

Tree Diversity and Human Health

Mother Nature's Moment - January 2021

by: Lesley Bruce Smith, ISA Certified Arborist

A decade ago when we were first visiting our daughter's-in-law family home in the mountains of Austria we had the privilege of witnessing life on a European farm first hand. While there we watched her young cousins on the mountain *alm*¹ playing, half naked in the pond where the pigs were bathing too. It was one of the first of many real life lessons, since, on the value of biodiversity, and the role of microbes in developing our human immune systems.

It seems counterintuitive, but research is continually affirming that not only is biodiversity in our landscapes good for our trees (Raupp et al. 2006), but it is showing that it is vitally important for human health as well. Many of us that were raised in suburban environments, especially now in the middle of the COVID-19 outbreak, often think exposure to bacteria and microbes is a terrible thing. The exact opposite is actually true. (Geoffrey H. Donovan 2020) Of course, exposure to some bacteria can cause disease, but now we know that the human immune system, in order to develop properly, must be exposed to certain types of bacteria. The good bacteria tend not to cause disease but rather are the ones we now refer to as "friendly bacteria", the bacteria that we have evolved with for millennia. Surprisingly in our bodies we have a 1.3:1 ratio of bacteria to body cells (Alison Abbott 08 January 2016, Nature). Without bacteria in our life and in our bodies and on our bodies, we would be dead.

The exciting news, for us as arborists who have been preaching about the importance of diversity in our landscape plants, is the recent research by Geoffrey H. Donovan that shows that species diversification in our urban forests contribute to human health. ***The earth's forests, both urban and wild, are a vital habitat for microbes***, and sadly, as global plant diversity has declined, so rates of immune diseases have risen. Donovan has now conclusively shown that plant diversity actually protects against immune related diseases. His research looked specifically at asthma and lymphoblastic leukemia² (both of which are immune diseases) and their correlation between diversity of trees and plants around us. What Donovan's research shows is that biodiversity in the plants around us reduce the incidence of asthma and childhood leukemia, due to the increase of microbes.





Prairie remnant in our back yard filled with bio-diversity in the form of native plants and trees that attract birds, bacteria and butterflies.

All of this to say that each of us has an opportunity to promote more diverse and natural landscapes in the urban (suburban) environment to insure the future of our health, especially among those most vulnerable, our children. Further research is needed to determine which microbes promote the greatest immune benefit and then determine which plants support those microbes. However, it doesn't take a PhD to observe that what is good for our macro-environment, the trees and birds and mammal populations, is good for us too. As I mentioned in last month's newsletter about *Sustainable Landscapes*, we can take steps towards a more healthy landscape by simply raising our awareness of the benefits of diversity and acting on that awareness. That includes things like: planting natives whenever possible, not using pesticides, protecting water sources on our property.

Healing Gardens are now accepted as an evidence-based component of many health care facilities, just as Pine grove plantings were once an often specified part of hospital



Children in the natural environment
boosting their immune systems

grounds for the beneficial effects of their aromatics in the healing process. Donovan suggests that perhaps "immune gardens will also become a normal part of a city's infrastructure". (Geoffrey H. Donovan 2020)

Intuitively we have always known that trees are healing. Each year we are learning more and more about the power of the trees and plants to heal us, and the science behind it. This knowledge is not really new, but it seems we are slow to learn. In the 1870's, one physician in New York City argued for planting trees to promote public health, specifically to "equalize the temperature" in the city after noting the correlation between highest average weekly temperatures and deaths among children from "diarrheal diseases" (Jenny Rogers, Nature Conservancy 2019).

Let's face it, we all know that we feel better when we are in the company of trees.

¹⁻ **Alm** is the German word for summer farming pasture in the mountains

²⁻ 1 in 12 people in the US have asthma (Moorman et al. 2011) and childhood acute lymphoblastic leukemia, the most common pediatric cancer, affects 1 in 2000 children in the US (Linabery and Ross 2008)