

T. E. KHRYSSTOVA<sup>1</sup>, O. E. PYURKO<sup>2</sup>

<sup>1</sup>Taras Shevchenko Kiev National University, e-mail: [diser03@rambler.ru](mailto:diser03@rambler.ru)

<sup>2</sup>Melitopol State Pedagogical University named Bogdan Khmelnytskyi, e-mail:

[diser03@rambler.ru](mailto:diser03@rambler.ru)

## THE EVOLUTION AND MODERN STATE OF PHOTOSYNTHESIS RESEARCHES IN UKRAINE

Nowadays, photosynthesis is composite and uncial phenomenon, extraordinary science problem, in which history it is allotted the six interdependence periods, each of them is characterized concrete peculiarities.

The first period (1771-1850 years) is defined the photosynthesis discovery by D. Prystly (1771) and general dependence establishment of this process under action of outside (Seneb'e, 1782) and inside (Sossyur, 1804) factors, Gh. Boosengo treatment of general photosynthesis equation.

The second period (1850-1900 years) is connected with photosynthesis energetic researches and ascertaining of sun energy peculiarities fixation (Mayer, 1842; Dreper, 1844 and ect.), the improvement of spectral analyze methods with simultaneous sensibility increase to gas methods (Timirayazev, 1903 and ect.). The O.M. Volkov (1875) works from Odessa according to studying of light energy assimilation and pigments role in this process are actually.

The third period (1901-1940 years) is characterized the physiological researches bloom of photosynthesis. At the first time the presence of photosynthesis light and dark stages are grounded, the cycle of CO<sub>2</sub> dark assimilation is decoded, the water meaning in photosynthesis process is ascertained, the main physiological dependences of gas-exchange and plants productivity from different factors are constituted. The works of P.A. Emerson, D. Arnold, A.A. Reechter, V.M. Lyubimenko lie in basis of modern conception of photosynthetic unit. The coryphaeus of Ukrainian science is V.M. Lyubimenko, which ascertained the light-requiring and shade-enduring nature of tree plants, deeply studying the dependence of photosynthesis process from chlorophyll contest in plant and environmental conditions dynamic. K.A. Purievich (1913) from Kiev university set that in

photosynthesis process it is used not more 2,5% radiant energy, which falls on green leaf; for this it is possible the using of mass and energy conservation law; in photosynthesis process, depending of conditions, with the exception of carbohydrates, it is able to synthesize the proteins and greases. E.P. Votchal is Kiev phytophysiologist, which is laid the studying fundament of photosynthesis ecological-physiological aspects.

The fourth period (1941-1950 years) is the period of activation of photosynthesis biochemistry researches with using of marked atoms,  $C^{14}$ -isotope. Finally it is defined the biochemistrical peculiarities of  $C_3$ ,  $C_4$  and CAM type of  $CO_2$  assimilation on basis of diffusion resistances; it is broaden the works about studying of individual chains of substances exchange and metabolism in whole.

The fifth period (1950-1960 years) is period of rough researches development of pigments bio- and photochemistry, mechanisms of souring-renewal reactions; mechanisms of energy transference in biomembranes and ect. In Ukraine at this period the different aspects of plants photosynthesis are researched by such famous scientists as A.S. Okanenko, B.I. Gulyaev, X.M. Pochynok, O.B. Mitrophanov.

The sixth period (1961- on today) is characterized by concept formation about two photosystem function, the definition of Z-scheme photosynthesis structure and function, the components studying of photosynthesis electron-transport chains and photophosphorylation mechanism. It is continued the researches of enzyme mecyanisms, regulative systems, cycles of carbon photosynthetic assimilation, photosynthesis genetics, plants productivity and of the last on the planet. The modern fundamental researches abot photosynthesis physiology is spent in Ukraine in such establishment as: Academy of Science, Institute of plant physiology and genetics, Institute of hydrobiology, Taras Shevchenko Kiev National University and ect.

Thus, the direct information according to photosynthesis of reearches evolution affirms, that domestic scientists carry out the ponderable contribution to it's elaboration, beginning from the second decennial of XIX century and continuing to actively work under this direction at the same time.