purifier. The species is fast vanishing from its natural habitat due to over-exploitation of the rhizomes. The local people collect the entire plants in bulk quantity from natural habitat and sell them to the local traders at Rs 150/kg, which is ultimately sold to traders at Rs 1500/kg in trade markets. Added to this, the host plant, V. negundo L. (‘Medhaki’ in Chitrakoot region) is also being exploited by the indigenous people and its population has also declined from the natural habitats.

A. chitrakutensis is a total root parasite and therefore, it is difficult to grow the plant using ex situ methods. However, to conserve A. chitrakutensis in herbal gardens, the roots of V. negundo with a few minute seedlings of A. chitrakutensis attached, were collected from natural habitat and planted in herbal garden. Within 20 days A. chitrakutensis started growing simultaneously with the sprouting of V. negundo plants. In the first year (2004) few plants of A. chitrakutensis were observed. However, in subsequent years (2005 and 2006) the number of plants increased (20–80 per plant) on all V. negundo plants. Thus, this critically endangered and endemic plant has been saved using ex situ methods (Figure 1).


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 Arenaria curvifolia Majumdar (Caryophyllaceae): An endangered and endemic Himalayan herb rediscovered

It is estimated that about 17,000–17,500 flowering plants grow within the Indian territory. Nearly half of this floristic diversity is contributed by the Himalaya alone sustaining about 8000 species, including more than 40% endemic elements mainly concentrated in the eastern and northwestern Himalaya.

The alpine zone of Garhwal Himalaya forming a part of western Himalaya, is comparatively poorer in endemic elements; most of the known endemic elements are newly described species. Arenaria curvifolia Majumdar, family Caryophyllaceae, is one of the endemic species of the alpine zone of Garhwal Himalaya recorded from a small area in the central part of Chamoli District. The species was described in 1980 on the basis of three old specimens collected by J. F. Duthie in 1885, housed at the Herbarium of Forest Research Institute (FRI), Dehradun (nos 3863, 3863a and 3858). Since the type collection in 1885 by Duthie, the species has not been collected from anywhere in the Himalaya, including Chamoli District and type locality. On account of its narrow geographical range (<100 sq. km) and herbarium history, it had been categorized as ‘Endangered’ in Indian Red Data Book. The species is considered among the three most threatened alpine species of Garhwal and falls under the ‘7th cell’ (restricted geographical range, narrow ecological amplitude and low anthropogenic pressure) in the eight-cell matrix for prioritization of endemics in the Himalaya suggested by Dhar.

We have been trying to locate its populations for the last 15 years in and around its type locality, which ultimately culminated in the discovery of its population on 15 August 2006 after 121 years of its type collection from an alpine slope near Kuari Pass at an altitude of 3400–3600 m asl (Figures 1–3). Few individuals at three locations were recorded. On account of its endangered status only few
pecimens were taken from the population and these were identified with the help of the original description of species and herbarium specimens housed at FRL. The identified specimens were processed according to standard taxonomic procedures and submitted at Herbarium of Botany Department, H.N.B. Garhwal University, Srinagar Garhwal (GUH). Specimens were also submitted at the Herbarium of Botanical Survey of India, Dehradun (BSD) and Central National Herbarium, BSI, Kolkata (CAL) for safe keeping.

The species was found growing on moist moss-laden rock ledges, vertically oriented moist rock faces and rock crevices in the locality. The other associated species are Anemone polyanthes, Angelica archangelica, Juncus spp., Nardostachys jatamansi, Onosma echiiodes, Polygonum numularifolium, Potentilla arbuscula,Potentilla eriocarpa, Primula reidi, Pleuroserpeum densiflorum, Stellaria sp., and members of Cyperaceae and Poaceae.

*Arenaria curvifolia* is a tuft-forming species with thicker perennial roots producing many short, perennial, horizontally spreading branches. These branches produce sub-erect or hanging annual branches bearing opposite linear lanceolate leaves and white flowers in terminal cymes. Flowers are fertile with ample seed-setting in the capsules concealed within persistent and enlarged sepals. Usually 6–8 seeds were recorded in each capsule.

The species is highly habitat-specific and not recorded in any other type of microhabitat in the area. However, its specific habitat seems helpful in its survival, usually being inaccessible and therefore avoiding grazing by domestic and wild animals. Further, the aerial shoots easily detach from underground branches by little jerk, avoiding complete uprooting of the plant. Obviously the plant cannot be removed easily from its habitat by grazing, browsing or pulling of aerial branches.

Close observations on the individuals reveal that species multiply vegetatively by detachment of daughter ramet (stoloniferous branches) from mother ramet (parent plant). Such clonal propagation is common in alpine plants. The daughter ramet may remain physically connected to the mother ramet, but is capable of surviving as a new individual whenever detached from the mother plant. Thereby, independence is not necessarily the disconnection of all physical ties, but rather a functional, which means the ramets become self-supported by roots and are fully photosynthetic. This continuation of physical connection of the daughter...
Occurrence of zygotically twin seedlings in mandarin orange plants of the northeastern Himalayan region

Polyembryony commonly occurs in citrus\textsuperscript{1}. Existence of multiple nuclellar embryos in the seeds of a particular citrus population was reported earlier\textsuperscript{2}. However, similar studies on multiple polyembryonic embryos in a seed developed through the cleavage of the original zygote or zygotic embryo\textsuperscript{3} are rare. In a natural cross-pollinated population of citrus, embryos of zygotic origin produce heterogeneous segregated population and those of nuclellar origin produce progenies identical to the mother plant. It is normally expected that from a polyeembryonic seed the zygotic embryo will produce a single seedling and multiple nuclellar embryos will produce more than one nuclellar seedling. So roguing out the off-types (zygotic) seedlings from the raised population may create true to the mother-type nuclellar progeny\textsuperscript{4}. This expectation may fail if the particular plant population has the inherent nature of producing polyzotic twins or triplets. There is no precise scientific method for identification of nuclellar and zygotic seedlings from a raised seedling population. DNA polymorphism analysis of the seedlings by RAPD and other markers could confirm the differences between them\textsuperscript{5}.

Seeds from twenty-eight mandarin orange (Citrus reticulata Blanco) plants from ten different locations of Darjeeling Hills in West Bengal, Upper and Lower Assam and West Khasi Hills in Meghalaya, northeastern Himalayan region, India were collected. Sterilized seeds were incubated in moist germinating plate and allowed for germination for 5–7 days. The germinating nuclellar and zygotic embryos were identified following the procedure standardized by Tisserat\textsuperscript{6} and their numbers were counted. The seedlings were grown in sterile soil: sand: organic matter mixture (2:1:1) for further observation. Seedlings of different origin were tested for their RAPD profiling with three primers selected from a set of 15, on the basis of reproducibility of bands and their efficiency of differentiation\textsuperscript{7}.

Occurrence of more than one embryo within a mature seed was a common phenomenon in all the 28 selected plants.

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