HEALTH FOREVER

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SORGHUM BICOLOR LEAF SUPPLEMENTS

ANTI-OXIDANT | ANTI-INFLAMMATORY | IMMUNE MODULATION | ANTI-AGING

WEST AFRICAN SORGHUM-BASED

JOBELYN

Jobelyn is produced from the colorful leaf base (sheath) of a recently domesticated West African variant of Sorghum bicolor, with unusually-high antioxidant and anti-inflammatory properties, due to its unique chemistry.

1 INTRODUCTION

Sorghum Superfood (RedSheath Sorghum™) is a proprietary blend of an ancient and sacred Egyptian plant. The world now calls it SORGHUM BICOLOR, the fifth-largest-grown grain worldwide.

Sorghum bicolor is a strong support for:

- The healing of the entire body from a deep cellular level to the outermost beauty of the skin
- The body as it heals itself by utilizing the anti-inflammatory, anti-oxidant, immune-modulating and chemopreventive power of the plant to activate healing on all levels.
- Anti-aging and anti-wrinkling of the skin

This dietary supplement may either be taken to promote whole health or for extra support at the onset of any immune system challenge.

SORGHUM-BASED JOBELYN

SAFETY

Jobelyn has gone through extensive analytical testing and selected biological activites have been proven in a panel of bioassays in vitro. Jobelyn has demonstrated safety in animal studies and shown clinical effects in human clinical trials.

Our goal is to advance Jobelyn from a traditional medicinal product to being accepted as a modern nutraceutical product. Science-based support of Jobelyn's effects will help build credibility, and increased acceptance of this important bioactive product.

- **SAFETY TESTING**
- **ORAC**
  CHEMICAL ANTIOXIDANT CAPACITY
- **CAP-E**
  CELLULAR ANTIOXIDANT PROTECTION
- **ANTI-INFLAMMATORY ASSAYS**
- **IMMUNE ASSAYS**
- **HUMAN CLINICAL TESTING**

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HEALTH BENEFITS

ACCORDING TO THE NATIONAL CANCER INSTITUTE, USA, SORGHUM BICOLOR SUPPLEMENT IS:

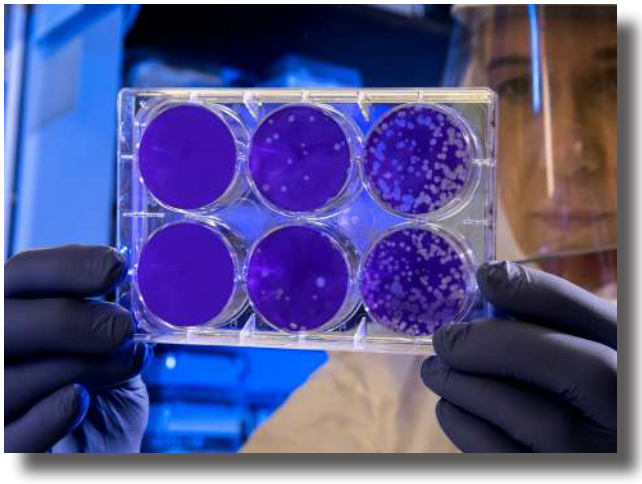
"An herbal-based nutritional supplement containing the leaf sheaths of the plant Sorghum bicolor, with potential antioxidant, anti-inflammatory, chemopreventive and immunomodulating activities.

Sorghum bicolor supplement contains various phytochemicals, including phenolic acids and polyphenols such as proanthocyanidins.

Sorghum bicolor supplement is particularly rich in 3-deoxyanthocyanins, such as luteolinidin and apigeninidin, and appears to induce apoptosis and inhibit cell proliferation in cancer cells through the stimulation of various apoptosis promoter genes and the downregulation of certain apoptosis inhibitor genes.

In addition, due to the strong antioxidant nature of the phytochemicals, these compounds are able to scavenge free radicals and prevent tissue damage.

Also, intake of this supplement modulates the immune system by both increasing the activity of natural killer (NK) cells and initiating the activation of macrophages."



A powerful anti-oxidant and natural colorant

- ORAC 37,000 µM TE/gram, many-fold higher than most other natural products
- 4% of dry weight consists of 3-deoxyanthocyanidin, an intense red colorant
- Both the aqueous and ethanol extracts of Jobelyn protect living cells from oxidative damage in the CAP -e bioassay

Anti-inflammatory properties

- Selective COX-2 inhibition
- Inhibition of free radical formation by inflammatory cells
- Inhibition of inflammatory migration of cells in response to leukotriene B4

Immune modulation

Immune cells

1. Express receptors on the cell surface to receive signals
2. Excrete compounds to send signals to other cells

Jobelyn impacts immune cell modulation in vitro:

- Activates natural killer cells, T-lymphocytes, and monocytes
- Increases production of selected immune-regulatory cytokines
- Increases production of anti-viral chemokines MIP-1a, MIP-1b, and RANTES

Jobelyn supports selected aspects of cellular production:

- Stimulates red blood cell production
- Increases production of CD4 T-cells in HIV-positive patients

Sorghum bicolor health benefits:

- Multi-facted anti-inflammatory properties
- Immune activation
- Hematopoietic effects
- Pain reduction

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POTENTIAL AS A NATURAL FOOD COLORANT

Jobelyn is produced from a unique variety of Sorghum bicolor, recently domesticated from a West African wild variety. It represents the original genetic makeup, not a result of intense breeding.

Many parts of the sorghum plant are used for consumption, including seeds, leaves, leaf sheaths, stems, and root. Jobelyn is an extract derived specifically from the intensely-colored leaf sheaths.

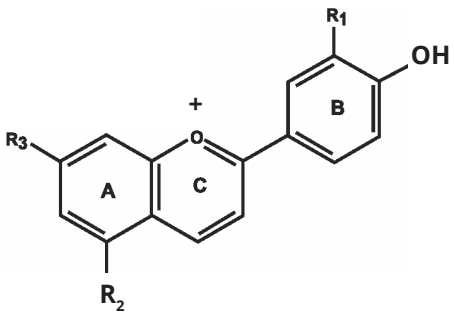
Jobelyn is GRAS-certified by the FDA.

Jobelyn has an unusual chemical profile compared to other variants of Sorghum bicolor.

It has a very high content of unique antioxidant polyphenols, including the dimeric 3-deoxy-anthocyanidins.

KNOWN POLYPHENOL COLORANTS IN JOBELYN		
	µg/g	**PHENOLIC CLASS**
Naringenin	130	Flavanone
Apigeninidin	39,900	3-deoxyanthocyanidin
Luteolinidin	450	3-deoxyanthocyanidin
Apigenin	6,910	Flavone
Luteolin	570	Flavone

THE COLORANT EXTRACT IS STANDARDIZED ON THE FOLLOWING POLYPHENOL COMPOUND MARKERS	
	% OF EXTRACT
Apigeninidin	17%
Luteolin	9%
Apigenin	4%



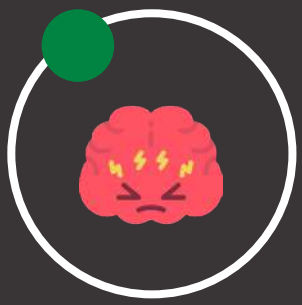
The 3-deoxyanthocyanidins in Jobelyn have been studied at the University of Texas A&M and are:

- Highly stable
- Possess a great resistance to denaturation by low pH or certain food additives. Most anthocyanidins are degrated by food additives such as bisulfites (SO2).

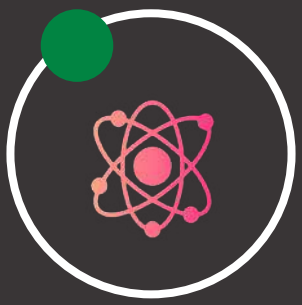
Jobelyn contains high amounts of anthocyanidins, including the two 3-3-deoxyanthocyanidins: apigeninidin and luteolinidin.

A total content per dry weight of 3-deoxyanthocyanidins exceeds 40,000 µg/g, which is over 4% of the dry weight of Jobelyn.

THE SCIENCE BEHIND JOBELYN



SELECTIVE COX-2 INHIBITION - PAINKILLER PROPERTIES



RE-PROGRAMS INFLAMMATORY CELLS AND REDUCES FREE RADICAL PRODUCTION

ACTIVATES NATURAL KILLER CELLS, T-LYMPHOCYTES & MACROPHAGES

THE ANTIOXIDANT CAPACITY

Jobelyn has a very high antioxidant capacity with a total ORAC score of 37,000 µM TE/gram of dry powder.

This protection includes quenching of peroxyl and hydroxyl free radicals, singlet oxygen, and superoxide anions.

Jobelyn quenches peroxyl free radicals at over 3,500 µM TE/gram - 4X higher than Acai berries and 50 times higher than tart cherries.

ANTIOXIDANT & CELLULAR PROTECTION

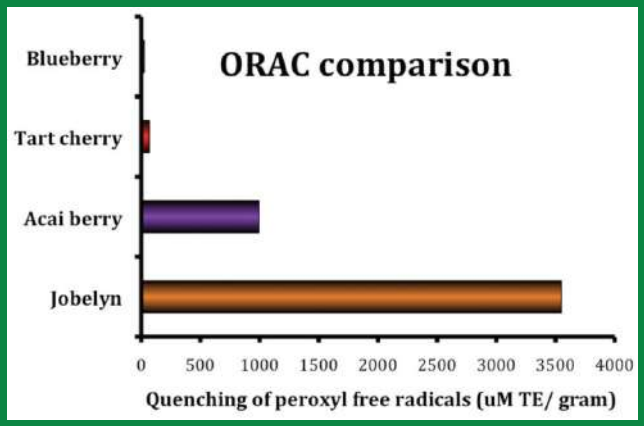
Oxygen is vital to life. However, many of the chemical reactions in our bodies use oxygen and a by-product of these reactions are harmful free radicals.

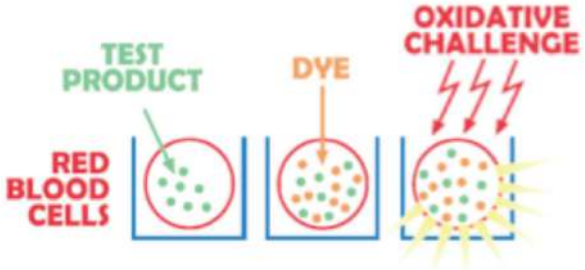
Our body can neutralize free radicals when present in smaller amounts. But antioxidants like Jobelyn can help quench more free radicals. Otherwise, there is a higher risk of potential damage to cells and tissues. Antioxidants help prevent cell and tissue damage, and offer multi-faceted health benefits.

Jobelyn has a very high content of unique antioxidant polyphenols, including unique dimeric 3-deoxyanthocyanidins. These compounds contribute to the chemical and biological antioxidant effects.

There are different ways to test for antioxidants. Each method offers different information, which is why we followed a sequential process.

The Oxygen Radical Absorbance Capacity (ORAC) test is a widely-used antioxidant test measuring chemical antioxidant capacity. It was used to test Jobelyn.



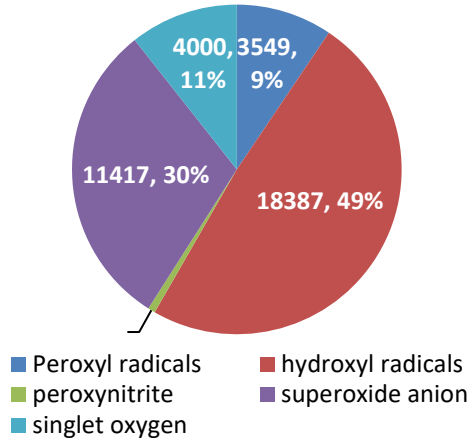


Jobelyn™ showed cellular antioxidant protection capacity in the CAP-e test.

The cellular protection seen in the CAP-e assay allows us to conclude that Jobelyn™ contains antioxidants that are bioavailable and functional at the cellular level. Both the water and ethanol extracts showed protection as well. This suggests a complex range of biologically active antioxidants in Jobelyn™.

Free radical: An atom or group of atoms with at least one unpaired electron. Unpaired electrons are highly reactive and can damage living cells. **Antioxidant:** A compound capable of donating an electron and neutralizes the electrical charge which may otherwise lead to cascading cellular damage.

JOBELYN™ IS A SUPERFOOD RICH IN NUTRIENTS & POLYPHENOLS



TOTAL BIOFLAVONOIDS IN JOBELYN™

Total bioflavonoids: 254.27 (mg/g)

The total bioflavonoids result is expressed as milligram rutin equivalent per gram.
Testing performed by Y. Kou & H. Ji.
At Brunswick Laboratory, USA.

PHENOLICS IN JOBELYN™

Phenolics: 106.86 (mg/g)

The phenolic result is expressed as milligram gallic acid equivalent per gram.
Testing performed by Y. Kou & H. Ji.
At Brunswick Laboratory, USA

Jobelyn™ nutritional analysis Test by GMP Labs, USA

PRINCIPLE	NUTRIENT VALUE	% OF RDA
Energy	324 cal	
Carbohydrates	75.3g	
Protein	4.87g	
Dietary fiber	50.30g	
Vitamin		
Vitamin B12	0.83 µg	34.5%
Riboflavin	0.18 mg	16.36%
Niacin	3.55 mg	25.35%
Minerals		
Calcium	352 mg	35.2%
Magnesium	183 mg	59.03%
Iron	51.20 mg	640.0%
Zinc	1.09 mg	13.62%
Copper	900 µg	127.77%
Phosphorus	700 mg	20.14%
Selenium	15.40 µg	28.0%
Electrolytes		
Potassium	0.5 g	10.63%
Sodium	1.15 g	95.83%

Jobelyn™ is polyphenol-rich. Test by Brunswick Labs, USA

TRIAL	LOT NUMBER	UNIT	APIGENINIDIN	LUTEOLINIDIN	APIGENIN	LUTEOLIN	NARINGENIN
TRIAL 1	JUN-12	µg/g	38,650	323	6020	585	230
TRIAL 2	09-0590	µg/g	47,380	890	6460	673	166

The 5 polyphenol marker compounds were evaluated by the highly-sensitive LC/MS methodology. Structures confirmed by CAD-MS/MS.

ANTI-INFLAMMATORY PROPERTIES OF JOBELYN

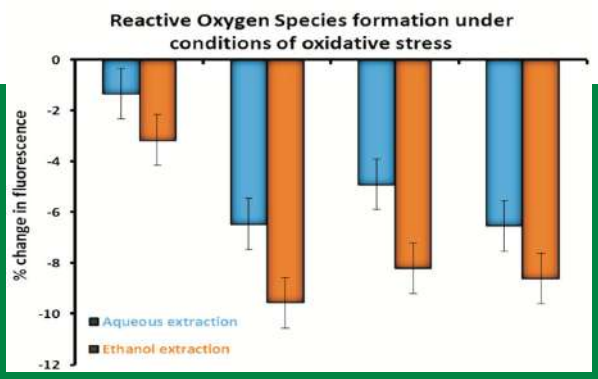
Chronic inflammatory conditions underlie many aspects of declining physical and mental health.

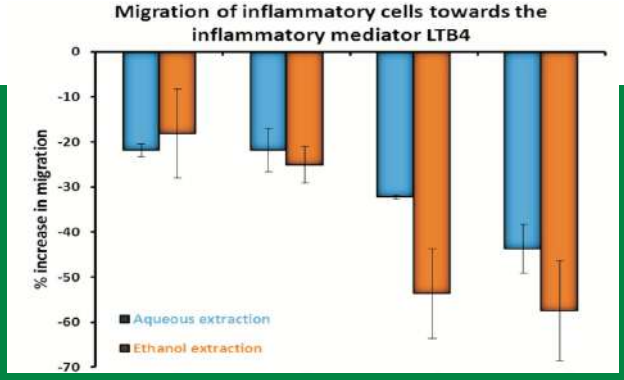
It compromises our immunity and increases our risk of developing chronic diseases.

Comprehensive anti-inflammatory nutritional strategies are increasingly gaining attention for health management.

Inflammation involves multiple pathways, including:

- Production of damaging free radicals
- Infiltration of inflammatory cells into target tissues
- Up-regulation of inflammatory enzymes, such as COX-2





Jobelyn™ was evaluated in laboratory tests involving separate mechanisms of action.

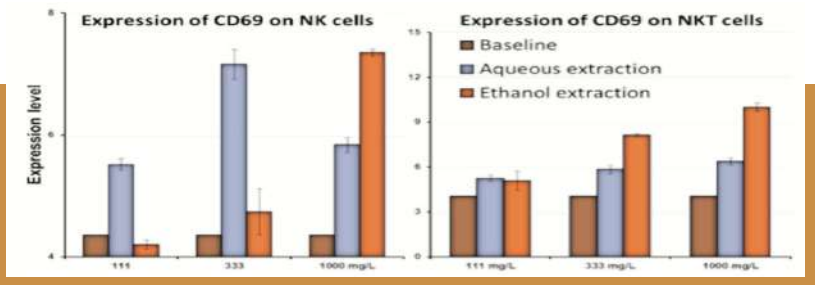
Jobelyn™ contains a complex array of compounds with different chemical properties that inhibit free radical production, reduce infiltration of inflammatory cells, and inhibit COX-2 enzymatic activity.

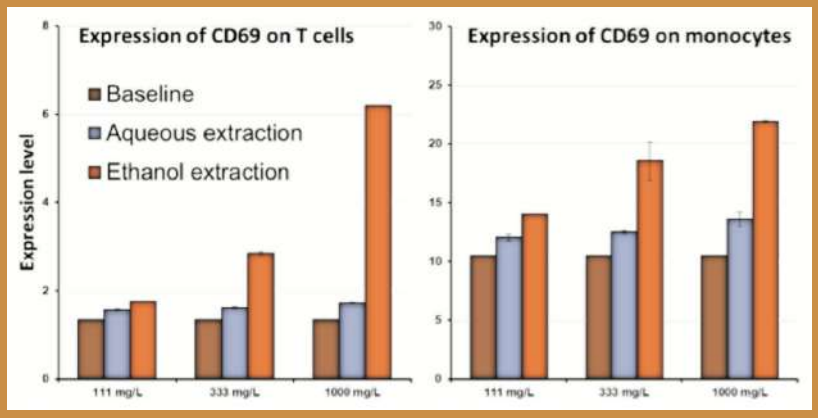
This suggests a multi-faceted anti-inflammatory capacity of Jobelyn™.

JOBELYN HAS IMMUNE ACTIVATING PROPERTIES - AS SHOWN IN LAB TESTS

Our immune system is not limited to a given organ or tissue, but is widespread throughout our body, blood, skin, and mucosal barriers. Immune cells, when activated, communicate in various ways by:

- Expressing receptors on cell surfaces to receive signals
- Secreting compounds to send signals to other cells.





CYTOKINE	FOLD INCREASE
IL-1R alpha	8
IL-6	174
IL-7	6
IL-8	13
IL-10	15
IL-12	5
IL-13	5
IL-15	9
MCP1	145
MIP-1 alpha	241
MIP-1 beta	168
RANTES	2
IFN-alpha	12

Jobelyn™ treatment of human immune cells resulted in increased expression of the CD69 activation marker on the cell surface of Natural Killer cells, NKT cells, T lymphocytes, and monocytes.

The cytokine profile in these cell cultures showed up-regulation of multiple cytokines, including several chemokines known to be involved in anti-viral immune defenses.

ANTI-AGING AND ANTI-WRINKLING ACTION

Wrinkles are caused by genetics factors but also aging, exposure to the sun, smoking, pollution, toxins, and underlying medical conditions.

As we age, we have lower levels of collagen and elastin. Collagen firms the skin and elastin supplies elasticity and suppleness.
As a result, the skin can get uneven, rough, thin, and have deep wrinkles . Even brown patches may begin to appear.

The skin ages as it oxidizes and produces more free radicals. These free radicals further result in protein glycation and leads to the deterioration of existing collagen due to crosslinking.

Diabetic patients are more susceptible to skin wrinkling because of high glycation levels from blood glucose levels.

For an anti-wrinkle product to be effective, it's inhibitory capacity on collagenase or elastase has to be evaluated. Jobelyn was tested against common benchmarks used for anti-wrinkling products.

Jobelyn was analyzed in parallel with ascorbic acid and alpha-tocopherol (the chosen benchmarks). Neither showed any significant anti-glycation activity.

Jobelyn anti-wrinkling effects:
- 15-fold potency of Vitamin C
- 8-fold potency of Idebenone
- 30-fold potency of ferrulic acid

Elastase inhibition:
- 22-fold potency of Vitamin C
- 8-fold potency of ferrulic acid
- 1.5 potency of quercetin

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