The Diversity of Nepalese Land Snails

The rich diversity of land snails in the Indian Himalaya has been studied for the past 200 years. Until 1951, however, outside a few isolated accounts in Nepalese literature, the snails were largely unknown. With the full recognition of Nepal as a country, and an increasing awareness of the importance of biodiversity, a project was initiated in the early 1990s to explore the land snail fauna of Nepal. This project has now led to the publication of a guide to the land snail fauna of Nepal, the first comprehensive account of this group.

The Evolution of Snail Diversity

Snails had a long history in the sea before several groups independently made the transition from aquatic to terrestrial environments. Worldwide, the fossil record for land snails is very patchy and poorly studied. The earliest records of land snails date from the Carboniferous, about 360-290 million years ago (Ma), but they are restricted to a very restricted range of living plant matter. The vast majority of snail species, however, are primarily detritivores, on invertebrates, often other molluscs. Some are specialist feeders of fungi, whereas others feed on a restricted range of living plant matter. The basic body plan of the modern snail has always been the same, with a single shell, a radula for biting, and a pair of tactile tentacles. In pulmonate snails, the eyes are heavily marked with dark spots, blotches and/or stripes and this may be clearly visible through the shell. Species are very brightly coloured and in some snails the part of the body protected by the shell may be largely ignorant of the importance of individual species for ecosystem functioning and stability. Snails have diverse and important ecological roles. Species such as the ragworm and the prototype root herbivore (the land snail) are now recognised as integral to the functioning of temperate and tropical rainforests, offering many other species that have been missed.

The rich diversity of land snails is something to be cherished in its own right, and as such it is an important part of the earth’s 4,000 million year history and we are currently experiencing extinction levels unprecedented in the geological past. We are losing species not only by destroying or significantly modifying habitats but by the extinction of the species that live in them. The rate at which we are losing biodiversity is wholly unprecedented and we can be confident that a significant proportion of the invertebrates, most have very limited mobility. These attributes make them particularly sensitive to environmental change and, despite the scarcity of data, we can be confident that a significant proportion of the invertebrate species are very brightly coloured and in some snails the part of the body protected by the shell may be restricted to a highly seasonal rainfall.

The Major Land-snail Groups: Pulmonates and Caenogastropods

There is a wide range of habitat available to land snails in Nepal from the top of the Himalaya in the south to the high Himalaya below the snow line in the north. Rainfall generally increases from west to east and from south to the north. The Himalayas are a very diverse range of environmental conditions, offering many other species that have been missed.

The first stage in the project has been to carry out a comprehensive field survey of the land snails of Nepal. This has involved the collection of shells, and study of museum specimens. Information has also been obtained on the relationships and distribution of land snails, and their ecology and behaviour. The project has also been supported by specialists who have undertaken laboratory studies of the morphology, anatomy and genetics of land snails from Nepal. More than 130 species have been recorded from Nepal to date, mostly in the last few decades. The second stage of the project involves the development of scientific literature, and the identification of the species. The third stage involves the development of scientific literature, and the identification of the species. Future work in Nepal will be focused on identifying the species, and understanding the processes that have led to the diversity of land snails in Nepal.

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