AGROCOS: From Biodiversity to Chemodiversity: Novel Plant Produced Compounds with Agrochemical and Cosmetic interest

- Granted under the 7th framework programme
- Call: Food, Agriculture and Fisheries, and Biotechnology
  Topic Prospecting for novel plant-produced compounds (FP7-KBBE-2009-3)
Consortium

1. National and Kapodistrian University of Athens, Greece (NKUA, Coordinator) 
2. University of Basel, Switzerland (UNIBAS) 
3. Centre National de la Recherche Scientifique, France (CNRS)
   a. ICSN (Paris, New Caledonia, Madagascar)
   b. ECOFOG (French Guyenne)
4. Universidad de Panamá, Panama (CIFLORPAN)
5. Council for Scientific and Industrial Research, South Africa (CSIR)
6. National Center for Scientific Research “Demokritos”, Greece (NCSR)
7. BASF, Germany (BASF)
8. KORRES SA, Greece (KORRES)
9. Bruker BioSpin GmbH, Germany (BRUKER)
Core target achieved

Discovery of plant derived small molecules with development potential as new cosmetic/agrochemical agents, from the global biodiversity.
Top 10 plant families among 3600 extracts

Bioevaluation of leads

Isolation

100 newly isolated molecules

Bioevaluation of fractions

Fractionation

4000 microfractions

Bioevaluation of extracts

100 hit extracts

Bioevaluation of scaffolds

Existing scaffold investigation

484 existing molecules

Bioevaluation of leads

3 Agro-assays
- Herbicidal
- Fungicidal
- Insecticidal

3 Cosmeto-assays
- Antioxidant
- UV-protection
- Anti-tyrosinase

Extraction

1810 plant species
3620 extracts

NPs AGROCOS Library
600 NP entities (extracts and compounds)
Dereplication of knowns
NMR spectral data and metadata

Extensive 96-well plate Bio-screening
3620 Extracts
600 compounds
4000 microfractions

AGROCONS results
# Development Agrochemicals

## AGRO-HIT INITIAL COMPOUNDS

**Fungicidal coumarins**

![Chemical structures of Seselin (NKUA-007) and Xanthyletin (NKUA-006)](image)

### Table: Effects of Fungicidal Coumarins on Different Fungi

<table>
<thead>
<tr>
<th>Compound</th>
<th>Titer Dose (ppm)</th>
<th>BOTRCI</th>
<th>PHYTIN</th>
<th>PYRIOR</th>
<th>SEPTTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NKUA-007</td>
<td>7.75</td>
<td>0.227</td>
<td>0.337</td>
<td>0.879</td>
<td>0.574</td>
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<tr>
<td>NKUA-007</td>
<td>3.1</td>
<td>0.712</td>
<td>0.642</td>
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<tr>
<td>NKUA-047</td>
<td>0.000118256</td>
<td>0.089</td>
<td>0.047</td>
<td>0.123</td>
<td>0.32</td>
</tr>
</tbody>
</table>

### Table: Effects of Fungicidal Coumarins on Different Fungi (continued)

<table>
<thead>
<tr>
<th>Compound</th>
<th>Titer Dose (ppm)</th>
<th>BOTRCI</th>
<th>PHYTIN</th>
<th>PYRIOR</th>
<th>SEPTTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NKUA-007</td>
<td>0.000118256</td>
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<td>0.024</td>
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<td>NKUA-007</td>
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<td>0.05</td>
<td>0.044</td>
<td>0.137</td>
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<td>0.074</td>
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<tr>
<td>NKUA-007</td>
<td>0.12109375</td>
<td>0.143</td>
<td>0.046</td>
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<td>NKUA-007</td>
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<td>0.138</td>
<td>0.041</td>
<td>0.282</td>
<td>0.047</td>
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<td>NKUA-007</td>
<td>1.9375</td>
<td>0.1</td>
<td>0.092</td>
<td>0.648</td>
<td>0.103</td>
</tr>
</tbody>
</table>

### Citrus sp. roots

**Dereplication – Isolation from sustainable sources**
Development Cosmetics

40 COSMETIC-HIT EXTRACTS

1600 COSMETIC-HIT MICROFRACTIONS

Morus alba (MORACEAE)
Tyrosinase inhibition
Antioxidant Activity

Extract to be used in cosmetic formulations with skin whitening activity

ENRICHED EXTRACT IN STILBENOIDS

ISOLATED COMPounds

Mulberroside A
Moracin M
Steppogenin 4’-O-β-D-glucoside
RESULT:
Launch of a full skincare antiaging line based on Agrocos findings / antiaging properties of Fagacea

Stay tuned, in pharmacies & department stores around the world in 2016!