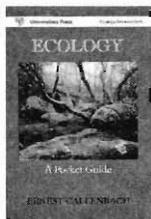


## Ecology – A Pocket Guide

Renee M Borges



*Ecology. A pocket guide*  
Ernest Callenbach, Universities Press  
(India) Limited, 1999  
Price: Rs.125/-

I picked up this book with curiosity especially as the back cover claimed to provide thumbnail accounts of 60 basic ecological concepts in alphabetical order. The first entry was Air, the last entry was Zoos and I thought, 'Ah, is this going to be an ecological equivalent of Peter Medawar's *Aristotle to Zoos*? Then it should be a good read'. A couple of hours and 149 pages later, I had a rather different opinion.

The word 'ecology' means many different things to many different people. In its original sense, ecology is the science of the study of the inter-relationships between living biota or between the biota and abiotic factors. Ecology in this sense subsumes autecology, behavioural ecology, physiological ecology, population ecology, metapopulation ecology, community ecology, landscape ecology and much more. What do all these sub-sciences involve? Perhaps a few examples would help. What sizes and shapes of shells hermit crabs prefer would be an autecologists's type of question. Why do kingfisher pairs in a rough, turbulent lake system allow non-breeding birds to help them with rearing their offspring

while those in another calmer lake actively dissuade helpers? A behavioural ecologist would ask whether these behavioural differences are due to differences in the ease of catching fish to feed the offspring in the two lake systems. Since a metapopulation is a set of populations that exchange genes with each other by the migration of individuals between the populations, a population ecologist might calculate the migration rate of rainforest butterflies between fragments of rainforest by measuring the genetic heterogeneity of the populations, and may ask why some populations are isolated while others are exchanging genes more frequently. A community ecologist might ask why the community of lizard species on one set of islands is more speciose and consists of larger lizards than the community on another archipelago. To address this question, the community ecologist might have to obtain data on the behavioural and physiological ecology of the lizards as well as the historical geography of the islands and the evolutionary history of the lizard taxa. Since bees are such important pollinators of crops and forest trees, ecologists may want to know how far pollen is travelling and have very recently attached miniature transponders to the bees to track their movements through landscapes using harmonic radar (Osborne and others, 1999). Ecology is, then, a multifaceted and fascinating science that asks questions about pattern and process at scales ranging from single rocks to entire continents, and from single individuals to entire communities. However, a couple of decades ago with the upsurge of

the 'environmental movement', ecology in some circles came to be synonymous with 'environmental sciences' which in many college curricula is largely concerned with nutrient cycles, eco-toxicology and environmental impact assessments. This is not, however, to say that such matters are not important research areas but it is certainly not all that 'ecology' is about. It is, therefore, unfortunate that Ernest Callenbach doesn't mention these other subsets of ecology that professional ecologists find so fascinating. More recently, ecology has been associated with such offshoots as 'Deep Ecology' (which emphasises man's spiritual connections with nature) and other New Age fetishes. The book by Ernest Callenbach smacks of New Ageism when we are told repeatedly about the harmony of nature, the symbiotic nature of living relationships, the sustainable future and of course, Gaia. Funnily enough, the author does Gaia an injustice because he does not explain the theory adequately, though I must confess that he dispels, in some very categorical statements, the idea that Gaia is a Supreme Being controlling the earth. I could read through the entries on Gaia, I scanned Ecofeminism and Deep Ecology which were actually quite moderately written about; it was when the author started making errors and sweeping statements that I began to want to skip pages.

Writing a pocket book that is targeted towards 'scientists, environmentalists, politicians, government officials, business people, and concerned citizens everywhere' is a very tall

and difficult order because the essence of a pocket Baedeker is that it should be brief without compromising on factual accuracy or leading to misinterpretation. The very fact that this was intended as a non-specialist book (though it supposedly targets scientists too) means that the author intentionally took on tremendous responsibility to marry clarity and non-technical language with fact. Unfortunately, it is not a happy union. We are told that viruses are not living beings while bacteria are 'fully alive'. We are told that only life forms are capable of perception as in finding food (by this argument, aren't viruses, that 'find' their target hosts using some form of receptors, alive?) And how can the author pronounce a life or non-life status on anything without adequately stating how 'life' may be defined? We are told that under stressful conditions, 'desperate bacteria spontaneously release their genes into their surroundings. Other desperate bacteria take up these genes and recombine them with their own'. We are told that mycorrhizae means 'fat roots' and that 'squirrels forage randomly and find nuts randomly dropped from trees'. The fact that mycorrhizae literally means roots which have fungal associations (Greek: *mukes* = fungus; *rhizae* = roots) is ignored. No student of squirrel foraging behaviour has ever found squirrels to forage randomly; there is quite complicated goal-directed behaviour based on olfaction, memory of the location of previous food resources and other cues. We are cautioned that only 'weak or foolish prey tend to get eaten' while only the 'smartest, strongest,

and most cooperative wolves survive by hunting bison'. The blatant anthropomorphisms are painful. If I understand correctly, the author uses the term symbiosis as any type of relationship other than predation or parasitism between two taxa. However, since symbiosis (in most texts) is conventionally meant to indicate mutualisms, it should be clearly differentiated from commensalism, amensalism, neutralism and other terms in the symbiotic continuum. This is especially because de Bary, who coined the word 'symbiosis' in 1879, included both mutualistic and parasitic associations within the term's meaning and there has been considerable confusion since (Lewis 1985). I could go on about inaccuracies and obtuse writing but enough.

The author has also provided a list of recommended reading at the end of the book. In keeping with the tone of this book, the author recommends Lovelock's *Age of Gaia*, Dashefsky's *Environmental Literacy*, Fritjof Capra's *The Web of Life* among a few others. Professional ecologists would be sorry not to see a recommendation for a classic textbook like Begon, Harper and Townsend's *Ecology*.

I have another bone to pick with the author. This book is written for a North American audience. All the examples are relevant to temperate systems. It is also evidently a book written for a New Age generation since, for example, in the entry on Impacts (Environmental Impacts), the author recommends that impacts can be reduced if

lifestyle changes can be made such as 'living in shared households, either with relatives or with other people'. Am I just being hypersensitive, or is this advocacy for life in communes? Further on, we are told that pavements should be abolished in cities so that children can play on or near streets, in a move to get back a 'bistro atmosphere to cities' which in any case usually 'exist in symbiosis with their hinterlands'! Besides these obvious difficulties, some word usages throughout the text are also inappropriate. For example, the author uses 'toxic' everywhere as a noun, i.e. toxics, which might be acceptable in neo-American colloquial parlance, however, 'toxin' or 'toxic substance' is definitely more appropriate.

Is there anything good about this book? Yes, and I must say so. The entries on 'Carrying Capacity and Fire' are well written as are some others. But these are placed within a minefield of errors. You may reach them unscathed or you may not. The author clearly seems to be more comfortable writing about eco-advocacy issues or those entries that are not too technical such as 'Sustainability and Bioregion'. He has also done a service to microbes by devoting several entries to them and repeatedly cross-referencing them. I wish he had maintained the same quality throughout. I am afraid that as it stands I cannot recommend this book to uncritical and impressionable readers who might be left with the feeling that ecology is more about advocacy and socio-political concerns than the important and fascinating science that it

really is. This is especially true for young students who are still testing the waters that will determine the course of their chosen careers.

**Suggested Reading**

- [1] M Begon, C R Townsend and J L Harper, *Ecology: Individuals, Populations and Communities*, 3rd edition, Blackwell Science, UK, 1998.
- [2] D H Lewis, *Symbiosis and mutualism: crisp concepts and soggy semantics*, in *The Biology of*

- Mutualism, Ecology and Evolution* (DH Boucher, editor), Croom Helm Ltd, UK, pp. 29-38, 1985.
- [3] J L Osborne, S J Clark, R J Morris, I H Williams, J R Riley, A D Smith, D R Reynolds and A S Edwards, A landscape-scale study of bumble bee foraging range and constancy, using harmonic radar, *Journal of Applied Ecology*, 36, 519-533, 1999.

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**Crossword Puzzle**

**Down**

- 1. Laconic shape generated by revolution of a triangle about a side. (7)
- 2. A powerful regular solid. (4)
- 4. Odd or even? (6)
- 6. Lie in, or sleep? (5)
- 7. (with 1 across) May ruin chance but could help differentiate complex functions. (6,7)
- 10. What it all leads to. (5)
- 13. Restricted Burnside problems, briefly. (4)
- 15. Confused car goes around partly. (3)

**Across**

- 1. See 7 down.
- 3. As against G.P.(2)
- 5. One of 1, 2, 3, etc. makes one lose feeling? (6)
- 8. Half a circle lost its head without the circle.(3)
- 9. The answer takes half a column. (3)
- 11. Abel has no extremities. (2)
- 12. I time races without the aces, to help return money? (1, 5)
- 14. Am bald – could be Greek (6)
- 16. Tear half the circumference. (3)
- 17. What the symmetric group does to  $\{1, 2, \dots, n\}$ . (4, 2, 2)

1			2			♠	♠
	♠	♠		♠	♠	3	4
5				6	7	♠	
	♠	♠	8			♠	
9		10	♠	11		♠	
	♠	12	13				
14	15					♠	
♠	16			♠		♠	♠
17							

by Yrus