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SUMMARY REPORT ON TESTING PROTECTIVE INFLUENCE ON GERMINATING BEAN SEEDS (*Phaseolus vulgaris*) AGAINST WIRELESS ROUTER RADIATION

FOR THE PRODUCT

Qi-Shield

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GENERAL INFORMATION ABOUT TESTING

Date of tests: 1st – 30th August 2019.

Place: BION Institute, Ljubljana, Slovenia, EU.

Purpose: Testing of an assumed protective influence of the product Qi-Shield against Wi-Fi router radiation on the germinating bean seeds.

METHODS

We tested an assumed protective influence of the Qi-Shield using the sensor system composed of germinating beans under a controlled (heat, temperature) stress (from now on called also C-stress). Based on the preliminary results, we followed two scenarios: (a) the seeds were exposed to Wi-Fi radiation *after* the C-stress, while in (b) they were exposed to the irradiation *before* the C-stress.

We performed two experiments: A and B following scenarios a and b, respectively. Each experiment consisted of two series and of five phases: soaking seeds, germination of seeds, temperature stress, water stress, and growth. In series 1 and 2 (exp. A), beans were exposed to Wi-Fi and/or Qi-Shield during the C-stress and the growth phase. In series 3 and 4 (exp. B), beans were exposed to Wi-Fi before the C-stress. In situations, where Qi-Shield was present, seeds were exposed to a device during the whole series. Control groups were treated the same way as the test groups, but they were not exposed to the C-stress. After each experiment, we weighted the seedlings and determined the effects of the tested device.



Figure 1: Growth chambers and arrangement of glass containers with beans. Left: control experiment, right: experiment where beans were exposed to Wi-Fi and Qi-Shield.

RESULTS WITH DISCUSSION

In preliminary test, we optimized the effect of heat and water stress on beans. The weight of seedlings of C-stressed beans was 55% lower compared to the non-stressed beans (Figure 5). The difference was statistically significant (non-parametric Kruskal-Wallis test, $p < 0.001$).

Experiment A (Wi-Fi radiation introduced *after* the C-stress)

The best growth of seedling was observed in the control group. The weight of seedlings was the lowest when beans were exposed to Wi-Fi and sham Qi-Shield (Figure 2). The difference was significant compared to control situation, but not compared to the situation where true Qi-Shield was present (ANOVA, $p < 0.05$).

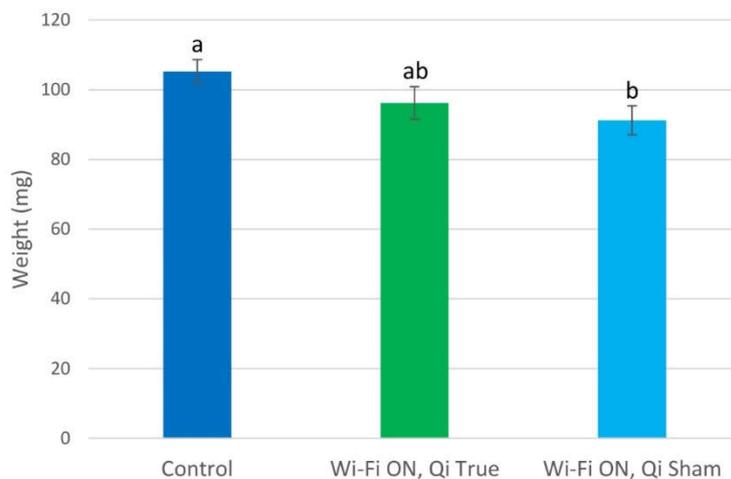


Figure 2: Comparison of weight of seedlings in control and combinations of Wi-Fi with either true or sham Qi-Shield. Mean weights (in milligrams) and standard variation are presented. The same letter above the histogram bars represent situations that are not statistically significantly different from one another; different letters denote statistically significant difference.

Experiment B (Wi-Fi radiation introduced *before* the C-stress)

Results showed the lowest growth of seedlings in the situation where beans were exposed to both, Wi-Fi and Qi-Shield (Figure 3). The weight of seedlings was 21% lower compared to control, and the difference was statistically significant. The weight of seedlings in control group compared to the situation with Wi-Fi only was in a similar range, a bit higher than in a situation where Qi-Shield was used.

Results showed that Wi-Fi did not have inhibitory effect. Since combination of Wi-Fi and Qi-Shield resulted in a significantly reduced growth of seedlings, and with the relation between Wi-Fi and Qi-Shield vs. Wi-Fi and *sham* Qi-Shield, the difference speaks in favour of protecting effect of Qi-Shield.

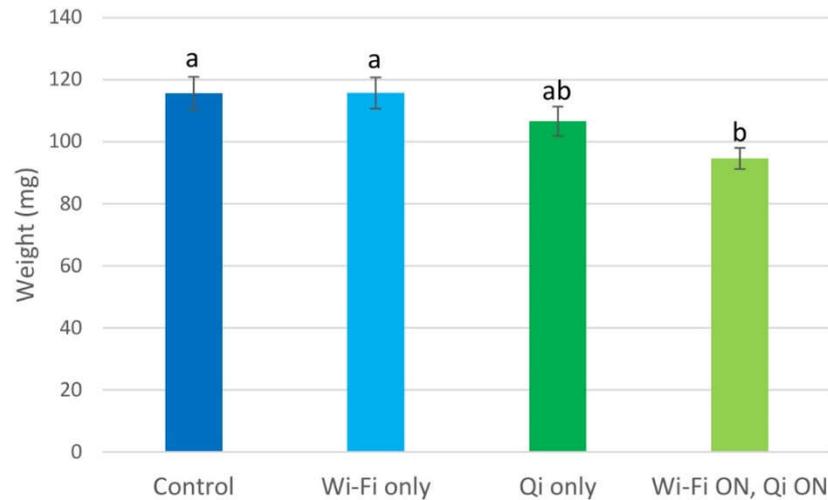


Figure 3: Comparison of weight of seedlings in control situation and various combinations of Wi-Fi and Qi-Shield presence during the experiment. Mean weights (in milligrams) and standard variation are presented. The same letter above the histogram bars represent situations that are not significantly different from one another; different letters denote statistically significant difference ($p < 0.05$).

CONCLUSION

According to the results of both experiments, we may conclude that the Qi-Shield

1. indicate a shielding effect on Wi-Fi radiation
2. the experiment B shows that Qi-Shield (alone but even more obvious in conjunction with Wi-Fi exposure) can induce more complex physiological changes in germinating seeds that either the seedlings make more sensitive to stress or make them more cautious in using the resources.
3. For a prediction of long-term effects of simultaneous exposure to Wi-Fi and Qi-Shield, another, lengthier testing should be performed. The same holds for the Qi-Shield only situation.

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