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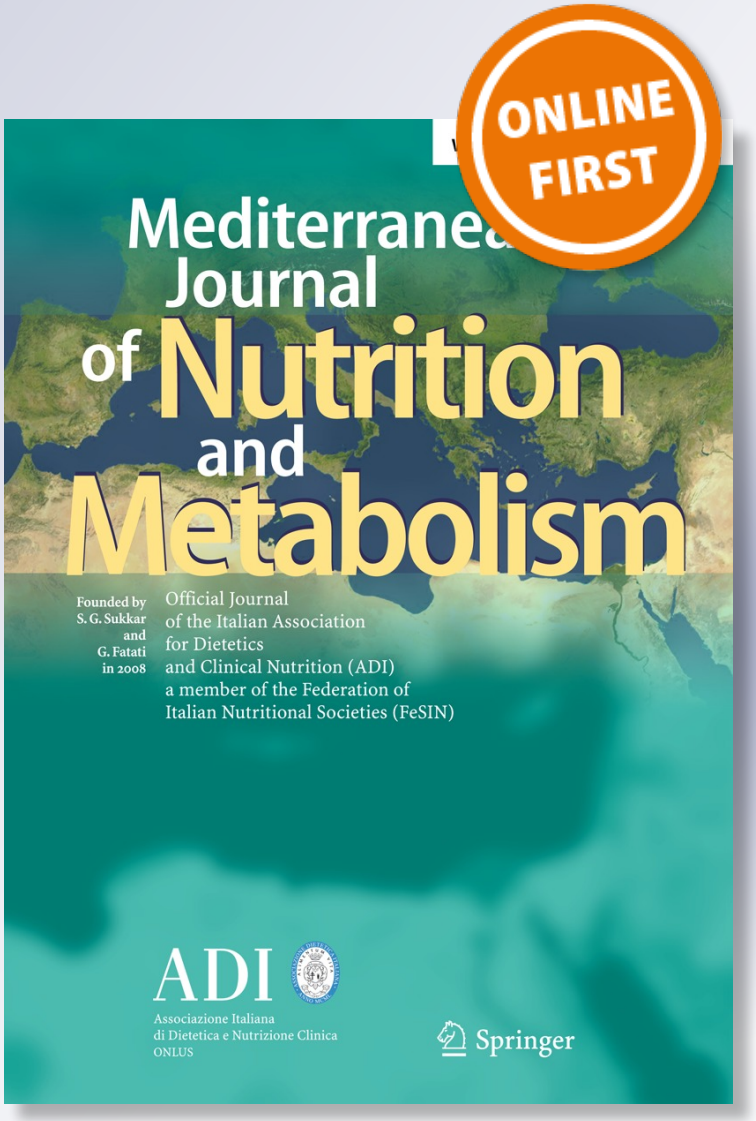

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REVIEW

Rose hips as complementary and alternative medicine: overview of the present status and prospects

Seema Patel

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Abstract Generally, the rose hips are discarded as horticultural wastes. Recently, they have been discovered to be storehouse of nutraceuticals and pharmaceuticals. Rich in polyphenols, essential fatty acids, vitamin A and C, mineral Ca and Fe, they have potential to be developed as functional foods. The extracts have demonstrated antioxidant, antiarthritic, antiinflammatory, analgesic, antidiabetic, cardioprotective, antimicrobial, immunomodulatory, gastroprotective and skin ameliorative effects. A slew of rose hip-based pharmaceutical supplements are already released to the market. Since very long, the indigenous traditional knowledge has accepted the medicinal value of rose hips. Now, modern clinical science is waking up to the rationale behind their incorporation in therapeutic regimens. This review has been compiled with a vision to promote the scarcely studied and barely exploited nutritional source as a nutraceutical aid and complementary and alternative medicine.

Keywords Rose hips · Functional food · Antioxidant · Antiinflammatory · Antidiabetic · Antimicrobial

Introduction

The rose hip is the bulbous part present below the petal corolla. This is the fruit, hypanthium or haw of rose (Fig. 1). It is edible like other popular Rosaceae members viz. plum, cherry, apple, pear, peach, apricot and strawberry. The hip is a repository of flavonoid, pectin, vitamin A, B complex, C and E, also minerals like Ca, Fe, Se and Mn. Trace amounts of Mg, K, S and Si have also been discovered. The tart-tasting fresh or dried hips can be used for preparing an array of delightful and refreshing fares. So far, soup, syrup, jelly, pie, pudding, custard, herbal tea and wine have been prepared from the hips. *Rosa rugosa* is renowned for producing the most abundant and best tasting hips. Apart from the culinary uses, the hips can be used for heath restoration and improvement. *Rosa canina* L. hip has been largely used in traditional folk medicine. The hips of *Rosa multiflora* have been traditionally used as dietary supplements and herbal remedies for the treatment of diseases, including cold, flu, inflammation, osteoarthritis, rheumatoid arthritis and chronic pain in China [1]. The Chumash Indians consumed the hips of *Rosa californica* (California wild rose) raw, cooked or brewed (Fig. 2). Sometimes, the hips are used for alleviating stomach disorders. Oil extracted from the rose hip seeds has immense popularity as a natural skincare product in Chile. Since centuries, this oil is being used by Chileans to get rid of skin blemishes.

Cosmetology research has proven the effect of rose hip oil in lowering skin pigmentation, reducing scars and stretches, acne management, rehydrating skin and rendering it supple and delaying wrinkling. Even the skin specialists are recommending the use of rose hip oil as skin vitalizing agent. However, the available data advocating the medicinal importance of rose hip formulations are sparse and disorganized. Chrubasik et al. [2] have reviewed the pharmacological and clinical effects of *R. canina* L. to reassert its usefulness in traditional medicine namely, for their probiotic additive, antioxidative, antiinflammatory, antiobesity, antiulcerogenic, laxative, muscle relaxing and skincare activities. In the past 4 years, considerable advancement has been reported in this field. This review

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Fig. 1 Ripe rose hips from bushes in Orange County, California

Fig. 2 Clusters of California wild rose hips ripening in autumn season

strives to assemble the evidences from the systematic studies conducted in recent times. Further, it aims at projecting the rose hip products as adjuvant therapeutics for curing multiple ailments.

Commercial rose hip supplements

Several rose hip extract have been released to the market as nutritive aids, health supplements and cosmetics. "Alvita" is a brand name of rose hip tea bags. "Podravka" is a Croatian brand of rose hip jam. "Litozin" is a joint health supplement enriched in galactolipid GOPO compound. The product "i-flex" is a joint relief formulae prepared from Danish processed rose hips. This unique formula is patented and widely used in Europe for improving mobility. "Thompson C 1,000 mg" is a vitamin C-rich product fortified with rose hips and acerola possessing antioxidant and immune-boosting properties. Aubrey Organic Inc manufactures *Rosa Mosqueta* rose hip seed oil-enriched body lotion, moisturizer, nourishing conditioner and bath bar. Eminence organics manufactures rose hip moisturizer for soothing irritated skin.

Constituents of rose hip extract

Bioactive profile of rose hip extract has been studied using several techniques, viz. high-performance liquid chromatography–electrospray ionisation-mass spectrometry (HPLC–ESI–MS). Salminen et al. [3] have isolated 15 individual proanthocyanidin aglycones and 19 glycosides and detected a complex mixture of non-separated tetrameric to octameric proanthocyanidin glycosides from *R. canina* hips. Along with these phenolics, a 50 % aqueous ethanol extract of rose hip was found to contain high levels of vitamin C. Strålsjö et al. [4] assessed that rose hips are a rich source of folate, about 400–600 μg/100 g of

dry matter and 160–185 μg/100 g of fresh weight. The bioactive compounds isolated from rose hips have been presented in Fig. 3.

Effect of harvesting time and dehydration

Andersson et al. [5] observed that the ripening state and harvesting time determine the bioactive profile of rose hip namely, chlorophyll *a* and lycopene. Yilmaz and Ercisli [6] reported that rose hips of Turkey are well established for their aromatic and medicinal properties.

The rose hips are generally harvested only once per year, during autumn, so preservation is a crucial step. Sun drying is the most common preservative method; however it is hampered by precarious weather and external contamination like molds. Hot air drying is another adoptable method, but is limited by the dehydration of surface only [7]. Further, air-drying leads to loss of ascorbic acid content. Erenturk et al. [8] investigated the kinetics of ascorbic acid degradation during air drying of whole rose hip. Drying time, air temperature and moisture content affected the vitamin C content. Chopping the rose hips before drying accelerated the drying process and increased the retention of vitamin C. The ratio of oxygen in the air–CO_2 mixture used as a drying medium influences the extent of loss of vitamin C. Mabellini et al. [9] studied that *R. eglanteria* hips dehydrated in forced convection oven retained about 50 % (450 and 500 mg/100 g of sample) of its initial ascorbic acid content, comparably higher than that of citrus fruits. Evin [7] evaluated the efficacy of microwave drying and observed that it dries the core of the hips, prevents overheating of the surfaces and retains natural colour.

Extraction of bioactive ingredients

Hexane, chloroform, ethylacetate, n-butanol are the common organic solvents employed for extraction of bioactive ingredients from the rose hips. Extracting solvents can alter the antioxidant activity of rose hip fractions. Szentmihályi et al. [10] compared various methods for finding the most suitable extraction of rose hip oil. Traditional solvent extraction, ultrasound, microwave, subcritical and supercritical fluid extraction methods were assessed in terms of unsaturated fatty acid and polyunsaturated fatty acid. Subcritical fluid extraction yielded about 38 % higher oil as compared to the traditional solvent extraction. Emerging

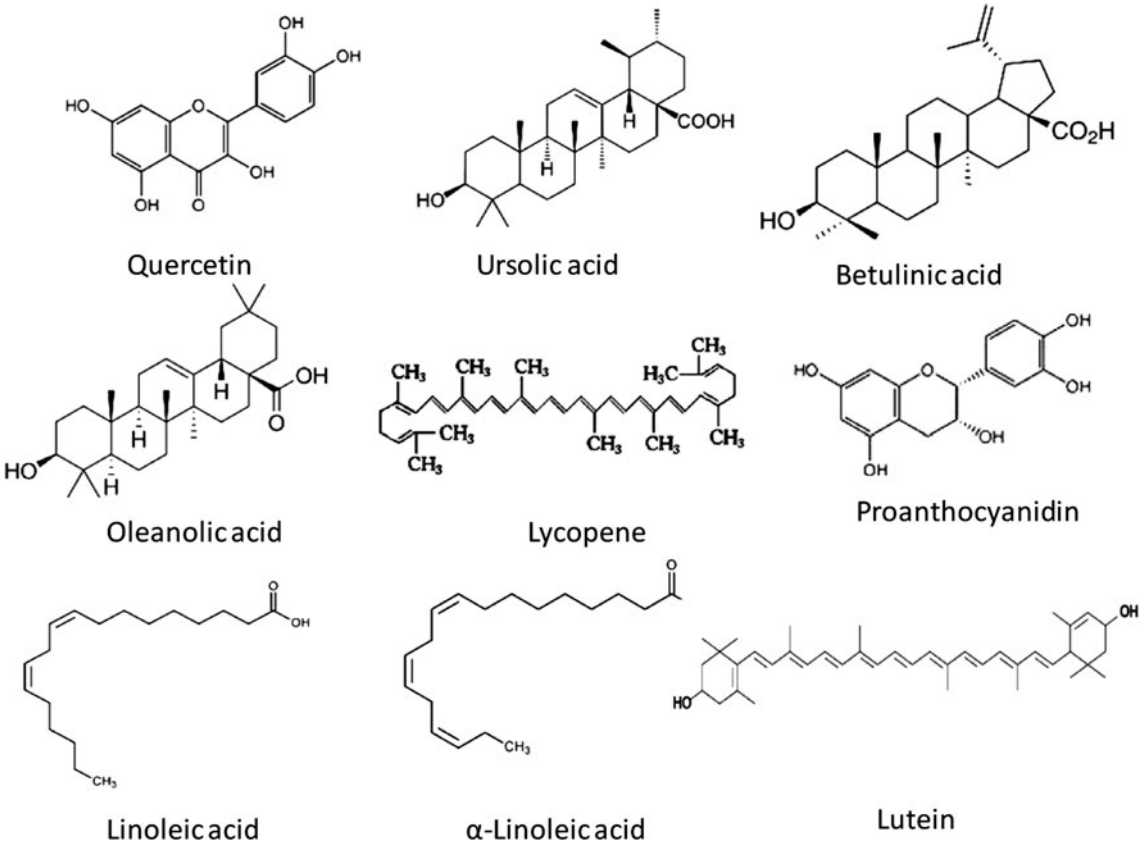

Fig. 3 The structures of the bioactive compounds isolated from the hips

methods, such as microwave, subcritical and supercritical extraction proved more efficient than the traditional Soxhlet extraction. Concha et al. [11] studied the effects of temperature and moisture during the enzymatic hydrolysis stage using two previously selected mixtures of commercial enzymes. In addition, the effect of pressing rate on enzymatic hydrolysis was determined. It was observed that enzymatic pre-treatment increased the oil extraction rate and yield by cold pressing. Further, it was found that elevated operation pressure and sample preheating enhanced the oil extraction yield to about 33 % as compared to the unheated sample. Tozzi et al. [12] assessed the suitability of preparation of a powder from β-cyclodextrin and the supercritical CO_2 extract of *R. canina* hips. The extracted β-carotene interacts almost quantitatively with β-cyclodextrin, formulating a solid phase. Machmudah et al. [13] extracted a maximum carotenoid content of 10–21 mg/g from rose hips using supercritical CO_2 at 80 °C, 450 bar and 4 ml/min. Existing literature testifies that so far, supercritical extraction is the most effective method for rose hip bioactives.

Uses of rose hips

The uses of rose hips scientifically reported so far are as functional food, antioxidant, osteoarthritis care, antiinflammatory, antidiabetic, cardioprotective, antimicrobial, immunomodulatory, gastroprotective and dermatological applications. In addition, rose hip gathering and processing can provide livelihood options. The food and health potentials of several species of rose hips are presented in Table 1. The few, but crucial human trial results have been mentioned in Table 2.

Delicacies and functional foods

Some rose hips are used to prepare 'Nypon soppa', the traditional Swedish fruit soup. *R. eglanteria* hips infusion is popular in Europe as herbal tea. In the Tokat region of Anatolia, Turkey, rose hips are consumed as marmalade and fruit juice [14]. Since long, rose hip products are used as jam and soft drinks in Iran [15]. *R. canina* hips are widely consumed in rural parts of Portugal [16]. Rosu et al. [17] studied the nutritional characteristics of native roses from North East part of Romania and recommended their utilization as functional foods and as edible colorants. Mabellini et al. [9] reported that the ascorbic acid and carotenoid-rich *R. eglanteria* hip powder can be developed into nutraceuticals. A probiotic dairy product "ROSALACT" is fortified with rose hip along with licorice extract. Mocanu et al. [18] characterized the sensorial and rheological attributes of the product after incorporation of the additives. The fortified probiotic formulation was approved by panellists in terms of taste, appearance, texture and aftertaste. The flow behaviour was determined to be non-Newtonian. Bohm et al. [19] reported that lycopene, the antioxidant with singlet oxygen quenching ability can be extracted from rose hip. Wenzig et al. [20] analysed the phytochemical profile of rose hip powder and reported the cyclooxygenase and 5-LOX-mediated leukotriene B_4 inhibitory activities of *n*-hexane and dichloromethane extracts. From the active extract, minute amounts of triterpenoic acids, ursolic acid, oleanolic acid and betulinic acid were identified along with oleic, linoleic and α-linolenic acid. Andersson et al. [5] also reported that rose hips are storehouses of carotenoids. Gao et al. [21] evaluated 18 samples of rose hip extracts for antioxidant activities. The ferric-reducing antioxidant power (FRAP) and Trolox-equivalent antioxidant capacity (TEAC) of the crude extracts showed high contents of carotenoids and total phenolics. The crude extracts rich in ascorbic acid exhibited about 51 %

Table 1 Some rose species producing hips with biological properties

Rosa species	Biological effects	References
R. canina (Dog rose)	Antioxidant	Rein et al. [24]
	Antiinflammatory	Winther et al. [25]
	Osteoarthritis care	Ameye and Chee [26]
	Antimicrobial	Deliorman et al. [34]
	Antidiabetic	Larsen et al. [36]
		Yilmaz and Ercisli [6]
		Orhan et al. [38]
R. multiflora *Thunb*	Antiinflammatory	Guo et al. [1]
R. villosa (Apple Rose)	Food	Yilmaz and Ercisli [6]
	Antioxidant	
R. eglanteria (Sweet briar)	Herbal tea	Mabellini et al. [9]
	Nutraceutical	
R. damascena	Analgesic	Gharabaghi et al. [15]
R. nutkana	Antioxidant	Yi et al. [22]
R. woodsii (Wood's rose)	Antioxidant	Yi et al. [22]
R. vosagiaca	Functional food	Rosu et al. [17]
R. caryophyllacea	Functional food	Rosu et al. [17]

Table 2 Validated health benefits of rose hips on human trials

Species	Disease	References
Rosa canina	Osteoarthritis	Rein et al. [24]
Rosa canina	Osteoarthritis	Winther et al. [25]
Rosa canina	Osteoarthritis	Rossnagel et al. [28]
Rosa canina	Osteoarthritis	Christensen et al. [30]
Rosa canina	Osteoarthritis	Willich et al. [32]
Rosa canina	Cardiovascular	Andersson et al. [40]

inhibition against the lipid peroxidation induced by 2, 2′-azobis (2, 4-dimethylvaleronitrile) and 85 % inhibition in 2, 2′-azobis (2-amidinopropane) hydrochloride (AAPH) assay at a concentration of 250 μg/ml . The crude extracts showed a large inhibitory effect in the ferric ion-induced lipid peroxidation and caused 83.7 % inhibition at a concentration of 25 μg/ml dried powder. Yi et al. [22] investigated the antioxidant activity of *R. nutkana*, *R. pisocarpa* and *R. woodsii* hip extracts from wild British Columbia populations *R. nutkana* pericarp extracts contained high phenolic concentrations and showed greater antioxidant, whereas *R. woodsii* seed extracts had higher phenolic concentrations and greater antioxidant activity. Yoo et al. [23] reported that rose hips can enhance the activity of superoxide dismutase and catalase in a dose-dependent manner and can increase cell viability by safeguarding against oxidative stress. Four varieties of rose hips obtained from *R. pisiformis*, *R. canina*, *R. villosa* and *R. dumalis* subsp. Antalyensis were tested for their antioxidant potential by β-carotene method and reported variation in total phenolics, vitamin C and antioxidant activity [6].

Rheumatoid arthritis care and antiinflammatory effect

Osteoarthritis is a degenerative condition caused by a gradual deterioration of the cartilage caps on bone endings. The joint friction leads to weakness, pain, inflammation and deformity. This debilitating disease affects a major fraction of older population. An array of medications exists to allay the symptomatic pain and stiffness in wrists, knees, hips and spine. To evaluate the potential of rose hips as natural therapy, a double-blind, placebo-controlled, crossover study was conducted. “Hyben Vital”, a herbal formulation prepared from *R. canina* hips was assessed for its antiinflammatory properties. The patients administered with 5 g/day for 3 months reported lower joint pain and stiffness. The results indicated that this product reduces the symptoms of osteoarthritis, although not significantly different from the placebo [24]. Winther et al. [25] evaluated the osteoarthritis curing capacity of *R. canina* hip extract consumption in a randomized, placebo-controlled, double-blind crossover trial. The subjects were administered the extract daily for a period of 3 months. Rose hip consumption resulted in a significant reduction in period, pain, stiffness, disability and global severity. It was inferred that the hip extract-based herbal medicine can be used to assuage the osteoarthritic pain rather than resorting to rescue medication for quick relief. Ameye and Chee [26] reviewed the joint pain alleviation property of standardised rose hip powder “Hyben Vital”. In a 4-month double-blind randomized controlled trial on hip and knee osteoarthritis, 2,500 mg of this powder twice a day did not improve active or passive mobility. In a 3-month crossover double-blind RCT, 2,500 mg of rose hip powder twice a day decreased pain more efficiently. The lack of significance after 3 months could have been due to the decreased paracetamol consumption observed when patients were under active treatment. Daily intake of 45 g of rose hip powder reduced chemotaxis of peripheral blood neutrophils and serum creatinine and C-reactive protein levels in healthy and osteoarthritic subjects. Chrubasik et al. [27] evaluated the evidences of therapeutic efficacies of rose hip extracts in clinical research. After searching through several databases, it was reported that moderate evidence exists for the use of *R. canina* hip derived seed and husk of *R. canina* in patients suffering from osteoarthritis. Rossnagel et al. [28] also conducted a systematic search of the literature dealing with rose hips and their clinical roles. Two double-blind randomized studies were analysed and a moderate effect of rose hip powder in patients with osteoarthritis were reported. Jager et al. [29] studied that a petroleum ether extract of rose hip contained linoleic acid and α-linolenic acid as obtained from HPLC analysis. It was further observed that linoleic acid and α-linolenic acid contributed to the COX-1 and -2 inhibitory activities. Christensen et al. [30] conducted a meta-analysis of randomized controlled trials of *R. canina* hip preparation for therapy of osteoarthritis. The rose hip administered patients responded better to therapy and the reduction in pain was consistent. Cameron et al. [31] searched electronic databases dealing with randomized controlled trials that compared herbal medicinal products with placebo in patients with osteoarthritis. Along with some other plant extracts, rose hip and seed was reported to show favourable effects on joint pain. Willich et al. [32] investigated the rheumatoid arthritis treating capacity of *R. canina* hip powder. In a double-blind placebo-controlled trial, patients with rheumatoid arthritis were randomised to treatment with capsulated rose hip powder 5 g/day or matching placebo for 6 months. The Physicians Global Scale demonstrated more improvement in the rose hip compared to the placebo group. The results indicate that patients may benefit from additional treatment with rose hip powder. de Silva et al. [33] evaluated the evidence regarding complementary and alternative medicine (CAM) taken orally or applied topically in the treatment of osteoarthritis. Randomized clinical trials of osteoarthritis using CAM, in comparison with other treatments or placebo, published up to January 2009 were considered. The review of databases furnished the evidence of capsaicin gel and *S*-adenosyl methionine in osteoarthritis management. However, rose hip also showed certain degree of efficacy without any major adverse effects.

Deliorman et al. [34] investigated the aqueous and ethanol extracts of *R. canina* L. fruits and its fractions for their antiinflammatory and antinociceptive activities in several in vivo experimental models. The ethanolic extract was

shown to possess significant inhibitory activity against carrageenan-induced and prostaglandin E1-induced hind paw edema models, acetic acid-induced increase in a capillary permeability model and *p*-benzoquinone-induced writhing mice model. Ethylacetate and *n*-butanol fractions displayed potent antiinflammatory and antinociceptive activities at a dose of 919 mg/kg without inducing acute toxicity. The antiinflammatory effects of a hydroalcoholic crude extract of *R. canina* hips were tested in carrageenin-induced rat paw edema model. Data showed that the *R. canina* extract inhibited the development of edema; showing antiinflammatory power akin to indomethacin. In higher dose of the extract, the effect was more pronounced. The antiinflammatory effect was attributed to the rich antioxidant content [35]. A complex galactolipid isolated from dried and milled *R. canina* hips showed antiinflammatory properties. It was attributed to the inhibitory effects on chemotaxis of human peripheral blood neutrophils in vitro [36]. Guo et al. [1] evaluated the antiinflammatory ingredient of the hip of *R. multiflora* Thunb. and deduced its mechanism of therapeutic action. The ethanol extract of the hip was fractioned with a series of solvents and screened for their activity in xylene-induced mouse ear edema model. The petroleum ether fraction when administered orally was identified to be effective fraction in inflammation animal models. This fraction evoked a dose-dependent inhibition of the edema. Down-regulating COX-2 expression and reducing NO production through inhibiting iNOS activity was assumed to be the partial mechanism of action. GC–MS analysis indicated that the unsaturated fatty acids in the extract imparted the antiinflammatory activity. Schwager et al. [37] investigated the modulation of pain by rose hip powder and its constituent galactolipid, GLGPG. In the RAW264.7 cells or human peripheral blood leukocytes, inhibition of NO and PGE_2 production and reduced secretion of cytokines (TNF-α, IFN-γ, IL-1β, IL-6, IL-12) and chemokines was observed. Gharabaghi et al. [15] conducted a double-blind placebo-controlled clinical trial in patients with elective cesarean sections to evaluate the analgesic property of *Rosa damascena* hip extracts. Total dosage of painkillers and the severity of pain in rose hip administered group were lower than the placebo group. The pain reduction without any significant side effects makes rose hip extract an ideal analgesic candidate as compared to NSAIDS and opiates.

Antidiabetic effect

Orhan et al. [38] administered the ethanol extract of *R. canina* hips to streptozotocin-induced diabetic rats at 250 mg/kg dose for 7 days. A hypoglycemic effect was observed which supported the traditional usage of rose hips as a folk remedy in the treatment of diabetes in Turkey. Andersson et al. [39] also investigated the possible metabolic effects of rose hip powder by administering as dietary supplement to obese C57BL/6 J mice. The results showed that the powder prevented and reversed the increase in body weight and body fat mass. Improved glucose tolerance was observed in mice fed with a supplement of rose hip as compared to control mice. Down-regulation of the expression of lipogenic proteins, lowering in the total plasma cholesterol and consequent antidiabetic effects are also attributed to the powder. So far there are no positive results from human trials.

Cardioprotective effect

Andersson et al. [40] investigated the possible beneficial metabolic effect of daily intake of 40 g rose hip powder over 6 weeks in a randomized, double-blind, cross-over study. A total of 31 obese individuals were enrolled for the trial. In comparison with the control drink, consumption of the rose hip potion resulted in a significant reduction in systolic blood pressure, total plasma cholesterol, low-density lipoprotein cholesterol and LDL/HDL ratio. It was concluded that the daily consumption of rose hip powder can significantly reduce cardiovascular risk in obese people mediated by lowered systolic blood pressure and plasma cholesterol levels. No side effects were recorded.

Antimicrobial effect

Yi et al. [22] investigated the antimicrobial activity of hip extracts of *R. nutkana*, *R. pisocarpa* and *R. woodsii* from British Columbia using disc diffusion assays. Both *R. nutkana* and *R. woodsii* pericarp extracts showed antimicrobial activity against yeast and Gram-positive bacteria. The microbial inhibitory potentials were attributed to the phenolic richness. Yilmaz and Ercisli [6] assessed the antibacterial properties of hips from *R. pisiformis*, *R. canina*, *R. villosa* and *R. dumalis* subsp. Antalyensis. *Bacillus cereus* showed susceptibility towards all hip extracts. *R. canina* showed maximum efficacy as an antibacterial agent.

Immunomodulatory effect

Sabby and Nielsen [41] studied the effect of *R. canina* L. hip powder on the cytokine production and proliferation of CD4(+) T cells and CD19(+) B cells induced by a self-antigen human thyroglobulin and by lipopolysaccharide in cultures of normal mononuclear cells. The triterpene acid mixture in the powder inhibited the production of tumour necrosis factor-α and interleukin-6, also prevented the CD4(+) T cell and CD19(+) B cell proliferation. Collectively, the mixture ingredients oleanolic, ursolic and betulinic acid are demonstrated to be active

immunomodulatory agents. Saaby et al. [42] investigated the immunomodulatory effect of standardized hip powder of *R. canina* L. Mono Mac 6 cell line was selected as human macrophage model and treated with crude dichloromethane extract of the hip powder. The extract inhibited the lipopolysaccharide induced interleukin-6 release in a dose-dependent manner. Oleanolic acid and ursolic acid are found responsible for inhibiting the release of the inflammatory cytokine from the macrophage cells.

Gastroprotective and antiulcerative effect

Hakansson et al. [43] studied the effect of oral administration of a blend of *L. plantarum* and rose hip in ischaemia/reperfusion injury of the mouse colon. The combination was selected for polyphenolic abundance of rose hips and the enzymatic activity of lactic acid bacteria towards the polyphenols. It was observed that the mix significantly decreased MDA levels in caecum tissue and Enterobacteriaceae counts in caecum stool. It was inferred that rose hip and *L. plantarum* may be used as a pre-treatment to tissue injuries, e.g. colonic surgery, organ transplantation and vascular surgery. The gastroprotective effects of a hydroalcoholic crude extract of *R. canina* hips were tested on an ethanol-induced gastric damage rat model. The gastric damage was reported lower in the rose hip pre-treated stomach as compared to the control. The antioxidants in the extract were deemed responsible for the gastroprotective activity [35].

Dermatological applications

Fujii and Saito [44] assessed the effects of compounds isolated from methanolic extracts of rose hips on melanin biosynthesis in B16 mouse melanoma cells. Quercetin emerged as the most potent melanogenesis inhibitor which decreased the intracellular tyrosinase activity in a dose-dependent manner. Fujii et al. [45] reinvestigated the extracts for their possible inhibitory action against melanogenesis using the melanoma cells. The aqueous extract fractionated with 50 % ethanol reduced the intracellular tyrosinase activity and lessened the production of melanin. Oral administration of the extract was studied in brown guinea pigs and the pigmentation inhibition in the skin was observed. These in vitro and in vivo results suggested that procyanidin glycosides-rich extract could be developed as a skin-whitening agent when taken orally.

Livelihood opportunities

People can achieve self-sufficiency by collecting rose hips from the withered blossoms, before the pruning. In autumn, the hips can be gathered in large quantities from wild as well as domesticated roses. In North East England, school children go rose hip picking after school, which lands at the factory for syrup manufacturing.

Future potentials

Non-hybrid roses yield more nutritious hips than the ornamentally cultivated ones. Considering the appreciable health applications established in the current times, it is important to conserve the wild species. Studies on the selection and improvement of rose hip cultivars are already at initial stage in Turkey. Some of the suitable genotypes have been selected and qualified for registry by the National Variety Registration and Seed Certification Centre of Turkey for commercial production of rose hips [46]. Yilmaz and Ercisli [6] have reported the germplasm preservation of wild roses in Turkey. Other parts of the world with abundance of wild rose varieties should follow the example of Turkey. California wild roses grow luxuriantly in South California chaparrals and bear copious hips that ripe in autumn. The fruits, despite their considerable food potential end up being eaten by squirrels, birds or are decayed. Nutritional research on rose hips must pick up momentum to develop cheap and accessible health supplements.

Conclusion

Taken together, the results of the studies discussed above illuminate on the potential of rose hip extracts in treating various disorders. Apart from being a desirable food ingredient, rose hips have demonstrated efficacy against arthritis, inflammation, diabetes, heart ailments, pathogens, gastric ulcers. In addition, immunological and skin emollient properties are being established. Emerging evidences corroborate that rose hips have potential to be a complementary and alternative medicine. Rose hip-based herbal medicines are already flooding the markets. However, the efficacy and safety of the products need evaluation for large-scale production. Substantial numbers of epidemiological trials are required to assure consistent results and achieve clinical significance. So far, therapeutic success has been obtained in osteoarthritis and cardiac ailments. This review is expected to stimulate investigations on the role of rose hip extracts in addressing other health problems.

Conflict of interest None.

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