
Biology in the 21st century – back to Stamp Collection ?

By all accounts the 21st century (and probably beyond) belongs to the life sciences. The diversity and complexity of life forms that have evolved and stayed on (not to speak of the vast majority that evolved and then became extinct) surpasses that of non living objects by orders of magnitude. Our insatiable demands for food, medicines, clothing and agents of biological control of pests will perpetually retain the need to understand and exploit the living world. This and the growing realization that human activities are destroying habitats and driving biological species to extinction have begun to make people to sit up and wonder. Arguably the most influential spokesman for conservation of the earth's biodiversity, the Harvard biologist E.O. Wilson has said "the worst thing that can happen - will happen - is not energy depletion, economic collapse, limited nuclear war, or conquest by a totalitarian government. As terrible as these catastrophes would be for us, they can be repaired within a few generations. The one process ongoing, that will take millions of years to convert is the loss of species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us".

As worrisome and embarrassing as this is for us, our vast ignorance about the magnitude of the earth's biodiversity is in some ways even more worrisome and embarrassing. About 1.5 million species of plants, animals and microbes have so far been painstakingly catalogued and described by biologists belonging to a nearly extinct branch called Taxonomy, and this task has taken over 200 years. Estimates of how many more species remain to be catalogued and described vary enormously. The magnitude of the earth's biodiversity is almost certainly over 10 million species and may be as much as 30 million species. So it should take some 4000 years to complete the task, provided we continue at the same rate. It may be hard to believe but the rate has been, and is likely to be further slowed down considerably. The reason for this is that it has become fashionable to brand taxonomists as mere stamp collectors and treat them as being incapable of analytical thought and deductive logic. Biologists interested in life processes such as physiology, genetics or molecular biology have been largely responsible for reducing the prestige of taxonomy to its present nadir.

Besides, mere cataloguing and describing is hardly likely to permit us to exploit a species for our benefit. The study of its properties as a source of a drug molecule or as an agent of biological control may take many decades of work for each species. But we are closing our option of doing so by being unaware of the existence of most species. Large scale destruction of habitats, especially forested habitats in tropical countries such as Brazil or India are driving large numbers of species extinct - and extinction is for ever! Even by the most conservative estimate, the rate of loss of biological diversity is shocking - the number of species doomed each year is atleast 27,000 - each day it is 74 and each hour it is 3!

What then should intelligent human beings do? How should educated, enlightened citizens of the world respond? What should young students aspiring for a career in biology do? Should we do nothing (which is usually the easiest thing to do) and let most of the 10-30 million species disappear once and for all from the face of the earth - and carry with them unknown chemical treasures and life saving drugs, produced by millions of years of biological evolution? Or should we continue to catalogue and describe and save as many species as possible, at the present pace and by present methods? Or, should we attempt to organize a mammoth global effort - on a scale bigger than the human genome project, perhaps requiring budgets comparable to our space programmes? What will this require - just think of the floors of museum space that will be required to store voucher specimens of > 10 million species and the number of journal pages that will be required to describe all of them. Or should we go back to our labs and spend the rest of our professional lives staring at that interesting one kilobase DNA sequence isolated from one bug? At the very least we need a debate.

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