In Vitro Acetylcholinesterase Inhibitory Activities of Subfractions and Isolate from Ethyl Acetate Fraction of Marine Sponge *Agelas nakamurai*

Andhika Dwi Aristyawan 1, Valentika Fitria Setyaningtias 2, Aty Widyawaruyanti 2,3, Tutik Sri Wubahni 2,3, Suciati 2,3

1 Postgraduate Program in Sciences of Pharmacy, Faculty of Pharmacy, Universitas Airlangga, Surabaya, 60115, East Java, Indonesia.
2 Department of Pharmacognosy and Phytochemistry, Faculty of Pharmacy, Universitas Airlangga, Surabaya, 60115, East Java, Indonesia.
3 Center for Natural Product Medicine Research and Development, Institute of Tropical Diseases, Universitas Airlangga, Surabaya, 60115, East Java, Indonesia.

BACKGROUND & OBJECTIVES

The inhibition of acetylcholinesterase (AChE), the key enzyme in the breakdown of acetylcholine, is currently the main pharmacological strategy for Alzheimer’s disease (AD). In the previous study we have investigated the potency of extract and fraction of marine sponge *Agelas nakamurai* collected from Tabuhan Island Banyuwangi as acetylcholinesterase inhibitor (AChEi), and discovered that the methanol extract as well as ethyl acetate fraction gave strong inhibition against AChE enzyme. The aim of the current study was to carry out bioassay-guided isolation of the active ethyl acetate fraction.

METHODS

The fractionation of ethyl acetate fraction was done by using VLC, HPLC, LCMS/MS, and NMR, in order to identify the active compound. The active compound was then identified as a diterpene alkaloid, and the IC50 was calculated.

RESULTS

Acetylcholinesterase Inhibitor Activity of Subfraction

<table>
<thead>
<tr>
<th>Subfraction</th>
<th>Replication 1 (IC50, µg/mL)</th>
<th>Replication 2 (IC50, µg/mL)</th>
<th>Replication 3 (IC50, µg/mL)</th>
<th>Average ± SD (µg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5.29</td>
<td>5.71</td>
<td>4.93</td>
<td>5.31 ± 0.39</td>
</tr>
<tr>
<td>3</td>
<td>3.18</td>
<td>4.99</td>
<td>3.37</td>
<td>3.84 ± 0.99</td>
</tr>
<tr>
<td>4</td>
<td>14.52</td>
<td>17.86</td>
<td>15.46</td>
<td>15.95 ± 1.72</td>
</tr>
<tr>
<td>5</td>
<td>24.82</td>
<td>36.18</td>
<td>31.43</td>
<td>30.81 ± 5.71</td>
</tr>
<tr>
<td>Galantamin</td>
<td>0.61</td>
<td>0.36</td>
<td>0.39</td>
<td>0.45 ± 0.13</td>
</tr>
</tbody>
</table>

Determing Compounds of Active Isolates

The compound was identified as a diterpene alkaloid, which was named *N*-Bromo-7-Oxocarinone.

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REFERENCES


CONCLUSIONS

The ethyl acetate subfraction 2 to 6 subfraction of *Agelas nakamurai* sponge has activity as acetylcholinesterase inhibitor. The diterpene alkaloid were isolated from the active ethyl acetate subfraction from *Agelas nakamurai* sponge have strong activity, it can be a good candidate of acetylcholinesterase inhibitor.