

Contents

1	Introduction	1
2	Breath Odors of Oral Origin (Oral Malodor)	5
	Oral Malodor and the Tongue.....	5
	Oral Malodor, Gingival Health, and Periodontal Disease	10
	Oral Malodor and Dental Restorations	14
	Oral Malodor and Oral Dryness.....	14
	References.....	15
3	Biochemical and Microbial Aspects of Oral Malodor Production	19
	The General Role of Bacteria in Breath Odors.....	19
	The Bacterial Origin of Oral Odors	19
	Metabolic Factors Affecting Malodor Production	20
	Biochemical Aspects	21
	Metabolism	21
	Malodorous Volatile Organic Compounds (VOCs) in the Oral Cavity	24
	Microbial Aspects	27
	Malodor Producing Microorganisms	27
	References.....	31
4	Odor Perception	35
	Olfactory Psychophysics.....	35
	Odor Mixtures.....	36
	Odor Perception and Odor Evaluation Panels	37
	References.....	38
5	Breath Odors of Nasal and Pharyngeal Origin	41
	Chronic Sinusitis.....	41
	Chronic Caseous Tonsillitis	42
	Foreign Bodies.....	43
	Craniofacial Anomalies	44
	References.....	45

6 Breath Odors and the Gastrointestinal Tract	47
Gastroesophageal Reflux Disease (GERD)	47
<i>Helicobacter Pylori</i> (Hp) Infection	48
References.....	53
7 Other Sources of Breath Odors	55
References.....	57
8 Measurements of Breath Odors and Related Parameters	59
Odor Judge Scoring	59
Instrumental Measuring of Malodor-Related Compounds	61
Gas Chromatography (GC).....	61
Sulfide Monitor	62
Measuring Techniques of Malodor-Related Compounds	63
Biochemical Assays	63
BANA Test.....	63
β -Galactosidase Activity Assay	66
Cysteine Challenge	67
Salivary Incubation Assays.....	67
Microbial Assays	68
References.....	70
9 Breath Odor Diagnosis	73
Pre-appointment Instructions	73
Patient Interview	74
Examination.....	74
Organoleptic Measurements	74
Oral VSC Quantification.....	75
Examination of the Oral Cavity	75
Biochemical and Microbial Assays	76
References.....	76
10 Self-Assessment of Breath Odors	79
References.....	81
11 Breath Odors, Prevalence, Gender, and Age	83
Prevalence.....	83
Gender	85
Age.....	86
References.....	86

12 Psychological Aspects of Breath Odors.....	89
Halitophobia.....	89
Olfactory Reference Syndrome (ORS).....	89
Back to Halitophobia	90
References.....	93
13 Oral Malodor Management.....	95
Mechanical Therapy.....	95
Chemical Therapy.....	97
Professional Treatment	102
References.....	105
14 History of Breath Odors.....	109
Culture and Folklore.....	109
Early Scientific and Medical Literature	111
Modern history.....	112
References.....	114
15 Future Prospects	115
References.....	116
Index	117