

Invertebrate Diversity and Conservation in the Western Ghats, India. D. M. Priyadarsanan, M. Soubadra Devy, K. A. Subramanian, N. A. Aravind and N. K. Seena (eds). Ashoka Trust for Research in Ecology and the Environment, Bengaluru. 2016. xv + 266 pp. Price: Rs 550. ISBN 81-902338-5-8

Western Ghats is among the world's oldest tropical mountains. It is one of the 34 biodiversity hotspots identified globally. The altitude varies from sea level to 2695 m above mean sea level making it second only to the Himalayas in terms of topographic complexity in South Asia. Yet another important feature of the Western Ghats is that along the 1600 km north-south stretch there is a clear gradient in the length of the dry season, it being the shortest in the south. North-south variations in the length of the dry season and the local differences in altitude, temperature and total annual rainfall have together created distinct patterns of vegetation, species diversity and endemism.

Species diversity and endemism are fairly well-known among vertebrate animals. Currently we know that there are around 1450 species of vertebrates (including freshwater fishes) in the Western Ghats. Endemism in vertebrate species could be up to 40%. Among the different classes of vertebrates, amphibians rank the highest in terms of endemism. Amphibians are followed by reptiles and freshwater fishes. Endemism is comparatively low in mammals and birds. Discoveries of new species of vertebrates have mainly involved amphibians, although there have been a handful of reptiles, freshwater fishes and at least one bird—the Ashambu Sholakili reported recently. As more species are being discovered and described, diversity and endemism in vertebrate animals tend to go up year after year.

As with vertebrate animals, knowledge of diversity and endemism in flowering plants is fairly complete. What is currently known is that there are 7402 species of flowering plants in the Western Ghats and 17% of the flowering plant species found here are endemic to the region. Diversity and endemism in invertebrate animals are however not so well known. Butterflies are probably the best-known group of invertebrates. Fair amount of knowledge exists on odonates (dragonflies and damselflies), spiders, Mayflies, dipterans (true flies), land snails, etc. Knowledge of diversity in many other groups of invertebrates is so little that we barely know that they even exist in the region.

While it is generally acknowledged that invertebrates are excellent indicators of ecosystem health, there is paucity of literature on taxonomy, diversity and ecology to advocate practical conservation strategies. The situation is the same even for well-explored regions like the Western Ghats. Any publication that addresses these subjects would therefore be a welcome addition to libraries and personal collections. The book under review is one such attempt to bridge the gaps in knowledge of invertebrates in the Western Ghats.

The book is a compilation of 22 chapters written by 45 authors. These chapters are organized into two sections, viz. ecology and conservation and taxonomy

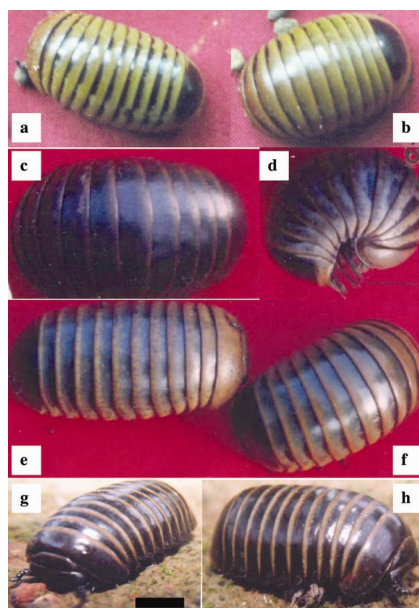
and diversity. Each chapter has an abstract, keywords and a list of references. The list of references, in particular, adds to the merit of the book. It is rather detailed (although not up to date).

Interesting facts that I gathered from the book are that besides 332 species of butterflies, there are 1262 species of true flies (Dipterans), 680 species of Chalcid wasps, 275 species of spiders including 30 species of Mygalomorphs (large-bodied spiders such as tarantulas), 257 species of white flies, 167 species of Platygastriid wasps, 113 species of aquatic bugs (Gerromorpha and Nephomorpha), 78 species of Opiliones (spider-like creatures commonly called harvestman) and 37 species of Mayflies in the Western Ghats. Further, while endemism is low in butterflies and Chalcid wasps, it is high in Mygalomorph spiders and aquatic bugs. Similarly, while butterflies and spiders are Oriental in affinity, Mayflies are of Gondwanaland origin.

As one would expect there are more chapters dedicated to butterflies. These chapters range from biogeography to participatory monitoring of species diversity in different localities and habitats in the Western Ghats. The latter is of interest as it describes one of the early attempts at promoting citizen science. Among the other chapters, there are two each on ants and spiders. And except the one on land snails, all the chapters in the book are devoted to arthropods. The arthropod groups covered include, other than butterflies, ants and spiders, parasitic wasps, millipedes, centipedes, gall mites, Opiliones, water bugs, freshwater copepods, dipterans, whiteflies and Mayflies. The focus on diversity, taxonomy and conservation of these different groups of invertebrates is however variable.

The editors have confessed in the preface that the book took too long to see the light. It was conceived in the year 2005 and there evidently has been difficulty in putting together the different chapters within a preset deadline and guaranteeing that they are relevant and current. For instance, the chapter on gall mites is based on work done in 1988–89. The chapter on the butterfly park in Bangalore is a bit out of place. Further, gleaning through the lists of references I found that the most recent publication listed is of 2010.

The splitting of the 22 chapters into 2 broad sections seems rather arbitrary. It is also disappointing that the focus of the chapters with the exception of one, has



Pill millipedes found in the Western Ghats forests.

been on legged invertebrates. Many interesting groups of legless invertebrates such as earthworms, nematodes and leeches do not find a place in the book. Is this because there is no information on these or is it that the editors failed to find the appropriate contributors?

As mentioned earlier, while browsing through the book I was able to get the numbers of species known in 10 different groups of invertebrates including Mayflies, spiders and the lesser known Opiliones. However, the book despite its two chapters on ants does not say how many species of ants are known in the Western Ghats. In fact, one of the two chapters on ants discusses diversity of ants in different habitats without once mentioning a species name in the entire text. Similarly, I was disappointed that I could not get an idea of how many species of land snails are there in the Western Ghats. Also I would have been happier to see a chapter

on dragonflies and damselflies in the book as these are well known.

There is definitely more knowledge about the invertebrates of the Western Ghats than what has been highlighted in the book. For instance, recently, a species of tree-dwelling crab was described from Kerala. I have also seen other publications on the freshwater crabs of the Western Ghats. There is research on crickets and praying mantises. These are very interesting invertebrates and should find a place in future compilations. Those that enter the Western Ghats are first struck by the sounds of cicadas. What do we know of these insects?

Study of invertebrates is like entering a deep mine without a bright light. There is so much to discover and a lot more to learn. At the same time, it is equally a challenge to bring out what is already known in the form of reference books. It is in this context that it would have been

of great help if the book under review had included an introductory chapter that gave an overview of the various groups of invertebrates known in the Western Ghats. Even a mere listing of the different groups would have added considerably to the value of the book.

Despite the shortcomings I feel the book is useful. I appreciate the editors for having conceived and brought out this book. My comments are only in the hope of seeing a future book that fills some of the identified gaps. Finally, I liked the illustration on the front cover of the book. Unfortunately, the book does not mention the name of the artist who did the illustration.

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