

To: **Tempus Public Foundation**

From: **Nevien Adel Ismaeil Elhawat**

Date: **18.06.2021**

Subject: **Report on long-term postdoctoral research** (the time period 01.09.2020 to 31.05.2021)

First of all, I would like to thank all the members of the Board of Trustees of Tempus Public Foundation (TPF) for giving me this chance to come to Hungary and collaborate with such experts in the field of Plant Biotechnology at the Department of Agricultural Botany, Plant Physiology and Biotechnology, University of Debrecen.

I had won 9 months scholarship (Type: D_hosszú posztdoktori tanút) under the supervision of **Professor Dr. Miklós Fári**.

After the promising results that we have abstracted from the pot experiment of selenium (Se) biofortification of alfalfa, we have started our field experiment in 2020. The main aim besides investigating the development of alfalfa plants under different concentrations of Se is to study the Se uptake by alfalfa during the different cuts (harvests) and the accumulated forms of Se in shoot part. After each harvest we analyzed our samples for total Se content, speciation of different Se forms in different plant parts, total antioxidant capacity and proteomic analysis. We have submitted our first article to Q1 journal this week (first week of June) and we are preparing now the second manuscript.

In parallel I had start writing manuscripts of research articles and submitting them to international recognized journals (Q1 and Q2), as well as Book chapter will be published by Springer.

Of course, I acknowledged TPF for your co-financial support and I will send the accepted manuscripts later to TPF.

Published articles:

- 1- Bákonyi N, Kisvarga Sz, Barna D, Tóth I, El-Ramady H, Abdalla N, Kovács Sz, Rozbach M, Fehér Cs, Elhawat N, **Alshaal T**, Fári M (2019) Chemical traits of fermented alfalfa brown juice: Its implications on physiological, biochemical, anatomical and growth parameters of Celosia. *Agronomy* 2020, 10(2), 247; <https://doi.org/10.3390/agronomy10020247>
- 2- Kaszása L, **Alshaal T**, Kovácsa Z, Koroknaia J, Elhawat N, Nagy É, El-Ramady H, Fári M, Domokos-Szabolcsy É (2020) Refining a high-quality leaf protein and valuable co-products from green biomass of different Jerusalem artichoke cultivars for sustainable protein supply. *Biomass Conv. Bioref.* (2020). <https://doi.org/10.1007/s13399-020-00696-z>
- 3- Kaszása L, **Alshaal T**, El-Ramady H, Kovácsa Z, Koroknaia J, Elhawat N, Nagy É, Cziáky Z, Fári M, Domokos-Szabolcsy É (2019) Identification of Bioactive Phytochemicals in Leaf

- Protein Concentrate of Jerusalem Artichoke (*Helianthus tuberosus* L.) (2020) *Plants* 2020, 9, 889; doi:10.3390/plants9070889
- 4- Sofy M., Elhawat N., **Alshaal T.** (2020) Glycine betaine counters salinity stress by maintaining high K⁺/Na⁺ ratio and antioxidant defense via limiting Na⁺ uptake in common bean (*Phaseolus vulgaris* L.) *Ecotoxicology and Environmental Safety* 200 (2020) 110732. <https://doi.org/10.1016/j.ecoenv.2020.110732>
 - 5- Kovács Z., Soós Á., Kovács B., Kaszás L., Elhawat N., Bákonyi N., Razem M., Fári MG., Prokisch J., Domokos-Szabolcsy É., Alshaal T. (2021) Uptake Dynamics of Ionic and Elemental Selenium Forms and Their Metabolism in Multiple-harvested Alfalfa (*Medicago sativa* L.). *Plants* (17th June 2021).
 - 6- Attia E., Elhawat N., Combined foliar and soil application of silica nanoparticles enhances the growth, flowering period and flower characteristics of marigold (*Tagetes erecta* L.), (2021) *Scientia Horticulturae*, 282 (2021) 110015. <https://doi.org/10.1016/j.scienta.2021.110015>
 - 7- El-Aidy F., Hassan N., El-Warakly Y., AbuElftooh ,F., Bayoumi Y., **Elhawat N.** Boron, manganese and zinc reduce the hazardous impact of sodic-salin soil on growth and yield of pea (*Pisum sativum* L.) (2021) *Journal of Plant Nutrition*, #1899215

Book chapter under processing:

- 1- Alsaeedi A H, Alshaal T., N Elhawat (2021). Silicon and Nano-Silicon Mediated Drought and waterlogging Stress Tolerance in Plants. In: Hossain M. et al. (eds.), *Silicon and nano-silicon in environmental stress management and crop quality improvement: recent progress and future prospects*, Springer Nature Switzerland AG

Now, we are almost done with the analysis of samples from pot experiment and later I am going to acknowledge TPF thanking them for their financial support.

Sincerely,

Nevien Elhawat