Maqui Select Extract
✓ Inflammation,
✓ Immunity
✓ Glucose Metabolism
✓ Prevent oxidation damage
HOST:
Geoff D’Arcy, Lic. Ac., D.O.M.

Geoff has been a practicing Traditional Chinese Medicine (TCM) Herbalist and Acupuncturist for over 30 years. He started Herb-for-Pets over ten years ago at the request of veterinarians looking for herbal pet care options. With his commitment to wellness and natural healing, he has trekked around the world discovering native herbs that have powerful healing properties. With his knowledge he has developed an excellent, well-balanced line of herbal formulas for pets; ranging from common conditions and nutritional support to formulas for serious disease and chronic conditions.

Geoff has authored and co-authored several books on holistic medicine and herbs, including “The Veterinary World Herb Handbook” and “The World Herb Handbook”. He has also co-founded two large integrative medical centers in Massachusetts and is now Director of the D’Arcy Wellness Center in Natick, Massachusetts. He is president of D’Arcy Naturals, Inc., a company that produces all natural herbal formulas for people and pets. D’Arcy Naturals offers free eNewsletters for veterinarians at www.naturalpetrx.com.
GUEST:
Juan Hancke DVM, Ph.D.

Principal researcher, CTI Salud, Chile.
Bachelor Degree of University Austral, Chile, Faculty of Veterinarian Science (1975), and PhD of King’s College University of London, Faculty of Medicine (1986).
He is specialized in the area of medicinal plants, his research areas are herbal medicine, immunity, and inflammation.

Between the years 1986-1995, Dr. Hancke was Scientist Director of the Swedish Herbal Institute, Gotemburgo, Sweden, a leading company in nutraceutical research and development. He has conducted many clinical trials with natural products that are published in journals of the field. Also he has directed various toxicology studies for companies of the European Community, which has allowed the registration of drugs to the various health agencies in Europe.

Juan is currently Principal researcher in the herbal medicine area, at CTI Salud in Santiago, Chile.
GUEST:

Rafael A. Burgos, DVM, MSc

Associate researcher, CTI Salud S.A.

Bachelor Degree of University Austral, Chile, Faculty of Veterinarian Science (1990), and Master of Science, Mention in Pharmacology, University of Chile, Faculty of Medicine (1996). In his career Dr. Burgos has served as Adjunct Professor of Virginia Regional College of Veterinary Medicine, at Virginia Tech, Blacksburg, Virginia, USA (1999). Currently he is Titular Professor since 2007, at the Institute of Pharmacology of the University Austral, Chile.

Rafael also has served as Director at the Pharmacology Institute of the University Austral, Chile (2003-2005), Director at the Graduates School of Veterinary Sciences Faculty of the University Austral, Chile (2004-2005), Dean of the Faculty of Veterinary Sciences of the University Austral, Chile (2006-2009; 2009-2011).

In addition as Member at the Mention Committee of the Doctorate Program in Molecular and Cellular Biology Science of the Science Faculty of the University Austral, Chile (2008), and Member of the Academic Committee of the Pharmacology Doctorate Program of the University Austral, Chile (2009-2011). He is currently Associate researcher in the herbal medicine area, at CTI Salud in Santiago, Chile.
MAQUI SELECT EXTRACT

The Essence of the most Powerful Superfruit
Maqui Berry is Harvested Wild in Pristine Southern Chile
Chilean Organic Maqui Berry

The highest anti-oxidant fruit on the planet

* Certified Organic by CERES (Certification of Environmental Standards GmbH)
Anthocyanins are antioxidant flavonoids that protect many body systems and have some of the strongest physiological effects of any plant compounds.

Anthocyanins are produced by plants for self-protection against, sun, irradiation, diseases, and biological enemies.

The harsh climate of central and southern Chile, together with recent high solar radiation (50% increase in the last 30 years) may have increased the anthocyanins in the fruits and berries that are grown in that region. Especially Maqui.
The Mapuche Indian tribe is the only tribe in American Continents that were not conquered by any European Countries. According to the Conquistadors the Mapuche warriors ate very little solid food and drink a fermented beverage made from maqui berry several times a day, which may have contributed to the extraordinary strength and stamina that the warriors exhibited.

The Mapuche Indians have used Maqui’s berry leaves, stems, fruits, and wine medicinally for thousands of years.
Maqui has the highest anti-oxidant content of any fruit

- **2-3 times higher** than Acai & Goji berry (currently considered as the highest ORAC value superfruit),
- **more than 3 times** higher than mangosteen,
- **8 –10 times higher** than pomegranate,
- **50 times** more than a glass of red wine.
Maqui berry, is one of the most power-packed with anthocyanins of all the fruits and berries for supplemental consumption.

Anthocyanins are produced by plants for self-protection against sun, irradiation, diseases and biological enemies; to thrive in the harsh climate of central and southern Chile, (increased solar radiation) necessitates maqui’s abundant anthocyanin production.
Research Confirms Benefits of Maqui Select

- boosts the immune system
- helps to maintain healthy inflammatory response
- helps control blood sugar and cholesterol levels
- helps prevent oxidation and related damage
ORAC as metric of antioxidants

• **ORAC**: The ORAC test, measures a food’s antioxidant ability to neutralize free radicals and potentially mitigate health imbalances. The power of each fruit or vegetable is measured in Trolox equivalents (u mole TE/g) per gram.

• **Nutritionist recommend** at least 3,000 ORAC per day and more if under any of the various stressors most of us face each day. Most individuals get only 1,200 ORAC units or less per day.
ORAC ranking superfruits (umolTE/g fruit)
Anthocyanins superfruits ranking (mg/g) fruit
Maqui Berry has the highest Total Antioxidant Reactivity (TAR):

- indicates the capacity to decrease steady state of free radical concentration and is a better index of antioxidant quality. Total phenols is positively correlate to TRAP and TAR.
Laboratory Research Shows That Anthocyanins:

- Reduce the coagulation of blood platelets, inhibiting formation of blood clots involved in stroke, pulmonary embolism, peripheral vascular disease and heart attack
- Promote higher levels of “good” cholesterol, HDL
- Inhibit oxidation of “bad” cholesterol, LDL
- Neutralize oxygen radicals
- Down-regulate enzymes leading to inflammatory reactions that cause pain and stimulate other diseases
Maqui Research at Universidad Austral de Chile

directed by Drs Burgos and Hancke

- Supports healthy blood sugar levels
- Anti-inflammatory
- Boosts immune system
- **Neutralize enzymes that destroy connective tissue**, prevents oxidants from damaging connective tissue, and repair damaged proteins in the blood-vessel walls.
- **Lightens allergic reactions and increase capillary permeability.**
- **Promotes cardiovascular health** by preventing oxidation of low-density lipoproteins (LDL), and protecting blood vessels wall from oxidative damage.
- **Maintain small blood vessel integrity** by stabilizing capillary walls.
- **May improve eyesight**
Maqui Select and Anthocyanins

The research team at Universidad Austral de Chile, have proven the exceptional properties of maqui, revealing their chemical origin and identifying other properties which were not known to the Mapuches.

It has a standardized content of anthocyananin (35.4%) and an astonishing level of delphinidins (28.6%), the highest among all food ingredients which are currently available.

<table>
<thead>
<tr>
<th>Anthocyanin</th>
<th>Content</th>
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<tbody>
<tr>
<td>Delphinidin-3-O-samb 5-O-gluc</td>
<td>6.38</td>
</tr>
<tr>
<td>Delphinidin 3,5-O-diglucos</td>
<td>13.64</td>
</tr>
<tr>
<td>Cyanidin-3-O-samb-5-O-gluc</td>
<td>3.36</td>
</tr>
<tr>
<td>Cyanidin-3,5-O-diglucos</td>
<td>1.58</td>
</tr>
<tr>
<td>Delphinidn-3-O-sambubloside</td>
<td>1.67</td>
</tr>
<tr>
<td>Delphinidin-3-O-glucoside</td>
<td>6.95</td>
</tr>
<tr>
<td>Cyanidin-3-O-sambubloside</td>
<td>0.79</td>
</tr>
<tr>
<td>Cyanidin-3-O-glucoside</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>TOTAL DELPHINIDINS</strong></td>
<td><strong>28.64</strong></td>
</tr>
<tr>
<td><strong>TOTAL ANTHOCYANINS</strong></td>
<td><strong>35.40</strong></td>
</tr>
</tbody>
</table>
Delphinidin content in selected “superfruits” and extracts
Source: http://www.blueberry.org

<table>
<thead>
<tr>
<th>Superberry</th>
<th>Content (%)</th>
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</thead>
<tbody>
<tr>
<td>Maqui Select</td>
<td>28.6</td>
</tr>
<tr>
<td>Blackcurrant Frozen Fruit</td>
<td>2.9</td>
</tr>
<tr>
<td>Black chokeberry Frozen Fruit</td>
<td>3.0</td>
</tr>
<tr>
<td>Bilberry Frozen Fruit</td>
<td>1.7</td>
</tr>
<tr>
<td>Maqui Frozen Fruit</td>
<td>7.8</td>
</tr>
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</table>

The research team in Chile made this important discovery on the ability of delphinidins present in Maqui Select® to stimulate the immune system.

Delphinidins are a type of anthocyanin, a vegetable pigment responsible for the blue and red colors of certain kinds of grapes, blueberries and pomegranates.

Research carried out by Maqui New Life has demonstrated that delphinidins elevate the liberation of intracellular calcium in Jurkot cells, which may activate the production of cytokines such as IL-2 and IFN-gamma in this cellular line and in human T lymphocytes.

Since cytokine production in T lymphocytes is activated through the NFAT transcription factor, and production of IL-2, induced by the delphinidins, is significantly reduced by the cyclosporin A (CsA) calcineurin inhibitor, it is evident that delphinidins have the ability to activate NFAT. All of these effects result in strengthening the cells of the immune system.
Maqui Select® has a potent antioxidant against the five most important radicals:

### Anti-oxidant capacity of Maqui Select against 5 radicals
Source: Brunswick Laboratories, 2010

<table>
<thead>
<tr>
<th>Radical</th>
<th>Valor (umole TE / 100 gram)</th>
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<tbody>
<tr>
<td>Peroxyl radicals</td>
<td>461,100</td>
</tr>
<tr>
<td>Hydroxyl radicals</td>
<td>1,437,200</td>
</tr>
<tr>
<td>Peroxynitrite</td>
<td>83,500</td>
</tr>
<tr>
<td>Super oxide anion</td>
<td>569,900</td>
</tr>
<tr>
<td>Singlet oxygen</td>
<td>124,500</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,676,200</strong></td>
</tr>
</tbody>
</table>

**Potent Antioxidant against the five most important radicals:**

Peroxyls, hydroxyls, peroxynitrates, superoxide anions and other oxygen-based free radicals. Maqui Select®:

- boosts the immune system
- helps to healthy inflammatory response
- helps control blood sugar and cholesterol levels
- helps prevent oxidation and related damage
Safety data

Maqui Berry

• **Toxicology Studies** completed at Chilean Universities studies prove Maqui to be safe.

• **According to regulations imposed by MERCOSUR, Maqui is registered as a condiment of botanical origin.** It is used as a fruit or for its properties as an aromatizer or flavoring and consequently there are no restrictions regarding those plant parts which are used in normal consumption.
Benefits of Maqui Berries:

- Anti-inflammatory
- Natural COX-2 Inhibitor
- Protect cells from oxidative stress
- Fight free radicals
- Anti-aging
- Cardiovascular health

Good source of Vitamin C and Potassium.
It contains the highest ORAC value of any known berry.
It also contains high level of polyphenols and anthocyanins.
The juice concentrate has an ORAC value of >800,000 μmole TE/kg and anthocyanin value of 22,420mg/kg.

**Exhibits strong anti-inflammatory activity.**
**Effectively inhibits the NFkappaB,** the key regulator of our immune and inflammatory system.
**At effective dose, Maqui completely erases the COX-2 enzyme** and reduces other cytokines that causes pain and inflammation.
**In vitro cancer study** with human leukemia cells and colon cancer cells confirmed maqui’s traditional usage for treating cancer and tumor.
Inflammation plays a major role in the development of most diseases.
Inflammation has been linked to several diseases:

- Heart failure
- Cancer
- Chronic obstructive pulmonary diseases

Other diseases linked to inflammation include:

- Ischemia/Reperfusion
- Cardiac hypertrophy
- Atherosclerosis
- Multiple sclerosis
- Muscular dystrophy
- Alzheimer’s disease
- Bone resorption
- Renal disease
- Incontinentia pigmenti
- Ectodermal dysplasia
- Crohn’s disease
- Neuropathological disease
- Helicobacter pylori-associated gastritis
- Systematic inflammatory response syndrome

Additional diseases:

- Arthritis
- AIDS
- Asthma
- Headache
- Diabetes type 1 and II
- Aging
- Lupus
- Sepsis
- Gut disease
- Skin disease
- Viral infections
- Sleep apnoea
Cancers linked to constitutive activation of NF-κB

- Esophageal cancer
- Laryngeal cancer
- Pharyngeal cancer
- Pancreatic cancer
- Renal carcinoma
- Colon cancer
- Head and neck SCC
- Lung cancer
- Bladder cancer

Tobacco-linked cancers

Carcinogens

NF-κB

Carcinogens

Viral cancers

- Acute lymphoblastic leukemia
- Cervical cancer
- Nasopharyngeal carcinoma

UV light

- Melanoma

Acute Myelogenous leukemia
- Hodgkin’s disease
- Non-Hodgkin’s lymphoma
- B cell lymphoma
- Adult T cell leukemia
- T cell lymphoma
- Mantle cell lymphoma
- Multiple myeloma

Thyroid cancer
- Liver cancer
- Breast cancer
- Ovarian cancer
- Prostate cancer
Preliminary research results in the area cancer

- **Chronic inflammatory processes** are an important factor in the formation of intestinal tumors. It is known that the transcriptional factor NF-κB is a central factor in the development of inflammation and colon cancer.

- **NF-κB-luc**, Preliminary results suggest that *Maqui* has an inhibitory effect on the reporter gen NF-κB-luc in HL-60 cells indicating that the product might represent an alternative for the treatment for colon cancer via antiinflammatory mechanism of action (*patent pending*).
Benefits of Anthocyanins:

• Anthocyanins are produced by plants for self-protection against, sun, irradiation, diseases, and biological enemies. With the harsh cold weather in central and southern Chile, and with high solar radiation in Chile, these factors guaranteed high anthocyanins in the fruits and berries that are grown in that region. Anthocyanins are antioxidant flavonoids that protect many body systems and have some of the strongest physiological effects of any plant compounds.
Maqui Berry scores the highest in ORAC, Anthocyanins and Total Phenols

<table>
<thead>
<tr>
<th></th>
<th>ORAC hydro (umole/100g)</th>
<th>Anthocyanins (mg/100g)</th>
<th>Total Phenols (mg/100g)</th>
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<tbody>
<tr>
<td>Red Wine</td>
<td>24-35</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Red Grape</td>
<td>30-750</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberry</td>
<td>2600</td>
<td>1600</td>
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</tr>
<tr>
<td>Boysenberry</td>
<td>3500</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Cherry</td>
<td>2100-4700</td>
<td>350-400</td>
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</tr>
<tr>
<td>Blackberry</td>
<td>5100</td>
<td>82-325</td>
<td></td>
</tr>
<tr>
<td>Cranberry</td>
<td>5200</td>
<td>50-80</td>
<td></td>
</tr>
<tr>
<td>Red Raspberry</td>
<td>2700-5300</td>
<td>213-428</td>
<td></td>
</tr>
<tr>
<td>Black Raspberry</td>
<td>5000-16,400</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Blueberry</td>
<td>3200-8700</td>
<td>25-495</td>
<td></td>
</tr>
<tr>
<td>Bilberry</td>
<td>8186</td>
<td>300-648</td>
<td></td>
</tr>
<tr>
<td>Mangosteen</td>
<td>20,000-30,000</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>Acai</td>
<td>18,400-31,000</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>Maqui Juice</td>
<td>40,000-80,000</td>
<td>800-2200</td>
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<tr>
<td>Maqui Concentrated Powder</td>
<td>75,000-92,000</td>
<td>4027-5000</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>7000-9000</td>
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</table>
Review of Maqui’s Benefits

- **Highest natural ORAC value**
- **Highest anthocyanins** (from plants,)
- **Highest Polyphenols** (plays a role in the prevention of degenerative diseases) of any known fruit or berry including acai, mangosteen, amalaki and pomegranate
- **Anti-inflammatory** effects by inhibiting the expression of COX-2, (also modulates NFkappaB) which plays a role in inflammation
- **Antimicrobial** (kills or inhibits the growth of bacteria, fungi or viruses)
- **Analgesic** / pain relieving properties
- **Thermogenic properties** / raises core body temperature
- Prohibits LDL oxidation
- **Anti-atherogenic** / Helps manage healthy cholesterol & triglyceride levels
- **Stimulates PPAR receptors** / regulates cell development
The Cancer Process

Normal cell

Detoxified carcinogen

Activated carcinogen

Inactive carcinogen

Spontaneous or inherited mutation

Repair

Cell proliferation

Metastasis

Tumor
How fruits and vegetables can help prevent cancer!

1. Normal cell
2. Spontaneous or inherited mutation
3. Activated carcinogen
4. Detoxified carcinogen
5. Inactive carcinogen
6. Repair
7. Abnormal cell
8. Tumor
9. Metastasis

How fruits and vegetables can help prevent cancer!
## Maqui Select™ Extract

<table>
<thead>
<tr>
<th>Name</th>
<th>MAQUI Select</th>
</tr>
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<tbody>
<tr>
<td>Manufacturer</td>
<td>INDENA, Milan, Italy</td>
</tr>
<tr>
<td>Short Description</td>
<td>Standardized dried extract topping 28 % total “delphinidins”</td>
</tr>
<tr>
<td>Medical Significance</td>
<td>Prevention of cancer and tumor formation.</td>
</tr>
<tr>
<td></td>
<td>• Apoptosis Inductor</td>
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Maqui Research at Universidad Austral de Chile

• **Anti-inflammatory**

Chronic inflammatory processes are an important factor in the formation of intestinal tumors. It is known that the transcriptional factor NF-κB is a central factor in the development of inflammation and colon cancer.

Preliminary results suggest that *Maqui* has an inhibitory effect on the reporter gene NF-κB-luc in HL-60 cells indicating that the product might represent an alternative for the treatment for colon cancer via anti-inflammatory mechanism of action.

• **Immunostimulant**

Effect of delphinidin in human t cells.
Delphindin induce intracellular calcium increase in jurkat cells

0
15 s
120 s

Diagram showing the effect of Delfindina (50 μM) on Razon 340/380 over time (minutos). The graph indicates an increase in Razon 340/380 at 120s following Delfindina administration.
Delphinidin but not delphinidin sambubioside induce Ca^{2+} release in t-cells
Delphinidin induce IL-2 production via Store operated channel entry in JURKAT E6-1 cells

**Figura: Delphindin induce IL-2 production in Jurkat E6-1 cells.** Jurkat E6-1 cells were incubated with DMSO (vehicle) or with 50 µM of delphinidin during 24 hours (A) or 48 hours (B). The IL-2 was determined in the supernatant using a commercial ELISA.
Delphindin induce IL-2 production via NFAT activation

**Figura:** Delphindin induce IL-2 production Jurkat E6-1 cells. Jurkat E6-1 cells were incubated with DMSO (vehicle) or with 50 μM of delphinidin during 24 hours (A) or 48 hours (B). The IL-2 was determined in the supernatant using a commercial ELISA. CsA = cyclosporin A (NFAT inhibitor)
**Figura: Delphinidin induce dephosphorylation and luciferase activity of NFAT.** JURKAT E6-1 cells were treated with PMA/Io or 50 μM of delphinidin. The electrophoretic band pattern represents the changes of phosphorylation NFAT is depicted (arrow) (A). Cells transfected with NFAT-luc were treated with 10, 50 or 100 μM of delphinidin or with PMA/Io during 16 hours. The luciferase activity were expressed as the ratio dpNFAT/pRL (B).
Delphinidin induce IL-2 production in human t-cells isolated from blood.

Figura: Delphinidin induce IL-2 production in human t-cells. The t-cells were isolated from blood of human healthy volunteers.
**Delphinidin induce INF-γ in human t-cells**

**A**

![Bar graph showing INF-γ production at different concentrations of Delfinidin](image)

**B**

![Graph showing concentration response of Delfinidina](image)

**Figura:** Delphinidin induce INF-γ production in human t-cells. The t-cells were isolated from blood of human healthy volunteers.
<table>
<thead>
<tr>
<th>Hora</th>
<th>Edema (mm)</th>
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<tr>
<td>6.0</td>
<td>****</td>
</tr>
<tr>
<td>24.0</td>
<td>*</td>
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</table>

**Diferencia significativa:**
- Diclofenaco 2 mg/kg
- *A. chilensis* 100 mg/kg
- *A. chilensis* 0.025 mg/kg

**Notas:**
- SS
- Hora de medicación
- Edema en mm

**Diagrama:**
- Comparación de edema en diferentes tratamientos y tiempo.
Sub-chronic toxicological study of MAQUI administered in rats for 60 days. Hancke J.; Rojas F., Caballero E., Burgos RA

Maqui liquid extract p.o did not caused haematological nor biochemical changes and body weight in Sprague-Dawley rats with 1x, 10x and 50x dose in drinking water after 60 days treatment period.
Maqui Research at Universidad Austral de Chile

- Supports healthy blood sugar levels
- Anti-inflammatory
- Boosts immune system
- Neutralize enzymes that destroy connective tissue, prevents oxidants from damaging connective tissue, and repair damaged proteins in the blood-vessel walls
- Lightens allergic reactions and increase capillary permeability
- Promotes cardiovascular health by preventing oxidation of low-density lipoproteins (LDL), and protecting blood vessels wall from oxidative damage
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- May improve eyesight

Effects of juice of the berry Aristotelia chilensis on COX-2 expression, NF-κB, ERK1/2, PI3K/Akt and apoptosis in colon cancer cells Hidalgo M. A., Ojeda J., Jara E., Molina L., Hancke J. L., Burgos R. A.
Join Geoff on a trip to Southern Chile and an Exploration of Maqui

See the video of Geoff’s journey as it winds through the South of Chile, exploring the highest anti-oxidant fruit in the world. It traces the discovery of the power of the Maqui fruit from the developing company, to the research at the University of Valdivia and onto the Mapuche Indian hospital where patients can choose treatment at their clinic, from either an MD or a Mapuche shaman. See dramatic shots of a Mapuche Shaman healing ceremony and psychic surgery.

Copy into you browser:
http://video.google.com/videoplay?docid=3744610803884045295#
Bibliography