

# RhodioLife™

**FOR SUSTAINED  
ENERGY AND  
FASTER RECOVERY**



STANDARDIZED EXTRACT, CONSISTENTLY PROVIDING THE SPECTRUM OF BIOACTIVES FOUND IN *RHODIOLA ROSEA*

THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION.  
THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.

# RHODIOLIFE™

## Today's discussion

### OVERVIEW

- Source
- Traditional Use

### SCIENTIFIC EVALUATION

- Published research with RhodioLife™

### TECHNICAL

- Profile vs. *Rhodiola rosea* root
- Profile vs. competition



**RhodioLife™**



# PLT

HEALTH SOLUTIONS

GROWTH THROUGH INNOVATION

## OVERVIEW

STANDARDIZED EXTRACTS  
SUSTAINABLY SOURCED  
FROM THE ALTAI  
MOUNTAINS OF SIBERIA



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# HIGHLIGHTS

RhodioLife™ is a standardized extract obtained from the root of *Rhodiola rosea*

## GUARANTEED ANALYSIS

- Standardized to total rosavins and salidroside content

## SUSTAINABLE HARVESTING

## UNIQUE MANUFACTURING

- Process preserves the active ingredients in their natural ratios

## SELF-AFFIRMED GRAS

## PUBLISHED STUDIES

## AVAILABLE AS FREEZE-DRIED OR SPRAY-DRIED POWDERS



# RHODIOLIFE™ — SOURCING

Raw material collection is performed according to the WHO Guidelines on Good Agricultural Practices



## RAW MATERIAL — ALTAI, SIBERIA

- PoliNat is one of very few companies granted an Export License by the Russian Government for the exportation of *Rhodiola rosea* roots from the Altai region
- This is the result of several years of joint collaboration with the local companies and farmers in product research and evaluation of sustainable exploitation of *Rhodiola rosea* resources by the local authorities



Altai Mountain View

# RHODIOLA ROSEA TRADITIONAL USE

Historically used as an adaptogen in Siberia

## TRADITIONALLY USED FOR:

- Endurance
- Work productivity
- High altitude sickness
- Fatigue
- Depression

## AN ADAPTOGEN

- Low to negligible toxicity
- Has a non-specific mechanism of action
- Increases resistance to stressors
- Has a normalizing effect



Rhodiola PoliNat Crop 2010

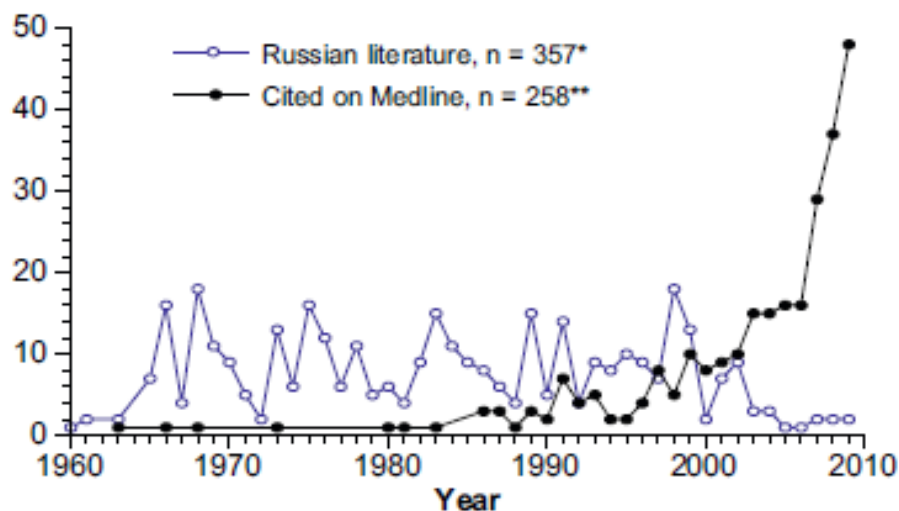
Kelly GS. Rhodiola rosea: A possible plant adaptogen. *Altern Med Rev* 2001;6(3):293-302

# RHODIOLA ROSEA RESEARCH

Extensive research history describes safety and efficacy

## PUBLISHED RESEARCH

- In addition to traditional knowledge and use, over 600 publications since 1960 document benefits of *Rhodiola rosea* in physical and mental performance



\* - References from Saratikov&Krasnov, Golden Root, 2004

\*\* - <http://www.ncbi.nlm.nih.gov/sites/entrez>

Panossian A, Wikman G, Sarris J. Rosenroot (*Rhodiola rosea*): traditional use, chemical composition, pharmacology and clinical efficacy. *Phytomedicine*. 2010 Jun;17(7):481-93. Epub 2010 Apr 7.



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# SCIENTIFIC EVALUATION

THREE PUBLISHED STUDIES  
USING RHODIOLIFE™



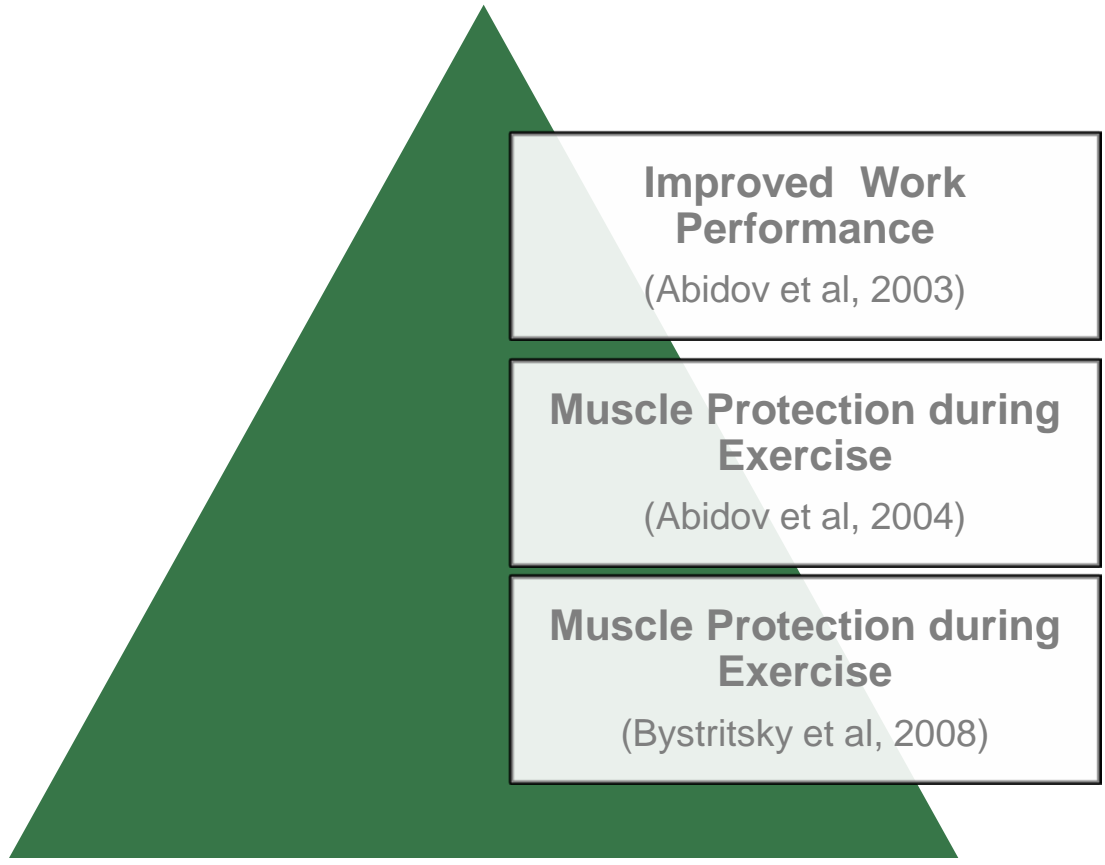
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# RHODIOLIFE™ PUBLISHED RESEARCH



**Improved Work  
Performance**

(Abidov et al, 2003)

**Muscle Protection during  
Exercise**

(Abidov et al, 2004)

**Muscle Protection during  
Exercise**

(Bystritsky et al, 2008)

# IN VIVO RESEARCH

## Effect of Extracts from *Rhodiola Rosea* and *Rhodiola Crenulata* (Crassulaceae) Roots on ATP Content in Mitochondria of Skeletal Muscles

M. Abidov, F. Crendal\*, S. Grachev\*, R. Seifulla\*\*, and T. Ziegenfuss\*\*\*

Translated from *Byulleten' Eksperimental'noi Biologii i Meditsiny*, Vol. 136, No. 12, pp. 664-666, December, 2003  
Original article submitted September 16, 2003

### STUDY DESIGN

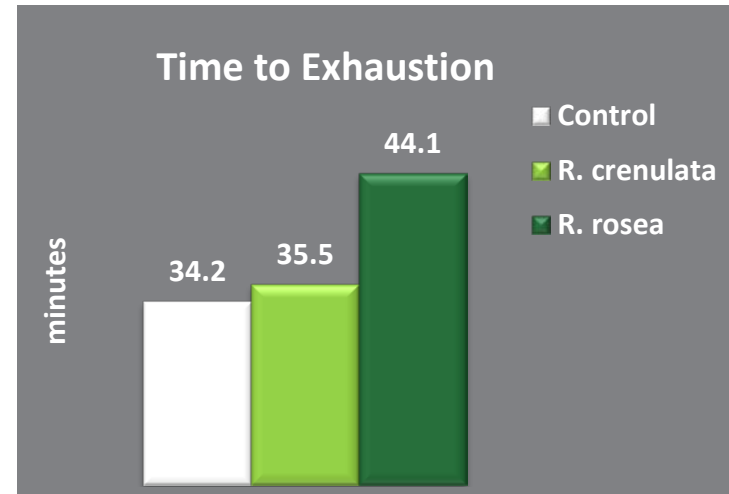
- 24 Sprague-Dawley Rats, 3 treatment groups (oral gavage)
  - *Rhodiola crenulata* (50mg/kg)
  - *Rhodiola rosea* (RhodioLife, 50mg/kg)
  - Placebo control
- Exhaustive swimming twice daily for 6 days
- Outcomes measured:
  - Time to exhaustion
  - Mitochondrial ATP

# IN VIVO RESEARCH

RhodioLife™ supplementation stimulates energy synthesis in skeletal muscles following exercise

## RESULTS

1. RhodioLife supplemented rats swam longer



2. RhodioLife supplementation attenuated ATP loss

**TABLE 1.** Effects of *R. rosea* and *R. crenulata* Extracts on ATP Content in Mitochondria of Sprague-Dawley Rats ( $\mu\text{mol/g}$  protein;  $M\pm m$ )

Group	Before test	After 6 days	After 24-h rest
Control	5.38 $\pm$ 0.30	3.86 $\pm$ 0.40*	4.69 $\pm$ 0.50*
<i>R. crenulata</i>	5.48.0 $\pm$ 0.5	3.81 $\pm$ 0.50*	4.63 $\pm$ 0.20*
<i>R. rosea</i>	5.41 $\pm$ 0.40	4.85 $\pm$ 0.30* **	5.22 $\pm$ 0.40* **

**Note.**  $p < 0.05$ : \*compared to previous value; \*\*compared to controls and rats treated with *R. crenulata*.

# CLINICAL RESEARCH

## Extract of *Rhodiola rosea* Radix Reduces the Level of C-Reactive Protein and Creatinine Kinase in the Blood

M. Abidov, S. Grachev, R. D. Seifulla, and T. N. Ziegenfuss

Translated from *Byulleten' Eksperimental'noi Biologii i Meditsiny*, Vol. 138, No. 7, pp. 73-75, July, 2004  
Original article submitted December 19, 2003

### STUDY DESIGN

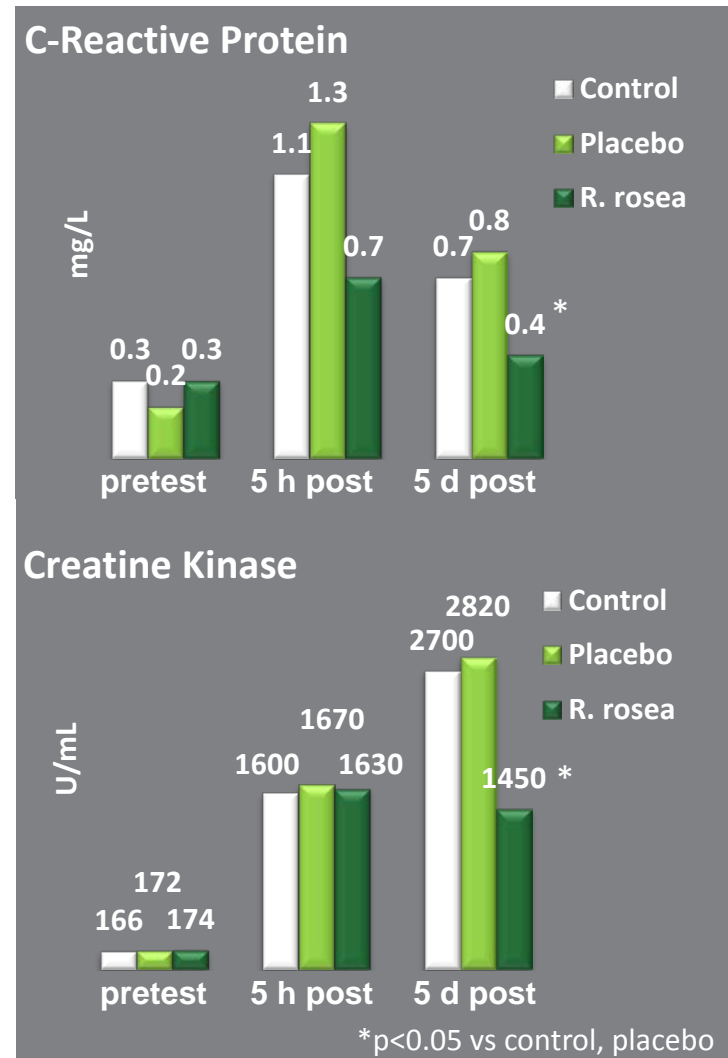
- 36 untrained human volunteers (3 groups), supplemented 30 d prior and 6 d after exhausting physical exercise with:
  - Placebo (340 mg twice/day)
  - *Rhodiola rosea* (RhodioLife, 340 mg twice/day)
  - Control (no treatment)
- Exhaustive physical exercise test using bicycle ergometer
- Outcomes measured:
  - Blood collected for C-reactive protein (CRP) and creatine kinase (CK) analysis

# CLINICAL RESEARCH

## Study #2: *Rhodiola Rosea* extract exhibited an anti-inflammatory effect and protected muscle tissue during exercise

### RESULTS

1. Exhausting exercise increased both CRP and CK levels in all subjects, but the rise in CRP was less pronounced at 5 hours for subjects consuming RhodioLife. CRP returned to pre-test levels only in the RhodioLife group.
2. Similarly, elevated CK levels remained high 5 days post-test for both placebo and control groups but was significantly lower in the group supplemented with RhodioLife.



# CLINICAL RESEARCH

THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE  
Volume 14, Number 2, 2008, pp. 175-180

## A Pilot Study of *Rhodiola rosea* (Rhodax<sup>®</sup>) for Generalized Anxiety Disorder (GAD)

ALEXANDER BYSTRITSKY, M.D.,<sup>1,2</sup> LAUREN KERWIN, B.A.,<sup>2</sup> and JAMIE D. FEUSNER, M.D.<sup>2</sup>

### STUDY DESIGN

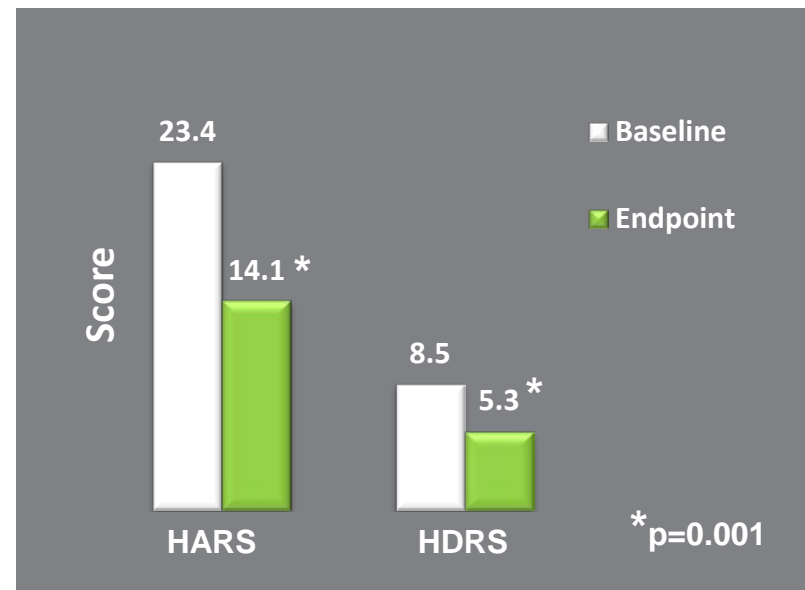
- 10 participants (ages 34-55 yrs) with a DSM-IV diagnosis of generalized anxiety disorder
  - Received *Rhodiola rosea* (RhodioLife, 340 mg/day) for 10 weeks
- Outcomes measured:
  - Hamilton Anxiety Rating Scale (HARS)
  - Four-Dimensional Anxiety and Depression Scale
  - Clinical Global Impressions of Severity/Improvement Scale

# IN VIVO RESEARCH

Study #3 *Rhodiola Rosea* extract significantly improves symptoms of generalized anxiety disorder in a pilot trial

## RESULTS

1. Daily RhodioLife consumption decreased ratings on scales of anxiety (HARS) and depression (HDRS).
2. Self-rated scores on the Four Dimensional Anxiety and Depression Scale (FDADS) also significantly decreased ( $p=0.043$ ).





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# TECHNICAL

COMPARING RHODIOLIFE  
TO *RHODIOLA ROSEA* &  
OTHER EXTRACTS ON THE  
MARKET



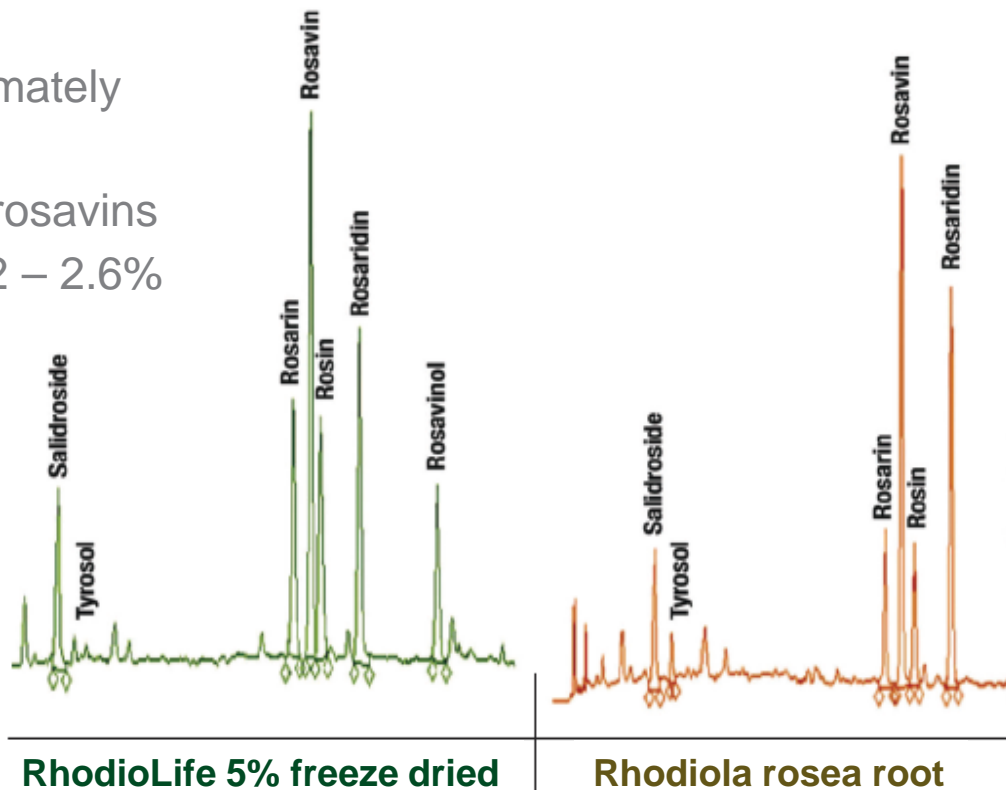


# BIOACTIVE PROFILE

RhodiLife™ fingerprint mimics root composition

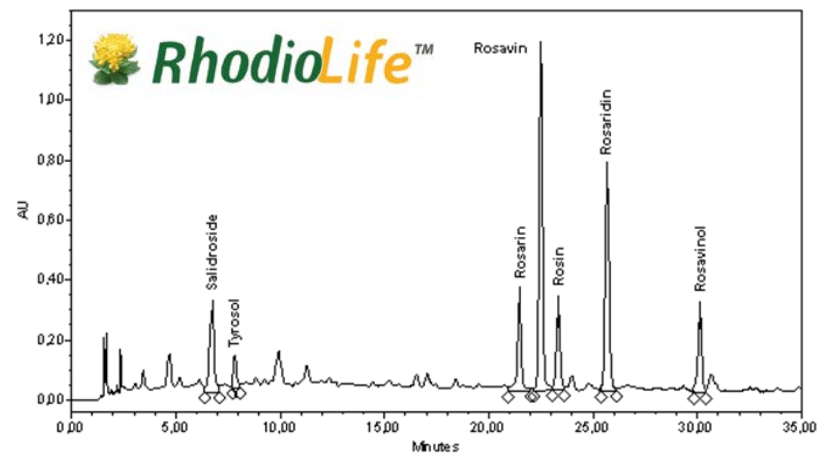
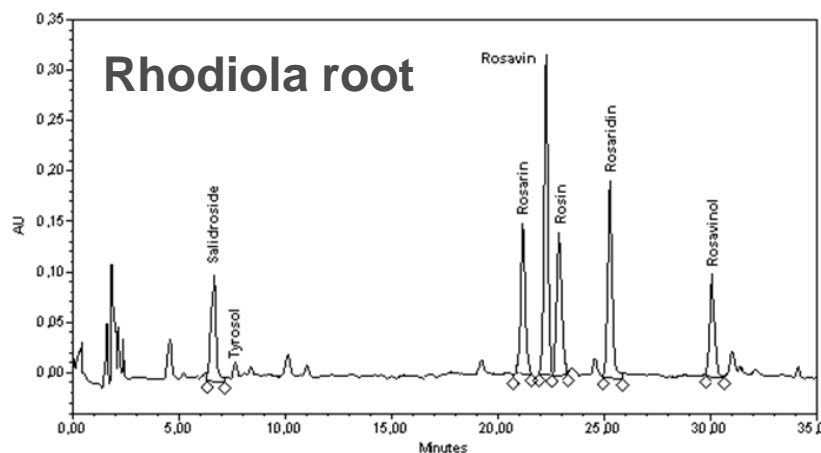
## STANDARDIZED RHODIOLA ROSEA EXTRACT

- Typical HPLC profile of *Rhodiola rosea* roots
- The natural ratio of rosavins:salidroside is approximately 3:1 – 1.3
- A product standardized to 5% rosavins should contain approximately 2 – 2.6% salidroside

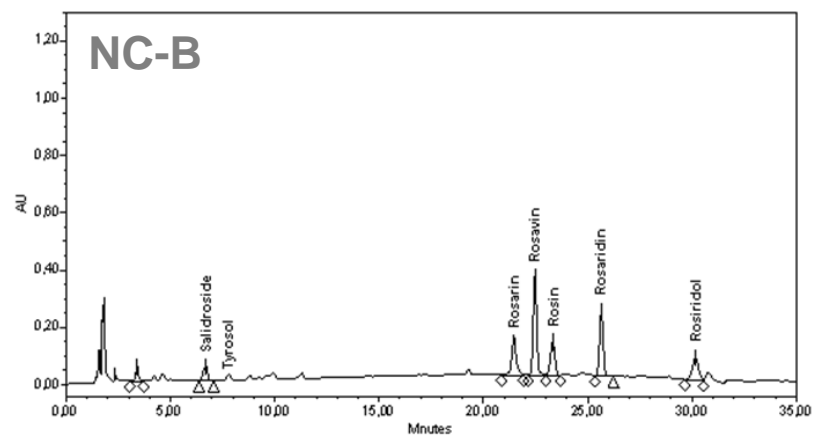
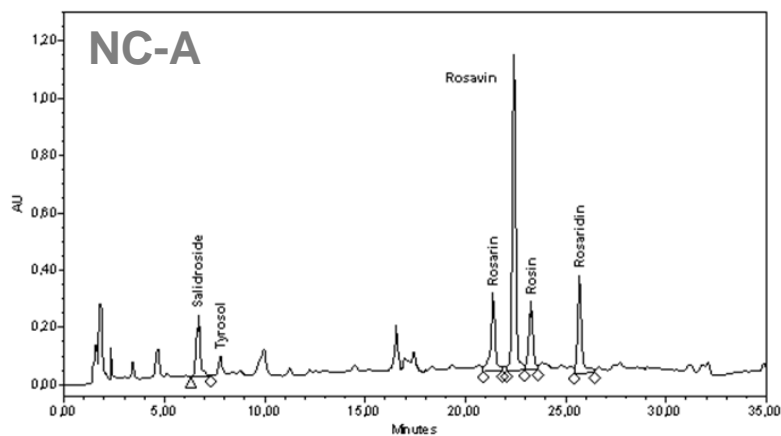


# RHODIOLIFE™ VS. COMPETITION

Comparative HPLC Analysis of *Rhodiola rosea* roots and different marketed *Rhodiola* extracts



## COMPETITIVE INGREDIENTS



# IMPACT OF DRYING METHOD

While both RhodioLife™ products contain the main actives of the *R. rosea* root, Freeze-Dried RhodioLife preserves more volatile compounds

## GUARANTEED ANALYSIS

- Both freeze-dried (FD) and spray-dried (SD) extracts are standardized to total rosavins and salidroside content.

## FD VS SD

- The freeze drying process is less aggressive and therefore preserves a higher content of volatile compounds.
- Animal research shows that rats supplemented with FD RhodioLife were better able to respond to physical exertion tests vs. those supplemented with SD RhodioLife (Abidov et al, 2005).

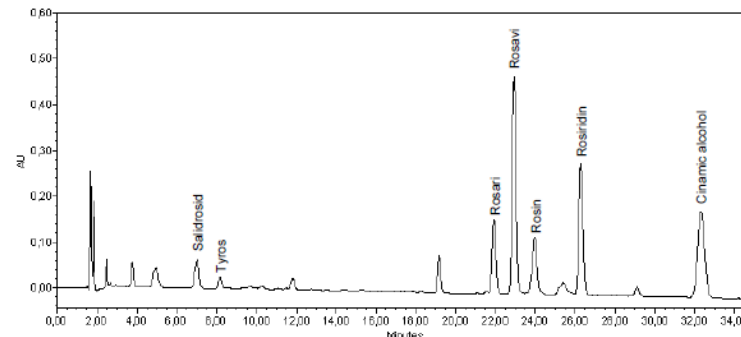


Fig. 1: HPLC fingerprint of Rhodiola rosea extract (Spray dried)

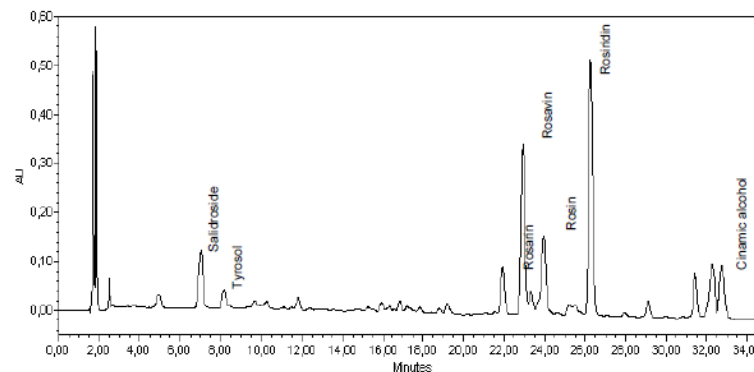


Fig. 2: HPLC fingerprint of Rhodiola rosea extract (Freeze dried)



OUR CORE VALUES MAKE US  
**BETTER PARTNERS**

BENEFICIAL AND FAIR TO ALL  
HIGH COMMITMENT CULTURE  
INTEGRITY  
CREATIVITY  
ECSTATIC CUSTOMERS