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PL7. Pharmacologically active derivatives of anthranilic acid occurring naturally in essential oils

Fabio Boylan [1]*

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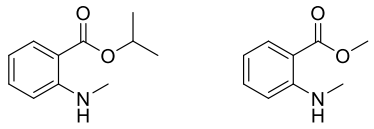
Volatile anthranilic acid derivatives are important in the perfume industry since the second half of the 19th century. Methyl *N*-methylanthranilate (MMA) is the key component of neroli essential oil and it is present in other plants of the family Rutaceae. During the first decade of the 20th century, MMA was sold by several important perfume suppliers such as Schimmel, Van Dyk & Co, W.J. Blush & Co. but very little was known about its pharmacological/toxicological properties. Methyl (MMA) and isopropyl (IMA) esters of *N*-methylanthranilic acid have been recently identified in the essential oil of *Choisya ternata* Kunth (Rutaceae) (Fig. 1) [1]. Both of these volatile alkaloids have been proven to possess diverse pharmacological activities, including antinociceptive [1,2], anti-inflammatory [3], gastro-, hepato- and nephroprotective activities [4-6], anxiolytic and anti-depressant properties, as well as an effect on diazepam-induced sleep [7]. Although the toxicity of MMA has been previously investigated [2,8], there are only scarce data on the toxicity of IMA. In one of our previous studies [2], no signs of toxicity of IMA and MMA in mice (100 mg kg^{-1}, *p.o.*, 5-day study) were observed. Additionally, pathohistological examinations revealed no signs of liver toxicity or other signs of toxicity. When the metabolization studies were undertaken it could be concluded that generally, MMA and IMA suffer analogous biotransformation pathways; however, MMA predominantly underwent chemical conversions of the ester group, i.e. transformation into derivatives of anthranilamide and anthranilic acid, while the major metabolic pathway of IMA was hydroxylation of the aromatic core [9].



1 **2**

Fig. 1. Isopropyl *N*-methylanthranilate (**1**) and methyl *N*-methylanthranilate (**2**)

[1]School of Pharmacy and Pharmaceutical Sciences, Trinity Biomedical Sciences Institute, Trinity College Dublin, Dublin 2, Ireland.
**Corresponding author*: desouzaf@tcd.ie

References:
[1] Radulović, N.S. et al., 2011. J. Ethnopharmacol. 135, 610–619.
[2] Gomes Pinheiro, M.M. et al., 2014. Eur. J. Pharmacol. 727, 106–114.
[3] Gomes Pinheiro, M.M. et al., 2015. PLoS One 10, e0121063.
[4] Radulović, N.S. et al., 2013. Life Sci. 93, 840–846.
[5] Radulović, N.S. et al., 2013. F.U. Phy. Chem. Technol. 11, 67–73.
[6] Radulović, N.S. et al., 2015. Life Sci. 135, 110–117.
[7] Radulović, N.S. et al., 2013. Phytother. Res. 27, 1334–1338.
[8] SCCS (Scientific Committee on Consumer Safety), 2011. Opinion on Methyl *N*-methylanthranilate (Phototoxicity Only). https://ec.europa.eu/health/scientific_ committees/ consumer_safety/docs/sccs_o_075.pdf. (Accessed 15 May 2018)
[9] Radulović, N.S. et al., 2017. Food Chem. Toxicol. 109, 341–355.

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