

Mirror Reflection Measurement of Leaves from Different Environmental Stresses

*Garid Zorigoo¹, Begzsuren Tumendemberel¹, Yukihiro Takahashi¹

1. Department of CosmoSciences, Graduate School of Science, Hokkaido University

Plants have a waxy-cuticle layer on their leaves to protect from dehydration. Different plant species have different waxy-cuticle layer thickness. The previous study suggests that one can estimate this waxy-cuticle layer thickness in the leaf with mirror reflection measurement with a polarizer.

In this work, some theoretical explanations are formulated for the previous study measurement. Yet, it did not match with new measurements. Theoretical explanations are still in development. Furthermore, we anticipate that within a single species, waxy-cuticle layers can be distinct depending on the environmental stresses. Especially by increasing its waxy-cuticle layer, plants may protect itself from losing more water in a dry environment. In this study, we investigated such occurrence of a change in thickness (or mirror reflection measurement output) of coffee-plants in 2-different environmental stresses: A healthy group (normal watered) and an Unhealthy group (dehydrated). This could lead to the possibility of detecting the leaf's health-status with a different approach. As a result of the measurement, a slight difference between the two groups is observed.

Keywords: Waxy cuticle layer, Plant leaf, Goniometer, Polarizer