only the beginning. Many more years are to come. Hopefully nature will be kind to us and LHC will make discoveries.

Now what are the theoretical speculations?

Supersymmetry: An elegant idea. But if it is right we have to discover a whole new world of particles equalling our known world. Remember we took hundred years to discover the known particles starting with the electron. So, maybe, patience is required.

Technicolour: A whole new world of strong interactions! Having lived through the old strong interactions in the 50s and 60s without knowing what they are, that is not my cup of tea. But if nature had decided to repeat her tricks, who are we to refute her? There is one point that is striking. Technicolour had to be replaced by Extended Technicolour and then came Walking Technicolour. All this has to be done to take care of one phenomenological detail or the other. Are we building epicycle after epicycle?

Extra dimensions: Again we are building a whole new world of extra dimensions. It took us thousands of years to understand the four (three space plus one time)-dimensional world where we live. Now the theorists are constructing worlds with more dimensions added to the three-plus-one. Can this be done so fast? Many of the constructions in extra dimensions again remind us of Ptolemy: fitting phenomenogical details with epicycles after epicycles.

Dark matter: In contrast to all the above topics, dark matter has been already established to exist. This discovery is due to astronomers. But its nature is left to physicists to discover. Dark matter is more abundant than visible matter (about 4–5 times). Dark matter may also have all the variety and complication of visible matter, which we took 100 years to understand. So, characterizing dark matter by one or two parameters (like the relic density and the mass of the dark matter particle) may be far from the truth.

I have mentioned Ptolemy. Real progress may need a Copernicus, or at least a Copernican idea. These are deeper questions.

Our immediate situation is positive. The LHC machine and its array of detectors – ATLAS, CMS, ALICE and LHCb – are all performing beautifully. Thousands of experimenters and theorists working together are bound to discover something new.

A word about India: More young people must be brought into HEP (both experiment and theory). This is the right time since LHC has started working. Many new institutions in India are opening up and we must see that strong HEP groups are built up in most of them. India is a big country. We must think big. No small measures or small steps will do. Our agenda is to discover whole new worlds.

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Nardostachys jatamansi DC. is at risk in the Himalayan region

Nardostachys jatamansi DC. or '*jatamansi*' is a small, perennial, dwarf, rhizomatous, herb and the most primitive species within the family Valerianaceae (tribe Patrinaeae; Figure 1). This high-value medicinally active plant is distributed in the Himalayas from Pakistan, India, Nepal, Tibet and China between 3300–5000 m asl. The plant grows to a height ranging from 10 to 60 cm and has stout and long woody root stocks. But owing to overexploitation it has been listed as an endangered species.

This species is traditionally employed in the treatment of disorders, including those of the nervous, digestive, circulatory, respiratory, urinary and reproductive systems as well as skin problems. All parts of *N. jatamansi* are used and are effecitve antipyretics, antiseptics, anticonvulsants, antispasmodics, antibacterial, antipyretics, antifungals, antiemetic and analgesics. Essential oil (Spikenard oil) from the rhizome possesses useful biological activity and is used in 26 Ayurvedic preparations.

Due to overexploitation of rhizomes for medicinal and aromatic uses, habitat degradation and other biotic interferences, the species has been declared critically endangered and survival of the herbs is at risk[1–3]. Using available information, it is assumed that the causes of degradation are largely overexploitation and low regeneration in the natural habitats.

A reconnaissance done by a research team working at the High Altitude Plant Physiology Research Centre (HAPPRC) at Srinagar-Garhwal, Uttarakhand in the area, including Dayara, Hari Ki Dun, Kunwari Pass, Panwali Kantha, Tungnath, The Valley of Flowers, Bedni Bugyal, Rudranath, Madmaheshwar and others parts of the Garhwal Himalayas, reveals that only a few pockets of *N. jatamansi* are present in these regions today. In fact, the remaining intact patches are also decreasing rapidly due to invasion by several biotic and abiotic factors. Steady increase in human population, overexploitation of natural resources, extensive clearing of forests and grazing have been responsible for the loss of natural habitat. The causes of failure in regeneration include lack of

Figure 1. Naturally growing *Nardostachys jatamansi.*

seed viability, erratic seed production, unfavourable micro-sites, overgrazing by domestic livestock and increased incidences of forest fires. Despite the large number of medicinal properties, religious importance and critically endangered status, *N. jatamansi* has not received much attention regarding conservation and sustainable utilization. Now, the Government of India has imposed a ban on its mass collection or removal of planting materials for any purpose from the natural habitats.

Keeping in view its endangered status and medicinal, aromatic and ecological significance, development of *ex situ* conservation areas may help in effective conservation. Detailed studies on different aspects of its biology will be helpful as well. The work done by HAPPRC suggests that propagation and multiplication of *N. jatamansi* through biotechnological methods is not too successful and therefore, development of a large number of seedlings through conventional methods, i.e. seed germination and splitting of rhizomes is a better approach for conservation of this valuable species.

Active participation of the Forest Department and local communities residing in nearby areas could help conserve the species. By improving the living standards and sharing the benefits of conservation with the local communities, long-term conservation goals can be achieved. To improve the understanding of ecosystems and to develop a holistic description of the landscape, both intensive studies on small areas and assessment of much larger areas are required. Serious effort is required to raise public awareness about the economic and ecological significance of the species and expand studies on development of efficient conservation methods. Long-term preservation of germplasm for further studies on different aspects of biology is also required. The National Medicinal Plant Board, Government of India, has been providing encouragement to carry out conservation programmes for this valuable species in the Indian Himalayan region.

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Does the tiny mite matter? Revisiting invasive pest problem under global climate change scenario

Red Palm Mite (RPM), *Raoiella indica* Hirst (Arachnida: Acari: Tenuipalpidae) is a pest of coconut, arecanut, date palm and many other ornamental as well as commercial palm species. The mites establish colonies on the under sides of leaves (Figure 1), usually along the midrib and feed on cellular contents of the leaves accessed through the leaf stomata. Feeding causes localized yellowing of the leaves followed by tissue necrosis. Symptoms on coconut leaflets start as small yellow spots on the abaxial leaflet surface, which develop into larger chlorotic spots.

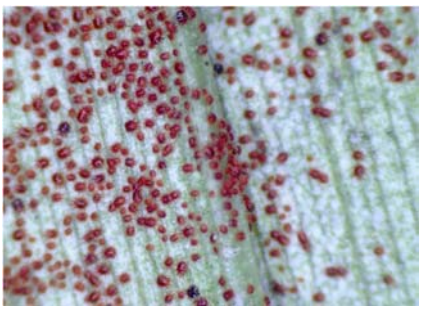

Figure 1. Red palm mite (RPM) colony on the under surface of a coconut leaflet.

The mite was first reported from Tamil Nadu, India about eight decades ago[1]. It attained economic significance when it was first reported as an invasive species in the Caribbean[2]. Later, the mite has spread widely throughout the Caribbean islands and has now been reported in Florida[3], Venezuela[4], Mexico[5], Brazil[6] and Colombia[7].

RPM has a wide host range in New World than the Old World. In India, infestation has been reported on arecanut and coconut[8,9]. The host list of RPM is extensive; according to the literature, prior to its introduction in the Caribbean, the mite was reported on *Areca catechu* and *Cocos nucifera* in India, Mauritius and Sri Lanka. Infestations on date palms (*Phoenix* sp.) have also been reported across the Middle East[10]. In the invasive range, the hosts reported for RPM include members of the families Musaceae, Heliconiaceae, Zingiberaceae and Strelitziaceae. Numerous hosts of the family Arecaceae are also reported, including those reported in the Old World[7]. Since the introduction of the mite, more than 60 host plants were recorded from the Caribbean region alone.

In Kerala, a collaborative research programme by the Kerala Forest Research Institute and CABI-Europe, UK is ongoing to trace the population dynamics and the host range of the mite and its natural enemy complex. Growing concern about the pest is due to its rapid range expansion in subtropical regions and its possible invasion to other regions of the western hemisphere (Figure 2). It seems that tropical and subtropical countries are prone to attack and till date, the mite has been recorded from 35 countries. In many countries like the Dominican Republic, Guadeloupe, Puerto Rico, Saint Martin, Trinidad and Tobago, the US Virgin Islands, Granada, Haiti and Jamaica, the pest is considered as invasive and has a large impact on agriculture and biodiversity. Though this mite was treated as a