Comparing Antioxidant Power of Super-Fruit Supplements

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What are Superfruits?
Fruits with extremely high concentrations of antioxidants

Why Do You Care?
• Antioxidants fight off cancer
• How?
  – Free radicals (•R) in the body cause cancer
  – Antioxidants (A) eliminate radicals by donating electrons

\[
\begin{align*}
A & \rightarrow A^- + \cdot e^- \\
•R + \cdot e^- & \rightarrow :R \text{ (stable, unreactive)}
\end{align*}
\]

Research Questions
1. How do we extract antioxidants from superfruit supplements?
1. How do we test the antioxidant power?
1. Which superfruit is best?
1. Are superfruit supplements more or less effective than common fruits (apples and oranges)?

Extracting Antioxidants
• Cut open pill
• Squeeze out pill contents into a vial
• Add solvent (water, methanol, ethanol, acetone)
• Shake vial for 30 seconds
• Top liquid layer was centrifuged, filtered, and tested with radical solution.

Selected Superfruit Supplements
Extracting Antioxidants

Testing Antioxidant Power

- UV-Vis Spectrophotometer

- Monitored %T or A of blue radical solution after adding fruit extract

- Calculated % radical removal = \( \frac{(\text{Abs}_{\text{control}} - \text{Abs}_{\text{sample}})}{\text{Abs}_{\text{control}}} \times 100 \)

Testing Antioxidant Power

Spectrophotometer Schematic

\[
\text{Transmittance (T)} = \frac{P}{P_0} \\
\text{Absorbance (A)} = -\log(T)
\]

Collecting Data

Extracting Antioxidants by Solvents

- Cranberry

\[
\begin{array}{c|c|c|c|c}
\text{Solvent} & \text{Acetone} & \text{Methanol} & \text{Ethanol} & \text{Water} \\
\hline
\% \text{ Radial Removal} & 97.1 & 95.9 & 97.5 & 89.8 \\
\end{array}
\]
Testing Supplement Extracts

% Radical Removal by Supplements

Comparing Natural Fruits

Conclusions

• Ethanol

• Pomegranate is the best

• Pomegranate supplement and natural fruit have near equivalent percent radical removal, 94.7% and 95.7% respectively.

• DON’T BELIEVE THE HYPE!

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