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PHARMACOGNOSTIC, PHARMACOLOGICAL AND ECONOMICAL PROSPECT OF COUMARINS

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ABSTRACT

Chemistry is known as a mysterious science. Every new compound when evaluated and developed has limited utilization. However, the evaluation using different criteria along with the possibilities of modification diversifies the compound. This diversification and modification make the compound to get categories therapeutically as well as commercially.

INTRODUCTION [1-9]

Coumarin is an oxygen heterocycle. Coumarin can occur either free or combined with the sugar glucose (coumarin glycoside). Coumarin is a phytochemical with a vanilla like flavor. Coumarin is found in several plants, including tonka beans, strawberries, apricots, cherries, cinnamon lavender, licorice, and sweet clover. Coumarin seems to work as a pesticide in the plants that produce it. Coumarin is responsible for the sweet smell of new mown hay. Coumarin has blood-thinning, anti-fungicidal and anti-tumor activities. Coumarin should not be taken while using anticoagulants. Coumarin increases the blood flow in the veins and decreases capillary permeability. Coumarin can be toxic when used at high doses for a long period. Natural products like esculetin, fraxetin, daphnetin and other related coumarin derivatives are recognized as inhibitors not only of the lipoxygenase and cycloxygenase enzymic systems, but also of the neutrophil-dependent superoxide anion generation. Such derivatives also possess anti-inflammatory as well as antioxidant activities. Coumarins are a group of important natural compounds, and have been found to have multi-biological activities such as anti-HIV, anti-tumor, anti-hypertension, anti-arrhythmia, anti-osteoporosis, pain relief, preventing asthma and antisepsis.

Pharmacognostic Prospect Of Coumarins

Coumarin is a natural flavouring and perfume that is found in many plants. It occurs in higher concentrations in the types of cinnamon grouped together under the name “cassia cinnamon”, for instance woodruff, tonka beans and melilot.

Table 1: Coumarins Product Data Sheet [10]

S. No.	Product	Coumarin Level (mg/kg)	Category
1	135 mg cinnamon extract powder, vitamins, trace elements	274	Dietetic food
2	333.3 mg cinnamon powder per 100 g: 57 g cinnamon powde	2533	Dietetic food
3	200 mg aqueous cinnamon extract (1:10), chromium, zinc	425	Food supplement
4	Cinnamon, vitamin B, chromium, zinc	3171	Food supplement
5	Cinnamon powder, vitamin B, chromium, zinc	3157	Food supplement
6	500 mg Ceylon cinnamon, vitamins, chromium, zinc	2300	Food supplement
7	Aqueous cinnamon extract(31.6 %, 1capsule corresponds to approx. 1 g cinnamon)	317	Dietetic food

8	Momordica fruit paste (50 %), low coumarin cinnamon powder (20 %)	433	Dietetic food
9	333.3 mg cinnamon powder per 100 g: 57g cinnamon powder	3090	Dietetic food
10	150 mg cinnamon Extract	312	Dietetic food
11	Natural cinnamon powder, chromium, zinc	3283	Dietetic food

Pharmacological Prospect of Coumarins

When it comes to the pharmacological aspects of the herbal plants and their derivatives, every formulation type is taken into account. The Coumarins and their pharmacological grip all over the herbal and chemical world have proved itself. The literature reviews have strongly recommended the pharmacological importance of the Coumarins. Hakan Kolancilar et al. and Rafat M. Mohareb et al. [11-12] through their studies on 3-methyl-1H-benzochromen-1-one and (E)-N-(1-(Furan-2-yl)ethylidene)-2-oxo-2Hchromene-3-carbohydrazide derivatives, respectively have recommended the anti-microbial activity of coumarin derivatives. Ravi Ahmad et al. [13] through their research have also suggested the anti-inflammatory activities of the coumarin derivatives. Cyto-toxic and anti-carcinogenic activity of the Coumarins and its derivatives have also been evolved. Parameswaran Manojkumar et al. [14] and Irena Kostova et al. [15] have separately studied over the Coumarins derivatives. Through their studies over 2-(3-(2-(4-methyl-2-oxo-2Hchromen-6-yl oxy) acetaamido)-4-oxo-2-phenyl thiazolidin-5-yl) acetic acid, they concluded the anti-neoplastic effects of Coumarins derivatives. A part from these effects the Coumarins derivatives too have got anti-viral, anti-hypertensive, anti-leukemic and anti-coagulant activities.

Economical Prospect of Coumarins [16]

Every formulation or preparation either Pharmaceutical as well as herbal is associated with the profit. The profit and loss in the marketed formulation is the main stay in the economics. This prospect affects the worldwide market scenario. Various countries in the world are today heading towards expansion of their market. But when it comes to Herbs and Herbal derivative product market China always put a step ahead of others. As far as the manufacturers/suppliers/traders of Coumarins are concerned China leads the market with 290 (89.78%), followed by Taiwan 18 (5.57%). India and United States ranked third with 5 (1.57%) each. There are few other countries which are also contributing but, their contribution looks dwarf when compared to China.

Table 2 List of Selected Mannufacturers/Suppliers/Traders Of Coumarins

Country	%Country Contribution	Mannufacturer/supplier/Trader
China	89.78%	Shaanxi Sciphar Hi-Tech Industry Co., Ltd.
		Anhui Haibei Import & Export Co., Ltd.
		Dalian Cr Science Development Co., Ltd
		Shanghai Yancui Import And Export Co., Ltd.
		Jiangyin Baihui Fragrance Co., Ltd.
		Hainan Zhongxin Chemical Co., Ltd
		Jiaxing Suns Int'l Trade Co., Ltd.
		Ningbo Hi-Tech Biochemicals Co., Ltd
		Kunshan Yalong Trading Co., Ltd.
		Terio Corporation
		Wuxi Cima Science Co., Ltd.
		Huzhou N.B.C. Biological Material Co., Ltd.
		Fuzhou Farwell Import & Export Co., Ltd.
		Hefei J&S Import-Export Trading Co., Ltd.
		Jinan Great Chemical Industry Co., Ltd.
		Wuhan Fortuna Chemical Co., Ltd.
		Eastnine Sanitary Ware Co., Ltd.
Tiawan	5.57%	Frank Food & Feed Addtive Co., Ltd
India	1.57%	Alpha Chemika
		Sri Neelima Laboratories
		Alpha Drugs & Intermediates
		Ffc Aromas Pvt. Ltd.
United States	1.57%	Cd Biosciences Inc
		Cinnamon Garden
Hong Kong	0.61%	Effv Chemical Industrial Limited
		B.R.Y. Chemicals Co., Limited
Philippines	0.30%	Unlimited Network Of Opportunities International Corporation
Dominican Republic	0.30%	Nikay Bioproceso S.A.
Czech Republic	0.30%	Irel, Spol. S R.O.

CONCLUSION

Many chemical moieties and constituents of different herbal plants are cementing their place in the present pharmaceutical market scenario. The diverse Pharmacognostic and Pharmacological aspects of Coumarins have made it possible for this compound to come into the limelight. Every compound has some economical prospect too. This economical prospect attracts the researchers along with the companies to widespread their market.

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