

and now occurs in Central America (Haiti and Honduras), South Africa, South America (Chile, Colombia and Uruguay), Asia (Republic of Korea and Japan) and southern Europe. Spain was the first European country where the disease was detected over ten years ago; more recently the pathogen has become established in Portugal and has also been reported in France and Italy. In adult trees the most common symptom of pitch canker is gumming of resin from cankers on the trunk, terminals or main branches. The pathogen also causes damping-off, shoot die-back and death of seedlings in nurseries. The pathogen has been reported as seedborne and can survive both superficially and internally within seeds, causing high seedling mortality rates. Until now *F. circinatum* is exclusively a pine species pathogen, although other host tree species such as *Pseudotsuga menziesii* were found susceptible to the pathogen. At least 57 species of *Pinus* are known to be susceptible to pitch canker. At present there are no means of managing the disease in adult trees in forests or plantations.

What Makes a Biosphere Reserve Successful? Local and International Insights

Lihi Golan, Daniel Orenstein and Pnina Plaut

Faculty of Architecture and Town Planning, Technion – Israel Institute of Technology
lihigol@gmail.com

Biosphere Reserves (BR) are designed to deal with one of the most important issues facing the world today: how do we reconcile biodiversity and natural resource conservation, while allowing their sustainable use? (UNESCO 1995, Ishwaran & Persic 2008). BRs are sites, designated by UNESCO's Man and Biosphere program, with spatial, social and administrative components. The BR concept was developed over the past four decades parallel to the development of the concept of sustainability and the emerging realization regarding the importance of biological and cultural diversity. In recent decades, conservation paradigms have been changing. One particular change is the realization that in order to preserve environmental resources, they shouldn't be "protected" from the people who live around them, but rather people should have an inherent part in managing them. BRs are one of the prominent models reflecting this paradigm shift (Price 1996). However, despite decades of experience, BR success in achieving their objectives is ambiguous, and many of them (including in Israel) only bear the "label" of the BR, and do not realize the model's potential in practice (Coetzer et al. 2014, Ishwaran 2012).

This paper reviews different perception of "success" in BRs, asking: what are the various opinions regarding how a BR should function? For this purpose, we examine how different sources measure success in BRs, including (1) UNESCO, (2) the academic literature and (3) 21 stakeholders and professionals in Israel. The findings show that there is some similarity in how success is defined and measured, though each source has unique emphases. Nonetheless, there seems to be a general consensus around operational indicators such as public participation and normative objectives such as environmental benefits. Nonetheless, not all of the Israeli stakeholders and professionals see social and economic benefits as a measure of success in BRs. This suggests that although the BR model is designed to promote development and conservation, it is still perceived by most respondents as a conservation centered model, rather than as a tool for social and economic development.

Bisphenol-A Removal by Constructed Wetland Plants

Eran Benyamini¹, Regina Borukhov-Sharapov¹, Itzhak Bilkis² and Elisha Tel-Or¹

¹ The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem

² Institute of Biochemistry, Food Science and Nutrition, Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem
elisha.telor@mail.huji.ac.il

Bisphenol-A (BPA) is a toxic pollutant used in the plastics industry and discharged into the environment.

This study tested optional removal of BPA by wetland plants. *Cyperus articulatus* and *Juncus acutus* were selected from a wetland system and the experiments were conducted in a hydroponic system.

Cyperus articulatus was most effective in BPA removal. At concentrations of 200 ppb removal took place within one day and high concentrations of BPA up to 10 ppm were removed within one to four days. The main breakdown product of BPA was 3-OH-BPA which is 10 times less toxic than the original pollutant.

We also identified the bacteria *Bacillus megaterium* associated with the roots of *Cyperus articulatus* and this bacterium was effective in BPA removal.

Altogether, *Cyperus articulatus* is a most effective candidate for BPA removal in hydroponic system and wetlands.

The Effectiveness of Forests in Semi-Arid Regions in Reducing Air Pollution During Dust Storms

Daphna Uni and Itzhak Katra

Department of Geography and Environmental Development,
Ben-Gurion University of the Negev
katra@bgu.ac.il

Dust storms are a major source of global atmospheric particulate matter (PM) and air pollution. During dust storms, PM₁₀ (particulate matter that is less than 10 micrometers in diameter) concentrations can reach 2000 µg/m³, high levels which exceed the World Health Organization (WHO) guidelines for air quality. The objective of this study was to study the effect of forests in a semi-arid zone on air pollution during dust events. Atmospheric PM concentrations were measured during dust storms and non-dust days (a background period) in a forest transect (Lahav, Northern Negev, Israel), including populated environments near the forest (Kibbutz Lahav) and at a more distant location (Lakiya). During a background period, without dust events, the forest and its surrounding areas were characterized by lower monthly average PM concentrations (38 µg/m³) compared with areas that are not influenced by the forest (54 µg/m³). Such a difference can be significant for human health in long-term exposure. A reduction in PM concentrations in the forest was also recorded during dust storms, depending on the storm intensity and the locations of the shielded areas. Significant reduction was recorded in Kibbutz Lahav during western storms, in which the Kibbutz is on the leeward side of the forest. In these storms, lower PM levels were recorded even in the windward area (exposed to winds) of the forest compared with Lakiya. Dust particles that were deposited on the foliage were analyzed in the lab. The total dust deposit on the foliage was found to be 8.1–9.2 g/m², which is equal to a minimum of 418 tons removed from the atmosphere by the foliage area of Lahav forest. The relative amount of PM₁₀ from the total dust was 41.7–60.2%. The results show the role of forests in reducing atmospheric PM during dust storms, thus contributing to a better air quality in the forest and its surrounding areas. This highlights an ecological service of forests, which provides support for environmental development plans for in regions that are exposed to potential risks of air pollution due to land use and/or climate changes.