

## Rosmarinic acid: a potent carbonic anhydrase isoenzymes inhibitor

Meryem TOPAL<sup>1</sup>, İlhami GULCİN<sup>1,2</sup>

<sup>1</sup>Department of Chemistry, Faculty of Science, Atatürk University, Erzurum, Turkey

<sup>2</sup>Department of Zoology, College of Science, King Saud University, Riyadh, Saudi Arabia

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**Abstract:** Rosmarinic acid is a water-soluble ester of caffeic acid and 3,4-dihydroxyphenyllactic acids, and is mainly found in plant species including Boraginaceae and Lamiaceae. In this research, we determined the inhibition property of rosmarinic acid on carbonic anhydrase isoenzymes I and II (hCA I and II) purified from human erythrocytes by using Sepharose-4B affinity column chromatography. hCA I and II isoenzymes were obtained with a yield of 57.9% and 67.2% and 76.5- and 509.3-fold purification of each isoenzyme, respectively. In order to show the purity of the isoenzymes, SDS-PAGE was performed and one band was observed. In vitro inhibition of both hCA I and II isoenzymes by rosmarinic acid using CO<sub>2</sub>-esterase activity gave K<sub>i</sub> values of 86.0 M and 57.0 M, respectively.

**Key words:** Carbonic anhydrase I, carbonic anhydrase II, rosmarinic acid, enzyme purification, enzyme inhibition