The other side of Albert Einstein

The editorial by Balaram[1] reminds the readers that Albert Einstein (1879–1955) is well-known as a theoretical physicist. It will be of interest to note that Einstein did high-quality experimental work too. For instance, in 1915 Einstein and the Dutch physicist, Wander J. de Haas (1878–1960) experimentally proved that magnetism is due to the motion of the electrons. The apparatus used by them is shown in Figure 1.

Figure 1. A replica of the Einstein–de Haas apparatus (courtesy: W. Engels, University of Oldenburg, Germany; http://www.histodid.uni-oldenburg.de/22205.html, accessed on 27 July 2010).

Between 1926 and 1928 Einstein with his colleagues sent 13 applications to patent their inventions. In eight cases they got patents. For instance, Einstein and his Hungarian colleague, Leo Szilard (1898–1964) developed a refrigerator (Figure 2). It was built by the firm Citogel (Hamburg) and presented at the Leipzig Exhibition 1928–1929. Being too heavy (350 kg), the product did not sell well (http://www.presse.uni-oldenburg.de/mit/2005/363.html, accessed on 24 July 2010).

Figure 2. A replica of the Einstein–Szilard refrigerator (courtesy: F. Riess and W. Engels, University of Oldenburg, Germany).

1. Balaram, P., *Curr. Sci.*, 2010, **99**, 149–150.

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Exotic weeds in Tadoba–Andhari Tiger Reserve

Tadoba–Andhari Tiger Reserve is located in Chandrapur district in Vidharba region of eastern Maharashtra, 142 km south east of Nagpur and 45 km north of Chandrapur. It became a national park in 1955 and was notified in 1986. It was declared as a tiger reserve in 1995. There are six villages inside the reserve and numerous villages surrounding the park. The reserve contains some of the best forest tracks, rich in biodiversity. The area of the reserve is 625.40 sq. km, that includes Tadoba National Park created in 1955, with an area of 116.55 sq. km and Andhari Wildlife Sanctuary created in 1986, with an area of 508.85 sq. km. Vegetation in the reserve is a southern tropical dry deciduous forests of Deccan Peninsula. There are teak forests with bamboo thickets and other indigenous trees like *Tectona grandis*, *Pterocarpus marsupium*, *Terminalia alata*, *Lannea coromandelica*, *Sterculia urens*, *Haldinia cordifolia*, *Madhuca indica*, *Diospyros melanoxylon*, *Syzigium cumini* and *Dendorcalamus stricuts*. Animals found in the reserve are tiger, leopard, sloth bear,

Figure 1. *Celosia argentea* and *Leonotis nepetiifolia* near Kathoda gate in the core area of Tadoba–Andhari Tiger Reserve.

gaur or Indian bison, rusty spotted cat, Indian mouse deer, spotted deer, sambar, wild boar, four horned antelope, wild dog, flying squirrel, etc.

Invasion of *Hyptis suaveolens* (native to Tropical America), *Celosia argentea* (Tropical Africa) and *Leonotis nepetiifolia* (Tropical Africa)[1] was noticed in the core areas of the reserve during our field visit. Major infested areas are Talab area, abandoned crocodile breeding centre, Jamoon bodi, Kathoda gate and Thelia water body. Red soil (*morrum*) excavated from the areas – used to lay the internal clay roads in the reserve – contains seeds of these exotic weeds. *Alternanthera tenella* (native to Tropical America) is intruded into the buffer zone of the reserve. Among the exotic weeds invaded, *Hyptis suaveolens* is an obnoxious weed. It has invaded the core areas of the tiger habitats of the neighbouring Andhra Pradesh, displaced the native flora leading to unavailability of food to the herbivores and has altered the food web of the tiger[2]. Heavy vehicular traffic on Chandrapur road and coal mining activities around the tiger reserve also facilitate the transportation of these exotic weeds. Infestation will lead to further deterioration of the vegetation in the reserve and become detrimental to the herbivores, ultimately affecting the prey availability of the tiger. Thus, these weeds alter the food web of the top predator, tiger. Biological invasion may be considered a form of biological pollution and a significant component of human-caused global environmental change (biotic interference). The invasion of alien species is recognized as a primary cause of global biodiversity loss. The Convention on Biological Diversity, 1992 visualizes 'biological invasion of alien species as the second worst threat after habitat destruction'[3]. It is time to pay attention to the ecological impact of invasive aliens both at the species and at the ecosystem levels[4]. We need to maintain the existing wildlife reserves and bring more areas under such reserves and protect them. Protected areas play a pivotal role in ameliorating the environmental and ecological degradation brought about by excessive biotic interference and illicit felling. Tiger is considered an indication of a rich and healthy forest ecosystem. If proper measures are not taken in this regard, the awe and grandeur of the Tadoba Tiger Reserve will be lost. Better planning and monitoring systems are needed for early detection and control of infestations, and spread of new and naturalized weeds, particularly in the tiger reserves to check further colonization of the exotic weeds.

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