“Aronia Berries: Extraction and characterization of valuable compounds”
Origin

- Deciduous shrubs
- Rosaceae family
- Eastern North America
Europe variates

- Balkan
  Bulgaria, Serbia, FYROM, etc.

- Middle-European (Viking)
  Poland, Germany, Belgium, France, etc.

- Euro-Asiatic (Nero)
  Russia, Finland, Sweden, etc.
Aronia species

Red chokeberry - Aronia arbutifolia

Black chokeberry - Aronia melanocarpa

Purple chokeberry - Aronia prunifolia

Green chokeberry - Sorbaronia mitschurinii
Melanocarpa (Black Chokeberry) - Photinia melanocarpa

- 1m tall - 3m wide
- Small leaves (< 6cm wide)
- White flowers
- Black fruit (6-9 mm wide)
- Persisting into winter (up to -40 °C)
Exploitable parts

- Fruits
- Leaves
## Chemical components

<table>
<thead>
<tr>
<th>nutrients</th>
<th>Organic acids</th>
<th>Vitamins</th>
<th>Trace elements</th>
<th>Phytochemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose</td>
<td>l-Malic acid</td>
<td>Vitamin C</td>
<td>Na</td>
<td>β-Carotene</td>
</tr>
<tr>
<td>Fructose</td>
<td>Citric acid</td>
<td>Folates (B9)</td>
<td>K</td>
<td>Phenolics</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>Isocitric acid</td>
<td>Vitamin B1, B2, B6</td>
<td>Ca</td>
<td>Amygdalin</td>
</tr>
<tr>
<td>Pectins</td>
<td>Shikimic acid</td>
<td>Niacin (B3)</td>
<td>Mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Succinic acid</td>
<td>Pantothenic acid</td>
<td>Fe</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(B5)</td>
<td>Zn</td>
<td></td>
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</table>
Pharmaceutical use

- Antioxidant, antimicrobial and antifungal properties
- Anti-inflammatory action
- Enhancement of the defense system (strong antioxidant) against degenerative diseases e.g. forms of cancer-neoplasias
- Positive effect on cardiovascular disease, cholesterol and hypertension lowering
- Prevention and treatment of urological diseases
- Cell rejuvenation (memory enhancement)
- Diabetes
- Treatment of aphrodisiac and skin diseases
- Hepato-protective effects
- Protection against radioactivity
- No undesirable or toxic side effects
Phenolic compounds

- Procyanidins
- Anthocyanins
- Flavonols
Manufacturing process of mother tinctures of plant origin:

- Raw material: Aronia melanocarpa
- Source: Greece, Denmark
- Method of exploitation: extraction-percolation
- Method of analysis: TLC, HPLC
Steps until plant extract
Choice of the most suitable soil:

- Only natural fertilization
- No chemical fertilizers
- No pesticide insecticides
- No fungicides
- No herbicides
Plant collection based on the specific collection rules:

- The harvest (August-mid September) takes place late in the morning to avoid moisture
- Completely dry parts of the plant
- Very clean raw material (no parasites, no illnesses)
- Meticulous cleaning of all kinds of impurities
- Transplantation time < 48h

- Use of well-ventilated packagings (perforated bags, baskets of reeds, boxes full of holes e.tc.)
- Place a specific ID-information card
<table>
<thead>
<tr>
<th>ID-information card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier:</td>
</tr>
<tr>
<td>Name of the plant:</td>
</tr>
<tr>
<td>Place of collection:</td>
</tr>
<tr>
<td>Time of collection:</td>
</tr>
<tr>
<td>Date of collection:</td>
</tr>
<tr>
<td>Weight (kg):</td>
</tr>
</tbody>
</table>
3

Processing methods:

1. Fresh fruits
2. Segmentation into alcohol vapor
3. Liquid extraction

1. To drying
2. Determination of dry residue using a sample to determine the moisture content of the plant, which helps to calculate the degree of alcohol
3. Drying at 50°C for 24hr
4 Drying
Extraction - Percolation:

- separation of active ingredients from inactive
- isolation or collection thereof in the pure state
- final formatting
Procedure

1. Preparation of the drip

2. Humidification to inflate with water-alcoholic solvent

3. Stack the drip into the percolator - add solvent

4. Maceration for at least 48hr

5. Receive extract

6. Let it calm for 24 hr

7. Filtration

Only pure alcohol and deionized water are used as solvents!
Final control of the extract

• Determination of degree of alcohol and degree of acidity (ph-meter).

• Determination of crude fiber, coefficient of expansion, bitterness limit.

• Immediate anthocyanin identification (therapeutic value) ➔ identification of aronia.
Preparations

- Dried fruits
- Powder
- Liquid extract
- Capsules
- Tablets
- Drops
- Powder
- Elixir

Non-toxic!
Our products:
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Thank you!

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