

シヨウガオイルに含まれるモノアミン酸化酵素 (MAO)-A 並びに
MAO-B 活性の阻害能を持つ化合物の精製とその推定構造

(2020年3月3日受付)

(2020年6月10日受理)

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Purification and structural analyses of the monoamine oxidase A and B inhibiting compounds
from ginger oil

(Received March 3, 2020)

(Accepted June 10, 2020)

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Abstract

Ginger (*Zingiber officinale*) rhizomes have been reported to exhibit multiple efficacies on human health. In this paper, we found that *n*-hexane extract from ginger rhizomes (ginger oil) exhibited the inhibiting abilities against monoamine oxidase A (MAO-A) and B (MAO-B), which catalyze the oxidative deamination of monoamine neurotransmitters, by using an *in vitro* luminescence-based method. To characterize the compounds responsible for the inhibiting abilities against MAO-A and MAO-B, all fractions from reversed-phase chromatographies were subjected to the luminescence assay. As a result, we isolated five compounds from ginger oil by nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. The half-maximal inhibitory concentration (IC₅₀) measurement using purified compounds revealed that (i) 6-, 8-, and 10-gingerols had strong inhibiting ability against MAO-A, whereas they showed weak inhibiting ability against MAO-B. (ii) IC₅₀ values of 6-, 8-, and 10-gingerols against MAO-A were calculated to be 175.7±11.0 μM, 54.6±2.0 μM, and 113.4±4.7 μM, respectively. (iii) Furthermore, we revealed that 1-dehydro-[6]-gingerdione (compound 1) and diacetoxy-[6]-gingerdione (compound 2) were contained in the ginger oil. (iv) The compound 1 showed strong and selective inhibiting ability against MAO-B with IC₅₀ of 6.77±0.45 μM, which was 10 times stronger than that against MAO-A. (v) The compound 2 showed weak inhibiting ability against both MAO-A and MAO-B. These findings suggest that the compound 1 having strong inhibiting ability against MAO-B could lead to the development of functional food materials intended to improve brain function.

Keywords : ショウガオイル、MAO-A 阻害剤、MAO-B 阻害剤、ジンゲロール、1-デヒドロ-[6]-ジンジャー
ジオン

ginger oil, MAO-A inhibitor, MAO-B inhibitor, gingerol, 1-dehydro-[6]-gingerdione

I 緒言

ショウガ (*Zingiber officinale*) はショウガ属ショウガ科の多年生草本で、原産地は熱帯アジアとされている。根茎部は特有の香りおよび味の付与、保存性の向上を目的に広く利用されている。ショウガは調理用途のほか、中国、イン

ド、日本を中心に生薬として利用されてきている。中国最古の本草書である神農本草経にショウガは体力を補うことを目的として収載され、現在でも漢方医学で多くの処方に配剤され、甘草に次いで配合頻度が高い重要生薬である¹⁾。ショウガならびにショウガ抽出物の機能性研究は多数行われており、抗炎症、利胆、鎮吐、鎮静、抗肥満など種々の生理作