



Shantijal-Its Bio Perspective And Present Scenario –A Preliminary Survey Report

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ABSTRACT

In Hindu Religion, Shantijal is regarded as pure and sacred water which remains within the Mangal –ghat (Auspicious vessels) which is made up of Brass or Silver.

In this study, attempts have been made to know about the purity or potability of Shantijal and its bio perspective. During study, it has been studied that the plant parts or their products which are used in Mangal –ghat show antibacterial activity and also other medicinal importance. In the Mangal –ghat, different plant parts like Panchapallav [Am (*Mangifera indica* L. , Aswatha (*Ficus elastica* L.), bat (*Ficus benghalensis* L.), pakur (*Ficus rumphi* Bl.), etc are kept inside within it. These components differ from place to place or by different opinions. As these above mentioned plants or plant parts are used for worshiped purpose, so by this way these plants will be conserved and bio-diversity conservation strategy will be fulfilled. So far, such type of study has yet been done. This type of study will be helpful for making the people aware about the purity of Shantijal; any adulterant of plant parts or products which are used in the auspicious ghat; or the process of using the original plant parts or products in definite proportion which will be helpful for purification of source water.

Aims and Objectives:

The main aims and objectives of this work are–

- To evaluate qualitative and quantitative information on the physical, chemical and biological characteristics of source and worshipped water(after treatment)
- To characterise present condition and trends
- To inform people about the uses of original plant material and purity of “Shantijal”
- To make people aware about any adulterated plant parts or products which are being used in the “Auspicious pot” or

of those water bodies from where source water is collected

“Mangal ghat”

- To inform about the process of using the original plant parts or products in definite proportion which will be helpful for purification of source water
- To evaluate the presence of coliform in source water
- To know the source of coliform contamination
- To study other pathogenic bacteria present in water
- To compare potability between the source water and worshipped water
- As the above mentioned plants are used for worshipping purposes, so by this way the plants will be conserved and thus biodiversity conservation strategy will be fulfilled.

Introduction:

In Indian subcontinent the Hindu are dominant and the oldest religion in the World is ‘Hinduism’. Since ancient periods, traditionally the Hindu people use a large number of plant species for worshipping different Gods and Goddesses. The important of plants which are used for religious purpose, has been described in different Vedas and also it could be seen in the hymns. In India , the Hindu are used to use many plant species which are associated with religious function, rituals and also in the celebration of festival. Such useful information has been recorded in the

religious books and this knowledge has been transmitted from generation to generation.

During “Kalasha pooja”(Ghat pooja) Some of these useful plants and their parts are used. Kalasha is a metal pot and usually made of copper, gold or brass. It has a large base and small mouth, large enough to hold a coconut. The kalasha is usually filled with copper coins, grains, gems gold or a combination of these. According to (Kabyabhusan B.,1973; Bhattacharya S.M.,1904; Bhattacharya S.,1948) the coronet of 5 mango leaves is placed on the mouth of the Kalash in such a way that the tips of the leaves touch water in the kalasha. Also some other plants like Aswatha (*Ficus religiosa* L.), Bot (*Ficus benghalensis* L.), Pakar/Pakur (*Fucus virens* Aiton), Jagya dumur(*Ficus racemosa* L.), Haritaki (*Terminalia chebula* Reg.), Supari (*Areca catechu* L.), Elaichi (*Elettaria cardamomum* L. Maton), Labanga/Laung (*Syzygium aromaticum* L. Merrill & Pery), Haldi/Turmeric (*Curcuma longa* L.), Paan leaves (*Piper betle* L.) etc. are added to the kalasha or also known as “Mangal ghat”. The above components may differ from place to place or by different opinion .The “kalasha” is also viewed as an “Auspicious pot” which brings good fortune and success. The coconut is sometimes wrapped with a red cloth and red thread is tied around the metal pot or Mangal Ghat. These entire arrangement of “kalasha”

is called as “Purna-kalasha”.

There are Other interpretation of the “Purna kalasha” associate with the five elements or the chakras. The wide base of the metal pot represents the element Prithvi (Earth), the expanded centre – Ap (Water), neck of the pot – Agni(Fire), the opening of the mouth –Vayu (Air) and the coconut and the mango leaves – Akasha(Aether). The “Purna kalasha” is also worshipped at Hindu ceremonies like Griha pravesh(house warming), child naming, havan(fire sacrifice), vaastu(dosha) rectification and daily worship.

After obtains are offered to different deities, the purified water from the “kalasha” or “Mangal ghat” which is also known as “Shantijal” or “Water of peace” is taken and sprinkled on all devotees assembled around and the objects by chanting the Shanti mantra. During sprinkling Peace is recited three times: “Om Shanti, Om Shanti, Om Shanti”

In this study, attempts have been made to know about the purity or potability of Shantijal and also of the source water from where it has been collected and kept in “Mangal ghat” and after its worship which is known as “Shantijal”. From literature survey, it has been studied that the plant parts or their products which are used in the “Mangal ghat” show some antimicrobial properties (Table No.- 3) and also show other medicinal importance (Table No.-4).

Area of Study:

Sample water for testing physical, biochemical and bacteriological parameters were collected from different puja mandaps and water sources of Midnapore ,Kharagpur town in paschim midnapore district and Howrah district, West Bengal. Kharagpur town and Midnapore town belongs to Paschim Medinipur district. The district Paschim Medinipur is located at longitude 87.318188 and latitude 22.431568. The area Kharagpur is located at longitude 87.231972 and latitude 22.346010 and the area Howrah is located at longitude 88.263641 and latitude 22.595770. The studied areas are situated 23m, 57m and 12m above Sea level respectively. (wikipedia, mapsofindia.com)

Materials and Methodology:

For the present study 10 numbers of water samples were collected mainly from ponds, wells and puja mandaps between the time periods of July 2019 to February 2020. Photographs of different plants and plant parts used in Mangal Ghat have been taken and identified by taxonomic literatures (Prain D., 1963; Bennet S.S.R., 1987,) . Common names have been confirmed by Local priests. Habit, Habitat and ecological also have been recorded during field collection which has been given in the Table No.-5.

Sample collection:

The water Sample was collected randomly

from puja mandaps, ponds, wells and river Ganga. Following equipments and materials were used for these purposes;

- a) Gloves, b) Sterilized bottles with screw caps, c) Bottle carrying box, d) Water bucket

Samples were collected in sterilized sampling bottle (500ml), with proper precautions.

Methodology:

Detection of Total Coliform Bacteria:

Conventional MTF (Multiple Tube Fermentation) technique was used to determine the Most Probable Number (MPN) of coliform bacteria present in samples of both water from Mangal ghat (Treated- 'T') and source water (Source- 'S'). This technique involves three main steps: Presumptive test, confirmed test and then complete test.

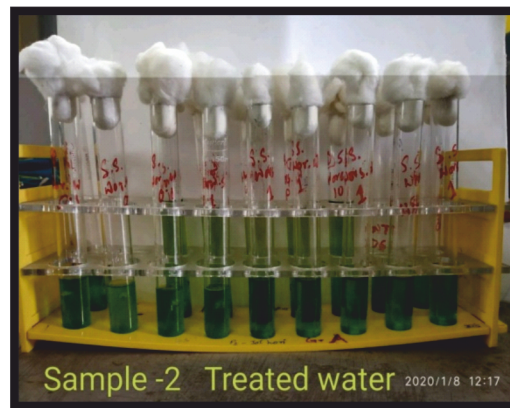
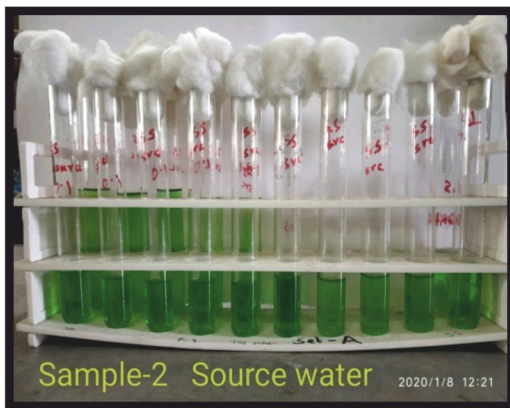
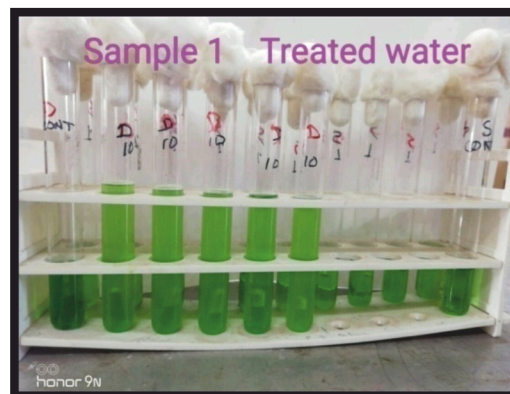
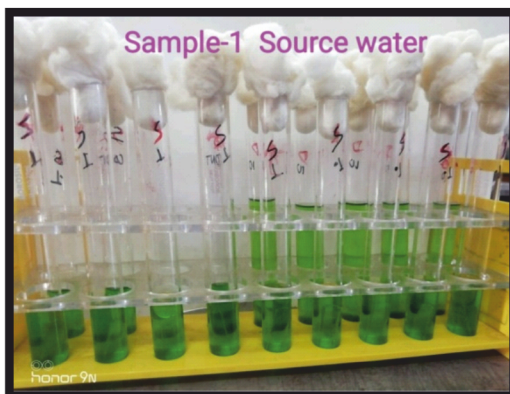
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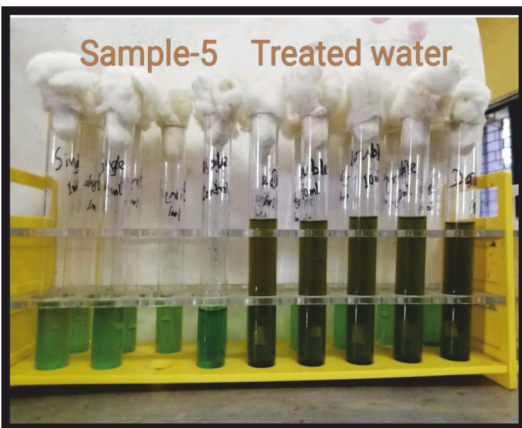
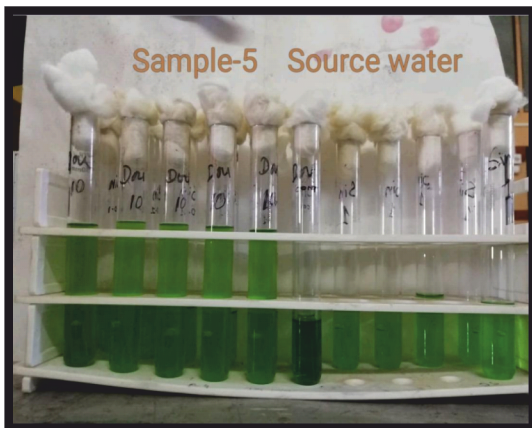
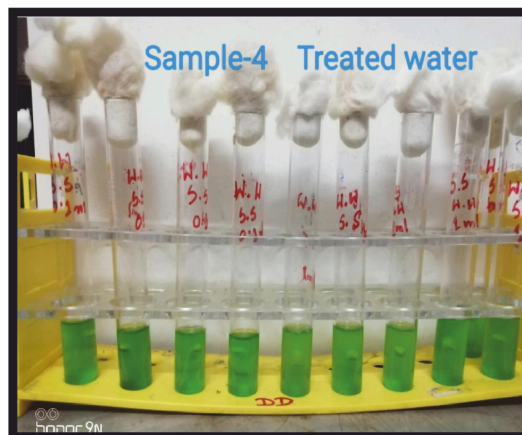
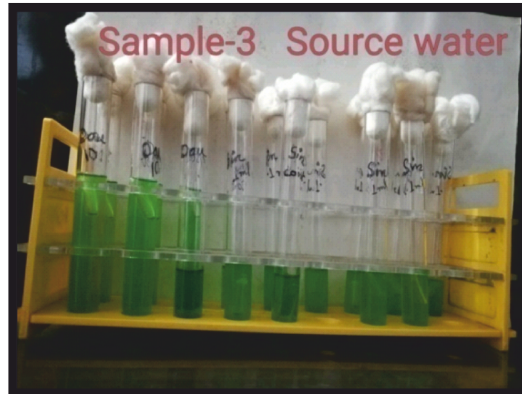
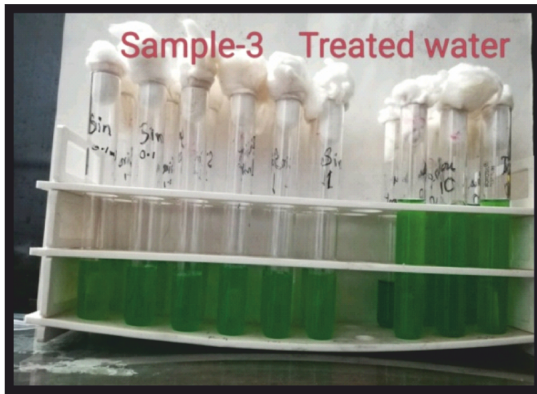
Table 1 (a) : TDS, pH, Temperature and MPN of different sources of water

WATER TYPE		TDS (mg/l)	pH	TEMPERATURE (°C)	MPN
S1	S	358	9	20.4	350
	T	389	8	20	175
S2	S	113	7	20	31
	T	208	7	19.8	2
S3	S	156	7	22.6	110
	T	315	7	22.6	29
S4	S	135	9	20	910
	T	280	8	20	210
S5	S	289	8	22.7	750
	T	299	8	22.7	170
S6	S	363	7	21.3	345
	T	389	7	21.3	210
S7	S	120	8	20	38
	T	195	8	20	11
S8	S	140	7	22.2	175
	T	340	7	22.2	41

Table 1 (b) : MPN Index for coliform bacteria of different sources of water

W Q I (W ater Quality Index)	W ater Quality
<50	Excellent
50-100	Good W ater
100-200	Poor W ater
200-300	Very poor water
>300	W ater unsuitable for drinking





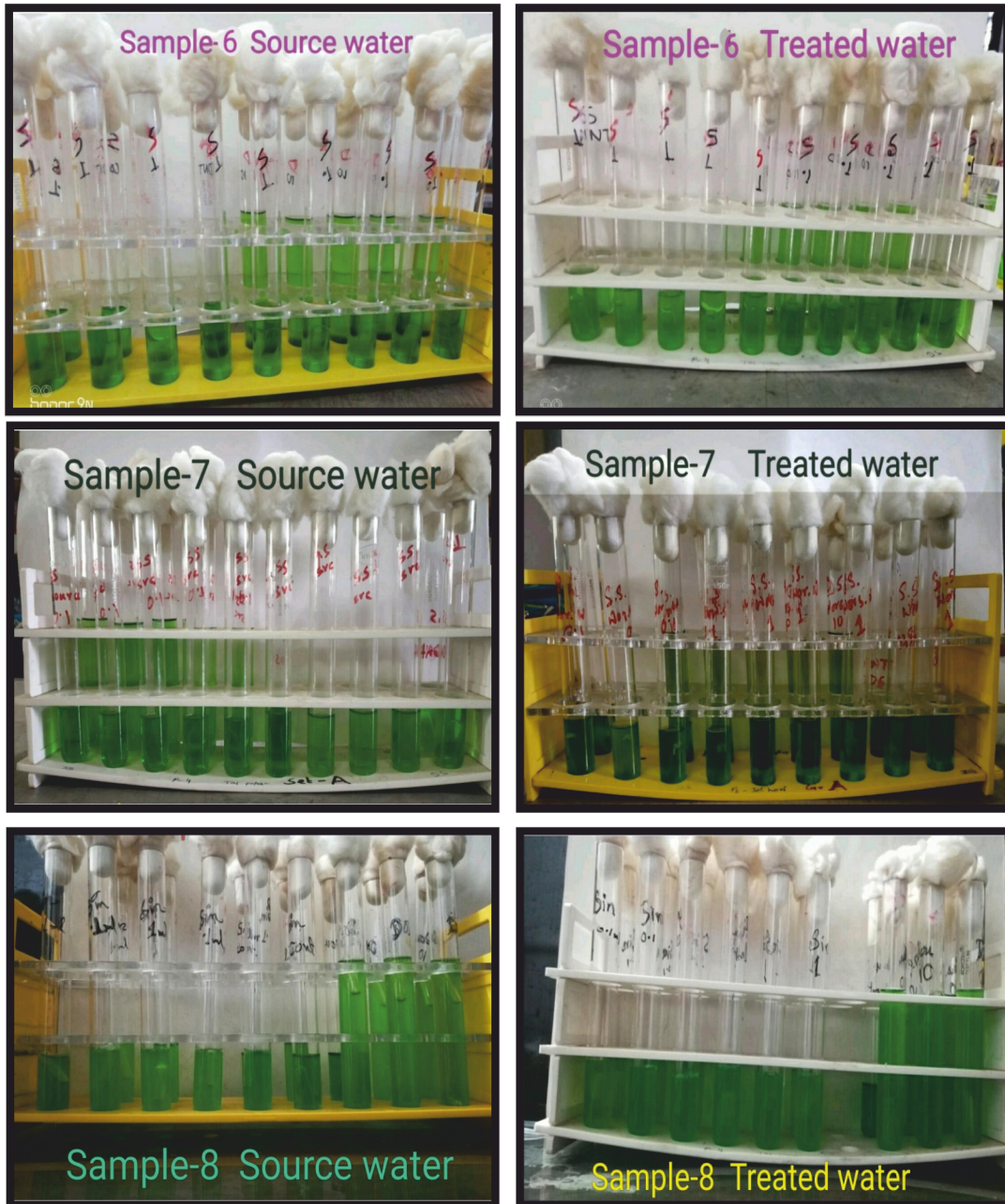


Figure- MPN test using Brilliant Green Blue

Graphical Representation

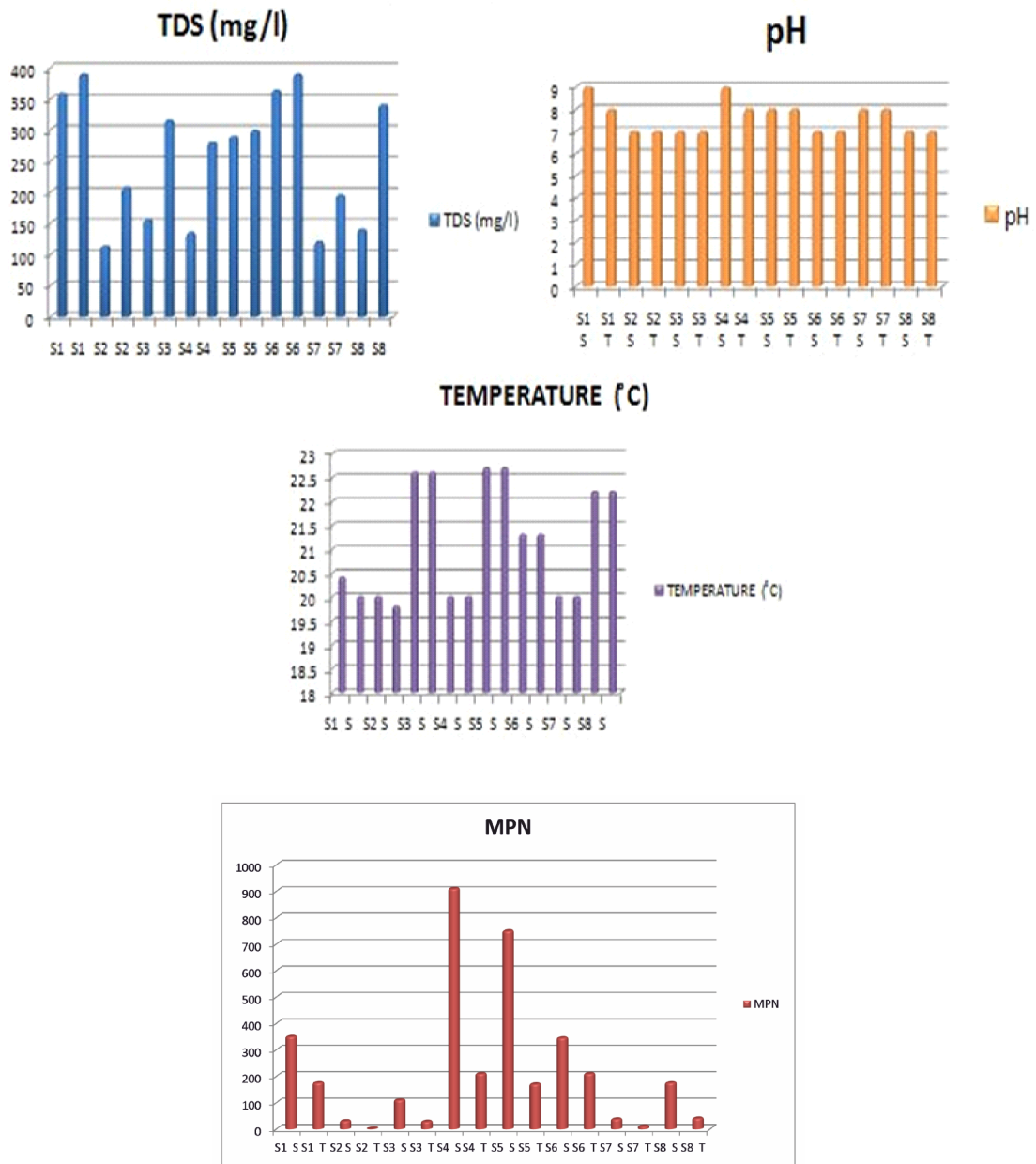


Fig: Graph showing values of MPN for different water samples

Table- 2: Chemical Ingredients of Plant Parts Used in Mangal Ghat :

Sl. No.	Common Name	Scientific Name	Family	Active Chemical Ingredient	Reference
1.	Supari	<i>Areca catechu L.</i>	Areaceae	Phenolic compounds such as flavonoids, tannins, and alkaloids. Saponin, Glycoside, Coumarin, Trimer procyanidin, Dimer procyanidin, Catechin, Quercetin, Reducing sugar	Sari M.L. <i>et al.</i> (2020); Rajamani R.K. <i>et al.</i> (2016)
2.	Elichi	<i>Elettaria cardamomum L.</i>	Zingiberaceae	Alkaloid, Flavonoid, Saponin, Tanins, Phenolic compounds, Catechin, Quercetin, Gallic acid, Luteolin, Myrecetin	Ahmed H. <i>et al.</i> (2019); Moulai-Hacene Faiza <i>et al.</i> (2020)
3.	Bat	<i>Ficus benghalensis L.</i>	Moraceae	Alkaloids, sterols, β flavanoids, phenols, tannins, saponins, ketones, flavonols, terpenoids, coumarins, esters, carbohydrates, serine protease.	Ahmad S. <i>et al.</i> (2011) ; Chaudhary S. <i>et al.</i> (2016)
4.	Dumur	<i>Ficus racemosa L.</i>	Moraceae	Alkaloids, Steroids, Flavonoids, Tannins, Saponin, Gum Reducing sugars, β -sitosterol, glauanol, hentriacontane, glauanolacetate, glucose, aspartic protease, racemoseic acid	Mohiuddin A.K. & Lia S. (2020) ; Deep P. <i>et al.</i> (2013)
5.	Aswatha	<i>Ficus religiosa L.</i>	Moraceae	Carbohydrates saponins, phenols, flavonoids, tanins and terpenoid, n-octacosanol, methyl oleanolate, lanosterol, β -sitosteryl-Dglucoside, stigmaterol, lupen-3-one, quercetin, myricetin, kaempferol, aliphatic alcohols, amino acids and minerals.	Devanesan E.B. <i>et al.</i> (2018) ; Prakash V. <i>et al.</i> (2017)
6.	Pakar	<i>Ficus rumphii Blume.</i>	Moraceae	β -amyrin, β -sitosterol, flavonol glycoside, erol and flavonol glycoside.[26] The leaves contained stigmast-5-en-3-yl acetate, 1-isopentyl-3,4-dioxomethylene-2-phenol, 3-acetyl-2H-chromen-2-one and 3-(2-hydroxyphenyl)-1-(piperidin-1-yl) propan-1-one	Ali M. <i>et al.</i> (2020)
7.	Aam	<i>Mangifera indica L.</i>	Anacardiaceae	Polyphenols, terpenoids, sugars, saponins, leucoanthocyanins, catechic, gallic acid, tannins, mangiferin, kaempferol and quercetin, Isoflavones, β -relemens, aromandrene, α -guaiene, β -endesmol, β -sitosterol and β -campester	Okwu D. E. and Ezenagu V. (2008) ; Kabir Y. (2017)
8.	Labanga	<i>Syzygium aromaticum L.</i>	Myrtaceae	Tannins, saponins, phlobatanins, phenolics, reducing sugar, terpenoid, steroid, glycosides, alkanoids, flavonoids, eugenol, β -caryophyllene, eugenyl acetate, chavicol, eugenol, eugenyl acetate	Gaylor R. <i>et al.</i> (2014) ; Jimoh S. <i>et al.</i> (2017)
9.	Pan	<i>Piper betel L.</i>	Piperaceae	The important antioxidants present in leaves are: flavonoids, tannins, saponins, alkaloids, terpenoids etc.	Aishwarya <i>et al.</i> (2016)
10.	Halud	<i>Curcuma longa L.</i>	Zingiberaceae	Rhizome contains Curcuminoids which is a mixture of Curcumin, demethoxy curcumin and bis demethoxy curcumin	Niranjan A <i>et al.</i> , 2008

Table- 3: Anti-Microbial Activity Of Plant Parts Used In Mangal-Ghat :

Sl.No.	Scientific Name	Used Parts	Anti-Microbial Activity Against	Reference
1.	<i>Areca catechu L.</i>	Nut	<i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , <i>E. coli</i> , <i>S.mutans</i> , <i>S.salivarius</i> , <i>S. mitis</i> , <i>L. acidophilus</i> , <i>C.albicans</i> , <i>P.intermedia</i> , <i>Candida albicans</i> .	Cyriac M. <i>et al.</i> (2012) ; Nisreen J M Al-Bayati. (2016).
2.	<i>Elettaria cardamomum L.</i>	Fruit	<i>S. aureus</i> , <i>L. monocytogenes</i> , <i>Bacillus cereus</i> , <i>Pseudomonas aeruginosa</i> , <i>E.Coli</i> , <i>S. pyogenes</i> , <i>S. typhi</i>	Jazila El Malti <i>et al.</i> (2007) ; Kaushik Purshotam <i>et al.</i> (2010)
3.	<i>Ficus benghalensis L.</i>	Leaf, Stem Bark, Fruit	<i>S. aureus</i> , <i>B. cereus</i> , <i>A. viscosus</i> , <i>P. aeruginosa</i> , <i>E. coli</i> ,, <i>S. typhi</i> , <i>L. acidophilus</i> <i>T. rubrum</i> , <i>C. albicans</i>	Hafiz Abdul Khaliq.(2017); Gaherwal S.(2013).
4.	<i>Ficus racemosa L.</i>	Fruit, Leaf	<i>E.coli</i> , <i>S. aureus</i> , <i>S. typhi</i> , <i>K. pnem</i> , <i>Bacillus subtilis</i> , <i>Pseudomonas aeruginosa</i> , <i>Aspergillus niger</i> and <i>C. albicans</i> , <i>Rhizopus Trichoderma</i> .	Thilagavath T. and Kathiravan G..(2017); Pingale T. <i>et al.</i> (2019); Kingsley, J. (2014).
5.	<i>Ficus religiosa L.</i>	Bark, Leaf	<i>B.subtilis</i> , <i>E.coli</i> , <i>P.vulgaris</i> , <i>S.aureus</i> , <i>S.typhi</i> , <i>S.typhimurium</i> , <i>K.pneumoniae</i> , <i>P.aeruginosa</i> , <i>A.niger</i> , <i>P.chrysogenum</i> , <i>Penicillium gluacum</i> , <i>Paramecium</i> .	Parasharami Varsha A. <i>et al.</i> (2014); Manimozhi D.M. <i>et al.</i> (2012);
6.	<i>Ficus rumphii Blume.</i>	Bark, Leaves, Fruit	<i>Bacillus subtilis</i> , <i>Sarcina lutea</i> , <i>E. Coli</i> , <i>Pseudomonas sp.</i>	Haque Md. Islamul and Azad Md. Mohsin Uddin. (2018).
7.	<i>Mangifera indica L.</i>	Leaf, Seed,Pulp	<i>S aureus</i> , <i>S pyogenes</i> , <i>Streptococcus sp</i> , <i>Pseudomonas aeruginosa</i> , <i>Salmonella typhi</i> , <i>Enterobacter aeruginosa</i> , <i>E.Coli</i> . <i>Candida albicans</i> , <i>Aspergillus niger</i> , <i>Aspergillus fumigates</i> , <i>Aspergillus flavus</i> <i>Herpes simplex virus (HSV) type 2</i> , <i>HIV</i> and <i>hepatitis B virus</i> .	Awad A. <i>et al.</i> (2012); Disegha G. and Akani N. (2019). Parvez, G M Masud. (2016)
8.	<i>Syzygium aromaticum L.</i>	Flower Bud	<i>S. aureus</i> , <i>E. Coli</i> , <i>S. benthamianum</i> , <i>Salmonella typhimurium</i> , <i>Aspergillus flavus</i> , <i>Penicillium citrinum</i> , <i>P. viridicatum</i> , <i>F. oxysproum</i> , <i>F.solani</i> , <i>F. moniforme</i> , <i>T. paradoxa</i> , <i>B. theobromae</i> , <i>R.solani</i> <i>Feline calicivirus (FCV)</i>	Okmen Gulden <i>et al.</i> (2018); Hamini-Kadar N. <i>et al.</i> (2014); Aboubakr Hamada A. <i>et al.</i> (2016)
9.	Pan	<i>Piper betel L</i>	<i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i>	Deans,S.G and M.T. Baratta,1998; Balaji.K <i>et al.</i> , 2011
10.	Halud	<i>Curcuma longa L.</i>	<i>Escherechia coli</i> , <i>Staphylococcus aureus</i> , <i>Klebsiella pneumonia</i> , <i>Staphylococcus epidermidis</i>	Niamsa.N <i>et al</i> ,2009

Table- 4: Medicinal Importance Of Plant Parts Used In Mangal-Ghat :

Sl.No.	Scientific Name	Used Parts	Medicinal Importance	Reference
1.	<i>Areca catechu L.</i>	Nut	<ol style="list-style-type: none"> 1. Useful in the treatment of AIDS (HIV), Gastro Intestinal (GI) disorders, diabetes, Cardiac Disorders, High blood pressure. 2. Areca nut possess anti allergic activity. 3. Areca nut possess anti-helminthic/anti-parasitic activity. 4. Areca nut possess anti- inflammatory activity and Wound healing effect. 	<p>Tiwari, Dr and Talreja, Shreya. (2020);</p> <p>ICAR-Central Plantation Crops Research Institute.</p>
2.	<i>Elettaria cardamomum L.</i>	Fruits	<ol style="list-style-type: none"> 1.It is used as a powerful pleasant aromatic stimulant, carminative, stomachic and diuretic. 2.Seeds of E. cardamomum possess anti-inflammatory, analgesic and antispasmodic properties. 3. Powdered E. Cardamomum posses antihypertensive activity. 4. It can also be used to ease cigarette addiction. 	<p>Sharma S. <i>et al.</i> (2018);</p> <p>Korikanthimathm Vs <i>et al.</i> (2001).</p>
3.	<i>Ficus benghalensis L.</i>	Leaf, Fruit , Bark, Root, Latex	<ol style="list-style-type: none"> 1.It is very effective in various treatments such as dysentery, diarrhoea,diabetes,leucorrhoea, menorrhagia,nervous disorders, tonic and astringent. 2. The water extract of F. benghalensis bark has been reported to possess hypocholesterolaemic and hypolipidaemic effects. 3. Milky juice is used for pains, rheumatism, lumbago and bruises 4. It has antistress and antiallergic activity 	<p>Tripathi, Ruchita <i>et al.</i> (2015);</p> <p>Patel, Ramesh and Gautam, Piyush. (2014).</p>
4.	<i>Ficus racemosa L.</i>	Leaf, Fruit , Seed, Bark, Latex, Root sap	<ol style="list-style-type: none"> 1. The fruits are astringent, stomachic, refrigerent, dry cough, loss of voice, disease of kidney and spleen, astringent to bowel, styptic, tonic, useful in the treatment of leucorrhoea, blood disorder, burning sensation, fatigue, urinary discharges, leprosy, intestinal worms and carminative. 2. Latex is aphrodisiac and administered in haemorrhoids, diarrhoea, diabetes, boils, traumatic swelling, toothache and vaginal disorder. 3.Bark is highly efficacious in threatened abortion and also recommended in urological disorders, diabetes, hiccough, leprosy, dysentery and piles. 4. The leaves are good wash for wounds and ulcers. They are useful in dysentery and diarrhoea. The infusion of bark and leaves is also employed as mouth wash to spongy gums and internally in dysentery, menorrhagia, effective remedy in glandular swelling, abscess, chronic wounds, cervical adenitis and haemoptysis 	<p>Deep P. <i>et al.</i> (2013);</p> <p>Shah S.K. <i>et al.</i> (2016).</p>

Sl.No.	Scientific Name	Used Parts	Medicinal Importance	Reference
5.	<i>Ficus religiosa</i> L.	Leaves, Bark	1. Leaves tied on bleeding wound are reported to immediately stop the flow of blood, it can cure fever and flu. 2. Paste of bark powder mixed with honey gives freshness to face by applied on skin 3. Putting of a few drops of leaves sap in nostrils have been reported to stop nose bleeding. 4. It contain highest amount of Serotonin which is responsible for its anticonvulsant effect	Sandeep <i>et al.</i> (2018); Singh Shailja and Jaiswal Shalini. (2014).
6.	<i>Ficus rumphii</i> Blume.	Bark, Latex, Fruit	1. It's fruit juice after mixing with turmeric, pepper and butter-fat considered efficacious against asthma. 2. The latex and fruits are emetic and anthelmintic, and used to treat itch. 3. The latex is given internally as a vermifuge and for the relief of asthma 4. Bark is used for snakebite.	Wikipedia ; Dogra Kuldip S. <i>et al.</i> (2015).
7.	<i>Mangifera indica</i> L.	Leaf, Stem, Seed, Plup	1. The aqueous and ethanol extract of leaves and stems of manghas activity against bacteria; <i>Staphylococcus aureus</i> , <i>Streptococcus pyogenes</i> , <i>Streptococcus pneumoniae</i> , <i>Pseudomonas aeruginosa</i> , <i>Candida albicans</i> , <i>Enterococcus faecalis</i> . 2. It has Anti-hemorrhagic, Anti-tetanus, Anti-inflammatory, Antidiabetic effects. 3. It has a cardio protective effect. 4. Mangiferin significantly accelerated gastro intestinal tract	Parvez G M Masud. (2016); Khan Nazma <i>et al.</i> (2017).
8.	<i>Syzygium aromaticum</i> L.	Flower Bud	1. Clove is used extensively in dental care for relieving toothache, sore gums and oral ulcers. 2. Clove oil stimulates the circulatory system, clearing the mind and reducing mental exhaustion and fatigue. It has also been used to aid insomnia, memory loss, anxiety and depression. 3. Not only purifies the blood, but also aids in stabilizing blood sugar levels, and may have benefits for diabetic individuals. 4. The active essential oil in clove, eugenol, has been shown to act as an effective platelet inhibitor, preventing blood clot.	Batiha G. E. <i>et al.</i> (2020); Kumar K <i>et al.</i> (2012).
9.	<i>Piper betel</i> L.	leaves	Leaves are used for curing diseases like diabetes, hypertension, boils and abscesses, obesity, wound healing, voice problems, conjunctivitis, constipations, headache, hysteria, itches, Leucorrhoea, swelling of Gum, rheumatism, abrasion, cuts and injuries, halitosis (Bad breath) etc.	Aishwarya et al (2016)
10.	<i>Curcuma longa</i> L.	Rhizome	Rhizome is used to treat several diseases like Leucoderma, Scabies, Urinary discharges, inflammation, Ozonemia, biliousness, dyspepsia, elephantiasis, small pox, swellings, boils, catarrh, diarrhoea, intermittent fever, dropsy, bronchitis, skin diseases etc. and leaf juice for the treatment of dysentery .	Paria N.D.(Ed),2005

Table- 5: Habit, habitat and ecological status

SI No	Common name	Habit	Habitat	Ecological status
1.	Supari	Tree	Terrestrial	Frequent ,Cultivated
2	Elichi	Shrub	Terrestrial	Frequent, Cultivated
3	Bat	Thorny climber	Semi aquatic	Common, wild and Planted
4	Dumur	Tree	Terrestrial	Common, wild and Planted
5	Aswatha	Tree	Terrestrial	Common, wild and Planted
6	Pakar	Tree	Terrestrial	Common, wild and Planted
7	Aam	Tree	Terrestrial	Common, Cultivated
8	Labanga	Shrub	Terrestrial	Cultivated, not grown in this district
9	Pan	Herb, climber	Terrestrial	Cultivated
10	Halud		Terrestrial	Cultivated

Some plant extracts used in Mangal Ghat



Fig: Bat (*Ficus benghalensis* L.)



Fig: Aam (*Mangifera indica* L.)



Fig: Dumur (*Ficus racemosa* L.)
Syn.name- *Ficus glomerata* Roxb.



Fig: Aswatha (*Ficus religiosa* L.)



Fig: Pakar (*Ficus rumphii* Bl.)



Fig: Supari (*Areca catechu* L.)



Fig: Haritaki (*Terminalia chebula* Retz.)

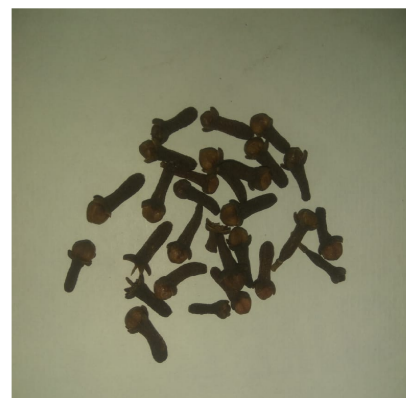


Fig: Labanga (*Syzygium aromaticum* L.)



Fig: Elaichi (*Elettaria cardamomum* L.)



A PREPARED MANGAL GHAT



Pan-*Piper betel* L.



Halud- *Curcuma longa* L.

DISCUSSION :

From the above table it is clear that the TDS (Total dissolve solute) value when compared among the source water and treated water, the value remains slightly higher in case of the treated water. Also after the use of different plant parts, their extracts or products etc. During worshipping of the water as “Shantijal” or “Water of peace” it is observed that the MPN (Most Probable Number) value is somehow

reduced on treating the source water or so called “Shantijal” with different plant parts or their extracts which contain varieties of chemicals(Table no.-2). This can be seen clearly in the ‘Sample 4’ and ‘Sample 5’ water, where the source shows an MPN value of 910 and treated shows a vast decrease of 210. Also in ‘Sample 5’ the source shows an MPN value of 750 and the treated shows a value of 170 which means that the treating effect on the

source water shows antimicrobial properties which are able to reduce the effect of the coliforms present in almost polluted source water. Thus proper use of the plant materials, products or any kind of adulterants if used in a proper optimum amount may reduce the effect and action of microorganisms, the reduction process may not be completed but still effective to some extent.

CONCLUSION:

So, during the project study in the dept. of Botany, funded by the Institution, Midnapore College (Autonomous) attempts have been made to know about the purity and potability of “Water of peace” or called “Shantijal” and also of the source water and its original source from where it has been collected.

In respect of present scenario, the source of water which is kept within Mangal ghat, is generally the pond or river water. Now-a-days this pond water is being polluted for using untreated poultry litter, Cow dung as fish feed by Farmers. So the source water is being polluted by different anthropogenic activities (De D. *et al.*, 2021).

Though these plant products and other components used in Mangal Ghat have antimicrobial activities, but cannot disinfect this so called Peace water or pure water totally because of their less amount and presence of adulterant.

Therefore, we should keep in mind about the

purity or potability of Shanti Jal, otherwise it will create health hazards. During survey it has also been noted that some are using tap water in exchange of Pond or River water as a source of water used in Mangal Ghat and there no such pollution are found. So, time has come to think about it. Further study is needed for anti bacterial assay by these plant extracts which can be used as water purifier. Besides, these plants also have other medicinal values (Table No.- 4). So in this perspective, these plants can be conserved as these are used for worshipping.

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References:

- Aboubakr Hamada A., Nauertz Andrew, Luong Nhungoc T., Agrawal Shivani, El-Sohaimy Sobhy A. A., Youssef Mohammed M. and Goyal Sagar M. In Vitro Antiviral Activity of Clove and Ginger Aqueous Extracts against Feline Calicivirus, a Surrogate for Human Norovirus. *Journal of Food Protection*, 2016, Vol. 79, No. 6, Pages 1001–1012

- Ahmad, S., Rao, H., Akhtar, M., Ahmad, I., & Iqbal, Z. Phytochemical composition and pharmacological prospectus of *Ficus bengalensis* Linn. (Moraceae)- A review. Journal of Medicinal Plants Research, 2011, 5.
- Ahmed, Hamza & Ramadhani, Ashraf & Erwa, Ibrahim. Phytochemical screening, chemical composition and antibacterial activity of essential oil of Cardamom. World Journal of Pharmaceutical Research. 2019, 8. 1166-1175. 10.20959/wjpr20199-15504.
- Aishwarya et al. A review: Nutraceuticals properties of Piper betel (Paan). AJPCT. 2016. (4)(02), 028-041
- Ali Mohammad, Sultana Shahnaz, Mir Showkat Rasool and Rangari Vinod Damoji. Chemical constituents from the roots of *Elephantopus scaber*, and leaves of *Ficus rumphii* and *Iphiona scabra*. European Journal of Pharmaceutical and Medical Research. 2020,7(12), 493-500
- Awad, Amgad & MRP, Joseph & Mahmoud, Ismail & Abdelkareem, Abdelkareem & Al-Hakami, Ahmed & Hamid, Mohamed. Antimicrobial Activities of Seed Extracts of Mango (*Mangifera indica* L.). Advances in Microbiology. 2012. 2. 571-576.. 10.4236/aim.2012.24074.
- Batiha, G. E., Alkazmi, L. M., Wasef, L. G., Beshbishy, A. M., Nadwa, E. H., & Rashwan, E. K. *Syzygium aromaticum* L. (Myrtaceae): Traditional Uses, Bioactive Chemical Constituents, Pharmacological and Toxicological Activities. *Biomolecules*, 2020, 10(2), 202. <https://doi.org/10.3390/biom10020202>
- Bennet S.S.R. Name Changes in flowering plants of India and Adjacent Region, Triseas Publishers, Dehra dun, 1987
- Bhattacharya Shyamacharan, Bhaabaadev paddhati, 1948, 1st Ed.
- Bhattacharya Surendra Mohan, Purohit Darpan, 1904, 1st Ed.
- Chaudhary S, Alok S and Verma. A: Phytochemical Screening and Chromatographic Evaluation of *Ficus Benghalensis* Leaves. Int J Pharm Sci Res; 2016, 7(8): 3522-32. doi: 10.13040/IJPSR.0975-8232.7(8).3522-32
- Cyriac, Maria & Vidya, Pai & Varghese, Ipe & Shantaram, Manjula & Jose, Maji. Antimicrobial properties of *Areca catechu* (Areca nut) husk extracts against common oral pathogens. International journal of research in Ayurveda and Pharmacy. 2012. 3. 81-84.
- De Dulal, Mandal Debojyoti and Giri Sreyashri. Effect Of Anthropogenic Activities On The Water Quality Of Community Pond In Keshpur Block Of Paschim Medinipur - A Survey Report. IJEP ,2021,41 (4) : 403-411.
- Deans, S.G. and M.T. Baratta, Antimicrobial

- and antioxidant properties of some essential oils, *Flav. Fragrance*, 1998.13.235-244
- Deep, Prakash & Singh, Amrit & Ansari, Mohammed Tahir & Raghav, Prashant. Pharmacological Potentials of *Ficus racemosa* - A Review. *International Journal of Pharmaceutical Sciences Review and Research*. 2013. 22. 29-34.
 - Devanesan Enit Beena, Anand Arumugam Vijaya , Kumar Palanisamy Sampath , Vinayagamoorthy Puthamohan and Basavaraju Preethi. *Phytochemistry and Pharmacology of Ficus religiosa . Systematic Reviews in Pharmacy*, 2018, 9(1):45-48
 - Disegha, Gabriel & Akani, Nedie. Antifungal activity of *Mangifera indica* leaf extracts on selected fungi. 2019. 4. 46-58.
 - Dogra Kuldip S., Chauhan Sandeep and Jalal Jeewan S. Assessment of Indian medicinal plants for the treatment of asthma. *Journal of Medicinal Plants Research*. 2015. Vol. 9(32), pp. 851-862.
 - Gaherwal S. Anti-Bacterial Activity of *Ficus benghalensis* (Banyan) Fruit Extract Against Different Bacteria. *International Journal of Microbiological Research*, 2013, 4 (2): 177-179.
 - Gaylor, Razafimamonjison & Jahiel, Michel & Thierry, Duclos & Ramanoelina, Panja & Fawbush, Fanja & Danthu, Pascal. Bud, leaf and stem essential oil composition of *Syzygium aromaticum* from Madagascar, Indonesia and Zanzibar. *International Journal of Basic and Applied Sciences*. 2014. 3. 10.14419/ijbas.v3i3.2473.
 - Hafiz Abdul Khaliq. A review of pharmacognostic, physicochemical, phytochemical and pharmacological studies on *Ficus bengalensis* L.. *Journal of Scientific and Innovative Research ; 2017; 6(4): 151-163*
 - Hamini-Kadar N , Hamdane F, Boutoutaou R, Kihal M and Henni J E. Antifungal activity of clove (*Syzygium aromaticum* L.) Essential oil against phytopathogenic fungi of tomato (*Solanum lycopersicum* L) in algeria. *Journal of Experimental Biology and Agricultural Sciences; 2014; Volume – 2(5)*.
 - Haque Md. Islamul and Azad Md. Mohsin Uddin. A Study on the Chemical Separation of *Ficus Rumphii* Blume Extract. *Global Journal of Science Frontier Research: B Chemistry*. 2018. Volume 18 Issue 1 Version 1.0.
 - <http://en.m.wikipedia.org> (received on 16.08.08.21)
 - <https://www.mapsofindia.com/maps/westbengal/districts/medinipur.html> (received on 16.08.08.21)
 - <http://www.thehindu.com> (received on 16.08.08.21)
 - ICAR-Central Plantation Crops Research Institute. Kasaragod-671124, Kerala. Health

- benefits of Arecanut.
- Jazila El Malti, Driss Mountassif and Hamid Amarouch. Antimicrobial activity of *Elettaria cardamomum*: Toxicity, biochemical and histological studies, Food Chemistry, 2007, Volume 104, Issue 4, Pages 1560-1568.
 - Jimoh, Simiat & Arowolo, Lateefah & Alabi, Kazeem. Phytochemical Screening and Antimicrobial Evaluation of *Syzygium aromaticum* Extract and Essential oil. International Journal of Current Microbiology and Applied Sciences. 2017. 6. 4557-4567. 10.20546/ijemas.2017.607.476.
 - Kabir, Yearul & Shekhar, Hossain & Sidhu, Jiwan. Phytochemical Compounds in Functional Properties of Mangoes. 2017. 10.1002/9781119014362.ch12.
 - Kabyabhusan Bhagabaticharan, Hindu kriya kalpadrum, 1937, 1st Ed.
 - Kaushik Purshotam, Goyal Pankaj, Chauhan Abhishek and Chauhan Garima. In Vitro Evaluation of Antibacterial Potential of Dry Fruit Extracts of *Elettaria cardamomum* Maton (Chhoti Elaichi). Iranian Journal of Pharmaceutical Research, 2010, 9 (3): 287-292.
 - Kaveti Balaji, Lisa Tan, Sarania, Tan Sin Kaun, Mirza Baig. Antibacterial activity of *Piper betel* leaves. IJPTP. 2011.2(3), 129-132
 - Khan, Nazma & Khushtar, Mohd & Ahmad, Nesar & Hasan, Noorul & Khan, Zafar & Idris, Sahar & Ahmad, Aijaz & Zishan, Mohd. Nutritional importance and pharmacological activity of *Mangifera indica*. World journal of pharmacy and pharmaceutical sciences. 2017. 6. 258-273. 10.20959/wjpps20175-8974.
 - Kingsley, J. & Prashant, J & Tirkey, Manik & Chauhan, Ritika & Abraham, Jayanthi. Evaluation of antimicrobial activity of *Ficus Racemosa* Linn leaves extract. International Journal of Pharmacy and Technology. 2014. 6. 5-7.
 - Korikanthimathm, Vs & Prasath, D. & Rao, Govardhana. Medicinal properties of *Elettaria cardamomum*. J Med Aromat Plant Sci. 2001. 22/23.
 - Kumar, K. & Yadav, Akhilesh & Srivastava, Shweta & Paswan, Shravan. Recent Trends in Indian Traditional Herbs *Syzygium Aromaticum* and its Health Benefits. J Pharmacogn Phytochem. 2012. 1.
 - Manimozhi D.M., Sankaranarayanan S. and Kumar GS. Effect of different extracts of stem bark of *Ficus* sp. on multidrug resistant pathogenic bacteria. *Int J Pharm Sci Res*; 2012; Vol. 3(7): 2122-2129
 - Mohiuddin, Abdul Kader & Lia, Sayra. PHYTOCHEMICAL SCREENING & BIOLOGICAL INVESTIGATIONS OF *Ficus racemosa*. 2020. 10.5281/zenodo.3970120.

- Moulai-Hacene, Faiza & Boufadi, Mokhtaria Yasmina & Keddari, Soumia & Homrani, Abdelkader. Chemical Composition and Antimicrobial Properties of *Elettaria cardamomum* Extract. Pharmacognosy Journal. 2020. 12. 1058-1063. 10.5530/pj.2020.12.149.
- Niansa.N and C. Sittiwet. Antimicrobial activity of Curcuma longa aquas extracts. J.Pharmacol.Toxicol.. 2009. 4(4),173-177
- Niranjan A.and Dhan Prakash. Chemical constituents and biological activities of turmeric(*Curcuma longa* L.) –A review- J. Food Sci Technol. 2008. 42(2),109-116.
- Nisreen J M Al-Bayati. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2016. 7(6).282.
- Okmen Gulten , Mammadhkanli Mahabbat and Vurkun Mustafa. The antibacterial activities of *Syzygium aromaticum* (L.) Merr. & perry against oral bacteria and its antioxidant and antimutagenic activities. International Journal of Pharmaceutical Sciences and Research. ; 2018. Vol. 9(11): 4634-4641.
- Okwu Donatus Ebere and Ezenagu Vitus. Evaluation of the phytochemical composition of mango (*Mangifera indica* linn) stem bark and leaves. Int. J. Chem. Sci.: 2008, 6(2)
- Parasharami Varsha A., Vati Vindya, Rabade Bhakti and Mehta Urmil J. Recent Antimicrobial and Pharmacological studies in *Ficus religiosa* Linn. Int.J.Curr.Microbiol.App.Sci , 2014: 3(1): 461-475.
- Parvez, G M Masud. Pharmacological Activities of Mango (*Mangifera indica*): A Review . Journal of Pharmacognosy and Phytochemistry , 2016: 5(3): 01-07.
- Paschim Medinipur, West Bengal- Wikipedia (received on 16.08.08.21)
- Patel, Ramesh & Gautam, Piyush. Medicinal potency of *Ficus bengalensis*: a review International Journal of Medicinal Chemistry & Analysis. 2014. 4. 53-58.
- Pingale T, Duse P, Ogale S. Antibacterial and Antifungal Approaches of *Ficus racemosa*. Pharmacog J. 2019. 11(2):355-7
- Prain D. Bengal plants, Botanical Survey of India, Kolkata, 1963 ,Vol. I & II , Reprinted Ed.
- Prakash, Ved & Gandotra, Shivali & Kumar, Prateek & Singh, Nishtha. Phytochemical Screening and Antimicrobial Activity of *Ficus religiosa*. Journal of Pharmaceutical Sciences and Research. 2017. 9. 100-101.
- Rajamani, Ranjithkumar & Kuppusamy, K.Selvam & M, Shanmugavadivu & Devadass, Dr. Rajmohan. Preliminary Phytochemical Screening of Aqueous Extract of Betel Nut and Betel Leaves. International Journal of Biosciences and Nanosciences. 2016. 3. 14-18.

- Sandeep, & Kumar, Ashwani & Sepla, Dimple & Tomer, Vidisha & Gat, Yogesh & Kumar, Vikas. *Ficus religiosa*: A wholesome medicinal tree. *Journal of Pharmacognosy and Phytochemistry*, 2018; 7(4): 32-37
- Sari, L. M., Hakim, R. F., Mubarak, Z., & Andriyanto, A. Analysis of phenolic compounds and immunomodulatory activity of areca nut extract from Aceh, Indonesia, against *Staphylococcus aureus* infection in Sprague-Dawley rats. *Veterinary world*, 2020, 13(1), 134–140. <https://doi.org/10.14202/vetworld.2020.134-140>
- Shah Sunil Kumar, Garg Gopal, Jhade Deenanath, Pandey Harish. *Ficus racemosa* Linn: Its Potentials Food Security and Rural Medicinal Management (Review Article). *J. Pharm. Sci. & Res.* 2016, Vol. 8(5), 317-322.
- Sharma, Shveta & Sharma, Jagmohan & Kaur, Gurpreet. International journal of drug formulation and research Therapeutic uses of *Elettaria cardomum*. 2018. 10.13140/RG.2.2.12210.91848.
- Singh Shailja and Jaiswal Shalini. Therapeutic Properties of *Ficus regligiosa*. *International Journal of Engineering Research and General Science*, 2014, Volume 2, Issue 5.
- Thilagavath T. and Kathiravan G. Phytochemical Analysis and Antimicrobial Activity of Ethonolic Leaf Extract of *Ficus racemosa* Linn. *Research J. Pharm. and Tech.*; 2017: 10(2): 537-540. doi: 10.5958/0974-360X.2017.00107.X
- Tiwari, Dr & Talreja, Shreya. A Pharmacological And Medicinal Study Of Areca Palm And Nuts: An Overview. *Research Journal of Pharmaceutical, Biological and Chemical Sciences.* 2020. 11. 100-108. 10.33887/rjpbcs/2020.11.5.12.
- Tripathi, Ruchita & Kumar, Abhishek & Kumar, Sanjeev & Prakash, Satya & Singh, Anil. *Ficus benghalensis* Linn.: A Tribal Medicine with Vast Commercial Potential. *Indian Journal of Agriculture and Allied Sciences.* 2015. 1(3).
- Paschim Medinipur, West Bengal-Wikipedia (received on 16.08.08.21) <https://www.mapsofindia.com/maps/westbengal/districts/medinipur.html>((received on 16.08.08.21)