FACTA UNIVERSITATIS
Series: **Physics, Chemistry and Technology** Vol. 16, N° 1, Special Issue, 2018, p. 76
49th International Symposium on Essential Oils (ISEO2018) • Book of Abstracts

49th ISEO

PP12. Chemical investigation of the volatile compounds of *Alpinia zerumbet* leaves using DH-TD-GC/MS

Eisuke Kuraya[1]*, Akiko Touyama[1], Kenta Watanabe[1]

Keywords: *Alpinia zerumbet*, dynamic headspace-thermal desorption-GC/MS

The aromatic perennial plant *Alpinia zerumbet* (Pers.) Burtt & Smith (Zingiberaceae) grows in Japan, from the southern Kyushu to the Ryukyu Islands. Recently, interspecific hybridization of *Alpinia* spp. was reported in Taiwan. We have demonstrated that the floral volatiles of *A. zerumbet* differ between individual plants [1]. We also showed that the yield, content of the major volatile compounds, enantiomeric ratio of some monoterpenes, and antioxidant activities of the *A. zerumbet* leaf essential oils varied significantly among individual plants [2], which reflected genetic variability within the species. However, this trend needed to be demonstrated with more individuals. Unfortunately, a large quantity of leaves is necessary to obtain sufficient essential oil to investigate the differences in the chemical composition of the oils among individuals, because *A. zerumbet* leaves yield only a small amount of the essential oil upon hydrodistillation (0.01–0.07%). Prompted by this, here, we combined the dynamic headspace method with thermal desorption-gas chromatography-mass spectrometry (DH-TD-GC/MS). For this method, a small piece of a leaf is used and sampling is possible directly in the field. The aims of this study were to test the effectiveness of this DH-TD-GC/MS method and reveal the variation in the chemical composition of the essential oils of the leaves among the individual plants.

Alpinia zerumbet leaves were collected from Okinawa and Ie (16 and 22 samples, respectively), the Ryukyu Islands, between May and October 2017. The leaves were oven-dried (40–45 °C) to a moisture content of 10% or less, and 0.5 g of the dried leaves and stems from individual plants were septum-sealed in a 27-mL gas-tight vial. After introducing air through the activated carbon trap into the vial, volatiles were aspirated by a minipump and adsorbed to Tenax TA (60/80 mesh, 130 mg) for 10 min at 60 °C. Chemical analysis was performed using a TD-GC/MS system. The major volatiles identified in this study (α-pinene, camphene, limonene, β-phellandrene, 1,8-cineole, *p*-cymene, camphor, linalool, and cryptone) well represented the characteristics of the essential oil of the leaf. The aroma profile obtained here also confirmed that the volatiles in the leaves clearly differed among individual plants. These observations suggest the plausibility of selecting lineages of *A. zerumbet* to optimize the future production of valuable essential oils.

References:
[1] Kuraya, E. et al., 2017. Nat. Volatiles & Essent. Oils 4, 153–154.
[2] Kuraya, E. et al., 2017. Nat. Prod. Commun. 12, 1321–1325.

[1]National Institute of Technology, Okinawa College.
**Corresponding author*: kuraya@okinawa-ct.ac.jp