Plant communication ہریالی کی بتیاں

Loud chatter in complete silence جنگل میں منگل یا اندھی خاموشی

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Personal introduction ذاتی تعارف

Proud Graduate of the first batch of LUMS SBA SSE

لمز ایس بی اے ایس ایس ای سے گریجویٹ

MSc and PhD in Environmental Biology from University of Eastern Finland.

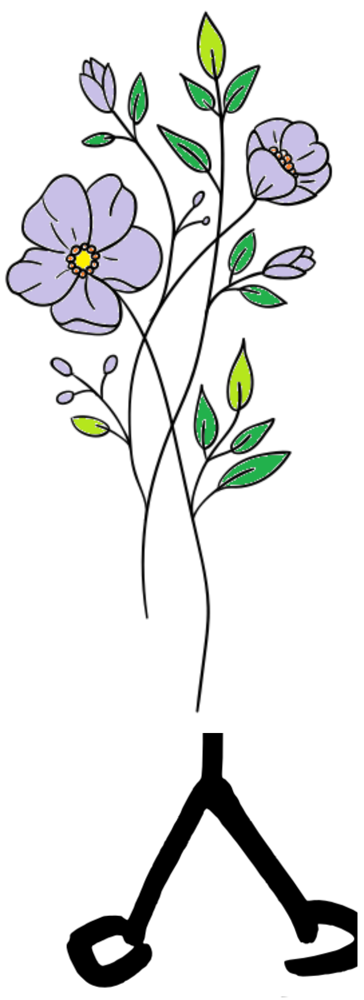
یونیورسٹی آف ایسٹرن فن لینڈ سے ماحولیاتی حیاتیات میں ایم ایس سی اور پی ایچ ڈی

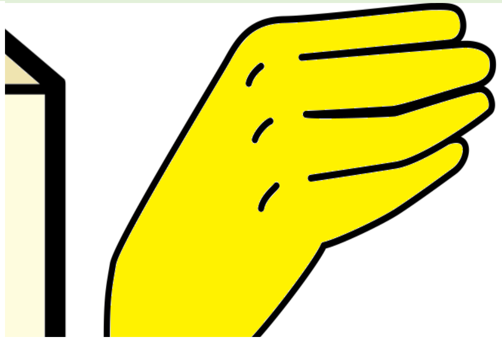
Currently working on plant communication in Scots pine seedlings.

فی الحال اسکاٹس پائن میں پودوں کے مواصلات پر کام کر راہا ہوں

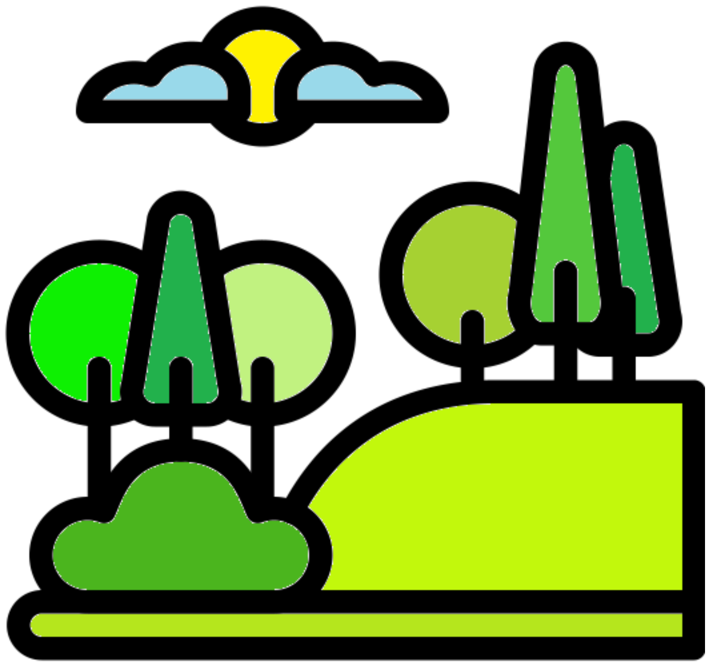
What is communication?   مواصلات کیا ہے؟

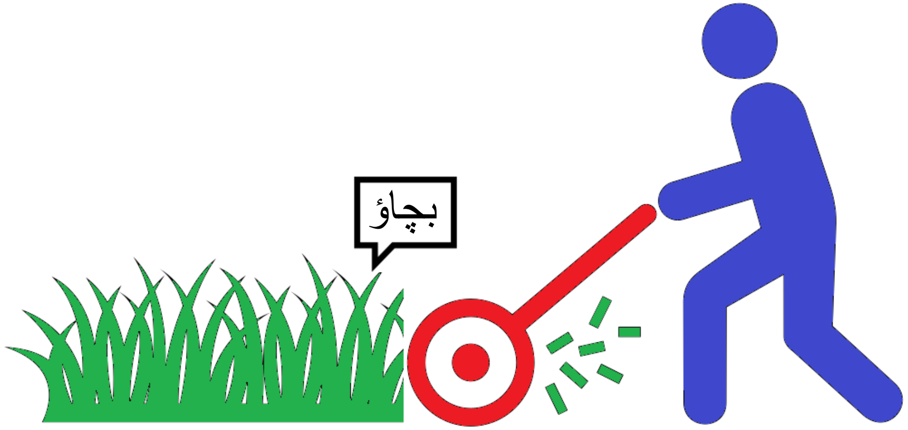
Communication is transmitting of information from a sender to receiver





Do plants have a way to send a signal?



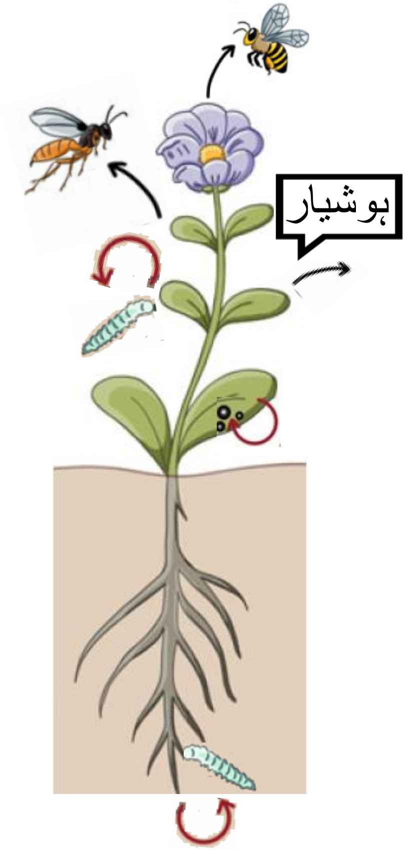


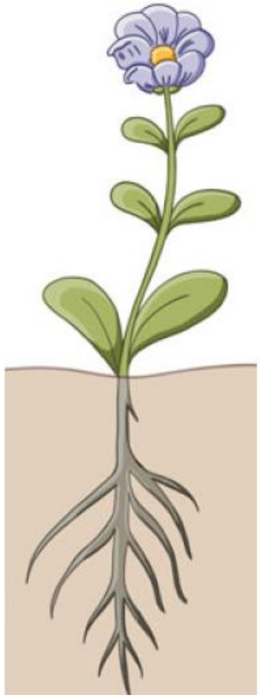
Why do plants communicate?

مواصلات کا مقصد کیا ہے؟

Communicate with their own species

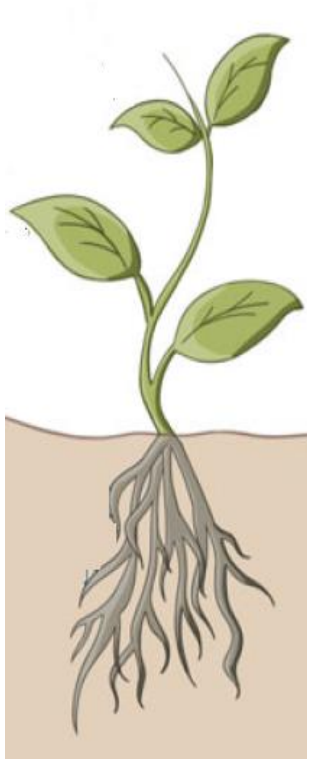
Communicate with other organisms

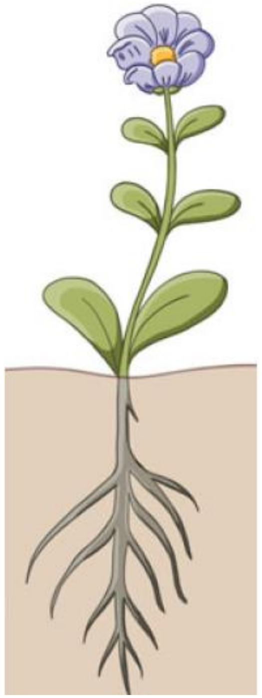




Why do plants communicate? مواصلات کا مقصد کیا ہے؟

Defend their territory





How do we study plant communication?

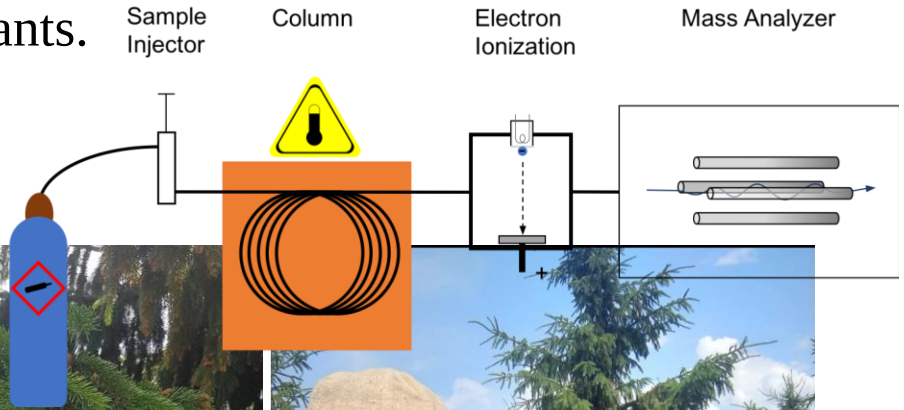
ہم پودوں کے مواصلات کا مطالعہ کیسے کرتے ہیں؟

There are two popular ways of studying the VOC emissions of plants.

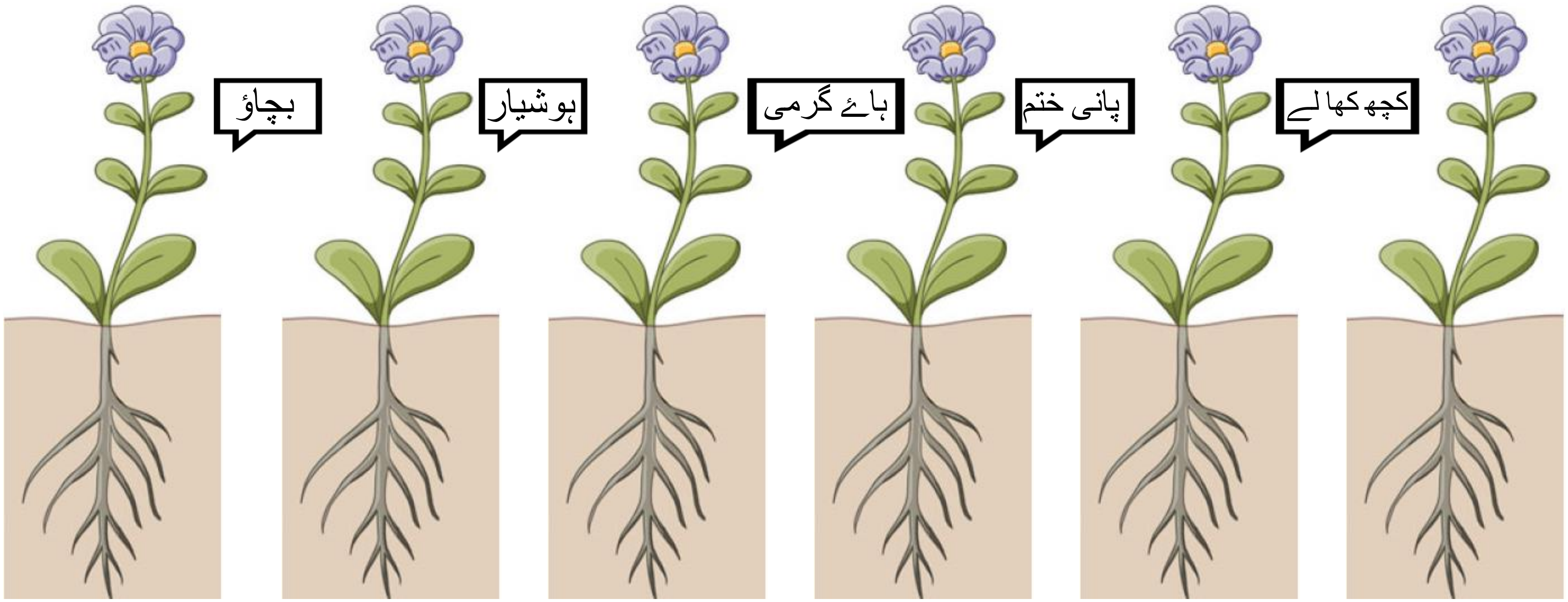
Adsorbant tubes and GCMS

PTR-ToF.

I will only briefly talk about this



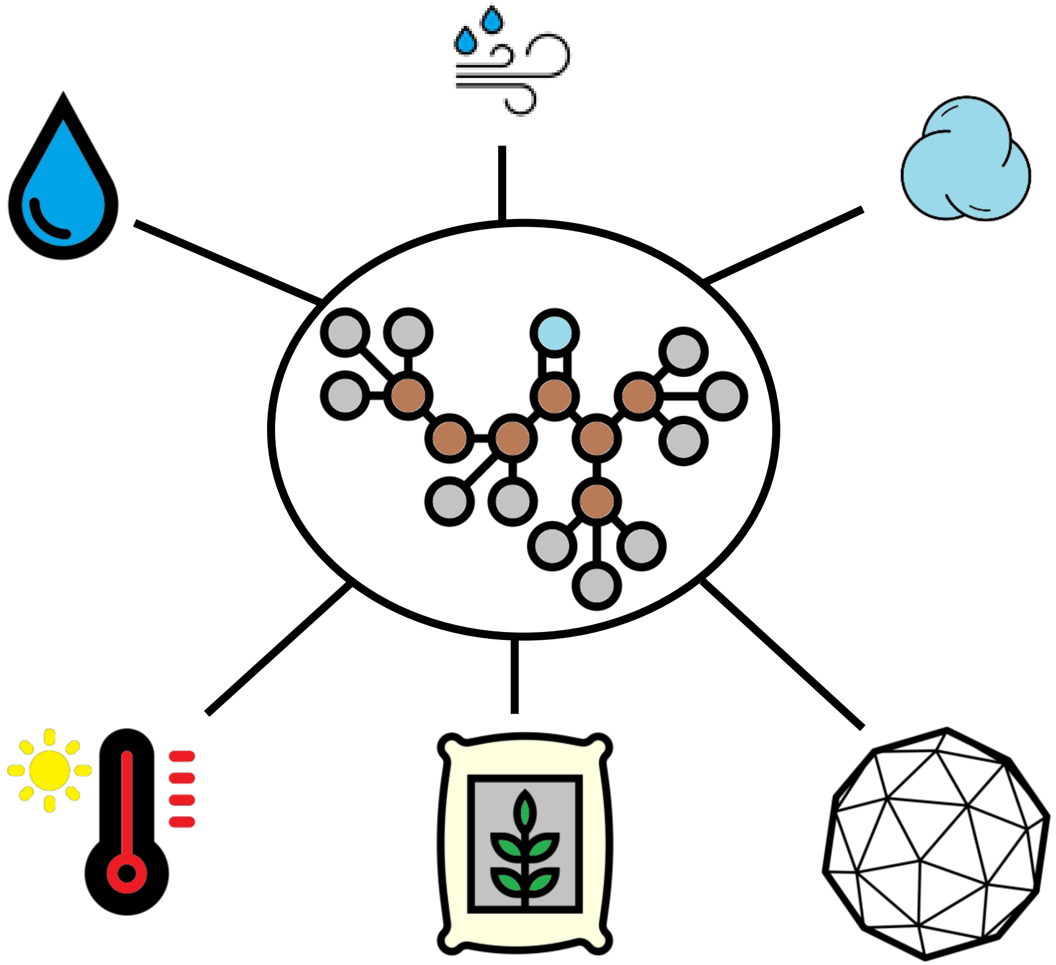
What new did we find? اس میں نیا کیا ہے؟



اور بہوت کچھ

Pollution and global warming effect plant communication گلوبل وارمنگ اور آلودگی کے اثرات

- Gaseous pollutants, e.g. ozone and nitrogenous oxides can react with the volatile compounds
- Particulate matter in air can interfere with the diffusion of the volatile compounds
- Increased temperatures can change emission rates
- Rain fall, humidity, soil moisture, nutrient content of soil, all affect the VOC emissions from shoot and root



How can humans benefit اس سے ہمیں کیا فائدہ ؟

- We use these compounds (limonene) in our mosquito repellent.
- We can use these communication signals instead of pesticides on crop
- Push pull method of cultivation
- We can use attractant chemicals for insect traps

Whats more? اس کے علاوہ ؟

- BVOCs are involved in cooling of the atmosphere and help cloud formation
- They are in integral part of surface level carbon cycling
- We can understand sexual behaviour of forest trees better if we understand the BVOC signalling

Relevant research articles مطلقہ خاکے

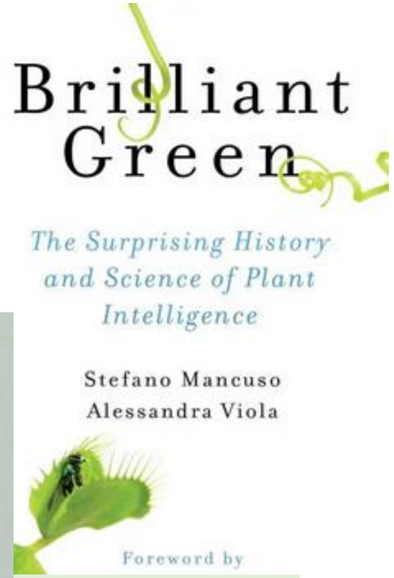
- Holopainen JK (2004) Multiple functions of inducible plant volatiles. Trends Plant Sci 9:529-533
- Holopainen JK, Gershenzon J (2010) Multiple stress factors and the emission of plant VOCs. Trends Plant Sci 15(3):1360-1369.
- Kivimäenpää M, Ghimire RP, Sutinen S, Häikiö E, Kasurinen A, Holopainen T, Holopainen JK (2016) Increase in volatile organic compound emissions of Scots pine in response to elevated ozone and warming are modified by herbivory and soil nitrogen availability. Eur J Forest Res 35:343–360.
- Rasheed MU, Kivimäenpää M, Kasurinen A (2021) Emissions of biogenic volatile organic compounds (BVOCs) from the rhizosphere of Scots pine (Pinus sylvestris) seedlings exposed to warming, moderate N addition and bark herbivory by large pine weevil (Hylobius abietis). Plant and Soil.
- Rasheed MU, Kasurinen A, Kivimäenpää M, Ghimire R, Häikiö E, Mpamah P, Holopainen JK, Holopainen T (2017) The responses of shoot-root-rhizosphere continuum to simultaneous fertilizer addition, warming, ozone and herbivory in young Scots pine seedlings in a high latitude field experiment. Plant Biology and Biochemistry, 114, 279-294.
- Grof-Tisza P, Karban R, Rasheed MU, Blande J (2021) Risk of herbivory negatively correlates with the diversity of volatile emissions involved in plant communication. Proceedings of the Royal Society B.
- Blande JD, Holopainen JK, Niinemets U (2014) Plant volatiles in polluted atmospheres: stress responses and signal degradation. Plant, Cell and Environment 37: 1892-1904.

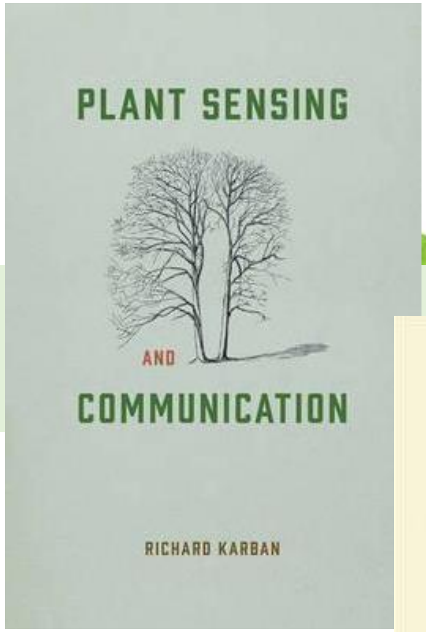
Recommended books on the subject

The Brillian Green by *Stefano Mascuno* and *Alessandra Viola*

Plant Sensing and Communication by *Richard Karban*

The Hidden Life of Trees by *Peter Wohlleben*





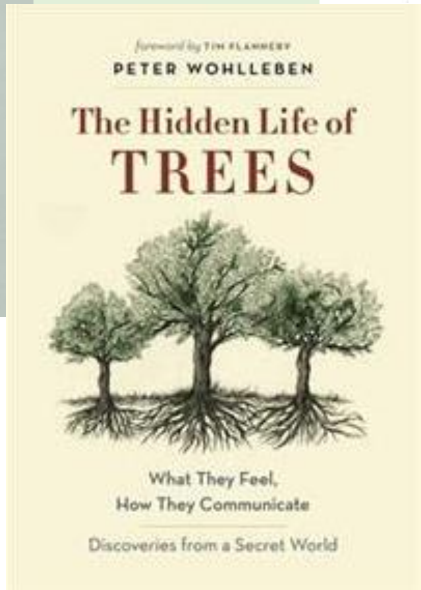
Other recommended pop-science books

I Contain Multitudes by *Ed Yong*

Factfulness by *Hans Rosling*

How to Avoid a Climate Disaster by *Bill Gates*

The Future We Choose by *Christiana Figueres* and *Tom Rivett-Carnac*



میرے علم کے مطابق ان میں سے کوئی بھی کتاب اردو میں دستیاب نہیں ہے۔

Questions please سوالات