Projet de Fin d'Etudes

Advances in relationship between plants and sound waves: possible innovative applications.

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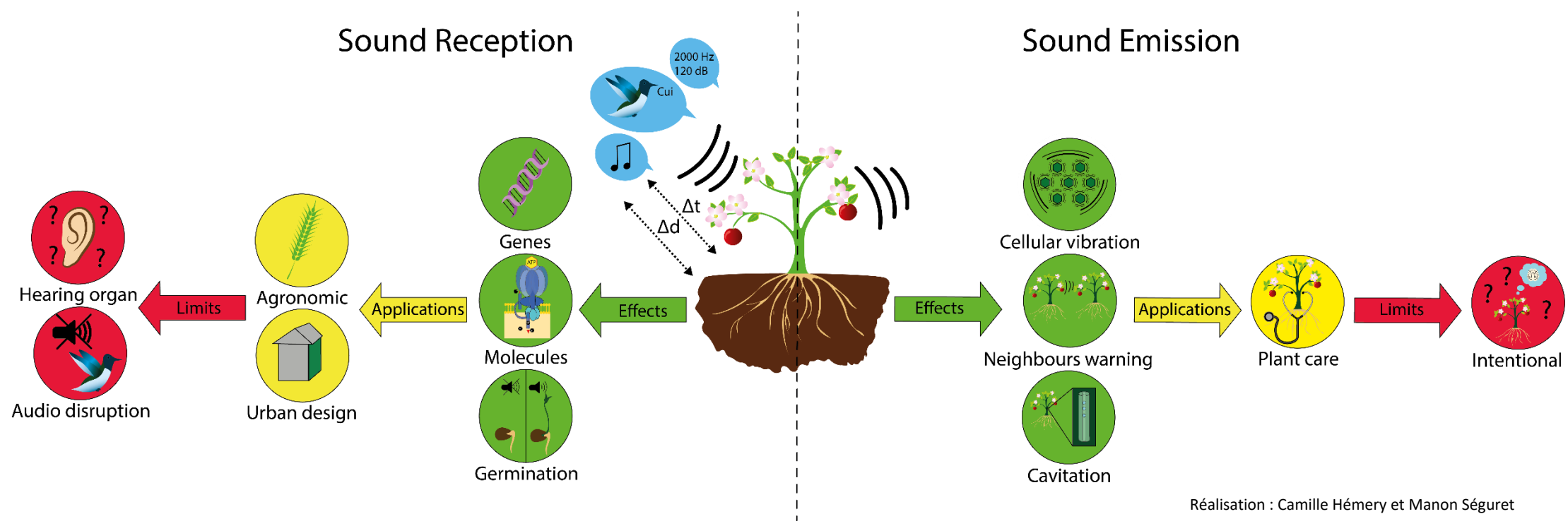
Graphical Abstract



Réalisation : Camille Hémery et Manon Séguret

Highlight

- Plants responded to environmental sound waves.
- Scientists are looking for a sound reception organ, or related, to understand responses.
- Sound emission by plants is proved but the reason is still unknown.
- New discovery in bioacoustics open applications in agronomic and urban design field

Key Words:

- Plant
- Sound wave
- Mechanostimuli
- Perception
- Audio
- Bioacoustic

Abstract

All living organisms have a vital need to know their environment. The sense of smell, the touch, the sight or the hearing… all species have developed organs or cellular sensitivity specialised in physical and chemical surrounding forces perception. Even if plants are living organisms, they have been considered as insensitive and quiet because they can't move like animals we are. However, in 60s, Milburn and Johnson discovered that plants emitted sounds. Then, numerous scientists started to get interest to the relation of plants with, not only audible sounds but also ultrasounds and infrasounds. It has indeed been proven that plants were able to emit sound vibrations at different frequencies. Many theories (Ritman and Milburn, 1988; Laschimke et al., 2006; Gagliano et al., 2012a) tried to explain why plants can do this and if those sounds were intentional or not. Other studies have also shown that a extended exposure with specific frequencies could have effects (positives and negatives) on plant growth and its development at different levels/scales. These revelations can put in perspective not only the use of chemical pesticides applied on plants, but also open up potential applications in other areas. Many studies are interested in the relationship between plants and sounds but questions still remain: what is the organ or molecule which allows plants to apprehend sound waves? Are their emissions and responses only due to a physical mechanism or are they intentional? Is the use of waves on a large scale without consequences? Despite recent interest in plants bioacoustics, research needs further investigations

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