

Contents

Preface by Job Kuijt	xii
Author's preface	xiii
Chapter 1. Introduction	1
What is a parasitic plant?	1
Parasite 'look alikes'	2
Box 1. Myco-heterotrophic plants	4
Types of parasites and some definitions	6
Box 2. Different structures called a haustorium	8
The haustorium	8
Box 3. Vascular tissue in higher plants	9
A parasitic gymnosperm	16
How many plants are parasitic?	20
History of research in parasites	23
Chapter 2. Hemiparasitic Santalales	25
Olacaceae	25
Schoepfiaceae	29
Box 4. Life cycle and embryology of flowering plants	30
Opiliaceae	32
Loranthaceae	33
Vegetative morphology	35
Haustorium anatomy	37
Floral structure and pollination	42
Bird pollination	44
Embryology	49
Dispersal biology	50
The root parasites	54
Loranthaceae in the New World	58
Loranthaceae in Africa	66
Loranthaceae in Eurasia	74
Loranthaceae in Australia	78
Loranthaceae in selected isolated islands	81
Box 5. Endemism	82
Misodendraceae	90
Eremolepidaceae	94
Santalaceae	95
Vegetative morphology	97
Floral biology	99

Herbaceous genera	100
Woody genera	102
Viscaceae	113
Dendrophthora	117
Phoradendron	117
Korthalsella	123
Notothixos	127
Viscum	127
Arceuthobium	136
Summary	143
Chapter 3. Hemiparasitic families other than Santalales	145
Krameriaceae	145
Cassytha (Lauraceae)	148
Cuscuta (Convolvulaceae)	153
Hemiparasitic Orobanchaceae	161
Habit and haustoria	162
Flower biology	167
Widely distributed genera	169
Northern temperate zone	174
Old World warm climates	183
Chapter 4. Holoparasitic families	189
Holoparasitic Orobanchaceae	189
Genera transferred from Scrophulariaceae	191
Orobanchaceae (sensu stricto)	198
Cynomoriaceae	207
Lennoaceae	210
Mitrastemonaceae	213
Apodanthaceae	215
Cytinaceae	220
Rafflesiaceae	223
Rafflesia	227
Sapria	231
Rhizanthes	232
Hydnoraceae	235
Hydnora	237
Prosopanche	239
Balanophoraceae	240
Vegetative morphology and anatomy	240
Inflorescences and flowers	243
The most widely distributed genera	245

American genera	248
African genera	255
Southeast Asian-Pacific genera	259
Chapter 5. Establishment of the parasite	263
Seed dispersal strategies	263
Germination and host recognition	267
Haustorial development	269
Haustorial initiation	270
Development of the holdfast	271
Box. 6. The plant cuticle	273
Development of the endophyte	276
Differentiation of the xylem bridge	284
The mature haustorium	285
Interrupted zone	287
Graniferous tracheary elements	287
The interface	289
Phoradendron case story	291
Physiology	295
Water relations (Transpiration)	295
Box 7. Absorption and transport of nutrient ions	296
Nutrient absorption and translocation	297
Translocation from parasite to host	300
Box 8. Photosynthesis	301
Photosynthesis	302
Further physiological topics	305
Chapter 6. Host ranges and various ecological aspects of parasitism ...	307
Facultative and obligate parasites	307
Host specificity	307
Determining the host range	308
Species delimitation and host range	312
Host specificity in various taxa	315
Epi- and self parasitism	326
Mimicry	329
Host reactions and defence	331
Biochemical defence	331
Hypertrophy and hormonal disorder	333
Mechanical defence	335
Relations to non-host organisms	335
Flowers and fruits as food sources	336
Herbivory	336

Diseases	341
Vegetation ecology	343
Arid vegetation - xerophytism	345
Box 7. Xerophytism	346
Coastal vegetation - salt tolerance	348
Temperate and tropical forests	350
Arctic vegetation	351
Cultivated and urban land	352
Ecosystems - fires	353
Chapter 7. Harmful parasites and control methods	357
Parasitic plants in agriculture	358
Cuscuta and Cassytha on crops	360
Striga on crops	361
Orobanche and Phelipanche on crops	365
Other root parasites on crops	367
Control methods	369
Parasites in forestry and orchards	376
Arceuthobium	377
Other stem parasites	379
Control methods	382
Chapter 8. Ecology and evolution	385
Evolution of parasitism in dicots	386
Evolution of different modes of parasitism	386
Convergent evolution	398
Co-evolution and bird pollination	401
Phylogeny	403
Transfer of genetic information	404
The phylogenetic tree	405
Nature conservation	406
Glossary	414
Selected literature	417
List of photographers	421
Index	425