is grey overall, with a striking red head. It has a long pointed bill in pale grey tint. Its eyes are generally brown and, at times, orange. It has long legs that are pinkish-red. Both male and female are similar, but the male is slightly larger than the female.

A 'vulnerable' bird as designated by the International Union for Conservation of Nature (IUCN) Red List data, the Sarus Crane has a total world population of about 20,000 individuals. In India, about 9,000 individuals are believed to exist. Besides India, it is found in Pakistan, Vietnam, Myanmar, Nepal, Cambodia and parts of Australia.

The Sarus Crane inhabits open grasslands, marshes, ponds, canals, sandy riverbanks and agricultural fields. Being omnivorous, it feeds on a variety of vegetable matter like seeds, grains and shoots of grasses and animal matter like molluscs, amphibians, insects and frogs. In India, the peak breeding season of the Sarus Crane is from July to October; however, if the conditions are suitable, it can breed anytime during the year. It builds its nest preferably on the bund in the middle of swamps, paddy field, etc. using vegetation such as reeds, straw and rushes.

Not just Sarus cranes, but several other birds, aquatic species and mammals inhabit Narora. The Narora region, including the exclusion zone of the nuclear power plant, is home to a large variety of wildlife. A recent study reveals that about 1,300 individuals of Indian Peafowl exist inside the exclusion zone. Besides, crocodiles, turtles, a variety of fishes, blue bulls, rabbits, foxes, butterflies, etc. are also the part of the wildlife present here. About 200 species of birds – both resident and migratory – are seen here during peak winter. A variety of ducks and several shore birds migrate to Narora every year. At least ten threatened species of birds can be spotted here. Because of the presence of diverse wildlife, Narora has been conferred the status of 'Important Bird Area'. The wetlands of Narora are internationally important and, indeed, the site has been declared a Ramsar site.

As the day set off, the sky became bright and the sun was in its full glory. The parent cranes soon flew away in search of food, leaving the child alone in the exclusion zone, which they felt was the safest place. It is the place where they stroll fearlessly, fly cheerfully and live peacefully. After all, it is the cranes' castle!

J. DEVAPRAKASH

Nuclear Power Corporation of India Limited,
Vikram Sarabhai Bhavan,
9-N-20, Anusakthi Nagar,
Mumbai 400 094, India
e-mail: devaprakash.jinadoss@gmail.com

Incidence of sandal spike symptoms in a one-year-old plantation in Karnataka

Santalum album Linn. (sandalwood) is a highly valued tree in India. The heartwood is extensively used for carving, a traditional art in Karnataka, Tamil Nadu (TN) and Kerala and the sandalwood oil is used in perfumery and pharmaceutical industries. The use of sandalwood in religious ceremonies and rituals dates back to several centuries. The plant is predominantly distributed in southern part of Karnataka and northern part of TN[1]. In these two states, due to stringent monopolistic rules, sandalwood tree was declared as Government property till recently. For long sandalwood was not cultivated and the natural population has also dwindled due to extensive illegal felling and smuggling. Therefore sandalwood was placed under the 'Vulnerable' category by the International Union for Conservation of Nature in 1997. Consequently, the governments of Karnataka and TN retracted the monopolistic policy in 2001 and 2002 respectively, and liberalized the policy for sandalwood cultivation and harvest by individual entrepreneurs and corporate bodies.

One biologically interesting fact is that sandalwood is a hemiparasite both at seedling stage and all through its life and therefore needs a perennial host plant. Sandalwood tree is highly susceptible to sandal spike disease caused by phytoplasma (earlier called mycoplasma-like organism, phytoplasmas are specialized bacteria that are obligate parasites of plant phloem tissue and transmitted through insects which eventually leads to the death of the tree, whereas Mycoplasmas are restricted to vertebrate hosts[2]). With the increased cultivation of sandalwood plantations, it is essential to review the status of sandal spike disease and its occurrence. During the survey of a one-year-old sandalwood plantation in Hagalwadi village, Gubbi taluk, Tumkur district, Karnataka, we noticed that young plants showed symptoms of the sandal spike-like disease. The plantation was established during August 2011 in an area of 1.9 ha. The plantation area was divided into two parts of 1.2 ha (plot A) and 0.70 ha (plot B) with a spacing of 4 m × 3 m and cowpea (*Vigna unguiculata*) as the intermediate host. Infestation was found only in plot B and none of the sandalwood plants was infected in plot A. It was observed that the leaves started shrinking by January–February 2012 and by May 160 out of 350 plants were completely infected. The infected sandalwood plants had all the typical symptoms of sandal spike disease such as little leaf, stunted height with reduced growth, malformation of laminae (reminiscent of mango malformation or phyllody occurring in inflorescence of plants either due to phytoplasma infestation or as a result of zinc deficiency) and the affected leaves having a spike-like appearance (Figure 1 *b–d*) compared with normal healthy sandalwood plant (Figure 1 *a*). It was noticed that plot B had been invaded by a common weed *Stachytarpheta indica* also showing symptoms as mentioned above. All the infected sandalwood plants have been uprooted to prevent further spread of the disease. Occurrence of spike disease symptoms might have been reported in young sandalwood seedlings in the forest area[3]. However, manifestation of spike disease symptoms being observed in a plantation has not been reported earlier. Further studies are being carried out to understand the vector–host and vector–pathogen interactions. It is suggested that

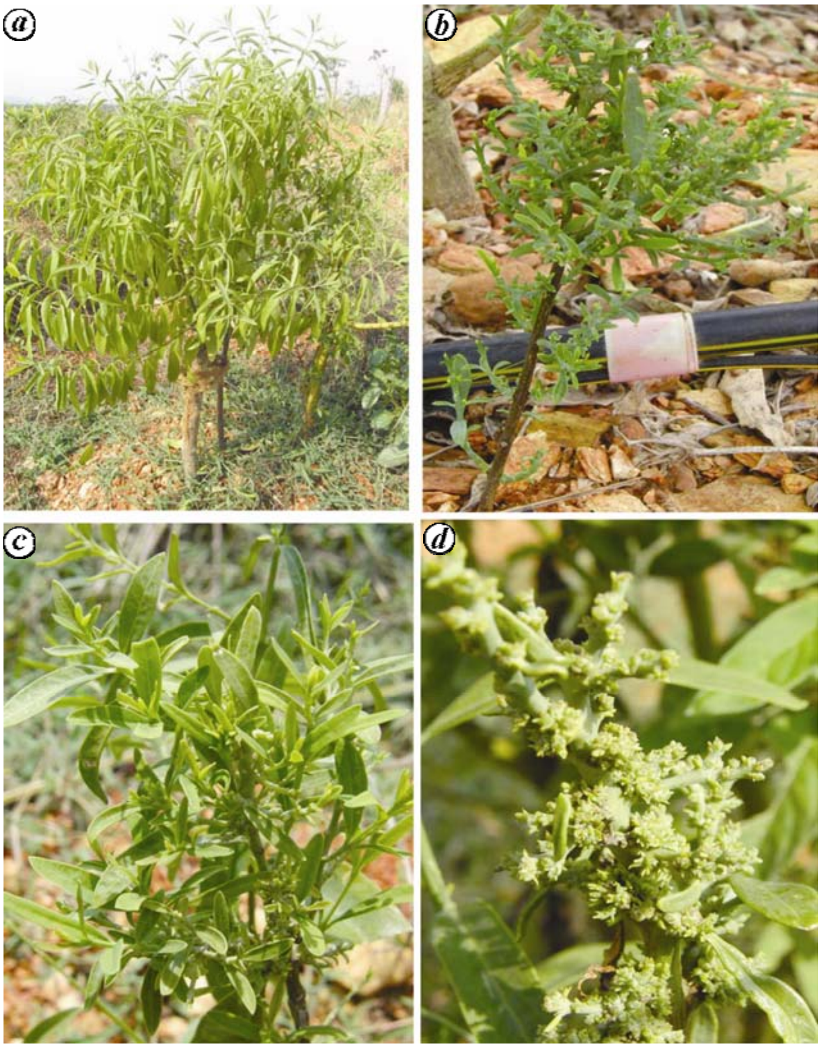

Figure 1. ***a***, Normal sandalwood seedling. ***b***, Severely infected sandalwood seedling (black structure in the background is the pipe used for drip irrigation). ***c***, Portion of the stem in which the disease has gradually spread. ***d***, Stem showing characteristic little leaf-like appearance.

plantations have to be managed and monitored by regular weeding and also preventing any growth of collateral hosts that may be a source of sandal spike infestation. As spike disease can infect sandalwood during any stage of its growth[4], practices to protect the plantation from sandal spike disease should be given priority. A clear understanding would ensure survival of the planted materials and assure anticipated yield to the growers and the stakeholders.

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A. N. ARUN KUMAR*
GEETA JOSHI

Institute of Wood Science and Technology,
18th Cross, Malleswaram,
Bangalore 560 003, India
**e-mail: anarunkumar@gmail.com*

Soil carbon sequestration through mulberry based agro-forestry system in temperate region

Temperate climatic condition of Kashmir is well suited for bivoltine sericulture. The sericulture in Kashmir valley sustains on tree type of mulberry. These plants are available on roadside (Figure 1), river bund and the borders of agricultural fields as they can grow under diverse climatic conditions[1]. The present trend is towards establishing intensive tree type of mulberry plantations, which will serve as a source of leaf for the rearers and will have positive effect on the environment. Soil is an important factor for successful adoption of mulberry cultivation, which determines the quality of leaf, thus in turn affecting the quality of silk produced. More so, continuous use and dependence on chemical inputs also adversely affect soil health. Therefore, refinement is needed to define greener ways to improve soil health and minimize the usage of chemical fertilizers[2]. Planting trees will have a positive impact on the ecosystem. Temperate fruit trees serve as effective carbon pools[3]. Mulberry presents alluring prospects in terms of soil carbon sequestration. The plant lives up to 45–50 years. It can be grown under any set of environment and soil. The plant can be vegetatively propagated, is hardy and biomass production is high. The leaves left after silkworm rearing are returned back to the soil in autumn, thereby returning the nutrients back into the soil. Improved soil management practices could offset a quarter of global emissions from fossil fuel use. In the present scenario, we need to urgently take steps to increase adaptive