WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Comprehensive Review on Wild Cherry

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Abstract:

Prunus avium, also known as the sweet wild cherry, and Prunus serotina, also known as the black cherry, are the two main species of wild cherry that are used medicinally and are found throughout Europe, Asia, and North America. Wild cherry has been used in cough remedies, digestive tonics, anti-inflammatory preparations, and antioxidant formulations since it was traditionally prized for its bark, fruits, gum, and leaves. The botanical traits, ethnomedicinal significance, phytochemical components, pharmacological actions, contemporary clinical studies, toxicology, and applications in the food and pharmaceutical industries are all methodically examined in this review. Flavonoids, anthocyanins, terpenoids, phenolic acids, cyanogenic glycosides, and coumarins are important phytochemicals that support its antioxidant, antimicrobial, antitussive, anti-inflammatory, and cardioprotective properties. Modern research emphasizes the need for cautious consumption despite widespread traditional use. Gaps and future opportunities for creating therapeutic formulations based on wild cherries are discussed in the review's conclusion.

Fig 1 Cherry Fruits

1. Overview

The wild cherry, which includes Prunus avium L. and Prunus serotina Ehrh., is a member of the Rosaceae family and has been prized for its nutritional and therapeutic qualities for centuries [1]. Traditional medicine in Europe, North America, and Asia has used a variety of plant parts, such as bark, fruit, leaves, stems, and gum [2]. Its fruits have been eaten for their nutritional value and antioxidant potential, while its bark has historically been used in fever remedies, sedative tonics, and cough syrups [3]. In-depth studies into its phytochemical profile, medicinal qualities, and possible toxicity have been spurred by growing contemporary scientific interest.

2. Description of Botany

2.1. Avium Prunus Prunus avium, also known as sweet or wild cherry, is a deciduous tree that grows to a height of 15 to 32 meters. It features serrated leaves, lenticels, smooth purplish-brown bark, and early spring clusters of white flowers [4]. Fruits have a single hard seed and are glossy red to dark purple drupes [5].

2.2. Serotina Prunus The black cherry, or Prunus serotina, has almond-scented leaves, long racemes of tiny white flowers, and dark, flaky bark. It can reach a height of thirty meters [6]. Native American tribes in North America have long utilized its dark purple fruits, which ripen in late summer [7].

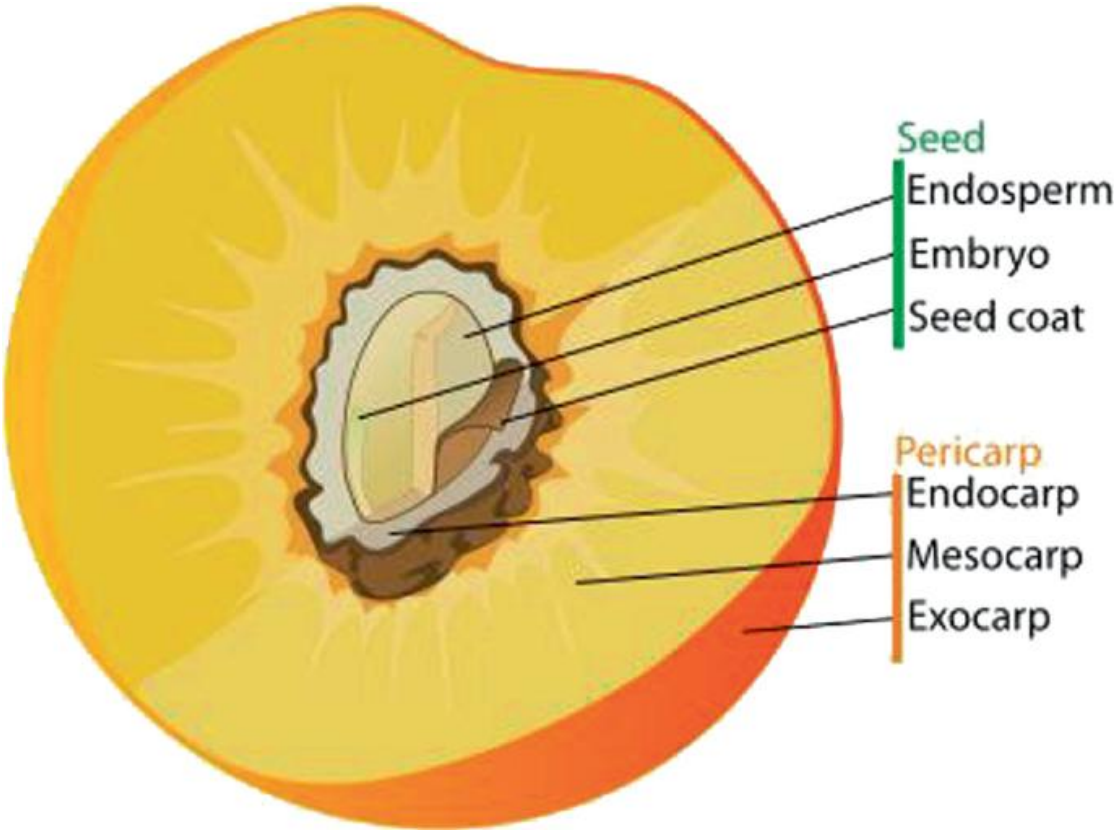

Fig 2 Morphology of Cherry Fruits

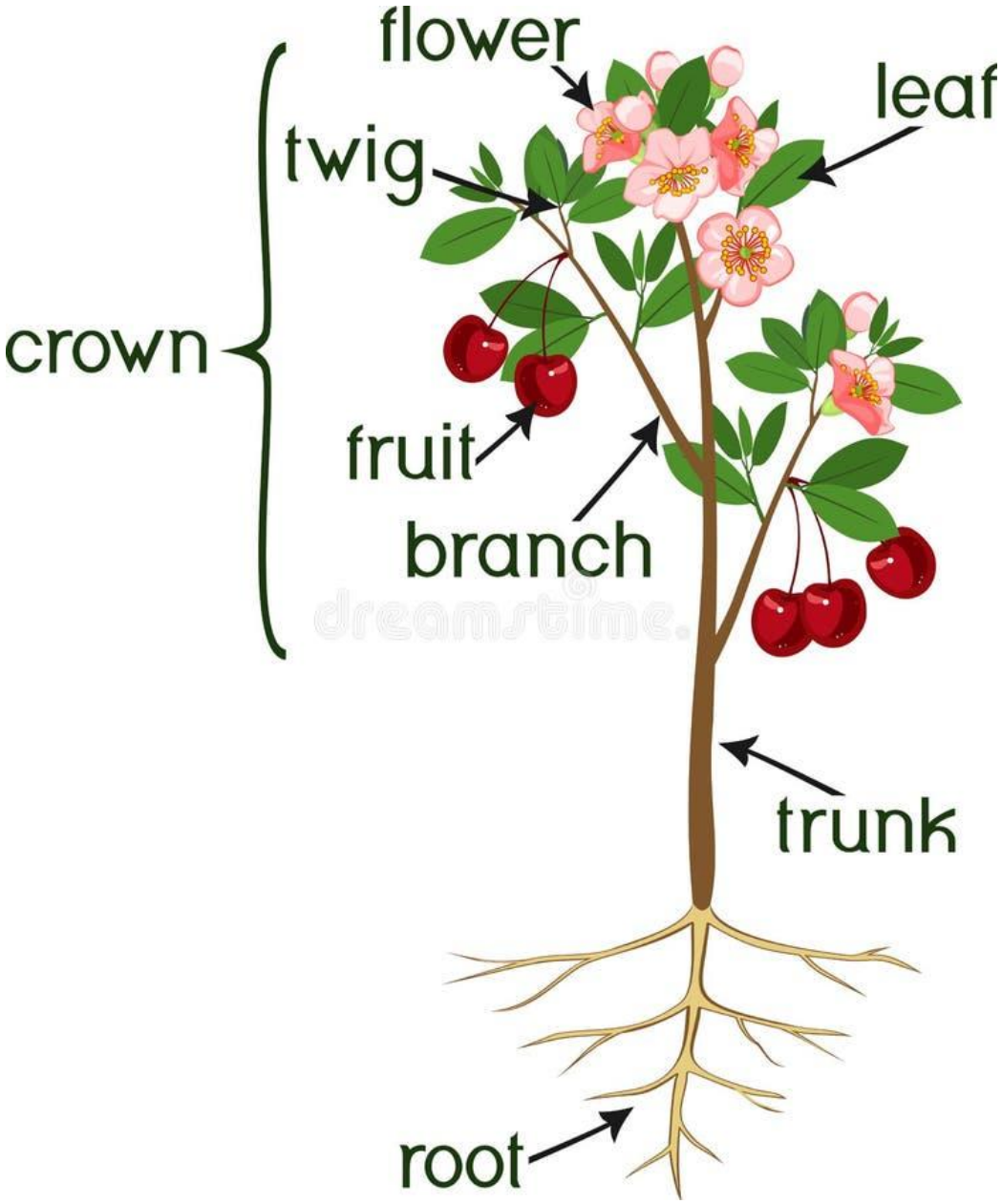

Fig 3 Morphology of Plant

3. Distribution and Taxonomy

The genus Prunus, which also includes apricot, plum, almond, and peach, is home to wild cherry species [8]. While P. serotina is native to North America but has naturalized in some areas of Europe, P. avium is native to Europe and western Asia [9]. Both species are found in forests, mixed woodlands, orchards, and mountainous areas, and they both favor temperate climates [10].

4. Therapeutic Benefits

in Ethnomedicine Early European herbals and Native American ethnobotanical records attest to the long history of using wild cherries in traditional medicine [11].

4.1 Respiratory Conditions Cough, bronchitis, asthma, and tuberculosis are all commonly treated with the bark, particularly that of P. serotina [12]. Decoctions function as mild sedatives and expectorants.

4.2 Digestive Health Dysentery, diarrhea, and stomach pain have all been treated with dried fruits and bark [13].

4.3 Pain and Inflammation Reduction Bark poultices were used by traditional healers to treat fever, muscle soreness, and arthritis [14].

4.4 Support for the Nervous and Cardiovascular Systems Infusions of fruit and leaves were ingested to improve circulation and lessen anxiety [15].

4.5 Additional Applications Local medicines used wild cherry gum as an adhesive and mild laxative [16].

Fig 4 Benefits of Wild Cherry

5. Composition of Phytochemicals

A wide variety of bioactive substances can be found in wild cherries:

5.1 Phenolic Substances Antioxidant capacity is influenced by phenolic acids like gallic acid, caffeic acid, and chlorogenic acid [17].

5.2 Anthocyanins and Flavonoids Fruits get their rich color from anthocyanins like cyanidin-3-glucoside; major flavonoids are quercetin, kaempferol, and catechin [18].

5.3 Volatile Oils and Terpenoids Aroma and medicinal activity are provided by monoterpenes and sesquiterpenes [19].

5.4 Cyanogenic Glycosides (Amygdalin, Prunasin) These substances, which are mostly present in bark, leaves, and seeds, need to be carefully controlled in dosage because they can release hydrogen cyanide [20].

5.5 Tannins and Coumarins mostly found in bark and linked to anti-inflammatory and antimicrobial properties [21].

6. Pharmacological Operations

6.1 Activity of Antioxidants Anthocyanins and phenolics in wild cherry fruit extracts exhibit potent free-radical-scavenging capabilities [22].

6.2 Effects on the Respiratory System and Cough Several pharmacopoeial cough formulations contain wild cherry bark, which has sedative and bronchodilatory properties [23].

6.3 Analgesic and Anti-Inflammatory Properties Extracts high in flavonoids reduce inflammation by blocking the COX and LOX pathways [24].

6.4 Activity Against Microbes Bark extracts are effective against both Gram-positive and Gram-negative bacteria, such as E. coli and Staphylococcus aureus [25].

6.5 Effects of Cardioprotection Anthocyanins may enhance vascular function and lessen LDL oxidation [26].

6.6 Effects of Neuroprotection Potential for lowering oxidative damage in neural tissues has been demonstrated by experimental research [27].

6.7 Potential for Antidiabetes The enzymes α-amylase and α-glucosidase may be inhibited by polyphenols [28].

7. Wild cherry fruit's nutritional makeup Vitamins A and C, potassium, magnesium, dietary fiber, and natural sugars are among the vital nutrients found in wild cherry fruit [29]. Both color and nutritional value are influenced by anthocyanins [30]. ---

8. Experimental and Clinical Research Despite the extensive documentation of traditional uses, there are still few clinical trials.

8.1 Research on Respiratory Health The mild antitussive effect of bark extract in syrups has been confirmed by a few clinical studies [31].

8.2 Research on Antioxidants and Anti-Inflammatory After extract administration, in vivo models exhibit decreased oxidative stress and inflammatory markers [32].

8.3 Research on Metabolic Health According to pilot studies, people who eat diets high in cherries have better insulin sensitivity [33].

9. Safety and Toxicology Issues

When used in the recommended therapeutic dosages, wild cherry is generally safe.

9.1 Toxicity from Cyanogens When damaged or improperly prepared, cyanogenic glycosides found in leaves, bark, and seeds can release hydrogen cyanide [34]. Toxicity is decreased by proper drying.

9.2 Reactions to Allergies There have been isolated reports of pollen or cherry fruit hypersensitivity reactions [35].

9.3 Contraindications should not be used concurrently with sedatives or during pregnancy or lactation unless under medical supervision [36].

10. Commercial and Industrial Uses

10.1 Use in Pharmacies Cough syrups, lozenges, and herbal remedies all contain bark extract [37].

10.2 The Food Sector Fruit is used in flavorings, candies, wines, juices, and jams [38].

10.3 Makeup Moisturizers and anti-aging formulas include antioxidant-rich extracts [39].

10.4 Wood P. avium and P. serotina yield premium hardwood for veneers and furniture [40].

11. Prospects for the Future and Research Requirements Additional investigation ought to focus on:

Phytochemical profile standardization [41] Long-term use safety assessment [42] controlled clinical trials evaluating effectiveness in metabolic and respiratory conditions [43] Techniques for reducing the toxicity of cyanogenic substances [44]

12. Conclusion

With solid ethnobotanical roots and promising pharmacological potential, wild cherries continue to be a valuable medicinal and nutritional resource. Even though it has long been praised for its antioxidant and antitussive properties, contemporary scientific validation is still being developed. The development of safe, efficient treatments derived from wild cherries will be supported in the future by ensuring standardized extraction, careful dosing because of cyanogenic glycosides, and thorough clinical evaluation.

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