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Obituary

Gábor Horváth (1944–2000)

Gábor Horváth, Professor of Plant Physiology at the University of Horticulture and Food Industry in Budapest, died of cancer at the age of 56 on September 11, 2000.

After graduating in Biology and Chemistry at Eötvös University in Budapest in 1968, Gábor began his scientific career in the research group of Ágnes Faludi-Dániel (1929–1986), who was then organizing a research group on photosynthesis in the newly-founded Institute of Plant Physiology at the Biological Research Center (BRC) of the Hungarian Academy of Sciences. This center was opened in Szeged in 1971, with Bruno F. Straub, a former student and close co-worker of Albert Szent-Györgyi, as its first Director General. It comprised many similar, newly organized groups in various fields of modern biology, all staffed by talented young people eager to embark in a new era in basic biology in Hungary. For this region at that time, it offered exceptional opportunities, but the expectations were also very high. I think Gábor would agree with me that the opening of the BRC was the most important single event in his scientific life, as it certainly was for most of us who were fortunate enough to be part of those pioneering years. For Gábor, the BRC remained his home institute, even after he founded the Department of Plant Physiology at the University of Horticulture, in Budapest in 1992, where he moved in 1995 and devoted tremendous effort in launching new and successful projects.

Gábor's first research and his PhD dealt with the biosynthesis of carotenoids in wild-type and light-sensitive mutant maize leaves, which clearly indicated the role of carotenoids in photoprotection (Horváth et al. 1972). Studies on greening granal and agranal chloroplasts of maize contributed significantly to the understanding of the composite character of the main absorbance and low-temperature fluorescence emission bands (Demeter et al. 1974; Garab et al. 1974), and revealed some peculiar features of the organization of the membranes and the pigment systems in granal and agranal chloroplasts of maize (Bialek et al. 1977; Faludi-Dániel et al. 1978). The thylakoid membranes of bundle sheath cells were shown not to contain active Photosystem II (Gregory et al. 1978), an important and, at that time, somewhat unexpected finding. In later research, it was also demonstrated that these membranes exhibit significantly different polypeptide composition from those of granal thyalkoids (Masojidek et al. 1987).

In 1974, Gábor received a United Nations Development Project (UNDP) fellowship to visit the laboratory of N. K. Boardman (in Australia), where he

spent a year together with his wife, Magdolna Droppa. There, in the forefront of photosynthesis research, in the same institute as M. D. Hatch and J. Anderson, he gained unmatched experience, and made long-lasting friendships. This was an unforgettable time for Gábor, which remained unrivalled throughout his entire life. Together with his hosts, Gábor studied light-induced absorption and scattering transients and established that the electrogenic events in thylakoid membranes are followed by slower transients due to proton uptake and conformational changes (Thorne et al. 1975). Fortunately, these investigations were not 'forgotten' after the Horváths returned home. Together with Ágnes Faludi-Dániel and with the generous help of M. E. Roux (Saclay, France), he continued his studies on the flash-induced absorbance transients in Szeged. By applying protoplast techniques, Gábor isolated perfectly intact mesophyll and bundle sheath chloroplasts from maize leaves; at that time, virtually unique preparations. He showed significant differences between the two types of chloproplasts. Whereas bundle sheath chloroplasts, on their own, were inactive under repetitive flash excitation, the mesophyll chloroplasts exhibited not only the fast phase originating from the primary charge separations, but also a slow rise (Horváth et al. 1978), an electrogenic component earlier thought to occur only in algal cells. This phase was in turn shown to be associated with proton pumping (Horváth et al. 1979; Farineau et al. 1980).

Gábor's interest later turned to the operation of Photosystem II, and he capitalized on the 'import' of thermoluminescence (TL) techniques, by Ágnes Faludi-Dániel from V.G. Tatake and P.V. Sane's laboratory in Bombay (now Mumbai), India. TL was at that time yet waiting for exploration as concerns its use in photosynthesis. Again, the striking difference between mesophyll and bundle sheath thylakoids, i.e. the absence of a signal in the latter, clearly showed that TL is generated only in PS II (Demeter et al. 1979). With these data available, it was straightforward to apply TL in the investigations of photosynthetic herbicides, and Photosystem II inhibitors in particular (Droppa et al. 1981; Horváth 1986).

In collaborative work and in Gábor's laboratory, TL remained a very useful technique through series of research for the elucidation of a number of other problems, such as the influence of the lipid environment on the activity of Photosystem II (Droppa et al. 1995), the effect of a new group of protonophores (Horváth et al. 1996) and diverse stress effects (Marder et al. 1998; Rahoutei et al. 1999). Yet another series of research from Gábor's desk concerned the role of copper in the assembly of Photosystem II (Droppa et al. 1984), the toxic effects of copper in chlorophyll biosynthesis and assembly of photosystems (Caspi et al. 1999), and diverse stress effects of various heavy metal ions (Szalontai et al. 1999). These will now have to be completed by his co-workers.

Gábor served science in many different ways. In the BRC, he worked for 2 years as deputy director of the Institute of Plant Physiology. During the years of the political transition and overall crisis of science policy in Hungary, he fought for science as a member of the Presidium of the Trade Union of Scientific Workers, to minimize long-term damage to science. In 1992, Gábor organized an immensely successful Federation of European Society of Plant Physiologists (FESPP) Workshop in Szeged on 'Environmental Factors Affecting Photosystem II', and in 1998, jointly with H. R. Bolhar-Nordenkampf, Matilde Baron, Zoltán Szigeti and Magdolna Droppa, an equally successful ESF (European Science Foundation) Workshop on Stress Synergism: 'Photosynthesis under Biotic and Abiotic Stress'. In the organization of the XIth International Congress on Photosynthesis, where he served as vice-chairman, Gábor's enthusiasm, endless energy, rugged humor and strong dedication were key elements, and we all constantly relied on his unending help and suggestions. He also worked selflessly for the success of the XIIth FESPP Congress, which was held just weeks before his untimely death. This was the first time when we began to fear that the battle, he had been waging for months, apparently with success, might not prove possible to win.

The photosynthesis community will remember Gábor Horváth's contributions. Those close friends and colleagues in Hungary and elsewhere, who worked together with him for decades or only occasionally, will sense a deeper loss, a void that will be difficult to fill, but will cherish warm memories of Gábor's vivid personality.

Gábor is survived by his wife, Magdolna, and daughter, Christina. Our deepest sympathy goes out to them at the loss of a loved husband and father.

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