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The Rosehip Plant and Medicinal Properties

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Annotation: The rosehip plant (Rosa canina), commonly known as wild rose fruit, is one of the most valuable medicinal plants due to its rich content of vitamin C, antioxidants, flavonoids, and essential nutrients. Numerous scientific studies confirm its strong anti-inflammatory, immune-boosting, antioxidant, and cardiovascular-supporting properties. In Uzbekistan, rosehip has long been used in traditional herbal medicine for strengthening immunity, treating colds, improving digestion, and supporting overall health. Today, it is widely consumed in the form of tea, syrup, jam, oil, and medicinal preparations. This paper discusses the medicinal properties of rosehip, its health benefits, and its significance within the Uzbek context.

Keywords: Rosehip; Rosa canina; medicinal plant; vitamin C; antioxidant; anti-inflammatory; herbal medicine.

Introduction: Medicinal plants play a crucial role in maintaining human health and preventing various diseases, especially in societies where traditional medicine remains culturally important. One such plant is rosehip, the fruit of the wild rose, which has been recognized for centuries as a powerful natural remedy. Rosehip is highly valued for its exceptionally high vitamin C content, along with antioxidants, organic acids, essential fatty acids, minerals, and flavonoids that significantly contribute to human health.

International scientific research highlights rosehip's ability to strengthen the immune system,

reduce inflammation, improve skin condition, support the cardiovascular system, and help in managing joint pain and arthritis. Its antioxidant capacity protects the body from oxidative stress and cellular damage, making it beneficial in preventing chronic diseases.

In Uzbekistan, rosehip holds a special place in traditional herbal healing practices. It is commonly used in households and folk medicine to treat colds, flu, weakness, anemia, digestive problems, and vitamin deficiency. Elderly people, children, and individuals with weakened immunity especially benefit from rosehip tea and syrup. The plant naturally grows in Uzbekistan's mountainous and foothill regions, particularly in Tashkent, Samarkand, Kashkadarya, Bukhara, and Fergana Valley areas, making it easily accessible and culturally familiar.

The increasing interest in natural and herbal health remedies in Uzbekistan has further strengthened rosehip's importance in both daily health practices and the development of herbal pharmaceutical products. Therefore, studying rosehip's medicinal value is essential for promoting public health, preserving traditional knowledge, and supporting sustainable natural medicine practices in the country.

Key Researchers and Contributors to Rosehip Medicinal Properties: The medicinal properties of rosehip, particularly its **anti-inflammatory**, **antioxidant**, and **analgesic effects** in conditions like osteoarthritis (OA), have been investigated through in vitro, in vivo, and clinical studies since the late 1990s. Research focuses on standardized powders (often containing seeds and shells) and the isolated galactolipid **GOPO**. Below is an expanded overview of the primary contributors, based on their seminal works, collaborations, and impact.

Joseph Schwager. Key Contributions: Focused on cellular and molecular mechanisms. Demonstrated that rosehip powder and isolated **GOPO** exert **anti-inflammatory** and **chondroprotective effects** by reducing cytokine/chemokine production in macrophages and chondrocytes. In 2008 Poster/presentation at OARSI World Congress on GOPO's role in arthritis. Studies showing inhibition of pro-inflammatory pathways, supporting cartilage protection. **Impact.** Provided key evidence linking rosehip's clinical benefits to specific bioactive compounds, particularly galactolipids.

Sigrun Chrubasik (also Chrubasik-Hausmann). Affiliations: University of Freiburg (Germany). **Key Contributions:** Expert in phytotherapy and systematic reviews. Authored comprehensive reviews evaluating rosehip's efficacy in OA, back pain, and musculoskeletal disorders. Highlighted moderate evidence for pain reduction and safety. **Notable Works.** 2006–2008: Systematic reviews concluding moderate evidence for rosehip in OA. 2014: Pilot study on shell-only powder for chronic pain exacerbations. Broader reviews on herbal anti-inflammatories. **Impact.** Critical in meta-analyses and evidence synthesis; noted the need for larger trials.

Joan Campbell-Tofte. Coordinating Research Unit, Frederiksberg University Hospital (Denmark); independent researcher. **Key Contributions.** Co-authored reviews and studies on antioxidative/anti-inflammatory properties, including in vitro work on bioactive ingredients. Contributed to human and animal studies on arthritis pain alleviation. **Notable Works**. 2016: Co-authored two-part review on rosehip's role in arthritis (in vitro and clinical/animal studies). Collaborations with Winther on mechanisms and clinical applications.**Impact:** Bridged traditional use with modern mechanistic understanding.

Akhtar Kharazmi. Rigshospitalet/University Hospital, Copenhagen (Denmark). **Key Contributions,** Early pioneer in rosehip's anti-inflammatory effects. Demonstrated inhibition of neutrophil chemotaxis and chemiluminescence in vitro and in vivo, reducing inflammatory parameters.**Notable Works,** 1999: First report on rosehip's anti-inflammatory properties via leukocyte modulation. 2003: Isolation/characterization of GOPO as an active anti-inflammatory galactolipid. Collaborations on OA trials**. Impact,** Laid foundational evidence for rosehip's neutrophil-related anti-inflammatory action.

Results and Analysis. The rosehip plant, particularly *Rosa canina* L., has been the subject of extensive research validating its traditional medicinal uses. Modern studies, including in vitro (cell-based), in vivo (animal), and clinical (human) trials, focus on its bioactive compounds—such as vitamin C, polyphenols (e.g., flavonoids like quercetin and kaempferol, phenolic acids like gallic and ellagic acid), carotenoids (e.g., lycopene, β-carotene), galactolipids (e.g., GOPO), and essential fatty acids. These contribute to antioxidant, anti-inflammatory, antidiabetic, anticarcinogenic, hepatoprotective, cardioprotective, nephroprotective, antimicrobial, and skin health benefits. Below, I summarize key results from recent studies (primarily 2020–2025), followed by an analysis of efficacy, mechanisms, limitations, and emerging applications.

Clinical Results: Standardized rosehip powder (containing seeds and shells) in multiple RCTs (e.g., with 287+ patients) reduced osteoarthritis pain, stiffness, and CRP levels, allowing decreased NSAID use; effects were comparable to NSAIDs but with fewer side effects.

Antidiabetic and Metabolic Effects, In Vitro Results: Acetone extracts inhibited α-glucosidase (IC50 0.3 g/mL) and promoted pancreatic β-cell growth and glucose diffusion.

In Vivo Results: Ethanolic extracts ameliorated hyperglycemia and hyperlipidemia in streptozotocin-induced diabetic rats, improving glucose tolerance and preserving β-cells in prediabetic models.

Clinical Results: In a 3-month trial with type 2 diabetic patients (aged 35–60, HbA1c 7–9%), 750 mg fruit extract twice daily reduced fasting blood glucose and total cholesterol/HDL-C ratio vs. placebo, with no changes in other lipids or HbA1c. **Anticarcinogenic and Antiproliferative Effects. In Vitro Results:** Ethanolic extracts induced apoptosis in breast cancer cell lines (MCF-7 and MDA-MB-468, ED50 25 µg/mL) and reduced ROS/proliferation in colon cancer cells (Caco-2). Silver nanoparticles from extracts inhibited HT29 colon cancer cell motility (IC50 7.89 µg/mL). Seed oils suppressed cancer cell development in some models.**In Vivo Results.** Limited direct data, but antiproliferative effects support potential in reducing tumor growth without harming normal cells. **Hepatoprotective, Cardioprotective, and Nephroprotective Effects, In Vivo Results.** Hydroalcoholic extracts (250–500 mg/kg) reduced kidney stones, lipid peroxides, and creatinine/urea in rat models of nephrolithiasis and ischemia/reperfusion injury. For liver protection, extracts (500–750 mg/kg) mitigated CCl4-induced damage by lowering enzymes and peroxidation.

Cardioprotective effects included reduced atherosclerosis and improved vascular dilation in ApoE-null mice, plus lowered ER stress in heat-stressed cardiomyocytes. **Skin Health and Wound Healing Effects. In Vitro and In Vivo Results.** Seed oils reduced UV-induced erythema, prevented transepidermal water loss, and promoted collagen synthesis/fibroblast proliferation. Rosehip powder minimized aging signs like wrinkles and UV damage, while extracts from roots reduced atopic dermatitis reactions in mice. Quercetin from *R. canina* lowered melanin in melanoma cells, aiding hyperpigmentation.

Clinical Results. Formulations improved skin penetration, reduced inflammation, scarring, acne, burns, and stretch marks; decoctions acted as moisturizers, decreasing lesion severity.

In Vitro Results: Ethanolic extracts showed MIC of 32–64 g/mL against pathogens like *E. coli*, *K. pneumoniae*, and *P. aeruginosa*. Galls contained unique compounds like 2-methyloctacosane (50.24%) with antimicrobial properties.Analysis of Efficacy, Mechanisms, and Limitations **Efficacy.** Evidence is strongest for anti-inflammatory and antioxidant effects, particularly in osteoarthritis, where meta-analyses show moderate pain reduction (effect size 0.37) and twice the response rate vs. placebo. Antidiabetic and protective effects (liver, heart, kidney) are promising in animal models but require more human data. Skin health benefits are emerging, with rosehip outperforming synthetics in wound healing due to better collagen support and reduced inflammation. Galls show superior antioxidant potential, suggesting untapped medicinal value from plant by-products. Overall, rosehip is safe (rare mild GI side effects) and effective as a

nutraceutical, often comparable to pharmaceuticals but with fewer risks.

Mechanisms. Antioxidant activity stems from scavenging free radicals and reducing oxidative stress via phenolics, vitamin C, and carotenoids. Anti-inflammatory effects involve inhibiting NF-κB, COX enzymes, and cytokines; antidiabetic via α-glucosidase inhibition and insulin sensitization; anticarcinogenic through apoptosis induction (e.g., caspase-3 activation); protective effects by lowering enzymes, peroxidation, and inflammatory genes (e.g., IL-1, CD36). Synergies among compounds enhance bioavailability, improved by advanced extractions (e.g., ultrasound, supercritical CO2).

Limitations and Future Directions: Variability in bioactive levels due to genetics, environment, and processing affects consistency. Clinical trials are limited (e.g., small sample sizes, short durations), with calls for larger, independent RCTs to confirm broader applications like diabetes and cancer. Bioavailability challenges (e.g., poor vitamin C absorption) can be addressed via nanotechnology or encapsulation. Future research should explore galls for novel drugs and sustainable by-product uses in functional foods.

Fugure-1. Rosehip Health Benefits and Medicinal Properties Infographic

As of 2025, research emphasizes sustainable valorization of rosehip by-products (e.g., seed oil, pomace) for functional foods like yogurt, bread, and sausages, enhancing nutrition without waste. New focuses include psychological benefits (e.g., stress reduction via skin barrier protection) and antimicrobial synergies in teas. Studies on related *Rosa* species (e.g., *R. rugosa* for higher vitamin C) highlight genetic variations for optimized cultivars. Commercially, products like GOPO-enriched powders are marketed for joint health, with ongoing trials for aging and metabolic

syndromes. Rosehip also shows promise in material applications, such as biodegradable films or cosmetics, leveraging its fatty acids (e.g., linoleic acid in seeds). For personalized use, consult a healthcare provider, as interactions with medications (e.g., anticoagulants) are possible due to vitamin K content

Conclusion

The rosehip (*Rosa canina* L.) stands as one of the most well-researched and evidence-supported herbal remedies in modern phytotherapy. Its long history of traditional use across cultures for inflammatory conditions, infections, and general health maintenance has been substantially validated by contemporary scientific investigation.

Strongest Evidence for Anti-Inflammatory and Joint Health Benefits. Multiple randomized controlled trials, meta-analyses, and systematic reviews consistently demonstrate that standardized rosehip powder (particularly formulations rich in the galactolipid GOPO) significantly reduces pain, stiffness, and disability in osteoarthritis of the knee, hip, and hand. Patients often achieve clinically meaningful improvements comparable to NSAIDs but with a superior safety profile, including reduced need for conventional painkillers and minimal gastrointestinal side effects.

Robust Antioxidant and Broad Protective Effects.Rosehip's exceptionally high content of vitamin C, polyphenols, carotenoids, and other bioactive compounds confers potent free-radical scavenging and oxidative stress-reducing properties. These underpin its observed benefits in cardiovascular health, skin aging, wound healing, and metabolic regulation.

In summary, rosehip represents a rare example of a traditional herbal medicine that has successfully bridged folk wisdom and rigorous scientific validation. It offers a safe, effective, and multifaceted therapeutic tool, particularly for inflammatory musculoskeletal disorders, while showing considerable promise across a wider spectrum of health applications. As research continues into 2025 and beyond, rosehip is likely to retain its place as a cornerstone of evidence-based herbal medicine and functional nutrition.

References

1. Chrubasik, C., Roufogalis, B. D., Wagner, H., & Chrubasik, S. (2008). A systematic review on the Rosa canina effect and efficacy profiles. *Phytotherapy Research*, 22(6), 725–733.
2. Chrubasik-Hausmann, S., Vlachojannis, C., Zimmermann, B. F., & Chrubasik, C. (2014). The clinical effectiveness of rosehip preparations. *Phytotherapy Research*, 28(4), 513–521.
3. Marjanović-Balaban, Ž., Stankov-Jovanović, V., & Vasiljević, P. (2017). Rosehip (Rosa canina L.): Chemical composition and beneficial health effects. *Journal of Medicinal Plant Research*, 11(16), 225–233.
4. Kharazmi, A., Winther, K. (1999). Rose hip inhibits chemotaxis of human peripheral blood neutrophils in vitro. *Scandinavian Journal of Rheumatology*, 28(1), 32–36.
5. Andersson, U., et al. (2011). Anti-inflammatory properties of rosehip. *Inflammopharmacology*, 19(5), 245–254.
6. Orhan, D. D., Özçelik, B., Özgen, S., & Ergun, F. (2009). Antibacterial, antifungal, and antiviral activities of Rosa canina L. extracts. *Turkish Journal of Biology*, 33, 283–288.
7. Patel, S. (2017). Rosehip as a source of functional food ingredients. *Food & Function*, 8, 1989–1999.
8. Lattanzio, F., Greco, E., Carretta, D., Cervellati, R., Govoni, P., & Speroni, E. (2011). Anti-inflammatory effects of Rosa canina extracts. *Journal of Ethnopharmacology*, 137(1), 880–885.
9. Barros, L., Carvalho, A. M., & Ferreira, I. C. (2011). Nutritional and bioactive compounds of wild edible roses. *Food Research International*, 44(5), 1406–1413.

10. Winther, K., Apel, K., & Thamsborg, G. (1996). A powdered rose hip preparation in patients with osteoarthritis. *Scandinavian Journal of Rheumatology*, 25(6), 302–305.
11. Fattahi, S., Jamei, R., & Siasar, B. (2012). Antioxidant capacity of Rosa canina fruits. *Journal of Medicinal Plants Research*, 6(30), 4731–4736.
12. Ercisli, S. (2007). Chemical composition of rosehip species. *Food Chemistry*, 104(4), 1379–1384.
13. Demir, F., Özcan, M. (2001). Chemical properties of rosehip fruits. *Journal of Food Engineering*, 47(4), 333–336.
14. World Health Organization (WHO). (2009). *WHO Monographs on Selected Medicinal Plants* – Rosa canina.
15. Uzbek Research Institute of Medicinal Plants. (Various years). Studies on the medicinal and nutritional value of rosehip in Uzbekistan. Tashkent: National Herbal Medicine Publications.