

The Importance of Descriptive Biology

Many subjects included in what is natural history, such as taxonomy (both animals and plants), anatomy, paleontology, and behavior are “descriptive biology,” or more broadly, “descriptive science”. The online Merriam-Webster Dictionary defines “descriptive” as “referring to, constituting, or grounded in matters of observation or experience.” The descriptive biologist or researcher first observes organisms and then tries to describe what they saw “in words”. In the other words, we can say that descriptive biologists are translators who convert their observations of nature into words (written descriptions) in order to make what they saw of nature part of the world of “science”. All natural phenomena are confined to the world of non-science and left “unknown” until they are described. Descriptive biology lays the foundation for understanding how the world functions and changes. It also makes possible modern advances in fields of science such as evolutionary biology (understanding why to natural world works the way it does), medicine, and technology, including such fields of biomimetics (the study and modeling of the structure and function of biological systems as models for the design and engineering of materials and machines). I believe that “descriptive biology” is one of the most challenging, exciting and important endeavors of science, especially in regions which have high biodiversity and many environmental problems, including Southeast Asia. Without accurate published descriptions of nature, we cannot document how our world is changing in time, and design solutions to our problems.

If you read the background of discoveries of important phenomena or theories in biology, you will discover that nearly all the scientists responsible for them were expert descriptive biologists. Probably the most famous example of this is Charles Darwin, who argued that the theory of natural selection which he proposed with Alfred Russel Wallace in 1858 explained how the entire biological world (including humans) came into being. His theory was supported by his meticulous observation of living things and even fossils. As a young man he became known as a taxonomist of barnacles, which developed his skills of observation and description. After later discoveries in genetics, population biology, and biochemistry, his theory became, and still is, the linchpin paradigm of modern evolutionary biology, often referred to as “Neo-Darwinism”. In another case, the existence of the “soldier caste” in aphids (before which such a caste was known only in social insects such as termites and bees) was a major sociobiological discovery made by the entomologist Shigeyuki Aoki, in 1977. His discovery was made during his taxonomic investigation of aphids, small plant-feeding insects.

Descriptive biology not only documents the structure and morphology of organisms and related phenomena, but provides the information needed to understand their phylogenetic relationships which is necessary for classifying organisms.

Because so many animals, plants, and microorganisms remain undescribed, and even “common” organisms have not been studied closely, many important phenomena and processes of use to humans await discoverers. At the same time, organisms and their habitats are disappearing before our eyes, and opportunities for making new exciting discoveries are escaping us.

During the past century, NHBSS has continuously encouraged and supported the publication of good “descriptive science”. We will continue to publish interesting natural history observations and descriptive studies, as is evident in this issue. Who knows if the next ground-breaking and paradigm shifting discovery will come from somewhere in this region (and, I really expect it!).

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