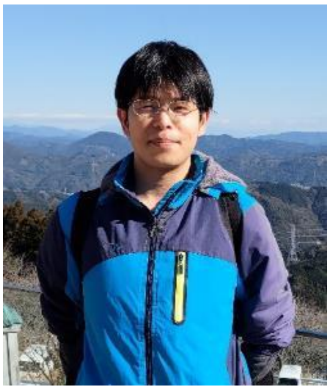

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研究紹介：

・竹のイソプレン放出特性の解明

Volatile organic compounds (VOCs) emitted from terrestrial vegetation can be considered as a large carbon emission from ecosystems. The chemistry of VOCs can potentially worsen air quality and impact climate change. Currently, several bamboos were reported with a large amount of isoprene (one of the most emitted VOC by plants) emission. However, lack of further data leads to a main obstacle for reliable estimation of isoprene emission dynamics from bamboo species. To achieve more realistic and effective determination of isoprene emissions from bamboos, our group primarily validated an existing isoprene emission model for an invading bamboo species. The unique temperature response curve of the studied bamboo suggests a need of adjustment of the current model. In a further examination on the variability in isoprene emission flux per unit leaf area of the invading bamboo, there was a strong to leaf mass per area and thus leaf mas per area generally explained the variation. In further a test on isoprene emission rate with 18 bamboo species, a major difference between woody and dwarf bamboos in isoprene emission ability was found, where the woody bamboos demonstrated greater emissions, while the dwarf bamboos showed negligible to no emissions in summer. It was also found that temperature, leaf mass per area, and electron transport rate explained most of the variation in isoprene emission flux among the woody bamboo species. The isoprene emission data from multiple sites and bamboo species aid in better understanding isoprene emission characteristics of bamboo species. With this knowledge we can effectively determine isoprene emissions from bamboos and make efforts to better estimate global volatile organic compound emissions from plants.

・ヤシの BVOC 放出の簡易測定方法の確立

Several studies have revealed the high isoprene emissions from palm species. The degradation of isoprene can lead to formation of peroxyl radicals and further react with NO to form NO_2. It would then photolyzes to form O_3 in the troposphere. Due to the increased need of biofuel and food, area of palm species has greatly expanded in recent years. Propagation of palm individuals with low isoprene emission capacity is considered as a strategy for mitigating its impact. A large number of samplings is expected to clarify the distribution of isoprene emission capacity and find out the low emitters for a species. Currently used method usually takes *in-situ* measurements on intact leaves with enclosed chambers. However, the portability of the equipment and the equilibration time of gas exchange in the chamber limits the reachable region and time efficiency of this method, making it unsuitable for large-scale samplings. Our group wanted to develop an *ex-situ* method, which the isoprene emission rate of leaf segments is observed after incubation under constant light and temperature, to achieve easier and faster sampling. Thus, we tested and optimized the parameters for the processes in this method. By monitoring isoprene emission rate under leaf temperature of 20, 25, 30 and 35 ˚C, we found that temperature of 25–30 ˚C was proper for the incubation when considering water loss. By measuring isoprene emission rate after 10-, 40-, and 60-min incubation, we found that the isoprene emission rate was typically low in the initial stage and increased at 40 min for all the palm species; the tendency after further incubation depended on the species, but generally, 40 min could be a moderately suitable incubation period. Next, we applied both the well-used method and this method on the same sections of leaves and found strong correlations between the emission rates obtained by the two methods. This implies that the new method is capable to evaluate the isoprene emission from palm leaves.