# Molecular Methods of Plant Analysis

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# Analysis of Taste and Aroma

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With 72 Figures

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# Preface

## Molecular Methods of Plant Analysis

### Concept of the Series

The powerful recombinant DNA technology and related developments have had an enormous impact on molecular biology. Any treatment of plant analysis must make use of these new methods. Developments have been so fast and the methods so powerful that the editors of *Modern Methods of Plant Analysis* have now decided to rename the series *Molecular Methods of Plant Analysis*. This will not change the general aims of the series, but best describes the thrust and content of the series as we go forward into the new millennium. This does not mean that all chapters a priori deal only with the methods of molecular biology, but rather that these methods are to be found in many chapters together with the more traditional methods of analysis which have seen recent advances. The numbering of the volumes of the series therefore continues on from 20, which is the most recently published volume under the title *Modern Methods of Plant Analysis*.

As indicated for previous volumes, the methods to be found in *Molecular Methods of Plant Analysis* are described critically, with hints as to their limitations, references to original papers and authors being given, and the chapters written so that there is little need to consult other texts to carry out the methods of analysis described. All authors have been chosen because of their special experience in handling plant material and/or their expertise with the methods described. The volumes of the series published up to now fall into three groups: Volumes 1–5 and Volume 11 dealing with some basic principles of methods, Volumes 6, 7, 8, 10, 14, 16, 18 and 20 being a group determined by the raw plant material being analysed, and a third group comprising Volumes 9, 12, 13, 15, 17 and 19 which are separated from the other volumes in that the class of substances being analysed for is indicated in the volume title. Volume 21 and future volumes of *Molecular Methods of Plant Analysis* will continue in a similar vein but will include more chapters involved with the methods of molecular biology.

### Development of the Series

The handbook, *Modern Methods of Plant Analysis*, was first introduced in 1954, and was immediately successful, seven volumes appearing between 1956 and 1964.

This first series was initiated by Michael Tracey of Rothamsted and Karl Paech of Tübingen. The so-called *New Series of Modern Methods of Plant Analysis*, Volumes 1–20, began in 1985 and has been edited by Paech's successor, H.F. Linskens of Nijmegen, The Netherlands, and John F. Jackson of Adelaide, South Australia. These same editors have now teamed up with a third, Ross B. Inman of Madison, Wisconsin, USA, to produce the renamed series *Molecular Methods of Plant Analysis*. As before, the editors are convinced that there is a real need for a collection of reliable, up-to-date methods of plant analysis covering large areas of applied biology ranging from agricultural and horticultural enterprises to pharmaceutical and technical organizations concerned with material of plant origin.

Future volumes will include such topics as Testing for Genetic Manipulation in Plants, Genetic Transformation of Plants and Various Aspects of Plant Genomics.

**Volume 21:** ***Taste and Aroma***

Chapters dealing in many cases with analytical procedures involving molecular biology are presented in Volume 21, beginning with an introductory chapter on the molecular biology of human taste and aroma receptors with implications for taste and aroma of plant products.

A subsequent chapter reports the use of DNA microarrays in identifying genes involved in strawberry flavour formation; further chapters deal with taste and flavour of beer, soybean and other plant products, hop aroma extraction and analysis, wine olfactometry evaluation, and analysis of citrus flavours.

The use of antisense genes in depressing certain aromas in fruits is also described, and articles on the use of electroantennography in analysing flower volatiles, analysis of rose flower volatiles, analysis of flavour by GC olfactometry (finger span method and solid phase microextraction method) and methods describing RNA gel blot analysis in determining floral scent gene expression round off this volume.

J.F. Jackson, Managing Editor, H.F. Linskens, R.B. Inman

# Contents

**1 Molecular Biology of Taste and Aroma Receptors: Implications for Taste and Aroma of Plant Products**
J.F. Jackson .......... 1

1.1 Introduction .......... 1
1.2 Taste Buds and Receptor Cells .......... 1
1.3 Taste Receptors .......... 2
1.4 Taste Receptor Expression Patterns .......... 2
1.5 Conclusions for Taste Modality .......... 3
1.6 Aroma Detection in Mammals .......... 3
1.7 Model for the Olfactory System .......... 4
1.8 Conclusions for Aroma Perception in Humans .......... 4
References .......... 5

**2 Use of DNA Microarrays in the Identification of Genes Involved in Strawberry Flavor Formation**
A. Aharoni and A.P. O'Connell .......... 7

2.1 Introduction .......... 7
2.2 The Microarray Method .......... 9
2.2.1 Principle .......... 9
2.2.2 Microarray Procedure .......... 9
2.2.2.1 Array Fabrication .......... 9
2.2.2.2 Preparation of Targets and Hybridization .......... 10
2.2.2.3 Image Analysis and Data Extraction and Mining .......... 12
2.2.3 Key Microarray Applications .......... 12
2.2.3.1 Monitoring Gene Expression (mRNA Abundance) .......... 12
2.2.3.2 DNA Variation .......... 13
2.2.3.3 Arrays Containing Other Types of Bio-molecules .......... 14
2.3 Strawberry and Flavor Formation .......... 14
2.3.1 Strawberry Fruit .......... 14
2.3.2 Main Flavor and Aroma Components in Strawberry and Their Biosynthesis .......... 15
2.3.3 Alcohol Acyltransferases and Ester Formation .......... 18

2.4 From Expression to Function:
Identification of Strawberry AAT (*SAAT*) ........................ 18
2.4.1 Gene Expression During Development and Ripening .......... 18
2.4.2 Identification of the *SAAT* Gene ........................ 19
2.4.3 *SAAT* Encodes the Ester-Forming Enzyme
from Strawberry Fruit ........................................ 20
2.4.4 Other Candidate Genes Associated with Flavor Formation
in Strawberry ................................................ 23
2.5 Conclusion and Future Prospects ............................ 23
References ....................................................... 25

**3 Testing for Taste and Flavour of Beer**
T. Yonezawa and T. Fushiki ....................................... 29

3.1 Introduction ............................................... 29
3.2 Characteristics of Taste and Flavour Compounds in Beer ..... 30
3.2.1 Taste and Flavour Substances in Beer ..................... 30
3.2.2 Threshold ................................................ 31
3.2.3 Flavour Units ............................................ 31
3.2.4 Bitterness from Hops ..................................... 32
3.2.5 Hop Aroma ................................................ 33
3.2.6 Alcohols ................................................. 33
3.2.7 Acids .................................................... 34
3.2.8 Esters ................................................... 34
3.2.9 Ketones and Aldehydes .................................... 34
3.2.10 Sulfur Compounds ........................................ 36
3.2.11 Some Notes on Thresholds ................................ 37
3.2.12 Effects of Carbonation .................................. 38
3.3 Sensory Testing for Taste and Flavour of Beer .............. 38
3.3.1 Descriptive Terminology .................................. 38
3.3.2 Standard Terminology for Beer Flavour .................... 39
3.3.3 Descriptive Test ......................................... 39
3.3.4 Difference Tests ......................................... 41
3.3.5 Bias in Sensory Verdicts ................................. 41
3.3.6 Application of Taste Sensor .............................. 41
3.3.7 Preference Test .......................................... 42
3.3.8 Drinkability Test ........................................ 42
3.4 Conclusions ................................................ 43
References ....................................................... 44

**4 Taste Evaluation for Peptides in Protein Hydrolysates
from Soybean and Other Plants**
K. Maehashi and S. Arai .......................................... 47

4.1 Introduction ............................................... 47
4.2 Bitterness of Peptides from Soybean Protein ................ 48

4.2.1 Theory for the Bitterness of Protein Hydrolysate ............... 48
4.2.2 Tastes of Soybean Protein Hydrolysate ........................ 48
4.2.3 Debittering of Peptides .................................. 50
4.3 Protein Hydrolysates from Soybean and Other Plant Foods ........... 51
4.3.1 Fermented Foods ....................................... 51
4.3.2 Other Plant Protein Hydrolysates ........................... 52
4.4 Acidic Oligopeptides ......................................... 53
4.4.1 Taste of α-L-Glutamyl Oligopeptides .......................... 53
4.4.2 Taste Properties of Food Protein Hydrolysates ................. 54
4.5 Isolation of Peptides from Protein Hydrolysate ..................... 57
4.5.1 Enzymatic Digestion ..................................... 57
4.5.2 Gel Filtration .......................................... 57
4.5.3 Ion-Exchange Chromatography .............................. 59
4.5.3.1 Group Fractionation ............................... 59
4.5.3.2 Ion-Exchange Chromatography by a Gradient Elution .... 60
4.5.4 Thin Layer Chromatography ............................... 60
4.5.5 Reverse-Phase HPLC .................................... 61
4.6 Sensory Evaluation ........................................... 61
4.6.1 Detection of Tasty Peptides in Purification Steps ............... 61
4.6.2 Determination of Recognition Threshold ..................... 63
4.6.3 Synergism Among Savory Peptides ........................... 63
4.6.4 Effect on Five Basic Tastes ................................ 64
4.6.5 Taste Duration-Intensity Curve .............................. 64
4.6.6 Buffer Capacity of Peptide ................................ 64
4.7 Conclusions and Vista ........................................ 65
References ..................................................... 65

**5 Hop Aroma Extraction and Analysis**
G. Lermusieau and S. Collin .............................................. 69

5.1 Introduction ................................................ 69
5.2 Hop Aroma .................................................. 72
5.2.1 Terpenic Compounds ..................................... 72
5.2.2 Oxidation and Hydrolysis Products from Sesquiterpenes ....... 77
5.2.3 Alcohols, Carbonyles, Acids and Esters ....................... 77
5.2.4 Hop Aroma Glycosides ................................... 82
5.3 Varietal Discrimination of Hop Cultivars According
to Their Oil Content ........................................ 83
References ..................................................... 86

**6 Olfactometry and Aroma Extract Dilution Analysis of Wines**
V. Ferreira, R. López, and M. Aznar ....................................... 89

6.1 Introduction ................................................ 89
6.2 A Review of Wine Olfactometry ................................. 89

6.3 Wine Olfactometry: An Overview ..... 95
6.4 Methodological Aspects ..... 109
6.4.1 Headspace or Total Extraction? ..... 109
6.4.2 Obtaining an Extract ..... 110
6.4.3 Evaluation of the Representativity of the Extract ..... 111
6.4.4 Concentration of the Extracts ..... 112
6.4.5 The Chromatographic System for Olfactometry ..... 113
6.5 Techniques for Processing the Olfactometric Signal ..... 114
6.6 Final Remarks ..... 116
References ..... 117

**7 Analysis of Volatile Components of Citrus Fruit Essential Oils**
G. Ruberto ..... 123

7.1 Introduction ..... 123
7.2 Chemical Composition of Citrus Peel Essential Oils ..... 125
7.3 Analysis of *Citrus* Peel Essential Oils ..... 134
7.3.1 High Resolution Gas Chromatography (HRGC) ..... 134
7.3.2 High Resolution Gas Chromatography–Mass Spectrometry (HRGC-MS) ..... 135
7.3.3 High Resolution Gas Chromatography–Fourier Transform IR Spectroscopy (HRGC-FTIR) ..... 138
7.3.4 Liquid Chromatography–High Resolution Gas Chromatography–Mass Spectrometry (LC-HRGC-MS) ..... 141
7.3.5 Multidimensional Gas Chromatography (MDGC) ..... 143
7.4 Deterpenation of *Citrus* Essential Oils ..... 147
7.5 Novel *Citrus* Fruits ..... 150
References ..... 153

**8 Aroma Volatiles in Fruits in Which Ethylene Production Is Depressed by Antisense Technology**
A.D. Bauchot, D.S. Mottram, and P. John ..... 159

8.1 Why Use Antisense Technology to Study Fruit Aroma? ..... 159
8.1.1 Successful Inhibition of Ethylene Biosynthesis in Fruit ..... 160
8.1.2 Studying Fruit Aroma in Ethylene-Depleted Fruit ..... 160
8.1.3 Fruit Volatile Compound Analyses ..... 161
8.2 Methods ..... 162
8.2.1 Inhibition of Ethylene Biosynthesis: Fruit Transformation ..... 162
8.2.1.1 Tissue Regeneration ..... 163
8.2.1.2 *Agrobacterium* Transformation ..... 163
8.2.1.3 Generation of Transformed Plants ..... 164
8.2.1.4 Production of Hybrids ..... 164
8.2.2 Volatile Analyses ..... 165
8.2.2.1 Solvent Extraction ..... 165

8.2.2.2 Headspace Sampling ..... 165
8.2.2.3 Gas Chromatography-Mass Spectrometry ..... 167
8.3 Illustration: Our Results ..... 168
8.4 Conclusions ..... 170
References ..... 171

**9 Detection of Physiologically Active Flower Volatiles Using Gas Chromatography Coupled with Electroantennography**
F.P. Schiestl and F. Marion-Poll ..... 173

9.1 Introduction ..... 173
9.2 Collection of Floral Scent ..... 174
9.2.1 Location of Floral Scent Emission ..... 175
9.2.2 Variation of Scent Emission ..... 175
9.2.3 Choice of Type and Amount of Adsorbent Material ..... 176
9.3 Gas Chromatography ..... 177
9.3.1 Fractionation of Samples ..... 177
9.3.2 Injector Types ..... 178
9.3.3 Columns ..... 178
9.3.4 Coupling the GC with the Electroantennographic Detector (EAD) ..... 179
9.3.4.1 Split ..... 179
9.3.4.2 Heating of the Transfer Line ..... 180
9.3.4.3 Air Flow Over the Antenna ..... 180
9.4 Electrophysiology ..... 181
9.4.1 Olfactory System ..... 181
9.4.2 EAG ..... 182
9.4.2.1 EAG Preparations ..... 182
9.4.2.2 Recording an EAG ..... 183
9.4.3 GC-SSR (GC-SCR) ..... 184
9.4.3.1 Technique ..... 184
9.4.3.2 Signal Measurement ..... 184
9.4.4 Overcoming Problems of Low Sensitivity ..... 185
9.4.5 Comparison of EAG, GC-EAD, and GC-SSR ..... 186
9.5 Behavioural Tests ..... 187
9.5.1 Attraction Tests ..... 187
9.5.2 Proboscis Extension ..... 188
9.6 Compilation of Results ..... 188
9.7 Concluding Remarks ..... 188
References ..... 194

**10 Analysis of Rhythmic Emission of Volatile Compounds of Rose Flowers**
J.P.F.G. Helsper, J.A. Davies, and F.W.A. Verstappen ..... 199

10.1 Introduction: Rhythmicity in Emission of Volatile Compounds, How and Why ..... 199

10.2 Rhythmicity in Emitted Volatiles ... 201
10.2.1 Methods... 201
10.2.1.1 Plant Containment ... 201
10.2.1.2 Environmental Conditions ... 201
10.2.1.3 Volatile Adsorption ... 202
10.2.1.4 Volatile Desorption ... 202
10.2.1.5 GC and GCMS Analysis ... 203
10.2.1.6 Calibration Curves ... 204
10.2.1.7 Quantification of Compounds for Which No Authentic Standard Is Available ... 205
10.2.1.8 Recovery of Volatiles in the Experimental Setup from Plant to GCMS ... 205
10.2.2 Circadian Rhythmicity in Emission of Volatile Compounds by Rose Flowers: Experimental Results and Discussion ... 205
10.3 Rhythmicity in Precursors of Emitted Volatiles in Rose Petal Tissue ... 211
10.3.1 Introduction ... 211
10.3.2 Methods ... 213
10.3.2.1 Plant Material ... 213
10.3.2.2 Assay of Non-glucosylated Fragrance Compounds in Petal Tissue ... 213
10.3.2.3 Assay of Glucosylated Fragrance Compounds in Petal Tissue ... 214
10.3.3 Rhythmicity in Petal Concentrations of Precursors of Volatile Compounds: Experimental Results and Discussion ... 215
10.4 General Conclusion ... 218
References ... 220

**11 Odour Intensity Evaluation in GC-Olfactometry by Finger Span Method**
P.X. Etiévant ... 223

11.1 Introduction ... 223
11.2 Description of the Finger Span Cross-Modality Matching Principle ... 224
11.3 Selection and Training ... 226
11.4 Performance of the Method ... 229
11.5 Applications ... 232
11.5.1 Sample Discrimination Based on Odour Intensity of Constituents ... 232
11.5.2 Determination of Stevens' Coefficients ... 234
11.6 Conclusion ... 236
References ... 236

**12 Solid Phase Microextraction Application in GC/Olfactometry Dilution Analysis**
K.D. Deibler, E.H. Lavin, and T.E. Acree ... 239

12.1 Introduction ... 239
12.1.1 Aroma Chemistry ... 239
12.1.2 Mouth Simulators ... 240
12.1.3 Solid Phase Microextraction ... 241
12.2 Description of Methods ... 242
12.2.1 SPME Initialization ... 242
12.2.2 SPME CharmAnalysis ... 243
12.2.3 Quantification of SPME ... 243
12.3 Example of SPME Dilution Analysis ... 245
12.3.1 Methods ... 245
12.3.1.1 SPME Extraction ... 245
12.3.1.2 GC Parameters ... 245
12.3.1.3 Optimization of Exposure Time ... 245
12.3.1.4 Dilution Analysis ... 246
12.3.1.5 CharmAnalysis of Coffee ... 246
12.3.2 Results of Example ... 246
12.4 Conclusions ... 247
References ... 248

**13 RNA Gel Blot Analysis to Determine Gene Expression of Floral Scents**
J. Boatright and N. Dudareva ... 249

13.1 Introduction ... 249
13.2 RNA Gel Blot Analysis ... 251
13.2.1 RNA Isolation ... 252
13.2.2 RNA Fractionation by Agarose-6 M Urea Gel Electrophoresis ... 253
13.2.2.1 Preparation of Vertical Agarose-6 M Urea Gel ... 255
13.2.2.2 Gel Electrophoresis ... 255
13.2.3 Transfer RNA from Gel to Membrane ... 256
13.2.4 Hybridization ... 257
References ... 259

**Subject Index** ... 263