APPENDIX

NOMENCLATURE OF NUTRITIONAL TYPES OF MICROORGANISMS

Many designations have been proposed for the delineation of groups of microorganisms on the basis of nutritional requirements. Various authors have defined such terms in different ways. This is confusing, and leads to misinterpretation when a term is used without reference or redefinition.

It has been felt that an international agreement in regard to terms and definitions is desirable. The following terminology is hereby proposed to characterize nutritional types. The segregation of these types is based on their minimal requirements for growth. Certain terms previously used have been redefined, and new ones introduced.

I. Nomenclature based upon energy sources.
   A. PHOTOTROPHY
      Energy chiefly provided by photochemical reaction.
      1. *Photolithotrophy*
         Growth dependent upon exogenous inorganic H-donors.
      2. *Photoorganotrophy*
         Growth dependent upon exogenous organic H-donors.
   B. CHEMOTROPHY
      Energy provided entirely by dark chemical reaction.
      1. *Chemolithotrophy*
         Growth dependent upon oxidation of exogenous inorganic substances.
      2. *Chemoorganotrophy*
         Growth dependent upon oxidation or fermentation of exogenous organic substances.
   C. PARATROPHY
      Energy apparently provided by the host cell.
      1. *Schizomycetotrophy*
         Growth only in bacterial cells.
      2. *Phytotrophy*
         Growth only in plant cells.
      3. *Zootrophy*
         Growth only in animal cells.

II. Nomenclature based upon ability to synthesize essential metabolites.
   A. AUTOTROPHY
      All essential metabolites are synthesized.
      1. *Autotrophy sensu stricto*
         Ability to reduce oxidized inorganic nutrients.
      2. *Mesotrophy*
         Inability to reduce one or more oxidized inorganic nutrients = need for one or more reduced inorganic nutrients.
   B. HETEROTROPHY
      Not all essential metabolites are synthesized = need for exogenous supply of one or more essential metabolites (growth factors or vitamins).
   C. HYPOTROPHY
      The self-reproducing units (bacteriophages, viruses, genes, and so on) multiply by reorganization of complex structures of the host.

Composite names are used for the concise characterization of a nutritional type with respect to the chief energy source as well as to the capacity for the synthesis of all essential cell constituents.

Examples:
Photolithoautotrophic—*Chlorella vulgaris.*
Chemoorganoheterotrophic—*Phycomyces blakesleeanus.*

		Autotrophy		Heterotrophy	Hypotrophy
		Autotrophy S.S.	Mesotrophy		
Phototrophy	Photolithotrophy Photoorganotrophy	*Chlorella vulgaris*		*Rhodopseudomonas palustris* *Rhodospirillum rubrum*	
Chemotrophy	Chemolithotrophy Chemoorganotrophy	*Thiobacillus denitrificans* *Pseudomonas fluorescens*	*Escherichia coli*	*Saccharomyces cerevisiae*	
Paratrophy	Schizomycetotrophy Phytotrophy Zootrophy				Bacteriophages? Plant viruses? Animal viruses?

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Figures in parentheses indicate the number of the bibliographic reference, where an author's name does not appear in the text.