Morphological performance of Thypa angustifolia L. grown in acid mine drainage (AMD)

ABSTRACT

Typha angustifolia L. was chosen to study responses of morphological characters to acid mine drainage (AMD) conditions for 120 days. The study was conducted at the former Mamut Copper Mine, Ranau, Sabah with observations carried out 15-day intervals. Plant samples from Tanjung Lipat, Kota Kinabalu were transferred to Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, for propagation. Second generation plants were transplanted to the study site experiencing AMD conditions (pH 3-pH 4.5). The transplants showed chlorosis at the leaf tips and the roots became blackened with less branching at the end of experiment. Iron plaque formed on the root surfaces. Analysis of root surfaces by scanning electron microscopy-energy dispersive X-ray spectrometry showed that iron concentrations (23.8% w/w) were the highest of the heavy metals detected, followed by lead (0.65% w/w) and copper (0.45% w/w). Typha angustifolia is clearly an acid tolerant plant which can survive in the extremely harsh environment of AMD.