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Review Article

Phytoconstituents and Pharmacological Activities of Medicinal Plants of Rosa Genus: A Review

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ABSTRACT

The Rosales includes 9 families and about 6300 species; the monophyly of this order is supported by molecular phylogenetic analyzes and characterized morphologically by a reduction or lack of endosperm and the presence (Rosaceae, Rhamnaceae, and some Ulmaceae) or absence (Cannabaceae, Urticaceae, and Moraceae) of a hypanthium. However, phylogenetic relationships within order are still not well resolved, but the principal families recognized are Rosaceae, Rhamnaceae, Ulmaceae, Cannabaceae, Urticaceae, and Moraceae. This Family is cosmopolitan and most abundant in the Northern hemisphere with showy species such as apples, pears, peaches, plums, cherries, almonds, apricots, firethorns, meadowsweets, hawthorns, etc. The genus Rosa L. (Roses) are perennial, dicotyledonous plants belonging to the sub-family Rosoideae.

Key Words: *Rosaceae, genus Rosa, dicotyledonous plants.*

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INTRODUCTION

The phylogenetic, botanical, physiological, and genomic characteristics of the various species in the Rosaceae family have been adequately summarised in several publications, highlighting the family's biological and economic significance. Rosaceae family contains around 2500 species from 90 genera, many of which are commercially important crops producing edible fleshy fruits (e.g., apple, apricot, cherry, peach, pear, plum, raspberry, and strawberry), nuts (e.g., almond), and ornamentals (e.g., rose) (Yamamoto and Terakami, 2016). Traditional classifications of this family included the subfamilies (Hummer and Janick 2009). Amygdaloideae, Maloideae, Rosoideae, Spiraeoideae, and others. Apples (Malus × domestica Borkh.) and pears (Pyrus spp.), which both belong to the subfamily Amygdaloideae, tribe Pyreae, are the most economically significant members of the Rosaceae [1]. Fruits produced by Rosaceae species include drupes, which have a hard central shell and a single seed, as well as dry achene, which have a comparatively soft core and several seeds like an apple or a pear (with a thin wall and a single seed) fruits (Potter et al. 2007a; Phipps 2014).Additionally, some species produce aggregate fruits like drupetums (a collection of small drupelets loosely attached to a central structure, like in the case of the raspberry), achenetums (multiple achenes from a single flower), sometimes with a fleshy, enlarged receptacle like in the case of the strawberry, or an enveloping hypanthium like in the case of the rose), and follicetums (several pod-like structures each with one or more seeds, from a single flower).

Fruits and seeds

There are many different types of fruits, and they were originally used to define subfamilies within the Rosaceae, leading to a mostly artificial subdivision. These can be follicles, capsules, nuts, achenes, drupes (Prunus), and accessory fruits, such the pome of an apple, or the hip of a rose. The seeds of the family's many edible fruits frequently contain amygdalin, which, if the seed is injured, can release cyanide during digestion.

Flowers

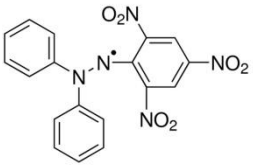
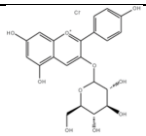
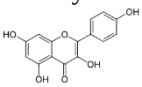
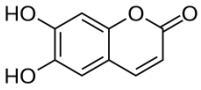
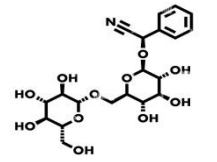
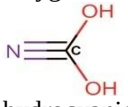
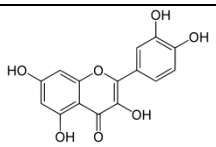
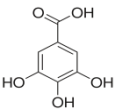
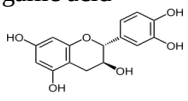
Often, "showy" is the word used to describe the flowers of plants in the rose family. They are virtually invariably hermaphroditic and radially symmetrical. Rosaceae typically have five petals, five sepals, and numerous stamens grouped in spirals. The sepal, petal, and stamen bases are joined to create a distinctive cup-shaped structure known as a hypanthium. They may be organised into heads or spikes. Rarely do flowers bloom alone. Rosaceae contain petals in a range of colours, although blue is nearly never present.

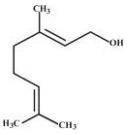
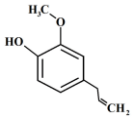
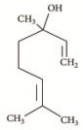
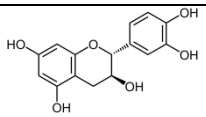
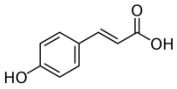
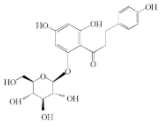
Leaves

They might be pinnately complex or simple (either odd- or even-pinnate). About 30 genera have compound leaves. The leaf margin typically has serrations. Paired stipules are often present and a primordial trait of the family;

nevertheless, various groups of Amygdaloideae have individually lost this trait (previously called Spiraeoideae). Sometimes the stipules are adnate (surface to surface attached) to the petiole. On the petioles or leaf margins, glands or extra floralnectaries may be found. On the rachis of compound leaves and the midrib of leaflets, spines may be visible [2].

Table 1: Phytochemical & pharmacological activities details of Rosaecea family:

S.no.	Parts	Biological source	Chemical constituents	Pharmacological action	Structure of chemical constituents
.	Goat's Beard (Root)	Aruneusdiocious [3]	flavonoids, phenylpropanoids, monoterpenes, and phenolic compounds, 2,2-diphenyl-1-picrylhydrazyl (DPPH)	The roots were used to treat blood diseases, swelling and internal bleeding, and during childbirth, while twigs were prepared into a slave for sores, swellings, and sore throats, Antioxident	 2,2-diphenyl-1-picrylhydrazyl (DPPH)
2.	Blackthron (Flower)	Prunusspinosa [4]	total phenol content (TPC), flavonoid content (FC),anthocyanins, flavonol heterosides (quercetin and kaempferol), phenolic acids (neochlorogenic and caffeic derivatives), coumarin derivatives as aesculetin, umbelliferone and scopoletin and proanthocyanidins **R2,,,**	antioxidant activity before and after *in-vitro* gastrointestinal digestion of vegetables, direct protective role of dietary antioxidantson intestinal mucosa through local antioxidant and anti-inflammatory activities R3	 anthocyanins  kaempferol  aesculetin
3.	Almond (Fruits)	Prunusdulcis	fixed oil (40-50%), Protein(20%), enzyme emulsin and bitter glycoside amygdalin (1-3 %). volatile oil (0.5%). Amygdalin gives benzaldehyde and hydrocyanic acid upon hydrolysis. Bitter almond oil contains 80% benzaldehyde and2-6%hydrocyanic acid [5]	anti-stress, anti-oxidant, immunostimulant, lipid lowering and laxative	 amygdalin  hydrocyanic acid
4.	Apricot (Fruits)	Prunusarmeniaca		antiparasitic, anticancer, antiaging, antiatherosclerating, antianginal, cardioprotective, hepatoprotective, renoprotectiveand antioxidant (especially β-carotene) [6].	 quercetin  gallic acid  catechin

5.	Rose (Leaves)	Rosa rubiginosa	Geraniol,Citronellol Linalool ,Phenethyl alcohol Nerol,Methyl eugenol Eugenol,Farnesol Rose oxide	antibacterial, antioxidant, antitussive, hypnotic, antidiabetic, and relaxant effect on tracheal chains anti-HIV [7]	 geraniol  Eugenol  linalool
6.	Apple (Fruits)	Malusdomestica	quercetin-3-galactoside, quercetin-3-glucoside, quercetin-3-rhamnoside, catechin,epicatechin, procyanidin,cyanidin-3-galactoside, coumaric acid, chlorogenic acid, gallic acid, and phloridzin [8]	Including cancer,cardiovascular disease, diabetes, pulmonary disorders, Alzheimer's disease, and other degenerative disease states.	 catechin  coumaric acid  phloridzin

CONCLUSION

Rosaceae have non-herbaceous, woody stems and are mostly shrubs or medium-sized trees..Their by-products and derivatives could be important sources of bioactive compounds and of some minerals that, in many respects, represent important elements for health. Their excellent sources of several important nutrients, including fibre and antioxidant carotenoids indeed, and, in some respects, other sources. Phytoconstituents are flavonoids, alkaloids and many types of phenolic compounds are present in rosaceae. They mainly have different types of pharmacological actions may be present such as antimicrobial activity, anticancer activity and heptoprotective activity.

REFERENCES

1. Molecular Biology and Evolution, Volume 34, Issue 2, (2017), Pages 262-281, https://doi.org/10.1093/molbev/msw242
2. https://www.britannica.com/plant/cherry
3. MengQue, Yan-Fang Su, Shi-Lun Yan, Ya-Hui Zhouand Xiu-Mei Gao, (2014). Two new phenylpropanoid glycosides from the roots of Aruncus Sylvester, *Journal of Asian Natural Products Research*. Vol. 16, No. 2, 158–162
4. Anna Marchelak, Aleksandra Owczarek,'M(2017), Bioactivity Potential of *Prunusspinosa* L. Flower Extracts: Phytochemical Profiling, Cellular Safety, Pro-inflammatory Enzymes Inhibition and Protective Effects Against Oxidative Stress *In Vitro*
5. Bitter Almond Biological Sources, Morphology, Chemical constituents
6. Mohammad Hossein Boskabady, Mohammad Naser Shafei, Zahra Saberi, (2011). 23493250Pharmacological Effects of *Rosa Damascena*Iran J Basic Med Sci. 14(4): 295–307.
7. Jeanelle Boyerand RuiHai Liu, (2004). Apple phytochemicals and their health benefits, Nutritional J , PMC442131
8. Florinda Fratianni, MariaNeve Ombra, Antonio d'Acierno, Luigi Cipriano, Filomena Nazzaro, Apricots: biochemistry and functional properties, ELSEVIER Volume 19, February 2018, Pages 23-29