

## Estonia

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### **Please describe any new experimental resources and/or software tools available to Arabidopsis researchers that have been initiated or funded in your country in 2020 or early 2021**

We continually update and improve the custom-built gas-exchange systems designed for measuring stomatal conductance, transpiration and photosynthesis in whole Arabidopsis rosettes and in leaves in controlled and adjustable conditions. Air temperature, air composition (humidity, CO<sub>2</sub>, O<sub>3</sub> etc) and light conditions can be manipulated throughout the experiment and several plants can be recorded in parallel.

### **Please provide a paragraph describing the general impact of the COVID19 pandemic on the scientific community in your country**

The COVID19 pandemic has resulted in reduced personal contacts, as everywhere. We have been able to continue laboratory work throughout the pandemic with measures in place for distancing and limiting the number of people present in the workplace, while encouraging working from home as much as possible. There has been active participation in virtual webinars and shifting of focus to data analysis and writing. Nevertheless, the lack of in-person discussions has left a mark on research progress.

### **Planned events for 2021 and 2022**

The New Phytologist next generation scientists meeting organized by New Phytologist Foundation originally planned for 2020 will take place in Estonia at the first possible instance, likely in a hybrid virtual and in-person format. (<https://www.newphytologist.org/nextgenevents/2020>)

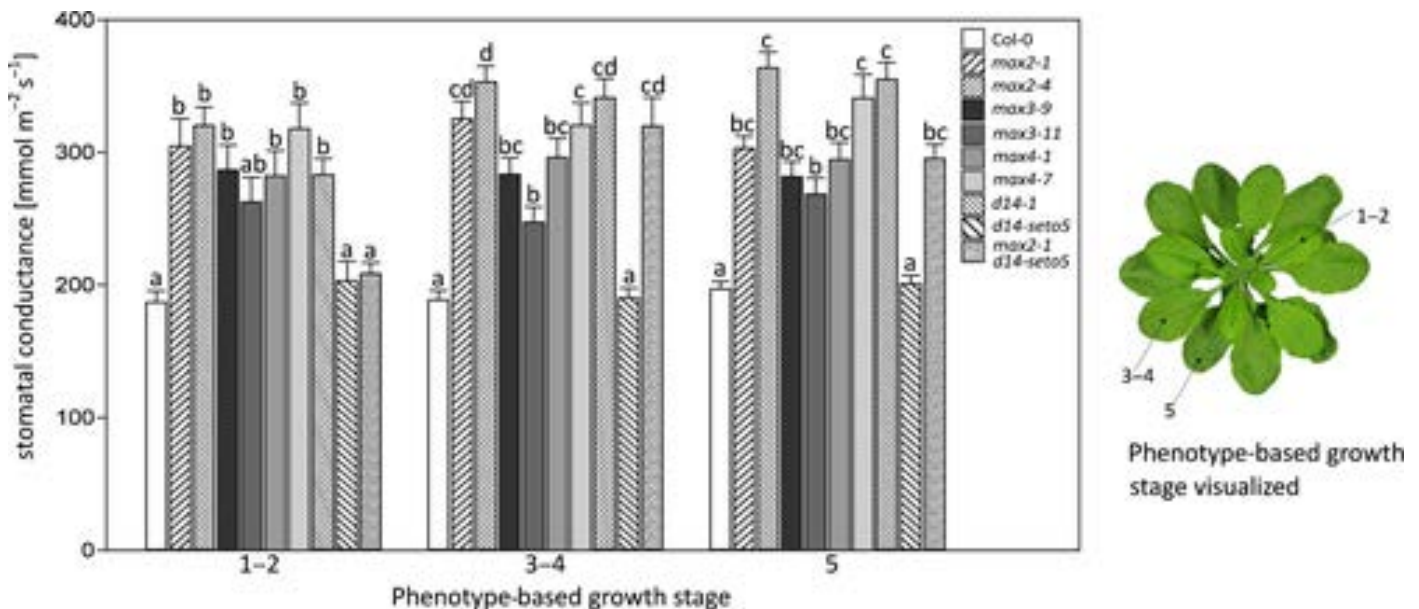
### **Selected Publications**

- Kalliola M, Jakobson L, Davidsson P, Pennanen V, Waszczak C, Yarmolinsky D, Zamora O, Palva ET, Kariola T, Kollist H, Brosche M. (2020) Differential role of MAX2 and strigolactones in pathogen, ozone, and stomatal responses. *Plant Direct* 2020;4:1–14. DOI: 10.1002/pld3.20

Collaboration with researchers from Finland indicates a role for MAX2 in stomatal responses to environmental stimuli:

- Mõttus J, Maiste S, Eek P, Truve E, Sarmiento C. (2021). Mutational Analysis of *Arabidopsis thaliana* ABCE2 Identifies Important Motifs for its RNA Silencing Suppressor Function. *Plant Biology*, 23 (1), 21\_31. DOI: 10.1111/plb.13193.

Analysis of mutant versions of the ABCE2 protein enabled identification of its motifs that are required for suppressing RNA silencing:



The stomatal conductance of strigolactone biosynthesis and perception mutants measured with a porometer from leaves of different developmental stages. The error bars represent standard error of the mean. 2–3 leaves per each growth stage was measured from each plant, and altogether, a minimum 20 plants were measured from each plant line. The phenotype-based growth stage is determined in the article by Boyes *et al.*, (2001) in which numbers indicate the growth stage: 1 indicates leaf production, 3 rosette growth, and 5 inflorescence emergence. We used the plants for analysis before they reached the stage 5.10 (i.e., before the first flower buds were visible). In statistical analysis, we conducted a logarithmic transformation on the data and then univariate analysis of variance combined to Tukey HSD post hoc test

- Hōrak H, Fountain L, Dunn JA, Landymore J, Gray JE (2021) Dynamic thermal imaging confirms local but not fast systemic ABA responses. *Plant, Cell & Environment* 44: 885–899. DOI: 10.1111/pce.13973.

Leaf temperature imaging indicates a lack of fast systemic ABA-induced stomatal closure in Arabidopsis but identifies a small slow response.

## Major Funding Sources

- Estonian Research Council, [www.etag.ee](http://www.etag.ee)

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