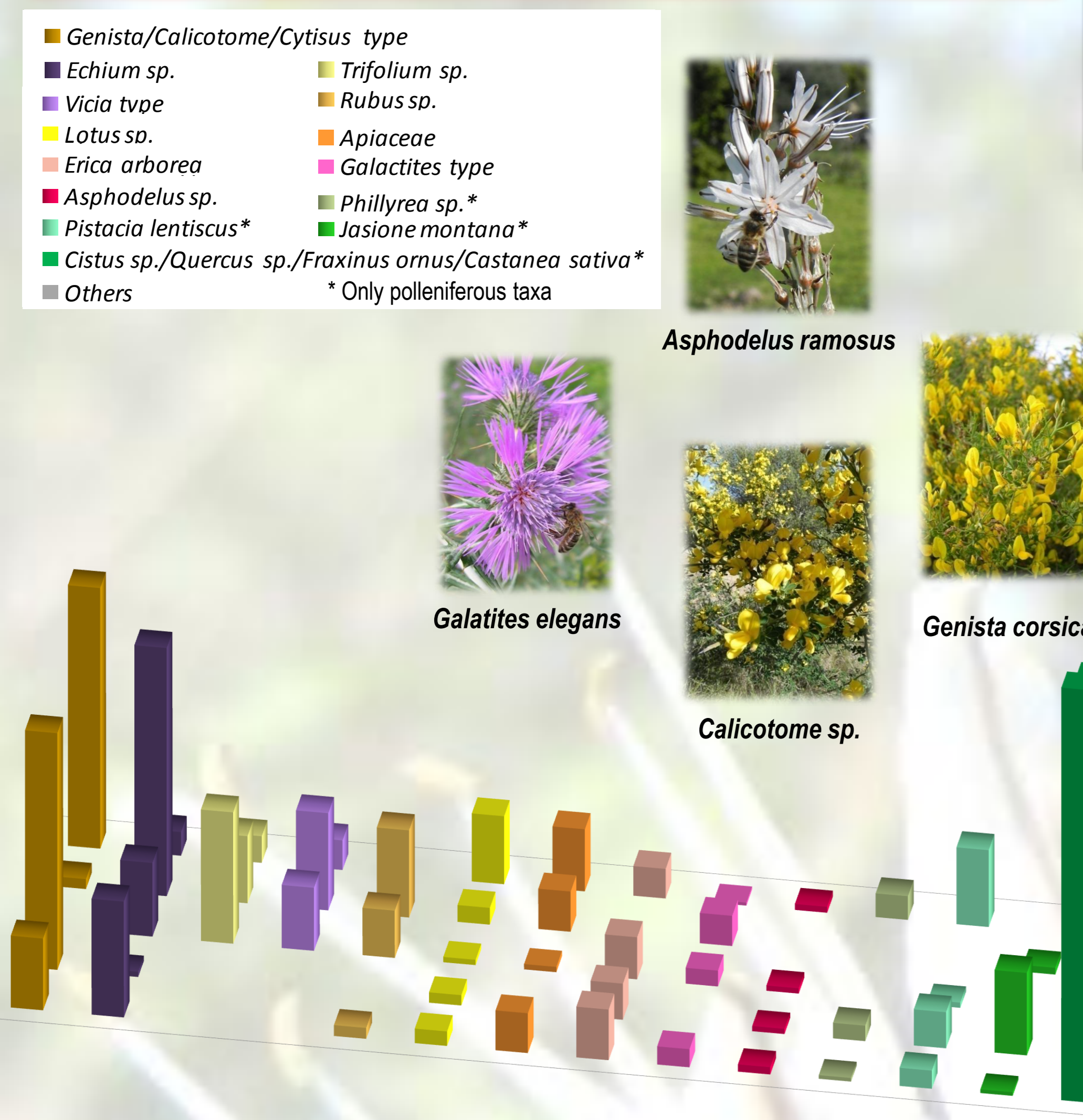
Results and discussion

In the current study, 11 Corsican "spring honeys" from 2004 to 2006 were selected according to their geographical distribution: five samples came from Ajaccio region and six samples came from Ghisonaccia region. It was noted that 2004 (post drought year) was an exceptional year for the production of "spring" honey. Pollen spectrum and total pollen density had been established in order to distinguish their botanical and geographical origins [1, 3, 4]. The volatile compositions of honey samples were studied using HS-SPME, GC and GC-MS. The aim of this work was to establish the characteristic of volatile fractions from Corsican "spring" honeys using HS-SPME, GC and GC-MS.

Melissopalynological analysis

For the samples studied, two distinct types of pollen spectra were demonstrated by melissopalynological analysis: samples of Ajaccio region could be considered as "predominant asphodel" honey (A200401-A2006) and others were "clementine" honey (C200401-C200602). The analysis showed not only the common characteristics of these honeys: the "under-representation" of *Citrus sp.* and *Asphodelus sp.* pollen and low to medium pollen density, but also the structure and typical associations of the different pollen spectrum type (Fig. 1).

"predominant asphodel" honeys



Common melissopalynological characteristics

Pollen density: low to medium (25 000 – 202 000 PG/10g)
Predominant taxa (*Citrus sp./Asphodelus sp.*): "under-representation"
Richness of polleniferous taxa: *Cistus sp./Quercus sp./Fraxinus ornus* etc.

"clementine" honeys

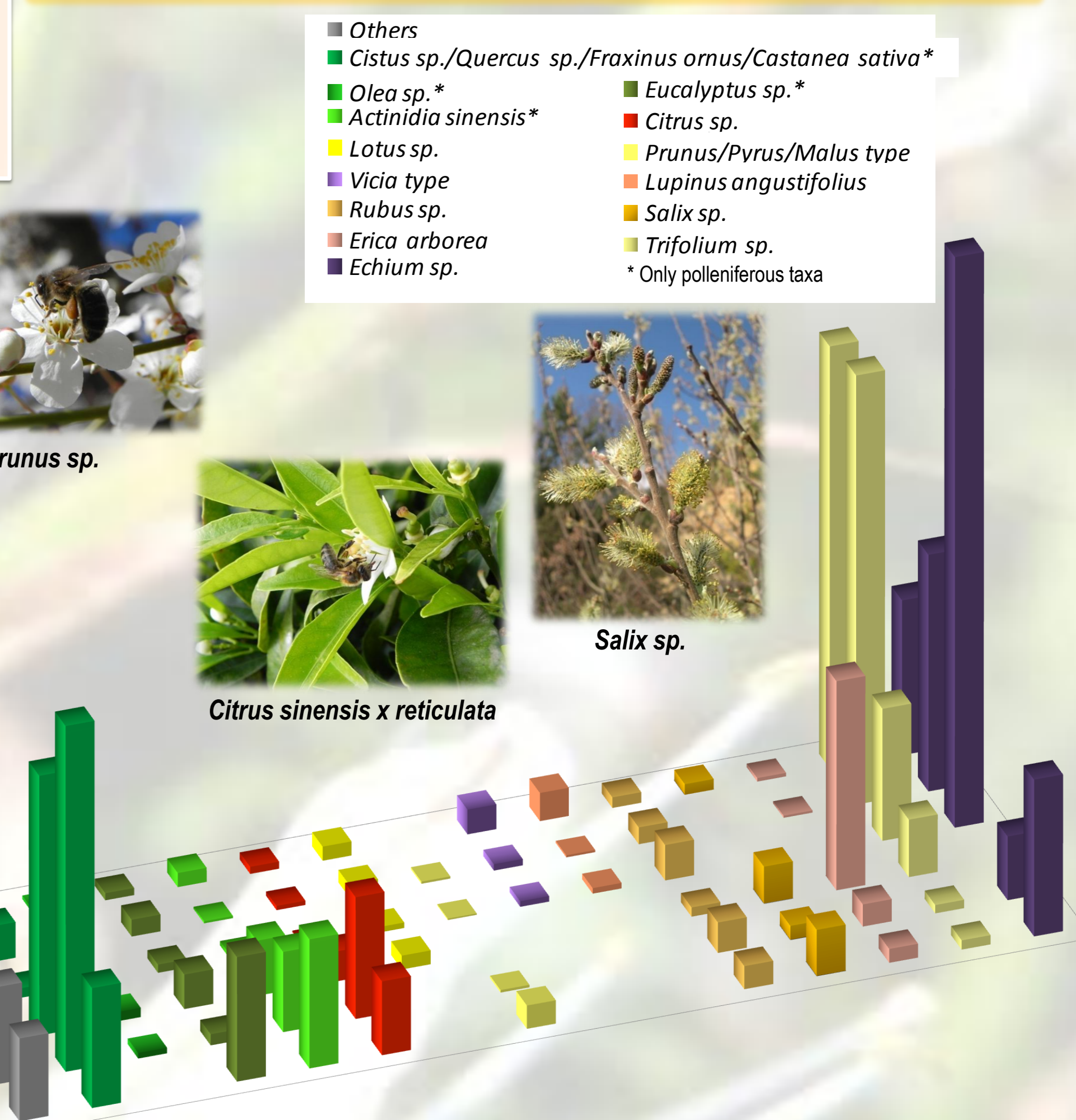


Fig. 1 Most representative taxa of Corsican "spring" honey

HS-SPME volatile fraction analysis

The volatile compositions of "predominant asphodel" and "clementine" honeys were characterized by 33 (amounting to 79.5-88.4 % of the total composition) and 42 components (72.2-87.0 %), respectively. The analysis showed two different profiles: the main compounds of "predominant asphodel" honey were phenylacetaldehyde (14.3-32.9) whereas were three lilac aldehyde isomers (10.9-33.5 %) identified as the main components of "clementine" honey. It was noted that the three lilac aldehyde isomers, two *p*-menth-1-en-9-al isomers and methyl anthranilate were absent in the "predominant asphodel" honey while the methyl 3,5-dimethoxybenzoate and methyl syringate presented only in "predominant asphodel" honey.

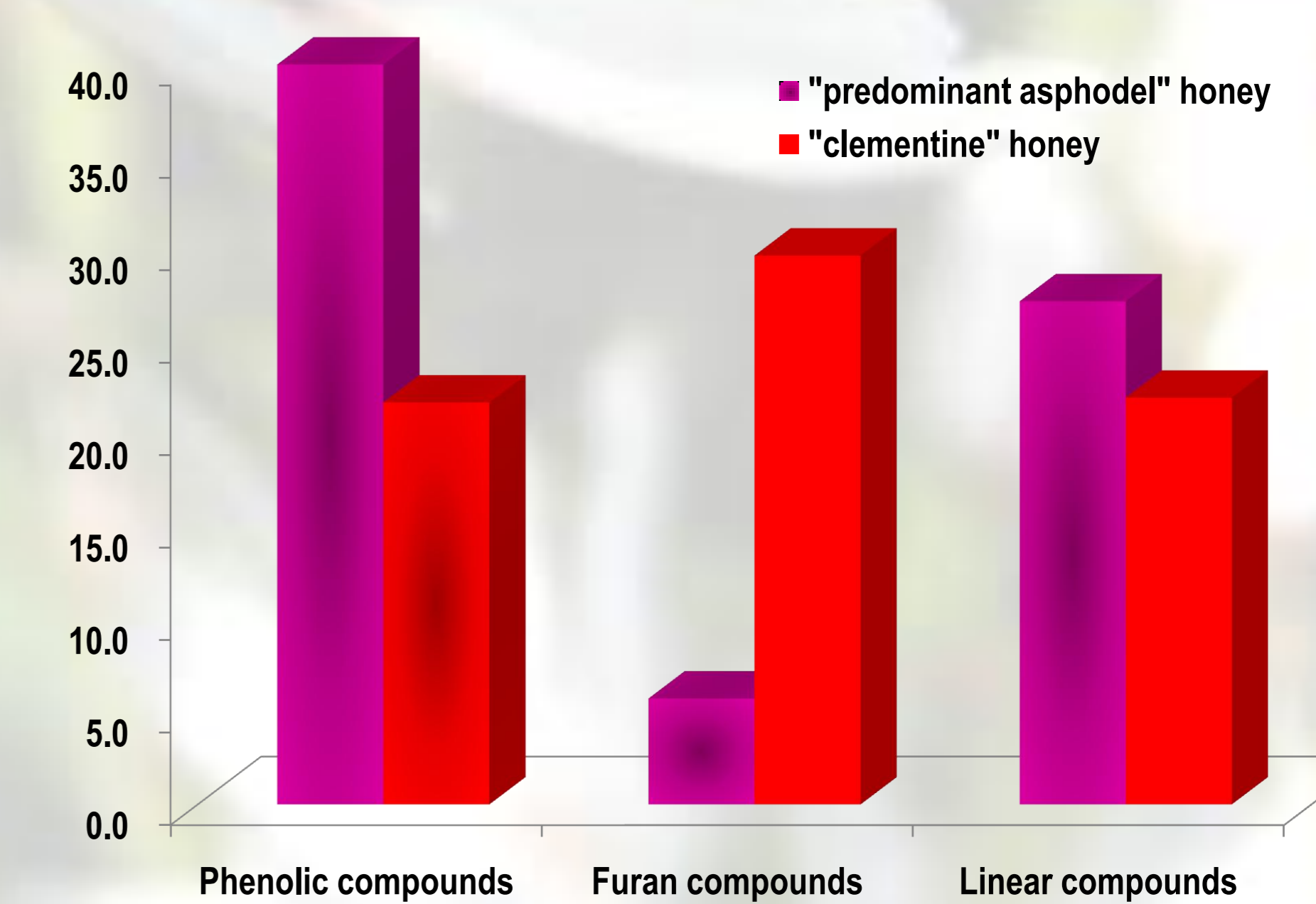
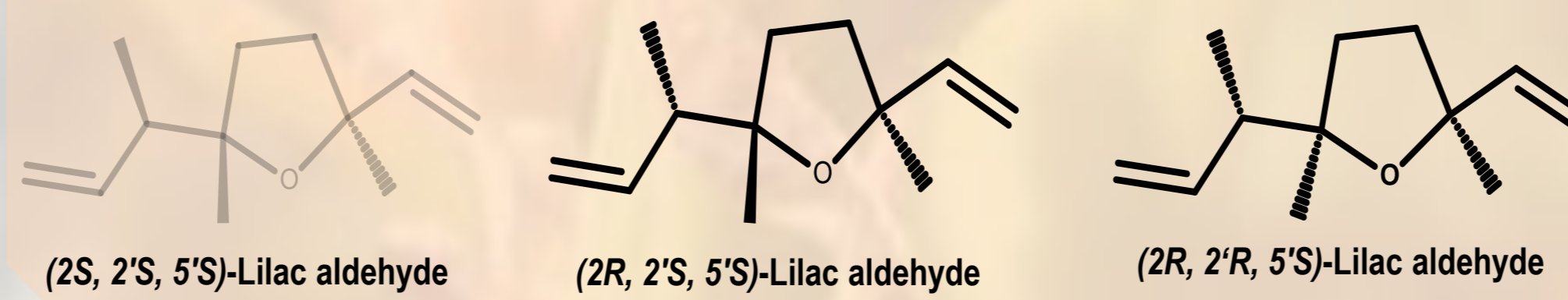
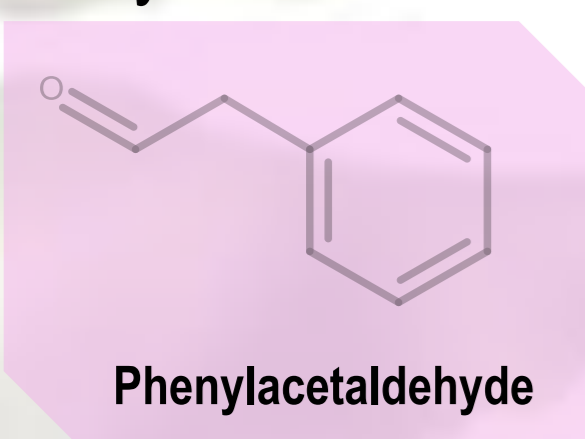


Fig.3 Classification of volatile compositions of honey samples

The average of the different class of volatile compounds (Fig. 3) showed that Corsica "spring clementine" honey is rich in furan compounds (29.7%) followed by linear and phenolic compounds (22.0% and 21.7%, respectively), while the volatile fraction of "spring asphodel honey" is dominated by phenolic compounds (40.0%) and linear compounds (27.2%).

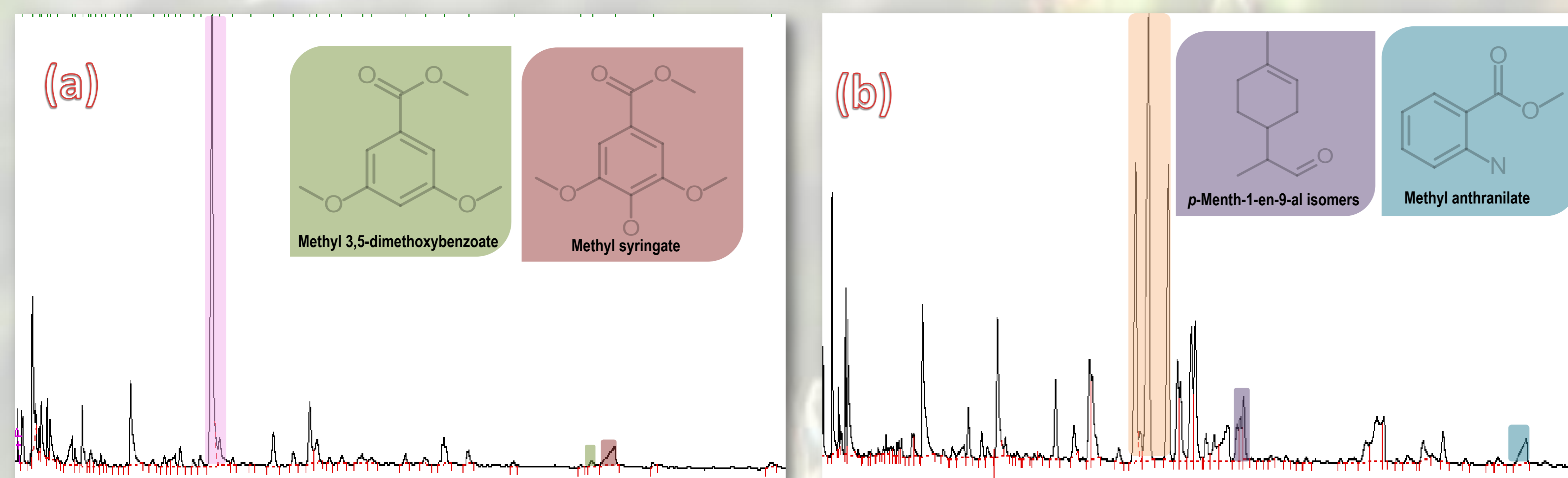


Fig. 2 Characteristic compounds presented in (a) "predominant asphodel" honey, (b) "clementine" honey

Conclusion

In our study, Corsican spring "predominant asphodel" and "clementine" honeys could be distinguished by their pollen spectrum and HS-SPME volatile fraction. Melissopalynological analysis showed that the complexity and variability of plant associations and the interannual variations. The "predominant asphodel" honeys displayed not only asphodel as principal resource but also a great richness of other nectariferous species. Otherwise, the "clementine" honeys were included in the *Citrus* honey described in the literature, but it possessed its particularity linked to the biodiversity of insular accompaniment resource. In addition, it appeared that the analysis of volatile components could be considered as an interesting supplementary method for the characterisation of botanical origin of Corsican honeys.

References

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