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Assessing Uttarakhand's endangered plant species

Of late there has been a global resurgence in the use of traditional medicine. The raw material for this purpose mainly consists of collecting commercially important medicinal and aromatic plants from their natural habitat. The indiscriminate harvesting has led to erosion of varieties to the point of extinction. The situation is no different in the sub-alpine and alpine regions of the country. One such region that has caught the interest of scientists who found the need to estimate the population status and biomass availability of threatened medicinal and aromatic plant species (TMAPS) is in the upper Gori Valley and the Kumaon Himalaya in the State of Uttarakhand. The pharmaceutical and herbal industry uses 90% of plant species obtained from wild habitats, majority coming from such sub-alpine and alpine regions.

The over-exploitation of important plant species necessitates assessing and counting such species in order that a viable conservation policy can be formulated, especially for the Himalayan region for protecting our plants from further pillaging. While valuable species are disappearing, quantitative analysis of the number and type of species in different habitat types is lacking. Illegal trade in medicinal plants is a source of grave concern especially in the Johar and Ralam valleys of the upper catchment area of Gori river in Kumaon Himalaya in the State of Uttarakhand.

The research article by Uniyal *et al.* on **page 1246** of this issue has undertaken a study of the current status and distribution survey of

fourteen commercially exploited and threatened medicinal and aromatic plant species. The area covered by the survey comprises nine different habitat types having varying climatic conditions, altitudes and variety of flora and fauna. In addition, the distribution and population estimates depended on micro-topographical features such as availability of water, slope inclination and habitat type. Variations of population density were seen between the habitat types like moist rock, grassy slopes, meadows, etc.

Uniyal and his co-workers have, by using field methods of selection, sampling and population estimation in the study area quantitatively estimated the distribution and diversity of the fourteen medicinal herbs used in a variety of applications from nine habitat types. The density per hectare or population status of TMAPS was compared to the protected areas like the Valley of Flowers (VOF) and the Nanda Devi Biosphere Reserve (NDBR). From the findings of their study of the current status and the pressure of exploitation on a particular species, grouped under six categories, a conservation approach has been suggested for their preservation.

Nirupa Sen

Indian marine bivalves: Potential source of antiviral drugs

Being filter-feeders, bivalves accumulate microorganisms along with the food. Recent studies have shown the presence of viruses that are virulent to fishes. The penetration of these virulent viruses in the tissues

of bivalves can stimulate the production of special types of antibodies to fight against these viruses. In 2000, A. Chatterji, his Indian and Russian colleagues have demonstrated that the Indian green mussel is a rich source of antiviral drug. This extract has shown high activity, when tested with influenza virus strains such as influenza, hepatitis, RSV and herpes.

In this paper (**page 1279**), they have reported that the extracts from five other mussels, namely estuarine oyster, giant oyster, estuarine clam, black clam and mud clam also possess high antiviral activity even at the dilution of $>10^{-4}$ against influenza virus strain Type A (Mississippi) and B (Harbin).

It is heartening to note that this discovery is a product of research work of Indian scientists in collaboration with their counterparts in Russia and their entire research was supported by the governments of India and Russia.

Incidentally, K. Kathiresan of Annamalai University has a series of publications claiming the presence of antiviral activity from the extracts of several mangroves. The CAS in Marine Biology of Annamalai University has also recorded the presence of heparin in marine plants and snails. Sheriff and his colleagues in College of Fisheries, Cochin have just noted the antiviral activity in glands of sepia, a cousin of octopus. One earnestly hopes that these Indian scientists also acquire patents for their respective discoveries, and endeavour to develop suitable drugs to reduce human suffering.

T. J. Pandian