

## Biodiversity in Dead Wood

Fossils document the existence of trees and wood-associated organisms from almost 400 million years ago, and today there are between 400 000 and 1 million wood-inhabiting species in the world. This is the first book to synthesize the natural history and conservation needs of wood-inhabiting organisms.

Presenting a comprehensive introduction to biodiversity in decaying wood, the book studies the rich diversity of fungi, insects and vertebrates that depend upon dead wood. It describes the functional diversity of these organisms and their specific habitat requirements in terms of host trees, decay phases, tree dimensions, microhabitats and the surrounding environment. Recognizing the threats posed by timber extraction and insensitive forest management, the authors also present management options for protecting and maintaining the diversity of these species in forests as well as in agricultural landscapes and urban parks.

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 Jogeir N. Stokland, Juha Siitonen, Bengt Gunnar Jonsson  
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*This book is dedicated to Bengt Ehnström.*

Contents

<i>Preface</i>	<i>page</i> xiii
<b>1 Introduction</b>	<b>1</b>
1.1 Biodiversity in decaying wood	2
1.2 Saproxylic species: defining the concept	5
1.3 Structure of the book	6
1.4 Knowledge, disciplines and perspectives	7
<b>2 Wood decomposition</b>	<b>10</b>
2.1 Structural wood components	10
2.2 Enzymatic degradation of wood	13
2.3 Fungal decomposition and rot types	17
2.4 Bacterial wood degradation	23
2.5 Animal degradation of wood	25
2.6 Ecological aspects	27
<b>3 The saproxylic food web</b>	<b>29</b>
3.1 Sugar fungi and wood-decaying fungi	30
3.2 Detritivores	35
3.3 Fungivores	41
3.4 Scavengers	45
3.5 Predators	46
3.6 Predatory fungi	48
3.7 Parasites	49
3.8 Mycoparasites	52
3.9 Mycorrhizal fungi	53
3.10 Fungicolous fungi	54
3.11 Ecological perspectives	54
<b>4 Other associations with dead woody material</b>	<b>58</b>
4.1 Vertebrates	58
4.2 Invertebrates	70
4.3 Epixylic species: life on the surface	76

x · Contents

<b>5</b>	<b>Host-tree associations</b>	<b>82</b>
5.1	Conifers versus broadleaved trees	82
5.2	Diversity and phylogeny of trees	87
5.3	Differences between the wood of conifers and broadleaved trees	96
5.4	Defence systems in trees	97
5.5	Host-tree preferences and decay	105
5.6	Hypotheses about host-tree associations	107
<b>6</b>	<b>Mortality factors and decay succession</b>	<b>110</b>
6.1	Mortality factors and qualities of dead wood	110
6.2	Decomposition pathways	121
6.3	The decaying tree as a changing resource	123
6.4	Fungal succession	128
6.5	Invertebrate succession	135
6.6	Succession of mosses and lichens	144
6.7	Overview of the decay succession	145
<b>7</b>	<b>Microhabitats</b>	<b>150</b>
7.1	Wounds and sap exudations in living trees	150
7.2	Cavities and hollow trees	154
7.3	Dead branches and roots	165
7.4	Bark, sapwood and heartwood	168
7.5	Fruiting bodies of fungi	168
7.6	Wood surface	182
<b>8</b>	<b>Tree size</b>	<b>183</b>
8.1	Factors causing diameter effects on species preferences	183
8.2	Diameter preferences of individual species	185
8.3	Species richness and composition patterns in relation to diameter	188
8.4	Importance of large trunks for species diversity	192
<b>9</b>	<b>The surrounding environment</b>	<b>194</b>
9.1	The abiotic environment	194
9.2	Above-ground environments	200
9.3	Wood buried in the soil	206
9.4	Submerged wood	210
9.5	Tree growth rate, wood density and secondary substances	213



<b>10</b>	<b>Evolution of saproxylic organisms</b>	<b>218</b>
10.1	Evolution of woody plants	218
10.2	Origins of wood decomposers	222
10.3	Ancient and derived saproxylic invertebrates	229
10.4	Evolution of functional roles	241
10.5	Prospects	246
<b>11</b>	<b>Species diversity of saproxylic organisms</b>	<b>248</b>
11.1	Saproxylic diversity in northern Europe	248
11.2	Additional saproxylic groups	260
11.3	Why are there so many saproxylic species?	265
11.4	Global species richness of saproxylics	269
<b>12</b>	<b>Natural forest dynamics</b>	<b>275</b>
12.1	Spatial and temporal variability in mortality	276
12.2	Stand-replacing dynamics	278
12.3	Continuous-cover dynamics	286
12.4	Dead wood in streams and rivers	292
12.5	Dead wood in natural forests	295
<b>13</b>	<b>Dead wood and sustainable forest management</b>	<b>302</b>
13.1	Amount, quality and dynamics of dead wood in managed forests	302
13.2	Forest management regimes	308
13.3	Sustainable forest management: background	314
13.4	Disturbance regimes and forest management systems	315
13.5	Retention	316
13.6	Forest reserves	319
13.7	Woodland key habitats	321
13.8	Restoration	322
13.9	Management for dead wood	326
13.10	Conservation goals and management standards	331
<b>14</b>	<b>Population dynamics and evolutionary strategies</b>	<b>338</b>
14.1	Life-history strategies	338
14.2	Factors affecting the population dynamics	341
14.3	Metapopulation dynamics	348
14.4	The role of continuity	353
<b>15</b>	<b>Threatened saproxylic species</b>	<b>356</b>
15.1	Historical evidence for the decline of saproxylic species	356

xii	·	<b>Contents</b>	
15.2		Current threat factors	362
15.3		Effects of reduced dead-wood volume on saproxylic species	365
15.4		Assessing the threat status of saproxylic species	371
15.5		Survey methods and nature conservation evaluation	376
<b>16</b>		<b>Dead wood in agricultural and urban habitats</b>	<b>380</b>
16.1		Cultural environments as habitats for saproxylic species	380
16.2		Europe’s forests after the last glaciation	382
16.3		Prehistoric modification of forests by humans in Europe	385
16.4		Historic woodlands and parks	388
16.5		Urban forests and wooded ruderal areas	392
16.6		Conservation and management of dead wood in cultural environments	393
<b>17</b>		<b>The value and future of saproxylic diversity</b>	<b>402</b>
17.1		Value of saproxylic diversity	402
17.2		Negative trends	406
17.3		Research challenges	409
17.4		Knowledge synthesis and dissemination	411
		<i>References</i>	413
		<i>Index</i>	495

## *Preface*

The last few decades have witnessed a rapidly increasing interest in the importance of dead and decaying trees for biodiversity. During their decomposition, dead trees offer habitats for thousands of species. This diversity has been studied by researchers interested in particular organism groups, such as cavity-nesting birds, wood-decaying fungi or saproxylic invertebrates. A holistic overview of the species communities inhabiting trees after their death has been lacking, and our aim is to provide such an overview here.

The scope of the book is global, but we admit that it has a strong north European bias. There are two reasons for this. Firstly, much of the research and many of the scientific publications about species living in dead wood originate from northern Europe, although during the last decade an increasing number of papers dealing with saproxylic organisms have also been published in North America, Australia, Japan and elsewhere. Secondly, our own studies have taken place in Fennoscandia, and our empirical knowledge is mainly derived from the boreal and temperate parts of Europe. We admit that we only have superficial first-hand experience of tropical forests and the temperate and evergreen forests of other continents.

We have written this book with several kinds of reader in mind: biologists and students of biology with an interest in forest ecology and biodiversity, forest and park managers, nature conservation managers, and people interested in nature and natural sciences. This readership includes people with very different background knowledge. Thus, it is likely that the book will cover both familiar and unfamiliar topics for most of our intended readers.

Much of this book is about fungi and insects. Expert mycologists and entomologists might find their own fields of expertise rather superficially treated in some sections, as we have not reviewed everything of potential relevance to each topic. Instead, we have tried to write about mycology for entomologists and about entomology for mycologists.

xiv · **Preface**

Similarly, our aim has been to write about ecology directed towards forest and park managers, and about forest dynamics and management directed towards people with a background in ecology. Hopefully, this will make the text more accessible to readers without expertise in any particular discipline.

We have tried to keep the amount of specialized terminology to a minimum and to explain terms and concepts when we first use them. We have used vernacular names for species and higher taxonomic groups wherever these exist, and have provided the scientific names in parenthesis. However, for most individual species we have used the Latin names only, since most wood-inhabiting species lack established vernacular names.

We have made every effort to keep the various topics updated with the most recent and most relevant publications. In many cases we have also highlighted important studies that are several decades old but still represent valuable knowledge. Throughout the book we have made numerous references to the primary literature so that the interested reader can access this for further details. Our intention has been to cite publications that, in combination, provide up-to-date coverage of each topic. However, in some cases, we may still have overlooked important references. This should be borne in mind by the reader.

When writing the individual chapters, we have been given many valuable pieces of information. We would particularly like to thank the following people for reviewing different chapters: Keith Alexander, Peter Baldrian, Manfred Binder, Mattias Edman, Michael S. Engel, Shawn Fraver, Jacob Heilmann-Clausen, David Hobbett, Jyrki Muona, Björn Nordén, Thomas Ranius and Graham Rotheray. Any potential mistakes remain our own responsibility. We also thank all the photographers who have kindly allowed us to use their splendid photos to illustrate this book.

Finally, we would like to pay tribute to the Swedish entomologist and naturalist Bengt Ehnström, to whom we have dedicated this book. He has an impressive knowledge of biodiversity in decaying wood and seems to recognize virtually every insect species as a personal friend. Bengt's warm personality and everlasting willingness to share his knowledge as a field guide, a speaker and a writer has been, and will remain, a great inspiration for innumerable people with an interest in nature and the life found in dead trees.