

objective, which includes promoting and reviving its teaching in all universities and colleges. A book at this juncture from a college covering varied aspects of taxonomy is truly a contribution for the avowed cause. The book focuses on both customary and modern topics providing a state-of-the-art on the subject. Most of the topics are authored by teachers who can understand students better than anybody. Nomenclature is a significant aspect of plant taxonomy that brings in more systemized naming and thereby documentation of biological resources and has been elaborately discussed in chapter 2. The diverse concepts of species, the process and modes of speciation and the impact of climate change and species under threat are presented in chapter 4. A connected topic on phylogeny (the pattern of descent) and phylogenetic relationships and thereby evolutionary histories are presented in chapter 9. These chapters give adequate background in weighing characters, assessing classifications and recognizing/ignoring novelties/freaks by the taxonomy practitioners. Chapter 7 deals with indigenous knowledge and biopiracy, and has greater relevance as the country has enriched knowledge systems and also 550 tribal communities who have their own understanding of the plant resources. There is a possibility that patents can be granted on indigenous knowledge and this is to be safeguarded from IPR legislations. A well-detailed presentation on the subject is indeed apt to bring in awareness. Taxonomists, as other subject specialists, should grow adopting new methods and tools in finer evaluation of characters and groupings, but not at the cost of ignoring fundamentals of the subject itself.

Among the modern topics, the importance of DNA bar-coding (identities based on uniqueness in a standardized sequence in the DNA) used for identification between individuals in a species and between species, advantages/limitations and future prospects therein are deliberated in chapter 5. Molecular markers offer numerous advantages over phenotype-based methods in diversity evaluation of plants. This is due to their stability and detectable ability regardless of growth, development and differentiation. Both DNA-based and protein-based molecular markers using PCR-based and non-PCR-based techniques are deliberated in chapter 14. The significance of

plant taxonomy for managing genetic resources is dealt with in chapter 6. The chapter on herbaria and data information systems (chapter 8) should have been more comprehensive and requires updating on inventory strengths in various herbaria as the figures cited are less. The kind of computerized data/information the herbaria hold also needs a review. With advancement in technology, effective biodiversity information networks are being planned by members of the COP to promote access to material generated by taxonomists throughout the world. Majority countries also plan to network and link all herbaria for faster flow and dissemination of information.

In chapter 15 on E-flora, the future of floristic documentation, the databases connected to floras, keys for identification, virtual herbaria (that contain specimen images) and live plant photos have been deliberated. This is truly useful to all taxonomists since it is realized that effective exchange of material and information enhances not only the pace but the quality of documentation. Most of this information concerns web-based taxonomic resources.

The reviewers have also noticed two chapters – one, on ethnobotanical Noah's ark and the other, on plants of Delhi, scientific names and their meaning (chapters 1 and 3) that have attempted to present the genesis and meaning of botanical names. These could have been dispensed with as the focus is merely to provide true meaning to botanical names or this could have been summarized as a section of chapter 2 under nomenclature. The publication should have achieved its completeness had it included/introduced chapters such as the subject significance (its relevance to allied fields of biology), principles (that include major and minor categories of classification), classification systems (artificial/natural/phylogenetic systems), existing/evolving systems of classification, plant identification (the procedures of plant description and further identification using herbaria and literature), field herbaria techniques (collection procedures, specimen preparation and preservation, and herbaria building), the distinctions in floristics and revisions and the connected literature. Though we have standard literature on the cited topics, their summation with appropriate citing of classical literature would have brought many desired topics together. These are in fact the subject areas that

are greatly neglected in teaching. When authors are as many as topics of a subject, to bring out a book in a uniform tone, language and quality is difficult and it becomes more obvious when they violate guidelines and the contours of presentation. Festschrifts often suffer from this vulnerability. A little more reorganization of existing chapters (to bring in natural linkage of chapters to readership) and inclusion of a few more, which may happen in future editions, can earn the book a permanent citing in taxonomy literature.

M. SANJAPPA<sup>1,\*</sup>

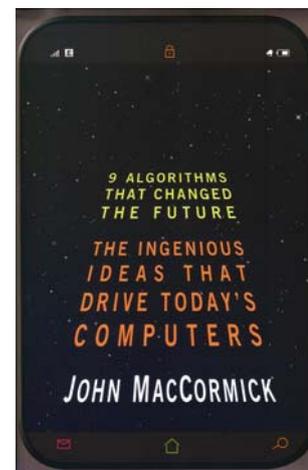
P. VENU<sup>2</sup>

<sup>1</sup>Botanical Garden,  
University of Agricultural Sciences,  
GKVK,

Bangalore 560 065, India

<sup>2</sup>Central National Herbarium,  
Botanical Survey of India,  
Howrah 711 103, India

\*e-mail: sanjappam@ymail.com



**9 Algorithms that Changed the Future: The Ingenious Ideas that Drive Today's Computers.** John MacCormick. Princeton University Press, 41 William Street, Princeton, NJ08540, USA. 2012. x + 219 pp. Price: US\$ 27.95/£19.95.

This is an interesting book with an alluring title, meant for readers who do not know any computer science, but are enthusiastic to know about how computers do all the remarkable things that they actually do. The author has handpicked nine path-breaking ideas which are found

## BOOK REVIEWS

dational to the spectacular capabilities of computers and has attempted to explain these ideas in a simple, non-technical way. The author has largely succeeded in his objective and the book is certainly worth exploring by interested readers.

The book embodies a description of nine algorithms in chapters 2 through 10. Though the content of each of these chapters is referred to as an algorithm, it can be classified more as an 'idea' than an 'algorithm'. For example, chapter 2 talks about search-engine indexing, which is actually an idea and not an algorithm. Similarly, pattern recognition which is the subject of chapter 6 is actually a complete subject area than an algorithm. Nevertheless, each of the chapters from chapters 2 to 10 exposes us to a breakthrough technique or concept or technology that is of a path-breaking nature.

Chapter 1 is a routine introduction to the contents of the book. Chapter 2 deals with the idea of search-engine indexing which was popularized by the Alta Vista search engine in the late 1990s. The famous PageRank algorithm of Sergey Brin and Larry Page (co-founders of Google Inc.) is the subject of chapter 3. Chapter 4 deals with the brilliant work on public key cryptography of Rivest, Shamir and Adleman (RSA algorithm). Chapter 5 walks us through the legendary contributions of Hamming and Shannon on error correcting codes. Chapter 6 dwells on pattern recognition, while chapter 7 deals with data compression. Database technology is treated in some detail in chapter 8. Chapter 9 is devoted to digital signatures and has some overlap with chapter 4. Finally, chapter 10 deals with the key notion of computability. Chapter 10 is truly a fitting tribute to Alan M. Turing, the computer science legend, during his centenary year which happens to be 2012.

There have been a few other books of this genre earlier – *Great Ideas in Computer Science, A Gentle Introduction* by Alan W. Biermann (MIT Press); *New Turing Omnibus* by A. K. Dewday and *Algorithmic Adventures* by Juraj Hromkovic. The above three books do need at least a little background in computer science and/or mathematics for a sound appreciation of the contents. In contrast, the present offering by MacCromick requires almost no background in computer science or mathematics. This is the defining and appealing feature of

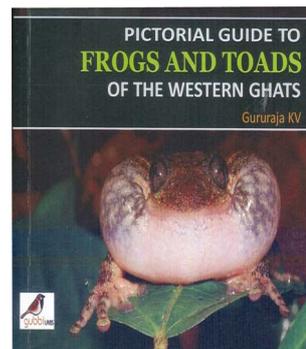
the book. The concepts are presented through apt analogies in real life, interspersed with engaging historical anecdotes. For example, the analogy of mixing paints to explain the RSA cryptography algorithm is quite original. Anecdotes about Richard Hamming, about the secret research on public key cryptography in Great Britain (that was declassified only recently), and about several other researchers are quite fascinating. This feature of the book sustains the interest of the reader throughout.

The choice of some of the topics in the book (such as, for example, the RSA algorithm and the error correcting codes) is beyond any question or controversy, while the choice of certain other topics can be questioned. However, in selecting a certain limited number of topics amidst a wealth of innumerable great ideas is always challenging. The sequence in which the topics have been presented seems to be neither logical nor chronological. Chapter 3 on the PageRank algorithm would have benefitted with a description of many already existing techniques that were put together by Sergey Brin and Larry Page. These are, however, minor issues in this superbly crafted book.

This book has already received accolades from leading computer scientists such as Chuck Thacker (winner of the 2010 Turing Award), Thomas Cormen (co-author of a celebrated book on algorithms) and William Press (co-author of the best selling book *Numerical Recipes*). The book will certainly delight not only readers with little or no computer science background, but computer scientists as well.

Y. NARAHARI

*Department of Computer Science and Automation,  
Indian Institute of Science,  
Bangalore 560 012, India  
e-mail: hari@csa.iisc.ernet.in*



**Pictorial Guide to Frogs and Toads of the Western Ghats.** K. V. Gururaja. Gubbi Labs LLP, #2-182, II Cross Extension, Gubbi 572 216. India. 2012. xviii + 153 pp. Price: Rs 300/US\$ 20.

In view of recent developments in the form of various new discoveries, taxonomic revisions and studies related to ecology and natural history in the last 15 years, Indian herpetology is greatly metamorphosing. If one looks at the post-independence era, Indian herpetology was overlooked except a few studies by researchers and scientists across the country. Most of the historical information on Indian herpetofauna was in the form of scientific publications or reports – which were 'beyond the reach' (physically and mentally) of various stakeholders like new researchers, Forest Department officials, amateurs and serious naturalists and nature photographers.

The pioneering efforts to bridge this gap was made by J. C. Daniel (Bombay Natural History Society) who published a popular book on Indian reptiles, which was eventually revised and published as *The Book of Indian Amphibians and Reptiles* in 2002. The amphibian section of this book was mainly based on the series of four papers published by him in the *Journal of the Bombay Natural History Society* from 1963 to 1989. In the book he has covered some common and endemic species of Indian amphibians and provided basic (but good) information about their identification, distribution and natural history to some extent along with photographs of live individuals of the respective species. Later R. J. R. Daniels published a book, *Amphibians of Peninsular India* in 2005, which was also considerably noteworthy. This was a step ahead, but as these were textbooks of large size, they had more text and fewer images and with old scientific names. In subsequent years there were many new