



I J A P C

INTERNATIONAL JOURNAL OF AYURVEDA AND
PHARMACEUTICAL CHEMISTRY

www.ijapc.com

E ISSN - 2350-0204

VOLUME 9

ISSUE 1

10TH JULY

2018

Greentree Group Publishers

Introducing Corn Oil in *Panchakarma* Therapeutics Scope and Possibility

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ABSTRACT

Science is not stagnant water. It needs to evolve or adapt according to time. *Ayurveda* (knowledge of life) is a medical science, present since time immemorial. In *Ayurveda*, properties of corn and its uses are mentioned under the classification of *dhanya varga* (groups of pulses). Many research works on corn oil show its high therapeutic effect. It is also known as maize oil. Corn is widely cultivated in entire the world, and a greater weight of maize is produced each year than any other grain. In Sanskrit, corn (*Zea mays* Linn.) is called as *Makkaya*, and comes under *Yavakula* (Gramineae family). *Makkaya* or *Mahakaya* has properties like *Kashaya rasa* (astringent taste), *Madhura rasa* (sweet taste), and *Guru* (heavy) *Snigdha* (unctuous) *guna* and *sheeta virya* (cold potency). The most important thing to note about edible oil is its fatty acid composition. 100 gm of corn oil contains 12.9 gm saturated fat, 54.6 gm polyunsaturated fats (PUFA), 27.5 gm monounsaturated fats (MUFA) In today's era, when many classical *Ayurvedic* herbs are becoming extinct, it is of utmost importance to discover its alternatives. Certain substitutes have been classically mentioned but even these are scarce today. Hence, here an effort made to introduce new, commonly available substitutes in the *Panchakarma* processes in order to make them more accessible and cost effective for the patient.

KEYWORDS

Corn oil, Makkaya, Panchakarma, Ayurveda



Greentree Group Publishers

Received 15/06/18 Accepted 30/06/18 Published 10/07/18

INTRODUCTION

Science is not stagnant water. It needs to evolve or adapt according to time. *Ayurveda* (knowledge of life) is a medical science, present since time immemorial. There are many properties of food substances, which are used to maintain health, through the maintenance of equilibrium in the body's *doshas* (bio-energetic principles), namely *Vata*, *Pitta* and *Kapha*. In *Ayurveda*, properties of corn and its uses are mentioned under the classification of *dhanya varga* (groups of pulses). Many research works on corn oil show its high therapeutic effect. It is also known as maize oil. Corn is widely cultivated in entire the world, and a greater weight of maize is produced each year than any other grain¹. The United States produces 40% of the world's harvest; and other top producing countries include Argentina, Brazil, Mexico, India, France, Indonesia and China. Worldwide production was 817 million tons in 2009—more than rice (678 million tons) or wheat (682 million tons)².

Corn oil is extracted from the germ of corn. These germs are rich in nutrients and oils. Corn oil is polyunsaturated vegetable oil. It is healthy oil because it is composed mainly of polyunsaturated fatty acids and is low in saturated fats.

Corn properties and its benefits were recognized centuries ago in *Ayurvedic* medicine. *Ayurvedic* medicine is based on the Veda, the oldest scripture of Hinduism. In Sanskrit corn (*Zea mays* Linn.) is called as *Makkaya*, and comes under *Yavakula* (Gramineae family). *Makkaya* or *Mahakaya* has properties like *Kashaya rasa* (astringent taste), *Madhura rasa* (sweet taste), *Guru* (heavy) *Snigdha* (unctuous) *guna* and *sheeta virya* (cold potency)³.

Panchakarma therapies are popular in the field of *Ayurvedic* disease management. Their effect and safety is well established by the evidence of experiences since many centuries. This therapy restores balance with natural law to maintain the equilibrium of *doshas* and stabilize the internal milieu of body. *Vaman* (emesis), *virechana* (purgation), *niruha basti* (decoction enema) *nasya* (errhine), and *raktha mokshana* (blood letting) are five *shodhana* therapies carried out systematically in three stages - pre therapy, therapy and post therapy. *Snehana* (oleation) and *swedana* (sudation) are common for all pre therapy procedures. *Snehana* is of two types - external oleation and internal oleation.

CORN VARIETY

Maize is one of the most widely distributed crops of the world. It is

cultivated in almost all area like tropics, sub-tropics and temperate from sea level to 4000 in under irrigated to Semi-arid conditions. Tremendous choice is available as regards to varieties maturing in 85 days to more than 200 days with variability in grain colour and texture etc⁴ corn comes in many shapes, sizes, colors and textures. Some are starchy varieties, some soft and some hard variety. Size wise some are long, some short and round, some with large kernels others with tiny ones. And colour wise some are blue, some white, some yellow or red.

Some of recent research has shown the antioxidant benefits from different varieties of corn actually come from different combinations of phytonutrients. In the case of yellow corn, antioxidant carotenoids are maximally present, with especially high concentrations of lutein and zeaxanthin. In the case of blue corn, it's the anthocyanins. There's one particular hydroxybenzoic acid in purple variety of corn contains protocatechuic acid, that's also been recently linked to the strong antioxidant activity in this corn variety.

PROPERTIES

The most important about corn oil is its fatty acid composition. 100 gm of corn oil contains 12.9 gm Saturated Fat, 54.6 gm polyunsaturated fats, 27.5 gm

Monounsaturated fats other details are mentioned in table 1, 2, 3⁵.

Table 1 Energy status of corn oil

Proximity	Amount	% DV
Energy	122 Kcal	N/D
Energy	512 kJ	N/D
Total Fat (lipid)	13.6 g	38.86%

Table 2 Vitamins availability in corn oil

Vitamins	Amount	% DV
Fat soluble Vitamins		
Vitamin E (alpha-tocopherol)	1.94 mg	12.93%
Vitamin K (phylloquinone)	0.3 µg	0.25%

Table 3 Lipids and its ratio in corn oil

Lipids	Amount	% DV
Fatty acids, total saturated		
Myristic acid	0.003 g	N/D
14:00(Tetradecanoic acid)		
Palmitic acid 16:00	1.439 g	N/D
(Hexadecanoic acid)		
Margaric acid (heptadecanoic acid) 17:00	0.009 g	N/D
Stearic acid 18:00 (Octadecanoic acid)	0.251 g	N/D
Arachidic acid 20:00 (Eicosanoic acid)	0.059 g	N/D
Behenic acid (docosanoic acid) 22:00	0 g	N/D
Fatty acids, total monounsaturated	3.75 g	N/D
16:1 undifferentiated	0.016 g	N/D
16:1 c	0.016 g	N/D
18:1 undifferentiated	3.717 g	N/D
18:1 c	3.717 g	N/D
20:01	0.018 g	N/D
Fatty acids, total polyunsaturated	7.436 g	N/D
18:2 undifferentiated	7.278 g	N/D
18:2 n-6 c,c	7.239 g	N/D
18:2 i	0.039 g	N/D
18:3 undifferentiated	0.158 g	N/D
18:3 n-3 c,c,c (ALA)	0.158 g	N/D
Stigmasterol	8 mg	N/D
Campesterol	26 mg	N/D
Beta-sitosterol	84 mg	N/D

These Values are based on 2,000 calorie diet intake. Daily values (DVs) may be different depending upon daily calorie needs. Mentioned values are recommended

by a U.S. Department of Agriculture. Calculations are based on average age of 19 to 50 years and weighs 194 lbs.

USES

Prevents Anemia:

Anemia is caused due to the deficiency of vitamin B12 and folic acid. Corn contains a significant amount vitamin B12 as well as iron. Both essential minerals required to form new red blood cells.

Energy booster

Corn is considered a starchy vegetable as it contains a high amount of carbohydrates that provide long term energy in short term. And also ensure proper functioning of the brain and the nervous system. Corn is a complex carbohydrate so it gets digested at a slow pace, thus providing the patient with balanced energy levels that is free of peaks and valleys. It is advised to consume corn before exercising for long lasting energy.

Lowers LDL Cholesterol:

Cholesterol is produced by the liver and there are generally two types of cholesterol - HDL or good cholesterol and LDL or bad cholesterol. Bad cholesterol increases due to the intake of fatty food, thus weakens heart and causing cardiovascular diseases. Sweet corn is rich in C- vitamin, carotenoids and bioflavonoids that keeps the heart healthy by controlling the cholesterol levels and increasing the blood

flow. Corn oil has an anti-atherogenic effect on the cholesterol levels as it lowers the cholesterol levels by reducing the cholesterol absorption by the body, thus preventing atherosclerosis and scavenging the free radicals throughout the body.

Now-a-days corn oil is popular for its ability to lower the blood cholesterol. It contains phytosterols in significant amount. These sterol compounds are derived from plant sources and are similar to cholesterol in structure. Many plant sterols have powerful ability to reduce absorption of cholesterol. Some sterols help the body to use more cholesterol so it results less cholesterol in the serum.

Promotes Heart Health

Corn oil is rich in linoleic acids and other PUFAs The diet which contains about 8 – 10 % of the total energy from PUFAs is good for heart health.^[7] So consumption of corn oil in suitable amount helps in maintain the proper function of heart. PUFAs also have LDL cholesterol lowering activity. This contributes to the earlier cholesterol lowering effect caused by phytosterols^{6,8}.

Skin and hair benefits

Corn oil improves skin functioning because of the presence of linoleic acid and vitamin E. It contains about 59 % linoleic acid thus it penetrates quickly into the skin.

Corn oil is also considered for use in hair care. It contains 54 percent of omega-6 and 28 percent of omega-9 fats, which lock water inside the hair and make it stronger and better, protected against dryness. Corn oil promotes moisture to the hair follicles, nourishes the scalp, promotes hair growth, and it preventing external damage. Corn oil is a good source of vitamin E and vitamin K. Vitamin E is an antioxidant so it improves the blood circulation in the scalp, protects the hair from external damage, slow down the aging processes and fight free radicals. Vitamin K is necessary for calcium absorption. Calcium is the key mineral for hair growth⁹.

DISCUSSION

Mahakaya is included in the *Dhanya Varga* of various *Ayurvedic* ethno-botanical treatises and broadly comes under the *Yavakula*. Corn has high medicinal value, as proven by studies conducted by modern sciences. It is *Kapha Pittahara*, *Vatakara*, and *Ruksha*¹⁰. Other *Karmas* include – *Truptionikara*, *Ruchiprada*, *Balaprada* etc. Owing to these properties, it can be used in the treatment of *Santarpana Janya vikaras* (disease due to over nourishment) like *Prameha*, *Kota*, *Kandu* (itching) etc. ^[11] The possible mechanism of action is due to its *Ruksha*

Guna which removes *Kledata* (moisture), *Tandra* (drowsy) and *Ama* in the body, thus increasing the *Agni*. Corn oil is *ruksha* in nature hence it prevents the fat deposition. As it is *Srotoshodhaka* (cleanses channels) in nature, it may also be used in the treatment and prevention of heart disease (*Raktavaha srotoshuddhikara*). Corn oil may safely be used externally as well as internally. Hence, it may be possible to consider using corn oil for the purposes of *Abhyanga* (oil massage), *Shirobasti* (retaining of oil over head), *Dhara* (pouring of oil), *Pichu* (keeping oil soaked cotton), *Basti* and other *Panchakarma* procedures.

CONCLUSION

In today's era, when many classical *Ayurvedic* herbs are becoming extinct, it is of utmost importance to discover its alternatives. While certain substitutes have been classically mentioned, even these are scarce today. *Ayurvedic* physicians thus need to quickly discover other efficient substitutes to many classical medicines and drugs, which are scientifically validated. This review paper, therefore has attempted to explore the therapeutic potentials of corn oil in *Ayurveda*, from the perspective of *Ayurvedic* basic principles,

and serve as a motivation for further experimental and clinical testing in this regard.

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