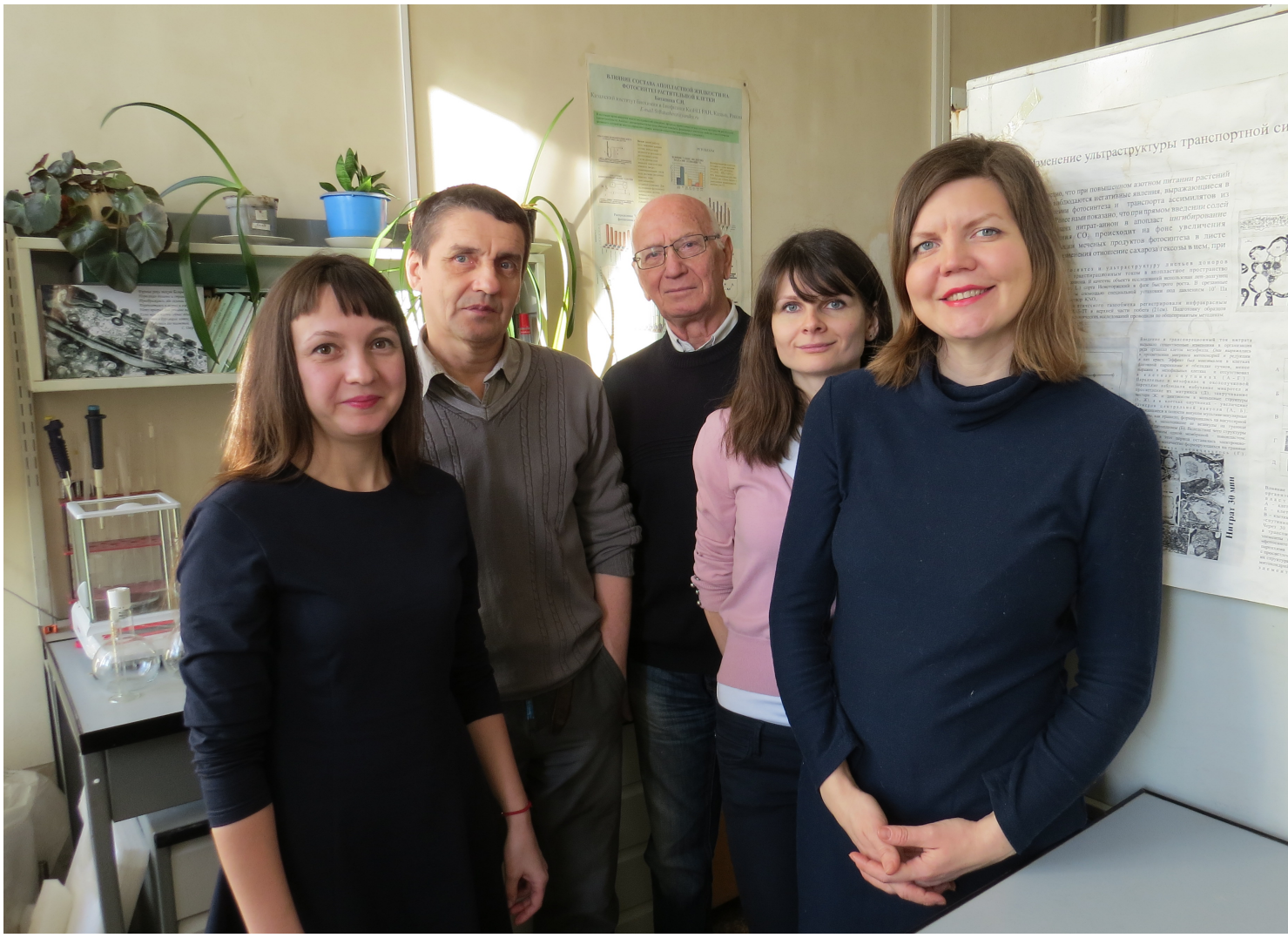


Head of laboratory

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Lab Members

Abdrakhimov F.A. - Senior Research Scientist, Cand. Sc. Bakirova G.G. – Senior Research Scientist, Cand. Sc. Batasheva S.N. – Research Scientist, Cand. Sc.

Khamidullina L.A. – Junior Research Scientist, Cand. Sc.

Salyakhova G.A. – Junior Research Scientist

Main focus of investigations:

Regulation of photosynthesis, photosynthetic carbon metabolism and assimilate transport in relation to realization of plant productivity.

Areas of current interest:

- Study of the role of apoplastic invertase in the regulation of photosynthesis and assimilate transport under different conditions of plant mineral nutrition and illumination.
- Elucidation of the role of light in productivity of potato plants.
- Investigation of the nitric oxide participation in inhibition of photoassimilate export by nitrate.

Major results of investigations:

1. NO-signaling system was shown to be a probable mediator of nitrate in suppression of assimilates export from the leaf and rearrangement of metabolism under increased nitrate nutrition of plants.

2. Complex compounds (ammoniates) were designed and patented. These compounds, affecting the acid-base properties of the leaf extracellular medium, change apoplastic invertase

activity and photosynthetic product export from leaves to sink organs. Treatment of plants with ammoniate solution enhances outflow of photosynthetic products from leaves to harvested plant parts and increases yields.

3. A hydroponic apparatus was devised and patented, allowing to obtain up to 30-40 healthy seed minitubers calibrated by size on test-tube potato plants propagated *in vitro*.

Selected publications:

1. Chikov V.I., Isaeva E.V., Ratushnyk A.A., Tarasov O.Y., Abramova K.I., Trushin M.V. Changes of photosynthesis and carbon metabolism in Typha angustifolia L. grown in conditions of nitrate nitrogen overload // Acta Botanica Croatica. 2012. I. 71. № 2. P. 1–7.

2. Chikov V.I., Salakhova G.A., Safiullina G.F., Zamaleeva F.F. Photosynthesis, assimilate transport and productivity of potato, cultivar "Nevskiy", depending on illumination during the growth // Selskokhozyaistvennaya biologia. 2012. №1. P. 71-77 (in Russ.).

3. Vladimir I. Chikov and Svetlana N. Batasheva (2012). The Role of C to N Balance in the Regulation of Photosynthetic Function, Advances in Photosynthesis - Fundamental Aspects, Dr Mohammad Najafpour (Ed.), ISBN: 978-953-307-928-8, InTech, DOI: 10.5772/28084.

4. Batasheva S.N., Isaeva E.V., Chikov V.I., Ratushnyk A.A. The influence of suddenly changing quantity of produced photosynthetic products on its export from donor-leave //Middle-East Journal of Scientific Research. 2011. Vol.10. P.188-190.

5. V. I. Chikov, G. G. Bakirova, S. N. Batasheva, F. F. Zamalieva, G. A. Salyakhova, G. F. Safiullina, M. S. Sinkevich, and L. A. Khamidullina Effect of Insertion of Apoplastic Invertase Gene on Photosynthesis of Potato Plants Grown at Various Light Intensities. // Russ. J. Plant

Phys. 2011. T.58. №5. P.879-884.

6. L. A. Khamidullina, F. A. Abdrakhimov, S. N. Batasheva, D. A. Frolov, and V. I. Chikov Effect of Nitrate Infusion into the Shoot Apoplast on Photosynthesis and Assimilate Transport in Symplastic and Apoplastic Plants // Russ. J. Plant Phys. 2011. T. 58. №3. P.484-490.

7. S. N. Batasheva, F. A. Abdrakhimov, G. G. Bakirova, E. V. Isaeva, and V. I. Chikov Effects of Sodium Nitroprusside, the Nitric Oxide Donor, on Photosynthesis and Ultrastructure of Common Flax Leaf Blades // Russ. J. Plant Phys. 2010. T. 57, № 3. P. 376-381.

8. Chikov V.I., Salyakhova G.A., Safiullina G.F. Zamalieva F.F. Formation of potato tuber number and mass under different level of assimilates in the plant // Uchenye zapiski Kazanskogo Universiteta. 2009. Vol. 151, Book.1. P. 164-172 (in Russ.).

9. Chikov V.I., Abdrakhimov F.A., Bakirova G.G. and Batasheva S.N. The role of sink-source relationships between different organs in regulation of photosynthesis and productivity // Acta Horticulturae. 2009. V. 835. P. 87-98.

10. Batasheva S.N., Abdrakhimov F.A., Bakirova G.G. and Chikov V.I. Nitrate ion bars assimilate translocation from leaves // Acta Horticulturae. 2009. V. 835. P. 99-108.

11. Abdrakhimov F.A., Batasheva S.N., Bakirova G.G., Chikov V.I. Dynamics of leaf plate ultrastructural changes in flax under assimilate translocation suppression by nitrate anion // Tsitologia. 2008. Vol. 50. № 8. P. 700-710 (in Russ.).

12. Chikov V.I., Bakirova G.G., Batasheva S.N., Sergeeva A.A., Khramov I.T., Yapparov A.Kh. The influence of ammoniates on plant photosynthesis and productivity // Selskokhozyaistvennaya biologia. 2006. № 3. P. 53-57 (in Russ.).

13. S. N. Batasheva, F. A. Abdrakhimov, G. G. Bakirova, and V. I. Chikov Effect of Nitrates

Supplied with the Transpiration Flow on Assimilate Translocation // Russ. J. Plant Phys. 2007. T. 54, № 3. P. 373-380.

14. Chikov V.I., Bakirova G.G., Batasheva S.N., Sergeeva A.A. The Influence of Ammoniates on Plant Photosynthesis and Productivity // Biologia Plantarum. 2006. V. 50 (4). P. 749-751.

15. V. I. Chikov, G. G. Bakirova, S. N. Batasheva, and A. A. Sergeeva Effect of Defoliation or Excision of Growing Axillary Shoots on the Composition of Labeled Products of Photosynthesis in the Leaves and Xylem Sap of Kidney Bean // Russ. J. Plant Phys. 2005. T. 52, № 4. P. 459-462.