Pawpaws in Romania

Florin STĂNICĂ
Introduction
Introduction

Position: 43° 37’ and 48° 15’ Northern latitude and 20° 15’ and 29° 41’ Eastern longitude
Area: 238,392 km²
Population: aprox. 22,500,000
Language: Romanian (Neo-Latin)
Climate: - temperate, excessive continental
  - average annual temperature: 8-11°Celsius
  - annual rain fall: 450-800 mm
Agriculture: - arable land: 10 million hectares
  - vineyards: 250,000 hectares: several local cv.
  - fruit orchards: 200,000 hectares: temperate fruits: Apples, European Plums, Pears, Quinces, Peaches, Apricots, Sweet & Sour Cherries, Walnuts, Hazelnuts, Chestnuts etc.
Introduction

New fruit species:
- kiwi, pawpaw, Chinese date, persimmon, Go Ji
History of pawpaw in Romania

- Pawpaw (*Asimina triloba* Dunal) is a new fruit in Romania the first reports on *Asimina triloba* came from a small village in Transylvania, north-western part of the country.

- At the beginning of the 20th Century, 1926, a Romanian immigrant family brought from USA, some pawpaw seeds in the village of Pianu Nou, Alba County.
History of pawpaw in Romania

- Suciu Family: Ioan, Maria and their son, Ioan Jr. in Toledo, Ohio, 1926, just before their return to Romania
History of pawpaw in Romania

Pianu de Sus, Alba, Romania
History of pawpaw in Romania

Pianu de Sus, Alba, Romania
History of pawpaw in Romania
Pianu de Sus, Alba, Romania

New owner since 1978: Elena Voișan (82)
Description of pawpaw genotypes in Romania

- Asimina PS – Pianu de Sus
Description of pawpaw genotypes in Romania

- Asimina PS – Pianu de Sus
Description of pawpaw genotypes in Romania

- Asimina LG – Geoagiu, HD – planted in 1985

Owner since 1985: Gheorghița Lup
Description of pawpaw genotypes in Romania

- Asimina LG – Geoagiul, HD – origin Orăştie HD
Description of pawpaw genotypes in Romania

- Asimina USAMV - București
Description of pawpaw genotypes in Romania

- Asimina USAMV București – origin Geoagiu 1998
Description of pawpaw genotypes in Romania

Asimina GBB - București Botanical Garden
Description of pawpaw genotypes in Romania

- Asimina GBB - București Botanical Garden
Description of pawpaw genotypes in Romania

- Asimina GBB - București Botanical Garden
### Description of pawpaw genotypes in Romania

#### Pawpaw genotypes fruits and leaves characteristics

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Origin</th>
<th>Fruit weight (g)</th>
<th>Firmness (kgf/cm²)</th>
<th>Soluble solids (%)</th>
<th>Leaves /shoot no</th>
<th>Single leaf area (cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>Ohio</td>
<td>36.7</td>
<td>2.93</td>
<td>18.2</td>
<td>9</td>
<td>190.07</td>
</tr>
<tr>
<td>LG</td>
<td>Pianu de Sus – Orăștie</td>
<td>56.2</td>
<td>7.5</td>
<td>23.6</td>
<td>9</td>
<td>177.96</td>
</tr>
<tr>
<td>USAMV</td>
<td>Geoagiu</td>
<td>65.7</td>
<td>3</td>
<td>20.4</td>
<td>9</td>
<td>106.07</td>
</tr>
<tr>
<td>GBB</td>
<td>?</td>
<td>36.0</td>
<td>2.05</td>
<td>18.2</td>
<td>8</td>
<td>166.72</td>
</tr>
</tbody>
</table>
Description of pawpaw genotypes in Romania

- Seed comparison

- Asimina triloba
  - Faenza – Italia 2002
  - Geoagiu 2002

- Asimina triloba
  - București 2002
  - București 2001
# Pawpaw variety introduction in trials & collections

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Year of introduction</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunflower</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Prima 1216</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Davis</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Overleese</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>NC-1</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Ithaca</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Prolific</td>
<td>2000</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Vitroplant 1</td>
<td>2000</td>
<td>Italy, Vitroplant</td>
</tr>
<tr>
<td>Vitroplant 2</td>
<td>2000</td>
<td>Italy, Vitroplant</td>
</tr>
<tr>
<td>Vitroplant 3</td>
<td>2000</td>
<td>Italy, Vitroplant</td>
</tr>
<tr>
<td>Taylor</td>
<td>2005</td>
<td>USA, Corvallis Repository</td>
</tr>
<tr>
<td>Wells</td>
<td>2005</td>
<td>USA, Corvallis Repository</td>
</tr>
<tr>
<td>Wilson</td>
<td>2005</td>
<td>USA, Corvallis Repository</td>
</tr>
</tbody>
</table>
# Pawpaw variety introduction in trials & collections

<table>
<thead>
<tr>
<th>Genotypes</th>
<th>Year of introduction</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny*</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Potomac*</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Rappahannock</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Shenandoah</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Susquehanna</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Wabash</td>
<td>2012</td>
<td>USA, Neal Peterson</td>
</tr>
<tr>
<td>Taytoo</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Taytoo</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Sweet Alice</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Mary Foos Jones</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Rebecca’s</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Belle</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>Mango</td>
<td>2016</td>
<td>Italy, Montanari Nursery</td>
</tr>
<tr>
<td>New Varieties</td>
<td>?</td>
<td>USA</td>
</tr>
</tbody>
</table>
Neal Peterson pawpaws in Romania – spring 2012
Neal Peterson pawpaws in Italia – July 2014

Allegheny  Rappahannock  Wabash
Pawpaw trials & collections in Romania
Faculty of Horticulture, USAMV Bucureşti
Pawpaw trials & collections in Romania
- Faculty of Horticulture, USAMV București
Pawpaw trials & collections in Romania
Faculty of Horticulture, USAMV Bucureşti, Dec. 2015
Pawpaw trials & collections in Romania

Private garden in Stăneşti, Argeș
Pawpaw trials & collections in Romania

Private garden in Stănești, Argeș
Pawpaw trials & collections in Romania
- Private garden in Otopeni, Ilfov
Pawpaw trials & collections in Romania
Simina - first Romanian - Italian pawpaw variety
Simina - plant description

Tree
Vigor: medium
Crown shape: round
Simina - plant description

Tree
Leaves: elongated
Leaf average area: 82.78 cm²
Simina - plant description

Tree
Flowers: normal size
Simina - plant description

Fruits: big, 210.62 g, elliptic, irregular, light green skin
Simina - plant description

Fruits:
- length: 9.84 cm; volume: 225.13 cm³
Simina - plant description

Fruits:
- Flesh: white-yellowish, creamy, very tasty
Simina - plant description

Fruits:
- Seeds: dark-brown, flat, elliptic, big 1.2-1.5x1.5-2.5 cm
  10-12 seeds/fruit, average 11.63 seeds/fruit
Simina - plant description

Fruits:
- Biochemical, physical and physiological characteristics

<table>
<thead>
<tr>
<th></th>
<th>Soluble solids (%)</th>
<th>Total dry matter (g)</th>
<th>Flesh firmness (kg F/cm²)</th>
<th>Minerals (%)</th>
<th>Acidity (%)</th>
<th>Ascorbic acid (mg)</th>
<th>Water (%)</th>
<th>Respiration intensity (mgCO₂/kg h)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USAMV - Control</strong></td>
<td>20.0</td>
<td>24.90</td>
<td>0.25</td>
<td>0.80</td>
<td>0.930</td>
<td>41.25</td>
<td>75.10</td>
<td>62.45</td>
</tr>
<tr>
<td><strong>Vitroplant 2 (Simina)</strong></td>
<td>23.0</td>
<td>22.81</td>
<td>0.30</td>
<td>0.81</td>
<td>0.119</td>
<td>35.20</td>
<td>77.19</td>
<td>63.86</td>
</tr>
<tr>
<td><strong>Vitroplant 3</strong></td>
<td>24.5</td>
<td>25.67</td>
<td>0.29</td>
<td>0.83</td>
<td>0.112</td>
<td>33.60</td>
<td>74.33</td>
<td>74.23</td>
</tr>
</tbody>
</table>
Simina - plant description

Fruits:

- Mineral composition

<table>
<thead>
<tr>
<th>Minerals</th>
<th>Vitroplant 2 (Simina) (mg/100 g fw)</th>
<th>Vitroplant 3 (mg/100 g fw)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>0.57</td>
<td>1.20</td>
</tr>
<tr>
<td>Barium</td>
<td>17.93</td>
<td>14.38</td>
</tr>
<tr>
<td>Boron</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Calcium</td>
<td>29.76</td>
<td>21.27</td>
</tr>
<tr>
<td>Crom</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Copper</td>
<td>0.09</td>
<td>0.12</td>
</tr>
<tr>
<td>Iron</td>
<td>0.17</td>
<td>0.26</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>7.35</td>
<td>7.62</td>
</tr>
<tr>
<td>Magnesium</td>
<td>16.91</td>
<td>14.01</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.10</td>
<td>0.12</td>
</tr>
<tr>
<td>Nickel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Plumb</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Potassium</td>
<td>301.63</td>
<td>316.28</td>
</tr>
<tr>
<td>Sodium</td>
<td>15.56</td>
<td>8.05</td>
</tr>
<tr>
<td>Strontium</td>
<td>4.24</td>
<td>3.49</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.15</td>
<td>0.18</td>
</tr>
</tbody>
</table>
Pawpaw research in Romania – PhD thesis

2005 - „Research regarding the propagation of Annonaceae Family species – Asimina triloba (L) Dunal” - Ariton Silvana-Mihaela

2015 - “Research regarding the biology and cultivation technology of the Asimina triloba (L.) Dunal Plant with a view toward its introduction among the ornamental plants of the Baia Mare area”

Szilagyi Beatrice Agneta

- Ornamental value
- Resistant to urban pollution
- High capacity of dust accumulation on leaves
- High capacity of heavy metals absorption
Conclusions
- Pawpaw is a promising new fruit specie in Romania,
- It is necessary to extend the trial plots in new growing areas,
- New varieties and selected hybrids need to be introduced,
- Research on breeding, propagation, orchard technology and processing will be developed,
- PhD and Postdoc thesis - double coordination with KSU,
- Marketing and consumer education.
Jujube Workshop 2016:

Chinese Jujube - a new fruit for Europe

October 9-12, 2016
București - România
PROVISIONAL PROGRAM

Sunday, 9th of October
17:00-21:00 Welcome and Registration

Monday, 10th of October
09:00-10:00 Opening ceremony of Jujube Workshop and Jujube Exhibition
10:30-13:00 Working sessions (Genetic Resources and Breeding)
14:30-16:30 Working sessions (Propagation and orchard technologies)
17:00-18:30 Working sessions (Chinese jujube plant protection)

Tuesday, 11th of October
07:30-23:00 Technical excursion in Dobrogea Region, Black Sea area:
11:00 Visit of the oldest jujube tree in Ostrov
12:00 Adamclisi Organic Wine tasting – Vifranca Company
16:00 Visit of Argamum Greek Antique Colony with wild jujube - Jurilovca

Wednesday, 12th of October
09:00-11:00 Working sessions (Postharvest, fruit quality and benefits to human nutrition)
11:30-13:00 Visit of Moara Domnească Research Station
16:00-16:30 Closing ceremony of Jujube Workshop and Jujube Exhibition
Jujube Workshop 2016: Chinese Jujube - a new fruit for Europe
October 9-12, 2016     București - România

Deadline abstract submission: 15th of September
Deadline fulpaper submission: 12 of October

Convenors
Prof. Dr. Florin Stănică   - USAMV București
Prof. Dr. Mengjun Liu     - Agricultural University of Hebei

We look forward to meeting you in București in October!

http://www.jujube.ro   e-mail: workshop2016@jujube.ro
Contacts

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Questions?