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ANTIOXIDANT POTENTIAL OF SOME INDOONESIAN FRUIT PEELS

Muhtadi*, Haryoto, Tanti Azizah, Peni Indrayudha, Andi Suhendi

The ethanolic crude extracts of some Indonesian fruit peels were screened for their free radical scavenging properties using vitamin E as standard antioxidant. Free radical scavenging activity was evaluated using 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical. The antioxidant activity of Kelengkeng (Euphoria longan Lour. Steud) fruit peel was the strongest, followed in descending order by Durian (Durio zibethinus Murr.), and Rambutan rind (Nephelium lappaceum Linn.) showed weak free radical scavenging activity with the DPPH method. The IC50 of the ethanolic extracts ranged between 9.23 and 158.67 µg/ml and that of vitamin E was 8.48 ± 0.1 µg/ml. The result showed that prospective antioxidant of Kelengkeng fruit peel extract was higher than the durian and rambutan fruit peels extracts.

Keywords: antioxidant, some fruit peels Indonesia, and DPPH assay.

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Introduction

- Fruit peels are often regarded as a waste or garbage
- Whereas chemically, "waste" are organic materials = chemicals substances that have chemical and biological activity
- Example: mangosteen peel (Manggis) contain alpha-mangostin a highly active as an antioxidant and has been used as an herbal medicine.
- Pre-screening studies to test the antioxidant activity, cytotoxic and antibacterial of waste fruit peels are still very limited.

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Objectives

1. This research aims to determine the potential activity of antioxidant of some Indonesian fruit peels using DPPH assay.
2. To search the prospective antioxidant from "waste" of some fruit peels from Indonesia as herbal medicine material.

RESEARCH METHOD

Samples / Simplisia Powder

Extraction by maceration with ethanol 96%, partition for fractionation with n-hexane until methanol-water

Antioxidant pre-screening testing in using DPPH method of ethanol extract and their fraction

Analyzed for getting the potential antioxidant material of some fruit peels from Indonesia
### Antioxidant activity of Kelengkeng (Euphoria longan Lour. Steud.)

<table>
<thead>
<tr>
<th>SAMPEL</th>
<th>IC$_{50}$ (µg/ml)</th>
<th>Rerata IC$_{50}$ SD**</th>
<th>EC$_{50}$ (mg sampel/mg DPPH)</th>
<th>ARP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>VITAMIN E</td>
<td>8.91</td>
<td>8.75</td>
<td>8.98</td>
<td>8.88 ± 0.12</td>
</tr>
<tr>
<td>KULIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Etanol</td>
<td>11.36</td>
<td>11.24</td>
<td>12.96</td>
<td>11.85 ± 0.96</td>
</tr>
<tr>
<td>F. Hokusana</td>
<td>363.83</td>
<td>378.25</td>
<td>382.35</td>
<td>374.81 ± 9.73</td>
</tr>
<tr>
<td>F. Etil asetat</td>
<td>9.10</td>
<td>9.19</td>
<td>9.39</td>
<td>9.23 ± 0.15</td>
</tr>
<tr>
<td>F. Metanol Air</td>
<td>43.99</td>
<td>43.99</td>
<td>46.69</td>
<td>44.82 ± 1.91</td>
</tr>
<tr>
<td>BIJU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Etanol</td>
<td>13.51</td>
<td>13.55</td>
<td>13.16</td>
<td>13.41 ± 0.21</td>
</tr>
<tr>
<td>F. Hokusana</td>
<td>489.67</td>
<td>540.29</td>
<td>576.68</td>
<td>535.51 ± 43.69</td>
</tr>
<tr>
<td>F. Etil asetat</td>
<td>9.46</td>
<td>9.72</td>
<td>9.32</td>
<td>9.50 ± 0.70</td>
</tr>
<tr>
<td>F. Metanol Air</td>
<td>35.42</td>
<td>36.13</td>
<td>36.01</td>
<td>35.85 ± 0.38</td>
</tr>
</tbody>
</table>

### Antioxidant activity of Durian (Durio zibethinus Murr.)

**Gambar 8. Hasil IC$_{50}$ pada sampel dan vitamin E.**

Keterangan: k1: kulit dalam; k2: kulit luar; E: Ekstrak Etanol; K:fraksi Kloroform; EA:fraksi Etil Asetat; VIT E: Vitamin E
# RESULTS AND DISCUSSION

Table of value $IC_{50}$ of various extract and fraction of Some fruit peels and seed

<table>
<thead>
<tr>
<th>No</th>
<th>Various extract and fraction</th>
<th>$IC_{50}$ value (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethanol extract of kelengkeng fruit peel</td>
<td>11.85</td>
</tr>
<tr>
<td>2</td>
<td>Ethyl acetate fraction of kelengkeng fruit peel</td>
<td>9.23</td>
</tr>
<tr>
<td>3</td>
<td>Ethanol extract of durian peel</td>
<td>26.83</td>
</tr>
<tr>
<td>4</td>
<td>Ethyl acetate fraction of durian peel</td>
<td>14.91</td>
</tr>
<tr>
<td>5</td>
<td>Ethanol extract of rambutan peel</td>
<td>7.74</td>
</tr>
<tr>
<td>6</td>
<td>Ethyl acetate fraction of rambutan peel</td>
<td>4.29</td>
</tr>
</tbody>
</table>
RESULTS AND DISCUSSION

Phenolic compounds had been isolated / reported

- From Kelengkeng (*Euphoria longan*) fruit skin: (-)-epicatechin, proanthocyanidin A2, ellagate acid, quercetin, kaempferol glycosides and hydroxycinamate derivatives (Jaitrong, 2006).
- From rambutan (*Nephelium lappaceum* Linn) rind: ellagat acid, corilagin, geranin, flavonol substituted and phenolic acid derivatives (Asrianti et al., 2006).
- From durian (*Durio zibethinus* Murr.) rind: apigenin, p-hydroxybenzoic acid, vanilic acid, kafeat acid, ferulic acid, and quercetin anisat acid (Poovarodom et al., 2010).

CONCLUSION

1. The etanolic extract of rambutan rind showed the highest antioxidant activity, with the IC$_{50}$ value 7.10 ppm. While the durian peel extract showed lower with IC$_{50}$ value of 28.83 ppm.
2. Ethyl acetate fraction of each fruit peel extracts, showed the highest antioxidant activity than the other fractions.
3. Rambutan peel is the best prospective as antioxidant ingredient.
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Thank You
CERTIFICATE OF PARTICIPATION

We hereby declare that

MUHTADI

has participated as

SPEAKER (ORAL PRESENTER)

in the 2nd International Conference on Nutraceutical and Cosmetic Sciences

Atlet Century Hotel, October 23-24, 2013

Indonesian Pharmacists Association Accreditation Number: 612/SK/SPK/PP/IP/I/VI/2013
Participant 10 SKP / Speaker 7 SKP / Poster Participant 3 SKP / Moderator 3 SKP / Committee 2 SKP

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