

Describing Species: Practical Taxonomic Procedure for Biologists. Judith E. Winston. Columbia University Press New York, USA. 1999. 518 pp. Price: Not stated.

'Taxonomists represent an endangered species.' This phrase is very popular amongst biologists throughout the world, wherever the magnitude of earth's biodiversity is addressed. Of the estimated 13.6 million species of organisms that possibly exist on earth, only 1.75 have been identified and described. It has often been said that if the current pace of taxonomic research is maintained it may take as many as 500 years before all the species on earth are identified and described.

What hinders biodiversity research is the steady decline in the number of active taxonomists worldwide. Several groups of organisms simply do not have taxonomic experts. Universities and biology departments in colleges are sadly witnessing their taxonomic facilities gradually perish, thanks to the lack of funds and non-availability of committed taxonomists. Even India's foremost taxonomic institutions such as the Zoological Survey of India and Botanical Survey of India are left without experts who could deal with certain lesser known groups of animals and plants. Anyone who has visited one of the regional offices or stations of these Government of India institutions would agree with me on this. Realizing the need to strengthen India's taxonomist power, the Ministry of Environment and Forests, Government of India has instituted 'taxonomy chairs' in a few biology institutions. However, there are only a few trainers and relatively fewer trainees who are at present being supported by this initiative.

In India, though unfortunate, taxonomic expertise is not vanishing solely due to limits of funding and infrastructure. Many interested biologists are discouraged from pursuing taxonomic research by the apparent monopoly held over the science by a few authorities and institutions. Taxonomic writings of many students and researchers representing not-so-well-known institutions, colleges and non-government organizations have often been disregarded on the grounds that they are not 'qualified'. On several occasions, I have come across

committed students who have collected hitherto undescribed species of amphibians and reptiles. They unfortunately lack the confidence to taxonomically describe them for the same reasons discussed above. It is therefore time that we stopped shedding 'crocodile tears' over the 'dying breed' of human beings called taxonomists and started a process of meaningful and sustainable 'succession'.

One means of conserving a dying tradition is to encourage more and more self-trained taxonomists throughout the country. And as the author of the book under review suggests, most biologists who find a new species, whether living or fossil, must describe it themselves.

The twenty-two chapters in the book grouped into four parts, attempt to explain the procedure by which scientists who find new species in the course of their research, can identify and describe them. Part one is introductory, dealing with the basics of the living world and the need to describe species. It also briefly discusses the history of taxonomy highlighting its origin, evolution and overall similarity to folk taxonomy. The codes of nomenclature, including the differences between the botanical and zoological codes are discussed. One of the most recent attempts to unify the two codes is the Draft Biocode (1996) developed by the members of the IUBS International Committee on Bionomenclature. The salient features of this unified code find a place in part one of the book.

Part two deals with recognizing species. The various species concepts such as the biological species concept, the phylogenetic species concept and others are analysed for their merits and limitations. Simple clues to recognizing species, labelling and housing them in museums, the number of individuals to be thus housed and most importantly, the rationale behind designating individuals as 'holotype', 'paratype' or 'syntype' are discussed.

Part three provides a detailed account of how to write species descriptions. If one were to know when a species name should end with *-ae* or *-us*, it is best that this part of the book be consulted. Part four takes the reader beyond species description into how to write publishable papers. It also touches upon the scope of molecular systematics with the following introduction: 'Because all the inherited aspects of organisms are

coded into their nucleic acid sequences, it seems that if we could only decode them directly we have no more need for systematics. In fact, in the 1980s plenty of people were saying just that. But it has not turned out to be that simple. For one thing, it has turned out that a lot of garbage or nonsense information is incorporated into those sequences as well. Furthermore, preparing and analysing DNA sequences is still a time-consuming and expensive process. That is changing rapidly, but molecular analysis is still at the stage computer analysis was at the time phenetic and cladistic analysis started, the stage in which a university might be able to afford one shared molecular lab, but not one for every biologist (pp. 446-447).

What makes the book an excellent guide to the self-styled taxonomist is the step-by-step treatment of each aspect. It provides illustrated examples to most of what has been discussed. In fact, after reading the book, for the first time I got to know how a simple illustrated key to identifying organisms can be designed.

At the end of each chapter, the book provides a list of suggested readings and sources of information, including the various sites from which such information can be electronically accessed. This chapter-wise list of published and electronic references has been provided throughout the book, despite the complete bibliography at the end of the book. The book also provides a list of journals of international circulation, wherein an interested taxonomist might publish her/his papers. And for the computer-based systematist, software such as MOLPHY, MEGA and PAUP should be ideal as suggested in the book.

In summary, the book is probably the best guide to students of taxonomy throughout the English-speaking world. I found the book of great interest and would really look for an opportunity to put it to good use. All Indian libraries should have at least one copy of the book.

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