

## Movement of heavy elements in plants by means of a standard-free method for living plants in in-air PIXE

K. Sera<sup>1</sup>, K. Terasaki<sup>1</sup>, T. Sasaki<sup>1</sup>, S. Goto<sup>2</sup>, C. Takahashi<sup>2</sup> and Y. Saitoh<sup>2</sup>

<sup>1</sup>Cyclotron Research Center, Iwate Medical University  
348-58 Tomegamori, Takizawa, Iwate 020-0173, Japan

<sup>2</sup>Nishina Memorial Cyclotron Center, Japan Radioisotope Association  
348-58 Tomegamori, Takizawa, Iwate 020-0173, Japan

### **Abstract**

The method, which was developed by our group, enables us to perform quantitative analysis of living plants. It has been applied to investigate the transport of heavy elements such as germanium, gallium, bromine and arsenic in plants. These heavy elements are transported to the leaf through vascular vessel, and changes of their concentration with elapsed time after absorption could be clearly observed. It was confirmed that the movement depends on elements, on the manner of absorption and on the states of plant growth. In addition to the movement of supplied elements, some elements in the plant show interesting changes in response to proton irradiation. It was found that the method is quite effective for examining elemental movement in living plants.