

## Systematics: Relevance, Resources, Services, and Management

Lloyd Knutson and William L. Murphy  
Biosystematics and Beneficial Insects Institute  
Beltsville Agricultural Research Center  
Agricultural Research Service, U.S.  
Department of Agriculture  
Beltsville, Maryland 20705 USA

[Editor's Note: The Association of Systematics Collections is soon to publish *Systematics: Relevance, Resources, Services, and Management*, a Bibliography by Lloyd Knutson and William L. Murphy. The Bibliography will be maintained on word-processor, and updated versions will be made available periodically. Below is an abbreviated version of the Introduction and Table of Contents. Persons interested in purchasing the Bibliography should contact ASC]

### Introduction

Systematics research, resources, and services are essential, fundamental components of almost all aspects of biological knowledge, especially in areas of applied biology such as agriculture, environmental science, forestry, pharmacology, and public health. Systematics currently is in a healthy state of intellectual growth but generally is considered to be in a disastrous situation in regard to support for research, collections, and personnel. Funding difficulties that began more than 50 years ago have reached a crisis situation worldwide.

Dependent on systematics support are the programs of a large number of public and private institutions encompassing a diverse spectrum of activities in numerous disciplines. Each systematics discipline and institution has unique goals and problems as well as concerns held in common with the overall systematics community. The sharing of ideas and solutions to common problems among disciplines and institutions traditionally has been difficult. Two factors that impede the sharing of systematics management, funding expertise, and general information are 1) very strong subspecialty orientations and 2) the relatively short tenure of many managers of systematics resources. The efficiency of systematics managers and their effectiveness in communicating with non-systematists would be improved through familiarity with systematics management experiences, ideas, and problems of a more global nature. The purpose of this bibliography is to bring together a critical mass of such information, arranged in the most useful manner.

The broad field of systematics covered by this bibliography includes descriptive taxonomy, theoretical systematics, analytical and synthetic studies, and non-classical, non-morphological biosystematics. The contents emphasize, but are not limited, to collections-based research. The bibliography is naturally strongest in the discipline of our experience—entomology. Building upon our file of several hundred documents, we are

continually expanding and improving the bibliography by including reprints and references provided by numerous colleagues.

A substantial amount of published information relates to the management of systematics research, resources, and services. The body of this literature is not readily accessible because of such factors as the diverse nature of the subject, the ambiguous titles and authorship designations, the highly specialized journals in which papers appear, and the fact that many valuable documents are in-house, unpublished reports. Recommendations and evaluations pertinent to systematics are contained in reports on other disciplines (*e.g.*, pest management), committee reports, resolutions in transactions of society meetings, and letters to editors. None of the computerized literature-search services that we queried produced more than a handful of references on the subject. Many widely applicable documents are written from a specialist's point of view, address narrow concerns of a certain taxonomic subspecialty, organization, or geographic area, and thus may be overlooked by specialists in other disciplines or in different geographic areas.

This bibliography is not all-inclusive, and certain special areas (*e.g.*, numerical taxonomy and computer applications) are not treated in depth. For example, chapters and sections from the major texts in a field generally are not included. Most foreign publications are included in Section 14 unless they specifically address one of the other sections. The availability of translations of non-English language documents has been indicated where these are available. Many unpublished, informal documents are included in the bibliography. Those of which we have copies are indicated by an asterisk. Eventually, we hope to merge our files of documents with the ASC archives of similar material.

The present bibliography is intended to serve as a nucleus in the development of a more comprehensive bibliography that will be updated periodically. Persons with material to add are requested to contact the senior author. Below is a telescoped table of contents of the Bibliography.

### Table of Contents

- 1) Purposes of and prospects for systematics
- 2) Predictive capabilities of systematics
- 3) Examples of the importance of systematic studies on "obscure" organisms
- 4) Relationships of systematics with other fields:
  - a. General
  - b. Biological control
  - c. Pest management other than biological control
  - d. Quarantine and regulatory activities
  - e. Ecology
  - f. Environment: Diversity—

- conservation—endangered species
  - g. Plant germplasm
  - h. Forestry
  - i. Biomedicine
  - j. Veterinary medicine
  - k. Genetics
- 5) Identification capability
- 6) Descriptions of identification sources and operations
- 7) Descriptions of systematics organizations
- 8) Voucher collections and specimens
- 9) Descriptions and analyses of collections resources for systematics work:
  - a. General
  - b. Botany
  - c. Mycology and Microbiology
  - d. Invertebrates, general
  - e. Malacology
  - f. Entomology
  - g. Ichthyology
  - h. Mammalogy
  - i. Herpetology
  - j. Ornithology
  - k. Nematodes
  - l. Parasites, general
  - m. Paleontology
- 10) Directories of systematists — human resources
- 11) Fiscal support and costs:
  - a. General
  - b. Formal resolutions and recommendations
- 12) National and regional plans and needs in the U.S.A.:
  - a. Multidisciplinary
  - b. Entomology
  - c. Malacology
  - d. Ichthyology
  - e. Mammalogy
  - f. Ornithology
- 13) Biological surveys:
  - a. General
  - b. Canada
  - c. United States
- 14) Systematics management, support, resources, surveys, and services in regions and countries other than U.S.A.:
  - a. Canada
  - b. Neotropical region
  - c. Mexico
  - d. Palearctic region
  - e. Afrotropical region
  - f. Australasian-Oceanic region
  - g. Oriental region
- 15) Status of systematics work on major taxa:
  - a. Microbial organisms
  - b. Nematodes
  - c. Invertebrates other than insects and mites
  - d. Apterygota
  - e. Coccoidea
  - f. Coleoptera
  - g. Diptera (excluding mosquitoes)
  - h. Mosquitoes
  - i. Lepidoptera
  - j. Isoptera
  - k. Birds
  - l. Paleontology
  - m. Plants
  - n. Fungi
16. Training in systematics
17. International relations