

# COMPARATIVE BIOCHEMISTRY

A Comprehensive Treatise

*Edited by* MARCEL FLORKIN  
HOWARD S. MASON

# COMPARATIVE BIOCHEMISTRY

*A Comprehensive Treatise*

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Volume VII

SUPPLEMENTARY VOLUME

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# COMPARATIVE BIOCHEMISTRY

## *A Comprehensive Treatise*

Volume I: Sources of Free Energy

Volume II: Free Energy and Biological Function

Volume III: Constituents of Life—Part A

Volume IV: Constituents of Life—Part B

Volume V: Constituents of Life—Part C

Volume VI: Cells and Organisms

Volume VII: Supplementary Volume

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## PREFACE

The previous volumes of this treatise have been arranged to survey the field of comparative biochemistry within a comprehensive framework. The energetic aspect of living organisms was described in Volumes I and II. The composition of living organisms, and the transformations of the constituents were described in Volumes III to V. Volumes VI and VII are concerned primarily with comparative biochemistry at levels of organization higher than the molecular. The present volume includes, in addition, two chapters relating to molecular biochemistry which, for reasons beyond the control of the editors, could not be included in the appropriate volume. Volume VII also includes a comprehensive topical index to the whole treatise.

With this volume we finish a task begun in 1955, the organizing and editing of a comprehensive treatise. The authors contributing to this treatise have pioneered in difficult areas of biochemistry and have helped to produce a work which we believe to be of enduring value whatever the future shape of the field. Once again, we wish to record our gratitude to our publisher, Academic Press, and its staff, for exceedingly competent professional assistance throughout the preparation of the treatise.

MARCEL FLORKIN  
*Liège, Belgium*

HOWARD S. MASON  
*Portland, Oregon*

*April, 1964*

# COMPARATIVE BIOCHEMISTRY

## *A Comprehensive Treatise*

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An Introduction to Comparative Biochemistry

MARCEL FLORKIN AND HOWARD S. MASON

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Comparative Biochemistry of Detoxification

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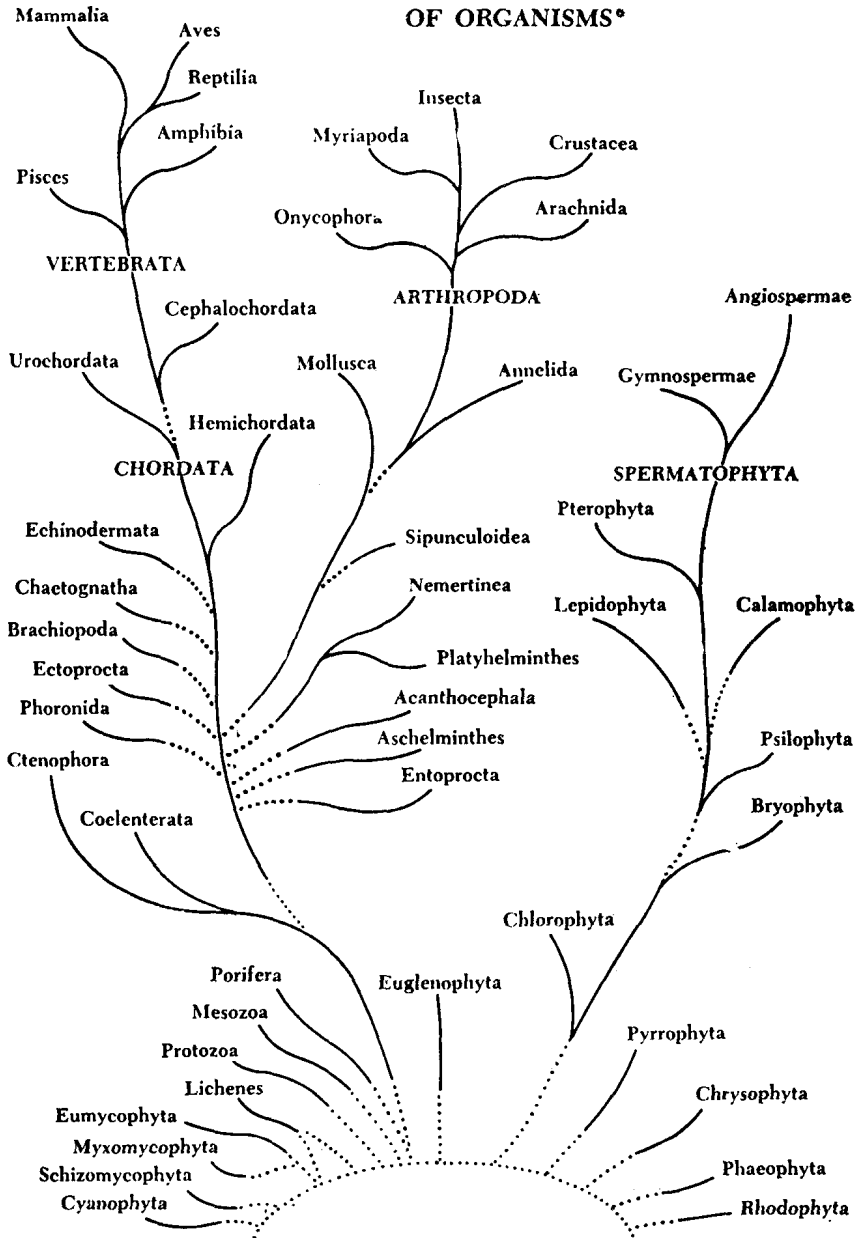
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\* Most of the names refer to phyla, except in a few cases where some of the smaller taxonomic groups are shown. Capitalized names written across lines are groups including all forms above the name.

NOTE: Charts I, II, and III were prepared by Helen A. Stafford, Reed College, Portland, Oregon. For further information see "A Guide to the Nomenclature and Classification of Organisms," by Dr. Stafford, in Vol. I of this treatise.

**CHART I**  
**HYPOTHETICAL PHYLOGENETIC RELATIONSHIPS**  
**BETWEEN EXTANT MAJOR GROUPS**  
**OF ORGANISMS\***



## CHART II: ANIMAL KINGDOM

Divisions	Estimated Number of Species <sup>d</sup>	Taxonomic Classifications			
Protozoa (acellular animals)	15,000				
Mesozoa	—				
Porifera (sponges)	5,000				
Coelenterata (coelenterates)	10,000			} Radiata	
Ctenophora (comb jellies)	100				
Platyhelminthes (flat worms)	6,000	} Acoelomates	}	}	
Nemertinea (nemertine worms)	500				
Aschelminthes <sup>a</sup>	7,000	} Pseudocoelomates			
Acanthocephala <sup>a</sup>					
Entoprocta <sup>b</sup>	3,000	} Protostomia			
Ectoprocta <sup>b</sup> (moss animals)					
Phoronida	15				
Brachiopoda (lamp shells)	120				
Mollusca (mollusks)	70,000	} Schizocoela			} Bilateria
Sipunculoidea	—				
Annelida <sup>c</sup> (segmented worms)	6,500	} Eucoelomates			
Arthropoda (arthropods)	750,000				
Chaetognatha (arrow worms)	30				
Echinodermata (echinoderms)	5,000				
Hemichordata	60,000	} Enterocoela		} Deuterostomia	
Chordata (including vertebrates)					

<sup>a</sup> Includes Rotifera, Gastrotricha, Kinorhyncha, Nematoda, Nematomorpha, Priapulioidea. Formerly called Nematelminthes.

<sup>b</sup> Formerly in Bryozoa.

<sup>c</sup> Includes Echiuroidea.

<sup>d</sup> Taken from "Handbook of Biological Data" (4), p. 533.

### CHART III: PLANT KINGDOM

Divisions	Estimated Number of Species <sup>d</sup>	Major Synonymous Terms
Euglenophyta (euglenoids)	340	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Algae</div> </div> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Thallophyta</div> </div> <div style="font-size: 4em; line-height: 1;">}</div> </div>
Chlorophyta (green algae)	5,700	
Pyrrophyta (cryptomonads, dinoflagellates)	1,000	
Chrysophyta (yellow green algae, diatoms)	5,700	
Phaeophyta (brown algae)	900	
Rhodophyta (red algae)	2,500	
Cyanophyta <sup>a</sup> (blue-green algae)	1,400	
Schizomycophyta <sup>a</sup> (bacteria)	1,300 <sup>e</sup>	
Myxomycophyta (slime molds)	430	
Eumycophyta (true fungi)	74,000	
Lichenes (lichens)	15,500	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Fungi</div> </div> <div style="font-size: 4em; line-height: 1;">}</div> </div>
Bryophyta (mosses and liverworts)	23,800	
Psilophyta <sup>b</sup> (whisk ferns)	3	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Cryptogamia</div> </div> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Bryophyta</div> </div> <div style="font-size: 4em; line-height: 1;">}</div> </div>
Calamophyta <sup>b</sup> (horsetails)	30	
Lepidophyta <sup>b</sup> (lycopsods)	1,300	
Pterophyta <sup>b, c</sup> (ferns)	10,000	
Spermatophyta (seed plants)	201,000	
		<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <div style="font-size: 4em; line-height: 1;">}</div> <div style="font-size: 2em; line-height: 1;">Phanerogamia</div> </div> </div>

<sup>a</sup> Sometimes grouped as Schizophyta.

<sup>b</sup> Formerly classed as Pteridophyta.

<sup>c</sup> Formerly classed as Filicineae in Pteropsida.

<sup>d</sup> Taken from "Handbook of Biological Data" (4), p. 533.

<sup>e</sup> There is much disagreement concerning designation of species here.

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