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Department of Pharmacognosy & Phytochemistry

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# Preparative Isolation of Glucosidase Inhibiting Compounds from *Olea europaea* Leaves

Naila H Alkefai<sup>1,2</sup> and Showkat R Mir<sup>2</sup>

<sup>1</sup>University of Hafer Albatin. Hafer Albatin, Saudi Arabia

<sup>2</sup>Phytopharmaceuticals Research Lab., School of Pharmaceutical Education & Research, Jamia Hamdard. New Delhi, India

## ABSTRACT

**Background and Aim:** *Olea europaea* L. (Oleaceae) has worldwide reputation for its medicinal properties. In Mediterranean region its health benefits are considered so great that it is used regularly as preventive medicine. A decoction of olive leaf is said to have a hypoglycemic effect. Our aim was to provide scientific evidence to back up this belief.

**Methods:** The ethanolic extract of leaves of *O. europaea* was fractionated with hexane and ethyl acetate. The hexane fraction was subjected to MPLC followed by preparatory TLC to isolate and purify compounds **1-4**. The isolated compounds were characterized using detailed spectroscopic analysis. *In-vitro*  $\alpha$ -glucosidase inhibition assay was carried out with the isolated compounds except **2**. Compounds **1** and **3** were further tested for anti-hyperglycemic activity in sucrose fed mice.

**Results:** Fractionation and chromatographic methods resulted in the isolation of four hydroxy oleanolic acid esters. Their structures were deduced to be dodec-3, 6-dien-1-yl-2,3,7 trihydroxy-olean-9(11),12,18-trien-28-oate (**1**), hexadec-3,7,11-trien-1-yl-2,3,7-trihydroxy-olean-9(11),12,18-trien-28-oate (**2**), octadecan-1-yl-2,3,7-trihydroxy-olean-9(11),12,18-trien-28-oate (**3**) and dodec-3, 6, 9-trien-1-yl-2,3,7,27-tetrahydroxy olean-9(11),12,18-trien-28-oate (**4**). Compounds showed concentration dependent inhibition of  $\alpha$ -glucosidase. Effective  $\alpha$ -glucosidase inhibition was achieved with compound **1** (IC<sub>50</sub> 50  $\mu$ g/ml), **3** (IC<sub>50</sub> 58  $\mu$ g/ml), and **4** (IC<sub>50</sub> 65  $\mu$ g/ml). In oral sucrose tolerance test, compounds **1** and **3** showed 26.41% and 24.58% reduction in peak blood glucose level, respectively.

**Conclusion:** The isolated compounds were twice as potent as the extracts and fractions of *O. europaea*. It is clear that 2, 3-dihydroxy oleantrieneic acid moiety was important for the  $\alpha$ -glucosidase inhibition of the compounds. Moreover, it can be inferred that acetylation truncated the inhibitory activity (as of **4**) while as the esterification with long chain alcohols improved the action of compounds (as shown by **1** and **3** versus oleanolic acid acetate). The results highlighted the significance of systematic study of traditional drugs to support their claims and wider global acceptability.

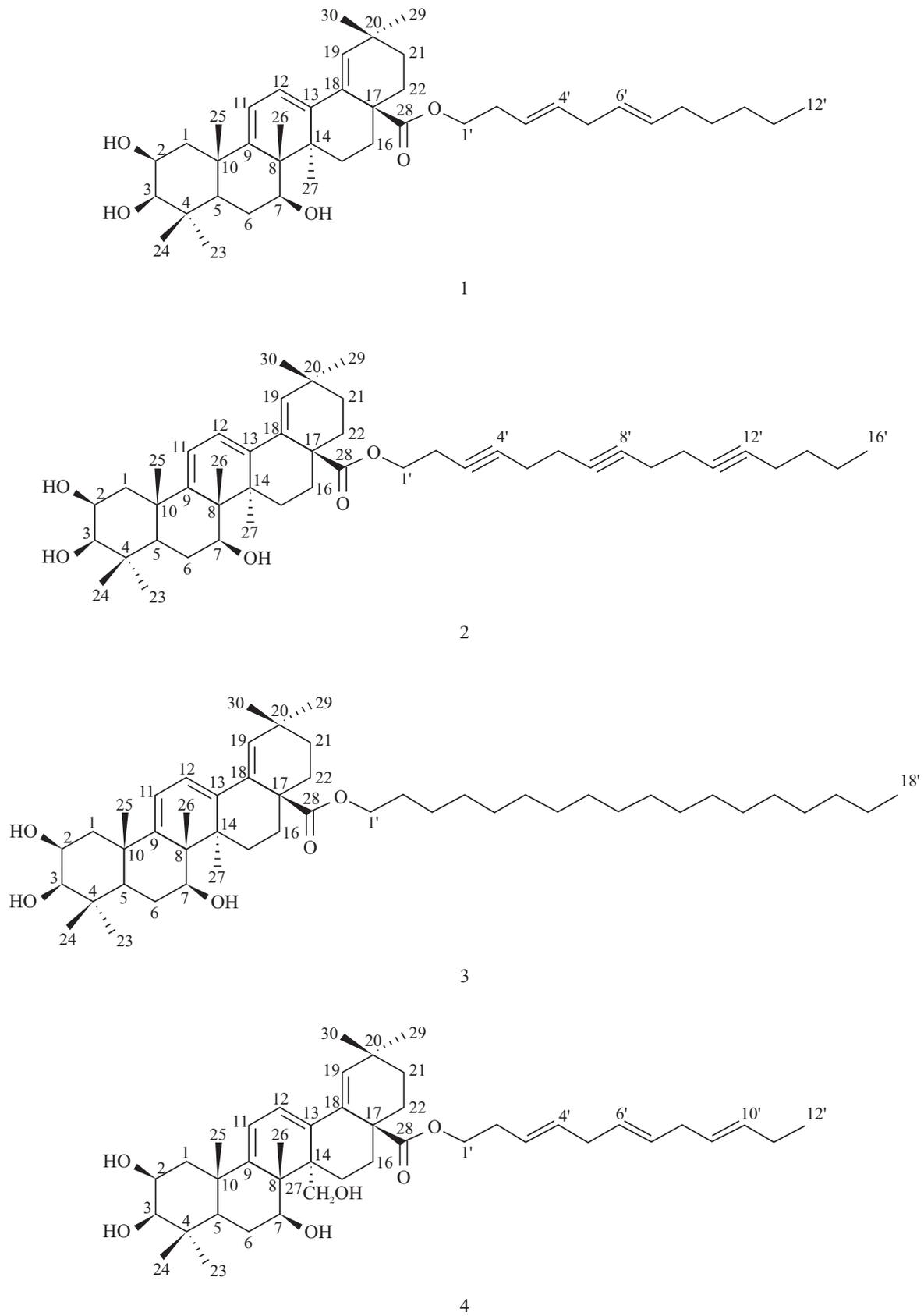


Fig. 1: Showing chemical structures of isolated compounds from *Olea europaea*



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