

Water logging tolerance of Indonesia chili pepper

Airi Higashi¹⁾, Rujito Agus Suwignyo²⁾, Jun-Ichi Sakagami¹⁾, Shin Yabuta¹⁾

¹⁾*Department of Biological production, Faculty of Agriculture, Kagoshima University, 1-21-24 Koorimoto, Kagoshima 890-0065, Japan*

²⁾*Department of Agronomy, Faculty of Agriculture, Suruwijaya University, Kampus Inderalaya, Ogan Ilir 30662, South Sumatera, Indonesia*

Abstract

Recently, global warming by greenhouse gas effect is getting danger and danger for human life and agriculture at present. In Indonesia, according to heavy rain in the agriculture land is often covered by excess water in result crop growth would be affected negative. This water stress triggers roots failure in anaerobic condition for upland crop because of limiting roots respiration. Chili pepper grows in upland sometimes in touch with waterlogging due to rainfall and /or over flow water from river in Indonesia. In this case, roots growing is inhibited by effect of shortage of oxygen at root cap. Therefore, the objective of this study is to observe the plant behavior in waterlogging using mahor local genotypes (Ferosa, Laris, Romario) in Sumatra. The experiment was kept by at 1cm depth water above the soil surface as a waterlogged treatment for ---days. As a result, waterlogging affected plant growth of chili negatively, especially for roots growth. Almost roots were getting bad and changed color for brown during waterlogging. A significant negative effect for nutrient absorption by roots was found in dry weight of all varieties during waterlogging. Dry weight of roots was decreased by 81.4% and 67.6%, and those of aerial part decreased by 74% and 67.2% compared with control in Ferosa and Romario at 1week after treatment. On the other hand, dry weight of roots was decreased only 35% in Laris. Therefore, Laris has a tolerance for waterlogging compared to with other varieties. Also, Laris in SPAD value was kept initial level during waterlogging however those of Ferosa and Romario decreased. Finally, due to impact of waterlogging, it may be the roots become failure because of less aerenchyma formation under anaerobic condition. We need confirm aerenchyma formation morphologically in the future.

Keywords: chili pepper, Indonesia, submergence, water stress

Corresponding author*

Jun-Ichi Sakagami : Address Kagoshima University