

objects in a different manner. Obviously, an object such as M42, the Orion nebula rates highly with all of the three instruments. Every seasonal object is illustrated with line diagrams of what the heavenly body would look like with a finderscope as well as with a small telescope and a Dob. The book tells you exactly what to expect and how to see it. The potential for error is great in such a book and except for one printer's devil (the section on the open clusters M36, M37 and M38 has a statement that '(M38)... is between M36 and M38 in size', where it should clearly be '...between M36 and M37 in size'.

As one would expect, most of the book is on practical astronomy and on how to locate and identify objects, occasional boxes provide the much needed theory. For instance, those who are unclear about the difference between diffuse nebulae and 'planetary' nebulae would benefit from reading the boxes on pages 55 and 99 respectively.

Who should possess this book? Just about every amateur astronomer, whether a novice or one with considerable observational experience. Of course, the novice in amateur astronomy would still need handholding while observing heavenly bodies. But there is a deep satisfaction, in amateur astronomy, as indeed in many other areas of life, to do something on one's own – to locate the Andromeda galaxy for the first time, to identify the craters Aristillus, Archimedes and Autolycus in the Mare Imbrium on the moon – these are delights that are hard to match. The committed amateur, too, may know much of this – but there is abundant information here that will benefit both groups, rank amateurs as well as committed amateurs, e.g. information on further dates and places of eclipses.

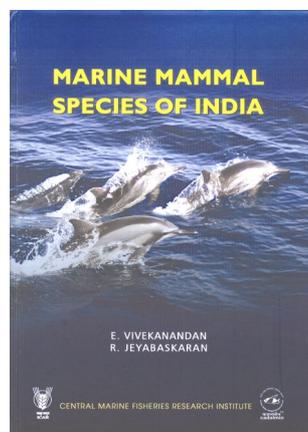
With Comet ISON, which potentially promises to be the comet of the century, on the way, I wondered if comets were mentioned in the book; they were not – but the authors explain that comet sighting is uncommon. Of course, comets are best viewed in binoculars, rather than by telescopes. However, artificial satellites do get an honourable mention at the very end of the book and the authors, using some technical jargon for a change, present a map which can help locate a geostationary satellite.

Finally, I cannot resist this: I find it delicious and droll that the first author of the book is an astronomer at the Vatican.

Readers will, of course, be aware that 400 years ago, it was this very church that had made Galileo publicly recant his belief that the earth was not the centre of the solar system. The acknowledgement by the Pope that the church had erred then was made only in 1992 – three years after the release of the first edition of this book!

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Marine Mammal Species of India. E. Vivekanandan and R. Jeyabaskaran. Central Marine Fisheries Research Institute (ICAR), Kochi. 2012. 228 pp. Price: Rs 750.

This book is a source of collective information on the marine mammal species found in the Indian seas. It is the outcome of a nine-year study (2003–2011) funded by the Centre for Marine Living Resources and Ecology, Ministry of Earth Sciences, Government of India, and the Central Marine Fisheries Institute, Kochi, Kerala.

The book starts with a brief introduction on the order Cetacea being the most diverse, having evolved from land-dwelling ancestors around 50–60 million years ago. More information regarding the evolution of cetaceans could have been provided by the authors. Cetaceans originated about 50 million years ago in South Asia. Fossils of an ancestor of the cetaceans, *Indohyus* were discovered from a 50 m thick bone bed from the

middle Eocene at Sindkhatudi in Kalkot, Kashmir¹. Stable isotope data indicate that *Indohyus* spent most of its time in water coming to land only to feed on vegetation or invertebrates found on the shore. Many palaeontological records support the theory of cetaceans originating from an *Indohyus*-like ancestor that later evolved to a more aquatic lifestyle due to change in diet. Over time, modern-day cetaceans have evolved from their ancestors with many adaptations specialized to suit their aquatic lifestyle¹. Out of the 130 species of marine mammals reported from all over the world, stranding and sighting records show that the Indian seas are a habitat of 25 species of cetaceans and one species of sirenian, and this book provides information about the 25 species of cetaceans. Five species belong to the sub-order Mysticeti (Baleen or toothless whales) and the rest 20 belong to sub-order Odontoceti (toothed whales).

Chapters 2–4 deal with the methodology used to conduct the survey, information on the cetacean species and suggestions on designing and conducting marine mammal surveys. Chapter 2 deals with the survey methodology. The survey was done in the exclusive economic zones (EEZs) and the contiguous seas within the Indian territory. A major part of the 7500 km of the country's coastline falls under the 2,305,143 sq. km of the EEZ. This survey covered northeastern Arabian Sea, southeastern Arabian Sea, northern Bay of Bengal, southern Bay of Bengal, Andaman Sea and the southern Sri Lanka Sea. The data were collected by conducting single-observer surveys on an oceanographic research vessel. However, the surveys were not systematically planned due to logistic constraints. An observer was positioned at a height of 17 m above sea level and the area was scanned in a 180° arc with the naked eye and interspersed with scans using binoculars for an average of 8 h/day. The cetaceans that were spotted were identified to lowest taxonomic level possible and were compared with the photographs and morphological identifications available. Out of a total of 1068 days on which surveys were conducted, cetaceans were spotted on 430 days. A record of 626 sightings comprising 8674 individuals was made with 65% of the sightings in oceanic waters (>200 m depth) and the remaining 35% on the continental shelf (<200 m depth). High-

est number of sightings (31%) was between 1500 and 1800 h. The survey team recorded 18 cetacean species (six species of whales and 12 species of dolphins). Out of the total 626 sightings, 57.7% was identified to either generic or species level. However, the rest of the 42.3% could not be identified. The team sighted and recorded during the surveys whale and dolphin pods varying from 1 to 10 individuals and 1 to 100 individuals respectively. They found sightings to be highest during January and lowest during August. This variation might be because of bad visibility due to choppy sea conditions during the monsoon season. Indo-Pacific Bottle Nose dolphin (*Tursiops aduncus*), Spinner dolphin (*Stenella longirostris*) and Long-beaked Common dolphin (*Delphinus capensis*) were the species that were commonly sighted by the team. The authors also tried to identify the habitat preference of the cetaceans by measuring distance from the shore, depth, temperature and salinity of the sea water. Chinese white dolphin (*Sousa chinensis*) was sighted nearest to the shore, ~100 km from the shore, whereas Long-beaked Common dolphin, Spinner dolphin and Indo-Pacific Bottle Nose dolphin were sighted at ~199, ~499 and ~599 km respectively, from the shore. Most of the cetacean sightings were in the 26°–32°C temperature range where salinity ranged between 26 and 36 parts per thousand. The authors, however, are not sure of these data, as it is known that the temperature of the sea water does not have much effect on the use of an area by cetaceans especially in tropical area.

Chapter 3 provides information on each of the 25 species. The taxonomic status, common name, identification characters, distribution, abundance, habitat, behaviour, food, exploitation, and threats and conservation status are the categories under which the available



Acrobatic leap of *Stenella longirostris* sighted off Dwaraka, Gujarat on 23.03.2009.

information is divided. Information provided in the book on Pygmy sperm whale (*Kogia breviceps* and *K. sima*), Melon-headed whale (*Peponocephala electra*), Cuvier's beaked whale (*Ziphus cavirostris*), Pygmy killer whale (*Feresa attenuate*) and Rough toothed dolphin (*Steno bredanensis*) are based on stranding records and previous sighting records as these species were not sighted during the survey.

The authors mention four cetaceans, the Irrawady dolphin (*Orcaella brevirostris*), Gangetic dolphin (*Platanista gangetica gangetica*), Sperm whale (*Physeter macrocephalus*) and Dugong (*Dudong dugong*) to be under Schedule 1 of the Wildlife (Protection) Act (WPA) of 1972. Though Sperm whale does not come under Schedule 1, it is included in Schedule 2 of the WPA. However, the Little Indian porpoise (*Neophocaena phocaenoides*) is included in Schedule 1 of the WPA. The authors have overlooked this mistake in the book.

In chapter 4 titled 'Future directions', the authors provide many suggestions on conducting research and survey on marine mammals. They support and highlight the need for the establishment of Marine Mammal Stranding Network and Marine Mammal Conservation Network which will be helpful in documenting cetacean stranding reports and also help in preparing an action plan for conservation of marine mammals in India. They also highlight the importance of conserving sea grass beds, the much needed amendment to the Marine Fishing Regulation Act, and the need to educate and spread awareness among fishermen on the basic functioning of marine ecosystems and the need to conserve them. The inclusion of a glossary section in the book provides definitions for the technical terms used throughout, making comprehension easy.

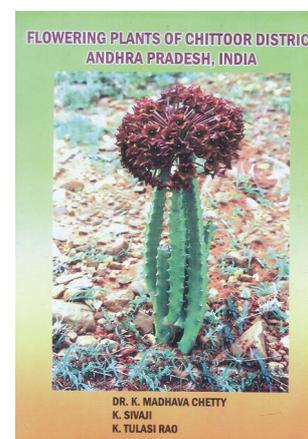
Very few studies or surveys on marine mammals have been conducted in India until now. Most of the information available is based on incidental catches and on individuals that were stranded or beach cast. This study has contributed significant knowledge on the country's marine mammal diversity and the effort of the authors is commendable as identification of marine mammals in open sea is a difficult task. Good identification guides and trained observers are essential to conduct such surveys. This was one of the handicaps in the survey in addition to

non-availability of a survey vessel entirely dedicated to the study and sufficient financial backing. This book presents consolidated information of the species and its ecology. Records of sightings, stranding and incidental catches have been compiled in the book. Information on a species found in Indian waters from other parts of its distributional range has also been provided. In conclusion, the book is a much needed pictorial guide for marine mammal identification in India and will be helpful for those working in marine ecology. We hope better financial backing and support will help the authors improve the quality and contents of the book in its future editions.

I. Thewissen, J. G. M., Cooper, L. N., Clementz, M. T., Bajpai, S. and Tiwari, B. N., *Nature*, 2007, **450**, 1190–1194.

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Flowering Plants of Chittoor District, Andhra Pradesh, India. K. Madhava Chetty, K. Sivaji and K. Tulasi Rao. Students Offset Printers, Tirupati. 2013. 4th edn. viii + 600 pp. Price: Rs 1250.

Books meant for students and authored by teachers often thrive long being in demand and rarely updated for several years. The same is expected of this book on the flora of Chittoor district. Floras generally serve the purpose of identifica-