



Contact with nature can reduce the risk of allergies

Loss of biodiversity may be connected to the rising incidence of allergies and other chronic inflammatory diseases, such as asthma, in people living in urban areas, according to recent research. Contact with the natural environment appears to be good for health, not only for a feeling of wellbeing, but also for boosting the human immune system.

Previous studies have suggested that certain types of bacteria living on human skin can make people less sensitive to allergens. Exposure to allergens, such as pollen and animal dander (small fragments of dead animal skin) can trigger allergic reactions in sensitive people.

This study, partly conducted under the EU MeDALL project¹, involved 118 randomly selected teenage participants from eastern Finland. The participants were screened to identify those who were and were not sensitive to a range of allergens. In addition, skin swabs were taken from all the participants to identify which bacteria were living on their skin. The environment surrounding the homes of the participants was recorded, including the identification of common and uncommon plant species in their backyard.

Participants who lived on farms or near forests had a different composition of bacteria on their skins and were less sensitive to allergens than those who had less contact with the natural environment and were living in built-up areas or near lakes and other water bodies. This study thus suggests that contact with biodiversity and the natural environment, including some types of bacteria and other microbes, can protect people from becoming sensitised to allergens, by building up the human immune system.

In particular, the sensitivity of participants to allergens appeared to be linked to diversity of plants around the home. The surroundings of healthy participants contained 25% more uncommon native flowering plants than the surroundings of allergen-sensitive participants. This was the case even after taking into account the effect of other possible triggers of allergies, such as a family member smoking, or contact with pets, was taken into account.

Healthy teenagers had a greater diversity of one group of bacteria, namely gammaproteobacteria, on their skin than teenagers who were more sensitive to allergens. In addition, among healthy teenagers, the abundance of certain gammaproteobacteria, *Acinetobacter*, on the skin was positively associated with the level of an important anti-inflammatory signalling molecule, interleukin-10, in the blood.

These results imply that having a diverse range of gammaproteobacteria species on the skin offered increased immunity to the effect of allergens. Gammaproteobacteria are found in the environment, such as in the soil, on plant surfaces, on grass pollen, and on dust, and may be more diverse in the natural environment than in the urban environment.

More and more people around the world are living in cities and experiencing little contact with nature. This is significant for public health, as this study has found that contact with the rich biodiversity found in the natural environment, especially groups of environmental bacteria, is related to the presence of beneficial protective bacteria on human skin and consequently with the human sensitivity to allergens.

1. MeDALL- Mechanisms of the Development of ALLergy is supported by the European Commission under the Seventh Framework Programme. See: <http://medall-fp7.eu/>

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