



Cultivating a sustainable source of a stress-busting adaptogen

Growing demand for *Rhodiola rosea* is creating pressure on wild-harvested supplies. Nektium's Deborah Thoma explains how a pioneering cultivation strategy is delivering a sustainable solution

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Physical and emotional stress are part of everyday life for people all over the world – and the impacts can be severe. In fact, stress-related non-communicable diseases such as coronary artery disease, diabetes, and cancer have been described as “the major health crisis in the 21st century.”¹ In this context, it is little surprise that adaptogens – ancient plants and herbs that can help the body adapt to stress – are seeing a significant increase in demand.²

The term adaptogen was coined by Dr. Nikolai Lazarev in 1947 and referred to substances that meet three criteria. First, they need to help the body contend with an array of conditions, such as physical, chemical, or biological stress. Secondly, they must regulate homeostasis, which means either

offsetting or resisting physical disorders resulting from external stress. Thirdly, they must not damage the body's normal function.³

While there are many adaptogens on the market today, *Rhodiola rosea*, primarily growing wild in the remote Altai mountains, is the one that best matches Dr. Lazarev's original definition.

Sustainable sourcing

With demand for *Rhodiola rosea* accelerating, there is now considerable pressure on wild supplies – leading to concerns around over-harvesting. Botanical extract manufacturer Nektium is therefore taking steps to secure the long-term sustainability of its standardized *Rhodiola rosea* extract by switching a significant proportion of its sourcing to cultivated plants.

The company is implementing this pioneering cultivation strategy in close cooperation with its long-standing partner in the Altai mountains. The material used to grow the cultivated *Rhodiola rosea* for



the ingredient was originally taken from wild-harvested plants from the area where the cultivation fields are now established. To ensure the plant will flourish, Nektium has worked with its partner to establish fields that offer optimal conditions for the controlled growing of *Rhodiola rosea*.

Barren land in undeveloped and unpopulated locations was selected for conversion to ensure minimal impact on local communities. Subsequent expansion of the initial cultivated area has been carried out not from seeds but through vegetative propagation of root rhizomes extracted from the cultivated *Rhodiola rosea*. Cultivation

presents significant challenges, especially in maintaining the levels of actives. Nonetheless, the company's vegetative propagation technique is not only faster and more reliable but ensures that the molecular composition of the cultivated *Rhodiola rosea* is identical to the wild-grown plant. This achievement was the outcome of many years of experimentation, testing, and refinement of techniques.

Growing *Rhodiola rosea* in a controlled setting also limits unknown factors and results in a more predictable and secure long-term raw material supply. Cultivation means improved price stability, superior safety, and more effective quality control. With a Quality Assurance system put in place with Good Agricultural and Collection Practices (GACPs) governing rules of production, harvesting, storage, and record keeping is monitored. This is accompanied by training programs, as well as traceability and recall plans, all of which has allowed the initiative to be established as a successful long-term project.

Harnessing the benefits

Rhodiola rosea's adaptogenic activity is usually attributed to four principal active compounds – salidroside, rosin, rosavin, and rosarin – which are found at high concentrations in the roots. Ensuring the final ingredient delivers the appropriate quantity of the desired bioactive components is a task that requires skill and care. Apart from the expertise in manufacturing the botanical extract, an understanding for how growing conditions affect the plants and, in turn, when to harvest them, while putting in place a quality management system together with the local partner, was developed.

Rhodiola rosea is an extremely hardy plant that is well suited to the harsh weather conditions in the Altai mountains. The coldest months are January and February, when the average temperature falls as low as -15°C. The snow usually begins to melt in early May, providing the plants with a short window in which to grow.

The bioactive compounds in the *Rhodiola rosea* root reach their highest levels between three and five years of growth. If harvested too early, the overall level of actives is likely to be substantially lower. Through visual inspection and by analyzing climatic conditions, it is possible to determine the ideal time to harvest the plant.

Scientific research

Rhodiola rosea is supported by centuries of traditional use for mental and physical stress. In the modern era, studies have found that it offers a range of cognitive health benefits, including reduced stress and fatigue as well as improved mental sharpness. In addition, *Rhodiola rosea* has been shown to deliver a boost to athletic performance by aiding recovery and enhancing immune health after exercise.⁴

A pilot study set out to evaluate whether the ingredient can reduce symptoms of generalized anxiety disorder (GAD). Ten participants with a DSM-IV diagnosis of GAD received a total daily dose of 340 mg



of the *Rhodiola rosea* extract over a period of ten weeks. Significant improvements in symptoms, with reduced scores on both the Hamilton Anxiety Rating Scale and the Four-Dimensional Anxiety and Depression Scale were demonstrated.⁵

Rhodiola rosea extract also has a long history of use among professional athletes to improve endurance and rapid recovery of muscles. A double-blind placebo-controlled study explored the effects of the ingredient on blood levels of inflammatory C-reactive protein (CRP) and creatinine kinase (CK) before and after exhausting exercise. Among 36 healthy, untrained volunteers, the extract was found to exhibit an anti-inflammatory effect and protect muscle tissue during exercise. Blood levels of CRP were less pronounced among those taking the *Rhodiola rosea* extract, while the exercise-induced rise in CK was also blunted.⁶

A further study provided evidence that the ingredient can increase immune protection after sports. Marathon runners are prone to viral illnesses shortly after competing in a race. A study set out to measure the antiviral and antibacterial properties of the bioactive metabolites of *Rhodiola rosea* in the serum of experienced marathon runners. The study found that the use of *Rhodiola rosea* induced antiviral activity at early times post-infection by delaying an exercise-dependent increase in virus replication. This suggests it exerts protective effects against virus replication following intense and prolonged exercise.⁷

Plant power

As one of the most powerful adaptogens found in nature, *Rhodiola rosea* is seeing a surge in popularity. Rhodiolife® is a sustainably produced root extract with a phytochemical profile that reflects all the natural active ingredient content of the wild Siberian *Rhodiola rosea* in terms of both composition and relative concentrations. It is ideally suited to supplements and can also be used across a wide range of food and beverage applications, including sports and energy drinks, dairy products, gummies, and cereal bars.

Supported by scientific research, the ingredient offers wide-ranging benefits for product development objectives across sports and cognitive health.

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