

PHARMACOLOGY AND ETHNO-PHARMACOLOGY OF TRADITIONAL BENGALI CUISINE 'CHODDOSHAK'

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ABSTRACT

Religious traditions are the backbone of anthropological knowledge for any country. Sometimes in disguise they become an integral part for the general wellbeing for a specific community. The tradition of taking 'Choddoshak' (leaves of fourteen leafy vegetables) during the season of autumn by Bengali people of West Bengal, India and Bangladesh may be a ritualistic event by them but in contrary this fourteen herbs may have synergistic effect to collectively fight against the common health problems that occur particularly during the season of autumn. This review discusses the possible ethno pharmacological role and pharmacology of the individual plants of *ChoddoShak* and helps to justify the intake of *ChoddoShak* in the particular season of autumn by Bengali community.

Keywords: *Choddoshak*, Ethno medicine, Bengali people

INTRODUCTION

Starting from the ancient civilizations, human beings always rely on medicines of natural origin for day to day treatment of their ailments. They mainly depend on natural resources for general well being. Hence they made some life style changes and incorporated some good habits within their daily routine which unknowingly enhance their health. This incorporation of good habits is contributed mainly through religious festival or local customs. India and Bangladesh are the countries

of rich cultural heritage of vivid anthropological knowledge. One such religious custom by the Hindu Bengali people of West Bengal, India and Bangladesh are eating *ChoddoShak*, a group of fourteen leafy vegetables during the months of *Diwali* (the festival of light).

TRADITIONAL BENGALI COUSINE CHODDOSHAK

There are numerous customs and believes within the Hindu people residing in the state of

West Bengal, India and in Bangladesh. This religious believes may not be supported apparently by scientific aptitude, but these ancient customs could have a scientific basis, if we look over the customs closely. One such custom is eating a group of fourteen leafy vegetables (Table-1) known as, 'Choddo-Shak' ¹ in the season of autumn by the Bengali people. 'Choddo' signifies the number 'fourteen' whereas 'Shak' means any leafy vegetable in Bengali or Hindi language. Though *Choddoshak* are eaten strictly as a ritualistic event by the Hindus in the month of autumn but they might have beneficiary synergistic health effect. Individually all the fourteen plants that comes within the group of *ChoddoShak*, are used as local ethno medicine in the area of West Ben-

gal and Bangladesh. Hence though there is no reported pharmacological reports or research on the *Choddo Shak* as a whole but by reviewing the ethno-pharmacological, pharmacological use of the individual plants, we may establish a preliminary idea of the fact that taking *ChoddoShak* during the specific period of the year may alleviate a group of diseases that may occur particular to the specific season of autumn in West Bengal and Bangladesh. Fresh leaves of these vegetables are plucked and fried in mustard oil, in the month of October-November time, in autumn season mainly on the day before the new moon of *Diwali* (festival of light). It was referred for the first time by 16th century author Raghunandan Bhattacharya in his book '*Smritirahasya*'.²

Table-1. Fourteen plants are considered as *Choddoshak* in West Bengal, India and Bangladesh

Sl. No	Traditional name in Bengali	Botanical name	Family
1.	<i>Oul</i>	<i>Amorphophallus campanulatus</i>	Araceae
2.	<i>Keou</i>	<i>Costus speciosus</i> Koenex.Retz.	Costaceae
3.	<i>Betho</i>	<i>Chenopodium album</i> Linn.	Chenopodaceae
4.	<i>Kalkasunde</i>	<i>Cassia sophera</i> Linn/ <i>Cassia occidentalis</i>	Caesalpiniaceae
5.	<i>Sorisha</i>	<i>Brassica campestris</i> Hook.f. &Thoms.	Cruciferae
6.	<i>Neem</i>	<i>Azadirachta indica</i> A. Juss.	Meliaceae
7.	<i>Jayanti</i>	<i>Sesbania sesban</i> (L.) Pers.	Fabaceae
8.	<i>Salinche</i>	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC	Amaranthaceae
9.	<i>Guruchi</i>	<i>Tinospora cordifolia</i> (Willd.) Miers ex Hook.F. and Thoms.	Menispermaceae
10.	<i>Potuk</i>	<i>Tricosanthes dioica</i> Roxb	Cucurbitaceae
11.	<i>Seluka</i>	<i>Cordia dichotoma</i> Forst.	Boraginaceae
12.	<i>Hilmochika</i>	<i>Enhydra fluctuans</i> Lour.	Asteraceae
13.	<i>Vontaki/ Ghetu</i>	<i>Clerodendrum infortunatum</i> Linn.	Verbenaceae
14.	<i>Sushni</i>	<i>Marsilea quadrifolia</i> Linn.	Marsileaceae

ETHNO-PHARMACOLOGY OF CHOD-DOSHAK

The season of autumn is the time for seasonal changes and winter is welcomed by a series of diseases, especially in the tropical region like

West Bengal and Bangladesh. As the autumn commences through the month of October and November, temperature fluctuation and alternation of humidity brings a group of seasonal diseases within the people of West Bengal and

Bangladesh. Alternation of temperature and humidity causes respiratory tract infection, gastrointestinal problem, skin rashes, etc. All the plants or vegetables within the group of *ChoddoShak*, are individually used ethno-pharmacologically for their specific action.

Seasonal Upper respiratory tract infection:

In Ayurveda, *Kasamarda* is the common name for *Cassia sophera* because it is useful to alleviate *kash* (~cough) hence this particular plant is highly effective in common cough and cold,³ which are very common during the seasonal changes in fall season. *Sesbania sesban* is used by Bengali people to treat allergic rhinitis and seasonal cold. *Clerodendrum infortunatum* is very useful in the treatment of allergic bronchitis, asthma and fever.⁴

Gastrointestinal problem: The human body is prone to allergies in the fall season, it indirectly increases the histamine, and as a direct consequence the gastric acid secretion and gastrointestinal spasmodic contraction also increases. It results in the gastrointestinal dysfunction which leads to the occurrence of stomach trouble. *Chenopodium album* has hepatoprotective activity.⁵ Leaves and seeds of *Brassica campestris* are useful in providing normal evacuation of bowels and normal micturition due to its counter-irritant and diuretic nature.⁶ Leafs of *Enhydra fluctuans* are useful in liver disorder.⁷ Leaves of *Tricosanthus dioica* is used as tonic, febrifuge and in sub acute cases of enlargement of liver and spleen.⁸ Antihelminthic property of *Costus speciosus* is well documented among the common masses of Bengal.^{9,10,11} Apart from this, *Amaphophallus campanulatus* is the plant of choice for the treatment of hemorrhoids or piles,¹² due to its haemostatic property, hence it's another name

is *Arsogna* in Sanskrit which means the plant which destroy *Arsha* (Piles).

Seasonal affective disorder (SAD): SAD is a type of depression with a seasonal pattern, mostly occurring in the winter and autumn season. Most common symptoms are alternation of mood, excessive or no food intake, excessive sleep or insomnia, lethargy, etc. *Alternanthera sessilis* leaves are used to relieve headaches and dizziness. The leaves of *Marsilea quadrifolia* is a nervine tonic and provides effective treatment against insomnia,^{13,14} while *Cordia dichotoma* is used to increase appetite and to treat anorexia.¹⁵ Leafs of *Enhydra fluctuans* are also useful in nervous disorder.

Seasonal skin rashes and infection: Leaves of *Enhydra fluctuans* have ethno medicinal value for its extensive use over inflammation and skin diseases.¹⁶ *Azadirachta indica* have beneficial role in dermatological problem and seasonal allergy of the skin and it also has antifungal, antibacterial, and antiviral properties.^{17,18} *Chenopodium album* has antiseptic activity.¹⁹ *Tinospora cordifolia* act as an immuno-modulator and act as a popular tonic in intermittent fever and juvenile fever,^{20,21} and hence it boost up the immunity of the individuals of West Bengal, India and Bangladesh during autumn season from minor infections.

PHARMACOLOGY OF CHODDOSHA

Antihistaminic activity: Study showed that powdered leaves of *C. sophera* which was extracted with ethanol and subjected for sequential fractionation with chloroform, ethyl acetate and ethanol respectively showed anti-asthmatic activity over carrageenan induced paw edema, histamine induced bronchoconstriction, clonidine and haloperidol induced catalepsy, milk induced leukocytosis, and eo-

sinophilia and passive paw anaphylaxis. The animals pretreated with parent extract, ethyl acetate, chloroform and ethanol fraction showed significant inhibition in reducing paw edema in passive paw anaphylaxis²².

Antimicrobial activity: Study proved that in-vitro biological screening effects of the methanol stem extract of *Sesbania sesban* were tested against ten bacterial species and five fungal species. Highly significant activity was observed against the bacteria *Erwinia amylovora* followed by *Escherichia coli*. In the case of fungi *Curvularia lunata* and *Fusarium oxysporum* were inhibited completely.²³

Hepatoprotective activity: Study revealed that *Chenopodium album* showed significant hepatoprotective activity against paracetamol induced hepatotoxicity as evident by restoration of serum transaminases, alkaline phosphatase and bilirubin content. Histopathology of the liver tissue further confirmed the reversal of damage induced by hepatotoxin. Study showed that the alcoholic and aqueous extracts of *Chenopodium album* significantly restore physiological integrity of hepatocytes. Aqueous and alcoholic extract did not show any sign of toxicity up to oral dose of 5 g/Kg in mice.²⁴

Anti-inflammatory activity: The tubers of *Amorphophallus species* are anti-inflammatory in nature and traditionally used in inflammations. Study revealed that the tubers were dried under shade and made to fine powder and extracted successively with petroleum ether, chloroform, methanol and water by using Soxhlet extractor. For the assessment of the anti-inflammatory activity of the extracts at the

dose of 200 and 400 mg/ kg, we used carrageenan induced paw edema model in rats. The standard drug diclofenac sodium at the dose of 5 and 10 mg/ kg were administered.²⁵

Anthelmintic activity: Study revealed the anti-helminthic activity of the methanolic and aqueous extracts of the aerial parts of *Costus speciosus* in Indian adult earthworms (*Pheretima posthuma*). The anthelmintic activity of methanolic (25 mg/ml, 50 mg/ml and 100 mg/ml) and aqueous extracts (25 mg/ml, 50 mg/ml and 100 mg/ml) of the aerial parts of *Costus speciosus* was evaluated using Indian adult earthworms (*Pheretima posthuma*) as experimental worms. The aqueous extract showed more significant effect on paralyzing the worms, in terms of paralysis time, at every concentration compared to that of methanolic extract when compared with standard albendazole. Thus *Costus speciosus* showed significant anthelmintic activity in the experimental study, it can be used as a promising anthelmintic agent.²⁶

Psychopharmacological activity: Study revealed that the hydroalcoholic extract of the entire plant *Marsilea quadrifolia* is effective for different psychopharmacological actions such as behavior, exploratory behaviour, muscle relaxant activity and phenobarbitone induced sleeping time. The extract was found to cause reduction in spontaneous activity, decrease in exploratory behavioral pattern by swimming and pole climbing test., reduction in the muscle relaxant by traction test. In addition, the extract significantly potentiated the phenobarbitone-induced sleeping time.²⁷

Immuno-modulatory activity: Study revealed that administration of *Tinospora cordifolia* stem methanolic extract to BALB/c mice increased the total white blood cell count significantly. It also increased bone marrow cellularity and α -esterase positive cells in bone marrow indicating increased maturation of stem cells. Administration of the extract was also found to significantly increase humoral immune response.²⁸

Anticonvulsant activity: Study revealed that both water and ethanolic extract of *Marsilia quadrifolia* were effective in reducing the severity of behavioral and EEG seizures induced by pentylenetetrazole in rats. This study justifies the traditional use of this plant in epilepsy. Both the water and ethanol extract of *Marsilia quadrifolia* increased the latency of seizure but also decreased duration of epileptic seizure and seizure severity score. This reduction of seizure severity was also observed in EEG recording and EEG power analysis. The effectiveness of *Marsilia quadrifolia* ethanol extract is better than *Marsilia quadrifolia* water extract. This study justifies the traditional Bengali use of this plant as a sedative.²⁹

Anxiolytic activity: Study revealed that the different fractions of *Enhydra fluctuans* aerial parts possess central nervous system depressant activity. The effect of the three fractions of *Enhydra fluctuans* on central and peripheral nervous system by using spontaneous motor activity, sedative activity, anticonvulsant property, anti-stress activity by tail suspension test (TST) and forced swimming test (FST). Benzene, chloroform and ethyl acetate fractions produced CNS depressant activity. The results of the research indicated significant spontaneous motility depressant, sedative, an-

ticonvulsant and anti-stress activity of the different fractions in the tested animal models.³⁰

CONCLUSION

Thus we see that individual plants that come under *Choddoshak* are useful medicinal agents which are supported by ethno-pharmacological and pharmacological findings. Hence though there is no reported pharmacological data of *ChoddoShak* as a whole but there is immense probability of synergistic activity of all the plants within the *ChoddoShak* which ultimately gets developed to a religious custom of having *ChoddoShak* in the autumn season by the Bengali people for fighting the diseases that occurs during seasonal transition. It may also keep them immune from the harsh climatic change that comes under fall season. The aim of this review is to not just simply discuss the therapeutic role of some medicinal plants but to bridge the gap between rituals and customs and to investigate the ethno-medicinal route for the anthropological study of several customs that may inclined for the development of good health and disease free. Further research and investigation over the *ChoddoShak* as a whole is welcomed from the budding researchers who could use this review as a baseline.

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