



HerbClip™

Mariann Garner-Wizard
David Levine

Shari Henson
Heather S Oliff, PhD

Amy Keller, PhD
Risa Schulman, PhD

Executive Editor – Mark Blumenthal

Managing Editor – Lori Glenn

Consulting Editors – Dennis Awang, PhD, Thomas Brendler, Francis Brinker, ND, Mark Dreher,
Steven Foster, Risa Schulman, PhD

Assistant Editor – Tamarind Reaves

AMERICAN
BOTANICAL
COUNCIL

File: ■ Rhodiola (*Rhodiola rosea*)

■ Fatigue

■ Stress

HC 041162-429

Date: July 29, 2011

RE: Human Studies on Rhodiola Show Enhanced Physical and Mental Functions

Hung SK, Perry R, Ernst E. The effectiveness and efficacy of *Rhodiola rosea* L.: a systematic review of randomized clinical trials. *Phytomedicine*. February 15, 2011;18(4):235-244.

Rhodiola (Rhodiola rosea) is found at high altitudes in Europe and Asia and has traditionally been used in Russia, Scandinavia, and eastern Europe for combating high altitude sickness, depression, fatigue, and for nervous system stimulation. *Rhodiola* is reported to influence monoamines and opioid peptides, and has been found to contain compounds unique to this species.^{1,2} Although the bioactivity of this plant is diverse, the authors point to a dearth of review articles on its efficacy and set out to summarize the methodology and results of randomized clinical trials (RCTs) of *rhodiola*.

To identify RCTs for the review, the authors searched AMED from 1985-July 2009, CINAHL from 1982-July 2009, The Cochrane Library in July 2009, EMBASE from 1974-July 2009, MEDLINE from 1950-July 2009 and Web of Science in July 2009. They employed the words or phrases "*R. rosea*," "SHR-5," "golden radix," "rhodiola," "arctic root," "Aaron rod," "roseroot," "rosavin," "rosin," "rosarin," "rhodaz," "Vitano," and "Hong Jian Tian." The authors also searched the references of all literature obtained to identify additional RCTs and inquired with *rhodiola* manufacturers and herbal medicine professionals to find any overlooked or unpublished material. The authors included all material regardless of language of publication.

The authors only included RCTs that investigated *rhodiola* as a single preparation used as an oral treatment alongside a control group with either ill patients or healthy subjects. Control group criteria included either a placebo, no treatment, or an active treatment. Studies that used *rhodiola* in combination with other treatments were excluded. The authors gathered the study design, study quality, number of participants, intervention, results, and adverse events. Each study was assessed using the Jadad score for methodological quality, with additional assessment taken from The Cochrane Handbook of Systematic Reviews of Interventions, used for standardizing healthcare interventions, and the CONSORT statement of herbal medicine. [The CONSORT statement of 15 criteria for clinical trials involving herbal medicine is conveniently included as an

appendix]. The type and appropriateness of sequence generation, allocation adequately concealed, whether intention to treat analysis was conducted and described, matching of groups at baseline, and the 15 items in the CONSORT statement were used to assess each RCT.

The literature searches yielded 693 candidates for further screening. Of these, 11 RCTs met all the inclusion criteria. In summary, the studies were published between 2000 and 2009 and were from Russia, Armenia, the USA, Sweden, Belgium, and the Netherlands. Although one study did not report the number of subjects, there was a wide range of participants in the included RCTs (n=12-121) for a total of 503 in the other 10. Eight of the studies were conducted on healthy subjects exposed to hypoxia, fatigue, or stress from exercise, work, or exams and one RCT investigated subjects for alterations of photon emission, stress, and fatigue. The two remaining trials focused on patients with stress-related fatigue and mild to moderate depression. All RCTs included a placebo.

The authors separated the studies into 7 investigations of physical performance and its physiological indicators, 4 on mental performance, and 2 for mental health conditions. Parameters reported in the RCTs of physical performance ranged from physical performance itself and exhaustion levels, to blood oxygenation in hypoxia conditions. Two of the RCTs (n=15 and n=12) reported that rhodiola failed to improve blood oxygenation after hypoxia was induced or to increase skeletal muscle phosphocreatine recovery after exercise. In contrast, other studies reported a significant increase in time to exhaustion, mean C-reactive protein levels, and neuromotoric fitness in the rhodiola treatment groups ($P < 0.005$). Another study also found that rhodiola improved tiredness perception ($P = 0.049$).

The measurements used in the mental performance RCTs were short term memory, reaction time to various stimuli, and concentration. Two of these studies observed significant improvements in Total Antifatigue Index and Total Fatigue Index scores of the rhodiola treatment groups in comparison with the placebo ($P < 0.05$).

In the RCTs examining mental health, fatigue syndrome and depression were analyzed. The rhodiola-treated patients with stress-related fatigue improved significantly over the placebo group ($P = 0.047$). In addition, patients suffering from depression significantly improved when treated with rhodiola as compared to the placebo group ($P < 0.0001$), according to the Hamilton Rating Scale for Depression and the Beck Depression Inventory, commonly used questionnaires for rating the severity of depression symptoms. Of the 11 RCTs in this analysis, eight of them assessed adverse effects and only three were reported including headache and hypersalivation, both from the placebo group. Although the trials did not describe these as serious, an unexplained illness caused one patient to drop out of the study.

According to the authors' assessment, five studies had good methodological quality with a Jadad score of three points or higher. Four studies had a score of two points or lower, and the authors mention that seven RCTs failed to clearly state their intention to treat analyses. The authors noted that, with possibly one exception, the studies did not adequately report on the preparations of rhodiola utilized.

The authors conclude that rhodiola may be active in a variety of ways and might be used to treat several ailments, including those brought on by stress and depression. However,

they do point out that they may have overlooked certain RCTs, and the studies included in this review have not been replicated.

This review is thorough and balanced, and the authors make excellent use of quantitative assessment to evaluate the RCTs involving rhodiola. The authors themselves conclude that the reported bioactivity of rhodiola warrants further investigation; this review outlines a convincing argument for this conclusion.

—Amy C. Keller, PhD

References

¹Webb D. *Rhodiola rosea* as a plant adaptogen. *HerbClip*. November 14, 2002 (No. 100411-220). Austin, TX: American Botanical Council. Review of *Rhodiola rosea*: a possible plant adaptogen by Kelly GS. *Altern Med Rev*. 2001;6(3):293-302.

²Oliff HS. *Rhodiola rosea* monograph in *HerbalGram*. *HerbClip*. December 31, 2003 (No. 070336-247). Austin, TX: American Botanical Council. Review of *Rhodiola rosea*: a phytomedicinal overview by Brown RP, Gerbarg PL, Ramazanov Z. *HerbalGram*. 2002;(56):40-52.

The American Botanical Council has chosen not to reprint the original article.

The American Botanical Council provides this review as an educational service. By providing this service, ABC does not warrant that the data is accurate and correct, nor does distribution of the article constitute any endorsement of the information contained or of the views of the authors.

ABC does not authorize the copying or use of the original articles. Reproduction of the reviews is allowed on a limited basis for students, colleagues, employees and/or members. Other uses and distribution require prior approval from ABC.