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"BRASSICA OLERACEA" A NUTRACEUTICAL: MODERN WORLD-TRADITIONAL MEDICINE

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ABSTRACT
This paper communicates the health benefits of nutraceutical plants from the family Brassicaceae (Cruciferae) or mustard family. Brassicaceae are regularly named as the ''mustard''(from the Latin mustum ardens) plant family due to the sharp, potent flavor attributable to their main metabolites, the glucosinolates (GLSs), which contain sulfur. Brassica is a genre of plants associated to family Brassicaceae commonly used as vegetables. Around worldwide it is predicted that most frequently consuming vegetables include cauliflower, cabbage, turnip, broccoli and kohlrabi. These vegetables are also a considerable source of valuable metabolites, which embrace anthocyanins, terpenes, S-methyl cysteine sulfoxide, sulforaphane, selenium, coumarins and glucosinolates. Unitedly, brassicas deliver leaf, flower and root vegetables that are eaten fresh, cooked and processed. Brassica species is robustly linked with the prevention against threat of numerous types of chronic diseases like Alzheimer's disease, cardiovascular disease, diabetes, cancer, age-related efficient waning and cataracts etc. and thus plays a demanding function in maintaining healthy human life.

KEYWORDS: Brassicaceae, Brassica oleracea, Nutraceutical, Glucosinolates.

1. INTRODUCTION

1.1 Brassicaceae

Brassicaceae are commonly referred to as the ''mustard' plant family (from Latin mustum ardens) due to the strong and powerful flavor that can infect their key metabolites, glucosinolates (GLS), which contain sulfur.[1]

Brassicaceae vegetables as stable food and are considered a great source of amino acids, minerals, carbohydrates, vitamins, distinctive clusters of phytochemicals.[2]

Cruciferous are the vegetables that have a place for the Brassicaceae family, commonly referred to as cruciferous. Broccoli, Brussels sprouts, kale, mustard, cabbage, turnips, cauliflower, baby Choy, and Chinese cabbage are some of the commonly eaten vegetables of Cruciferae that have high phytochemical components and a rich source of vitamin C.[3]

In the Brassicaceae family, all glucosinolate-containing vegetables are found to contain myrosinase enzyme which improves the hydrolysis of glucosinolates into aglycone and D-glucose and encourages aglycons to changes in indoles or isothiocyanates. Different health benefits are found within the dynamic forms of glucosinolates.[4]

List of Plants from Brassicaceae family with Pharmacological activities.

S.No	Botanical name	Common name	Parts used	Pharmacological activity
1.	*Brassica rupestris* L.	Brown mustard	Whole plant	Anticancer and antioxidant activity
2.	*Brassica tournefortiiGouan*	Asian mustard	Whole plant	Anticancer and antioxidant activity
3.	*Brassica napus* L.	Rapeseed	Whole plant	Anticancer, antioxidant, analgesic, diuretic and Anti-catarrhal activity, Diuretic, anti-scurvy, anti-inflammatory of bladder and anti-goat
4.	*Brassica* L. *var. perviridis*	Mustard spinach	Whole plant	Anticancer and antioxidant activity
5.	*Brassica rapa*L. *var. rapifera*	Turnips	Whole plant	Anticancer and antioxidant activity
6.	*Brassica rapa*L. *var. chinensis*	Bokchoy	Whole plant	Anticancer and antioxidant activity
7.	*Brassica rapa*L. *var.pekinensis*	Chinese cabbage	Whole plant	Anticancer and antioxidant activity
8.	*Brassica oleracea*	Cauliflower	Leaves	Antibacterial activity
9.	*Brassica carinata* A. Braun.	Ethiopian or Abyssinian mustar	Whole plant	Used as bio-fumigant, to suppress soil-borne pests and

1.2 Brassica

These defensive impacts of Brassica vegetables are mainly authorized by the proximity of enormous amounts of glucosinolates, which recognizes them from other vegetables. Vegetables of the Brassica genus, including broccoli, kale, cabbage, Brussels sprouts, cauliflower, black and brown mustard, kohlrabi, root crops such as turnips, and rapeseed subsidize the most extreme consumption of glucosinolates.[5]

Brassica vegetables show organic exercises as antibacterial, anticancer, antiviral activity and for the safe natural reaction framework, these vegetables act as a powerful modulator.[3]

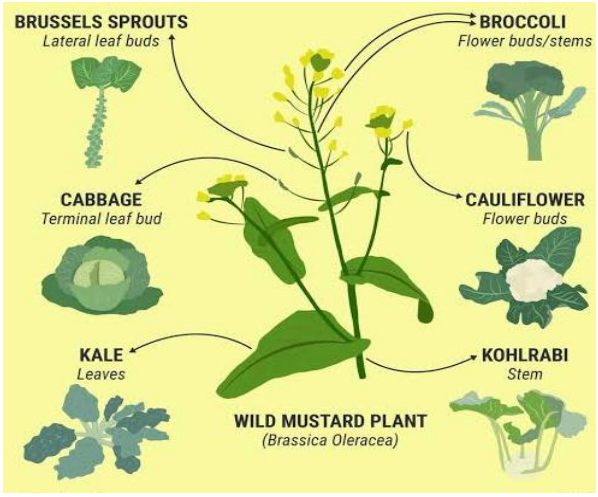
Brassica's vegetables are rich in bioactive compounds that include polyphenols, glucosinates, sulfur-containing compounds, and carotenoids (β-carotene, lutein, zeaxanthin), and are found to have a positive impact on human health when consumed regularly. These vegetables are also rich in potassium, magnesium, calcium, phosphorus and vitamins C, E, K.[6.7.8]

The most commonly consumed members of the genus Brassica

Species	Group	Common name	Edible portion
Brassica oleracea	*acephala*	Kale, collards	Leaves
	capitata capitata	Cabbage	Terminal leaf buds (heads)
	capitata sabauda	Savoy cabbage	Terminal leaf buds (heads)
	costata	Tronchuda cabbage	Loose heads
	qemmifera	Brussels sprouts	Vegetative buds
	botrytis botrytis	Cauliflower	Inflorescences
	botrytis italic	Broccoli	Inflorescences
	gongylodes	Kohlrabi	Stem
	albogabra	Chinese kale	Leaves
Brassica rapa	*chinensis*	Pak choi, bok choy	Leaves
	dichotoma	Brown sarson, toria	Seeds
	narinosa	Chinese flat cabbage, watacai	Leaves
	nipposinia	Mibuna, mizuna	Leaves
	oleifera	Turnip rape, rapeseed	Seeds
	perkinensis	Chinese cabbage, pe-tsai	Leaves
	perviridis	Komatsuna, Tendergreen	Leaves
	parachinensis	Choy sum	Leaves
	rapa	Turnip, turnip greens, turnip tops	Roots, leaves and shoots
	ruvo	Broccoleto	Shoots
	trilochularis	Yellow sarson	Seeds
Brassica napus	*pabularia*	Leaf rape, nabicol	Leaves
	napobrassica	Swede, rutabata	Roots
Brassica juncea	*rugosa*	Mustard greens	Leaves
	capitata	Head mustard	Heads
	crispifolia	Cut leaf mustard	Leaves

1.3 Brassica oleracea

Brassica oleracea L. (2n D 18) could be part of the Brassicaceae family, whose wild species have been found as more or less isolated populations in marine habitats on the Atlantic coast of Spain, France and the British Isles. It is proposed that modern Brassica crops be determined from these species and that early selection of crop varieties has occurred in the Mediterranean area.[9]



2. LITERATURE REVIEW

2.1 Broccoli

The broccoli plant is a dim green vegetable with a firm stalk and brancing arms that in florets. The title comes from the latin word brachium meaning arm or branch, or the Italian word broccoli for cabbage sprout. The consumable parcels are the florets and 6 to 8 inches of the supporting stem. Broccoli is closely related to cauliflower, cabbage and brussel sprouts.

2.1.1 Synonyms: coleslaw, collards, sauerkraut.

2.1.2 Source

Family: cruciferae[10]
Scientific name: Brassica oleracea L. var.italica
High in vitamin –A and vitamin-C
A cruciferous vegetable that contains phytochemicals called that may help prevent cancer.[10]

Pharmacological activities

- Broccoli in cancer prevention:-
- Broccoli in the treatment of diabetes:-
- Effect in neural disorders:-
- Effect in asthma:-
- Antioxidant activity:-
- Gastroprotective Activity:-
- Anti-inflammatory Activity:-
- Immunomodulatory Activity

2.2 Cabbage

Cabbage is a leafy vegetable that grows on heads close to the ground. The leaves may be loosely or tightly compacted and vary from pale green to deep purple-red, depending on the variety.

2.2.1 Synonym: Purple cabbage, red kraut, or blue kraut

2.2.2 Source

Family: cruciferae[10]
Scientific name: Brassica oleracea L. Var.capitata
Common name: cabbage[10]
High in vitamin – C

A cruciferous vegetable that contains phytochemicals called indoles that may help prevent cancer.

Pharmacological acitivities

- Antidiabetic effect:
- Analgesic effect:
- Antioxidant and Anti-inflammatory:
- Antioxidant Activity:
- Hypnotic effect of Red Cabbage:

2.3 Kale

Kale or cabbage leaf has a place for a lot of cabbage cultivars grown for its consumables, although some are used as ornamentals. kale has green or purple leaves and the central leaves do not form a head.

2.3.1 Synonyms: leaf Cabbage, cole.

2.3.2 Source

Family: cruciferae[10]
Scientific name: Brassica oleracea L. Var.acephala
High in vitamin – C[10]

Pharmacological activities

- Antioxidant activity
- Anticancerogenic activity
- Effects on gastrointestinal tract
- Effects on cardiovascular system

3. CONCLUSION

The vegetable Brassicaceae stands out for the presence of compounds with high sulfur content in its bioactive metabolites.

The family means to be an outstanding source of health promoting phytochemicals and supplements that would pay beneficial dietary importance of these food crops against certain types of infections. In this way, this provides a gigantic sum of data on the present nutritional value and pharmacological activities associated with Brassica vegetables in which it eventually coordinates people to choose healthier foods.

The protective effects of Brassica vegetables can be increased through the content of improved functional foods, however these must be tested for safety.

Therefore, we can conclude that Brassica vegetables play a vital role in the prevention of chronic non-communicable diseases and in the maintenance of healthy well-being.

At first it may seem surprising that so many organic exercises have been shown for plants as commonly consumed as these. However, reflection on the complex chemical nature of most plants suggests that there may be more biological potential in all of them than might be expected from something that is generally considered biologically neutral.

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