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a function of the fluid velocity. The rate of electrical energy generated being the product of current and voltage, it is a very small fraction of a nano watt, in this case, since the current, although not mentioned in the report, is a small fraction of a nano-amperes. Such a source can, at best, power a sensor. Unfortunately, media (national newspapers, and prominent magazines such as India Today, etc.) splashed the news of this DST-pronounced hype of a new source of energy. These reports were taken so seriously by some scientific officers in the Ministry of Non-Conventional Energy Sources (MNES) that the use of carbon nanotubes for generation of a usable source of energy was proposed as a new thrust area. Being a member of the R&D committee of MNES, I had the proposal rejected.

It should be pointed out that reports of voltages in the range of microvolts generated by pumping water through porous glass by Larry Kostiuk of the University of Alberta, Canada (Science Reporter, CSIR, December 2003) have also appeared in the scientific literature. The electric current so obtained is stated by the investigators to be very small. The generation of some voltage by rubbing a glass (and several other materials) surface is a well-known phenomenon. One can also create a voltage difference by rubbing differentially or by passing a stream of dry air over the surface of a variety of insulating or semi-insulating surfaces. Along similar lines, some years ago, MNES received a research proposal, strongly recommended by a Minister of the Govt of India, for generation of useful electrical energy by pumping dry sand over an appropriate surface. I reviewed the proposal and recommended its rejection.

As to the origin of this fraction of nano-energy, thermoelectric power created by the difference in the temperature across a suitable surface by a gas flowing under Bernoulli pressure difference conditions is a possibility, as has been pointed out by Bhattacharya. In such a case, the observed voltage should depend on the square of the gas velocity. Further, the role of surface electrostatic charges generated by friction or by a desorption process, as also pointed out by Kostiuk, cannot be ruled out. Some simple experiments should be able to sort out the origin(s) of the observed voltage so that the observed nano-energy finds an appropriate place in the scientific literature.


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Mass mortality of livestock in the high altitude areas of western Himalaya

Pastoralism has been a mode of livelihood for villagers dwelling in the high altitude areas of Himalaya. Limited agricultural land, severe climatic conditions and seasonal availability of resources have been the main reasons for migration of pastoral communities from one place to another. Gaddis, Bhangalis and Gugars represent some of the pastoral communities of the western Himalaya. Bara Bhangal area of Himachal Pradesh (HP) lying in the western Himalaya has been an age-old summer grazing ground for these communities and is seasonally visited by them along with their sheep and goats. From June to September, the pastoralists use the resources of the alpine pasture (above 3500 m) of Bara Bhangal and in October they start their return journey of Bir, Baijnath, Barot and Billing areas of HP that are located at comparatively lower altitudes (1800 m). Their movement patterns from one place to another are guided by their traditional practices and local knowledge.

At times they have to brave the vagaries of inclement weather. Recently in the first week of October, unprecedented heavy snowfall in the Bara Bhangal area has left many families shocked and dejected as the graziers while returning to their winter grazing areas were trapped in about 1 m deep snowfall. In the snow clad surrounding the livestock had nothing to eat except the vegetation or plants that were protruding out of the snow. Consequently, more than 3500 sheep and goats died in the area and a large number of them are still ailing. It was soon realized that the livestock had died of consuming leaves of a plant that is locally referred to as ‘kashmiri patta’. This was the only plant that could be seen coming out of the snow during that time.

In order to ascertain the identity, the plant sample was brought to the herbarium of the Institute of Himalayan Bioresource Technology, Palampur. It was identified as Rhododendron campanulatum D. Don (Figure 1). The plant belongs to the family Ericaceae and is one of the most common plants found in the high altitudes of the Himalaya. Rhododendrons have 72 species in India and their diversity in the eastern Himalaya (71 species) is par excellence. Out of the total 72 species, 61 are found in Arunachal Pradesh alone. In order to protect the high species diversity amongst them, a Rhododendron sanctuary has been established in the north-east. As compared to eastern Himalaya, the western Himalaya has only 8 species. These species are well distributed from lower (1800 m) to higher altitudes (4500 m). The lower altitude forests are dominated by R. arboreum while at higher altitudes (above 3000 m) R. campanulatum dominates the

![Rhododendron campanulatum in flowering.](image)
vegetation and is an important element of the krumholz zone, both in the eastern and the western Himalaya. The plant is well adapted to the harsh climatic conditions of the high altitudes where high wind velocity and heavy snowfall are a common phenomenon. Due to these adverse climatic conditions, R. campanulatum has a crooked and bent stem, and therefore it rarely attains a height of about 5 m. It forms dense thickets and is one of the most important fuelwood species of the alpine region. It has also been reported to be locally used as a medicine for curing various diseases of humans. Moreover, contrary to mortality of livestock as a result of consuming it, R. campanulatum forms an important component of the diet of the endangered musk deer, Moschus chrysogaster.

R. campanulatum has been mentioned to be poisonous to livestock as it contains a toxic substance closely resembling a-tronremodotoxin in its chemical and pharmacological properties. However, such large scale mortality of livestock has not been reported earlier. Many other species of Rhododendrons such as R. arboreum, R. cinnabarimum, R. dalhousiae, R. setosum and R. thomsonii have also been reported to be poisonous. Thus the genus Rhododendron with such vast species diversity, large number of traditional uses and of such common occurrence provides an ideal group of plants for detailed research especially on its chemical constituents during different seasons and phenological stages.


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Status of the loggerhead turtle in India

According to sea turtle literature from India and Indian Ocean area, of the world’s seven species of sea turtles, five are known to inhabit Indian coastal waters, its Bay Islands, Lakshadweep, etc. Except for the loggerhead turtle (Caretta caretta), the remaining four species nest along the Indian coastline. All these five species are legally protected under the Indian Wild Life (Protection) Act, 1972, and included in Appendix I of the CITES (Convention on International Trade of Endangered Flora and Fauna). Although the major nesting site of the loggerhead turtle is in the north-west Indian Ocean, this species was only occasionally recorded in these waters. Except for the few observations of loggerheads in the Gulf of Mannar (GOM) between India and Sri Lanka, Caretta caretta seems conspicuously absent from the northern Indian Ocean. Nesting apparently occurs in Sri Lanka, but Caretta does not nest along Indian shores despite claims to the contrary. Also, there is a curious discrepancy between the nesting seasons reported suggesting that confusion exists in the identification of the species. The most widely quoted reference in any turtle publication from India relies on the occurrence of loggerhead turtles in Indian coastal water based on a cross reference and is based on secondary information from fishermen of GoM. The records on tetrapod reptiles of Ceylon mentioned loggerhead occurrence in the GoM. However, there was no information on the Indian part of GoM. Similarly, although Caretta caretta was stated to occur in the Andaman Islands, the survey by Satish Bhaskar did not record this species in any of the islands of Andaman and Nicobar. There is no record of juvenile or sub-adult loggerhead turtle anywhere along the coast. Yet, in many natural history documentaries, the loggerhead turtle is misidentified and named as Caretta olivacea. There was a description of the Indo-Pacific red-brown loggerheads as Chelonia gigas to distinguish them from the Atlantic red-brown loggerheads (Caretta caretta) and the olive brown loggerhead (i.e. ridleys), which was also placed within the genus Caretta. Over the last two centuries (since the loggerhead was described by Linnaeus, 1758), more than 35 names have been applied to this species. The misidentification of sea turtle species is common throughout the world and particularly between the loggerhead and the olive ridley. There is ample literature on misidentification between Caretta caretta and Lepidochelys olivacea. For example

A nesting female loggerhead turtle at Masirah Island, Oman, Indian Ocean. Photograph by Blair Whittington.