The volatile compounds released by plants have been widely investigated as they are involved in plant biology (growth, interactions with microorganisms or pests,...), agricultural and food products, pharmaceuticals and cosmetics. The studies have concerned the biogenesis, the biological reactivity, the environmental stability or the synthesis through various pathways and biotechnological processes. These investigations have required the development of more and more refined analytical techniques such as gas chromatography coupled with (infrared, mass, mass–mass) spectrometry itself associated with olfactometric analysis.

The aim of the book was to detail these modern and innovating techniques which had been used for the development of basic and applied knowledge relative to the analysis of the volatile compounds which are involved or not (as in the case of isoprene) in the aroma or fragrance of various plant organs (fruits, leaves, flowers) and of various derived products such as wine and aromatized teas. The contents of the book, which are presented as reviews and more specific papers are divided into three main chapters.

In the first chapter, the methodological approaches developed for the detailed investigation of the qualitative and quantitative changes in the release of odoriferous volatiles by the plant under particular environmental conditions are presented. A particular and quite original attention is given to the determination of (2-methyl-1,3-buta-diene) isoprene and ammonia in the air.

The second chapter is focused on the physicochemical and olfactometric analysis of essential oils. Various traditional extraction techniques, such as hydrodistillation or solvent extraction, are compared with super critic fluid extraction, using CO₂, which is unflammable, readily removed and does not induce molecular rearrangements. The GC-FID, GC-FTIR-MS techniques associated with olfactometric assessment and with the multivariate mathematical analysis of the data have led to significant advances in the identification of the characteristic volatile molecules of the essential oils of thymus, eucalyptus, juniperus, mentha and mandarin.

The third chapter is devoted to the determination of the aromas of two major beverages: wine and tea. Particular attention has been paid to quantitative investigations on wine, using the stable isotope dilution technique coupled with GC-MS of methoxypyrazines, which are characteristic of the green pepper note and occur as traces in the wine issues from the fermentation of Sauvignon Blanc and Cabernet Sauvignon musts.

In the case of tea, two innovative aspects are presented. The characterization of the free fraction of the aroma, is detailed through the comparison of various extractions techniques (SDE, SDR, BW). The second aspect concerns the analysis of the aroma release from scented teas. Original investigations on the isolation of heteroside precursors of scent (whose glucidic copula is primeverose or the primeverose-malic acid conjugate) and on the purification of β-primeverosi-
dases are developed. These valuable and promising investigations recently led the Laboratoire des Arômes et des Substances Naturelles (INRA) in Montpellier to isolate for the first time, in grape skins, an endoglycosidase capable of the enzymatic hydrolysis of a wide set of disaccharide glycoside precursors of aromas in one step.

Plant Volatiles Analysis can be considered as a reference book for scientists (physiologists, biochemists, chemists interested in the subject and more particularly for post graduates and post-doctorates who would like to be informed on the latest advances in the determination of the molecular structures involved in aromas and/or fragrances of plants.

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