



THERAPEUTIC EFFECTS OF COW URINE AND DUNG

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Article Received on 07/03/2016

Article Revised on 28/03/2016

Article Accepted on 19/04/2016

ABSTRACT

Since thousands of years, we worship cow as "KAMADHENU", the God who fulfills our desire. We worship cow as the mother of all entities, which gives all pleasures to everyone. The utility of cow dung, cow urine & other gavyas of Panchgavya are being investigated by using modern tools in term of relevant scientific research. The findings are reestablishing the lost glory of cattle and its utility for mankind. Cow dung and urine have now proved to be prime rich resource base which has been clearly said in ancient text "Gomaye Vaste Laxmi". Westerners adopted a different paradigm, namely "Doodhmaye Vaste Laxmi" implying that. the milk is the only valuable product from cow. Now a days Almost every house hold has one or more patients suffering from environmentally influenced diseases such as diabetes, hypertension, heart troubles, renal failures, depression, cancer, asthma In India, drinking of cow's urine has been practiced for thousands of years. One form of cow's urine with popular use now a day is cow's urine distillate (Gomutra – arka – in Ayurveda). A transparent liquid obtained when cow's urine is subjected to the process of distillation. This distillate shows more acceptability than crude cow's urine and also shows all properties equal to crude cow's urine. Recent researchers prove that cow's urine distillate acts as a bio-enhancer of antibiotic activity. Traditionally cow dung has been used as a fertilizer, though today dung is collected and used to produce biogas. This gas is rich in methane and is used in rural areas of India/Pakistan and elsewhere to provide a renewable and stable source of electricity. The cow dung is utilized for fields, plants as fertilizer. The cow dung is used for gas plants. The cow dung is an efficacious disinfectant and often used as fuel in lieu of firewood in India. Additionaly smoke from a dung fire keeps flies away and acts as mosquito repellent.

KEYWORD: gavyas of Panchgavya, Gomaye Vaste Laxmi.

INTRODUCTION

Cow, *Bos indicus* a most valuable animal in all composition containing cow's excretions, urine, dung, milk, curd and ghee, five ingredients together known as "Panchagavya" is given to women after she delivers a baby. Panchagavya is the main ingredient of many of our ayurvedic preparations.^[1] Cowpathy (Sanskrit: Panchagavya) is a treatment based on the products obtained from cows, used in Ayurvedic medicine.^[2] Ancient literature in Ayurveda states that cow's urine is one of the best natural remedies to cure many bacterial and fungal diseases.^[3] According to ancient literatures distillate of cow urine was the one to be used mainly and the distillate was found to exhibit antioxidant effect, Cow is also used along with herbs to treat various diseases like fever, epilepsy, anemia, abdominal pain, healers.^[4] Cow's urine (Sanskrit: Gomutra) is being used as an effective medicine. Recent researches prove that cow's

urine therapy is capable of curing several diseases, including certain types of cancer.^[5] A lots of research has been conducted in Cow Urine Treatment and Research Center, Indore over the past few years and it has been reported that gomutra is capable of curing blood pressure, blocking arteries, arthritis, diabetes, heart attack, cancer, thyroid, asthma, psoriasis, eczema, prostrate, AIDS, piles, migraine, ulcer, acidity, constipation, gynaecological problems, ear and nose problems and several other diseases.^[6] Cow dung is very helpful as micro organisms present in Cow dung are helpful for decreasing the value of total petroleum hydrocarbons and also helps in improving the soil properties like pH and electrical conductivity. This technology not only decreases the amount of pollutants in soil but also helpful in increasing nutrients of soil as well as helpful in enhancement of soil properties like water holding capacity, softness etc for enhances growth

of plant.^[7] In the rural villages on India, cow's urine is being used since a very long time, as an effective antiseptic for wounds, skin diseases, bathing, etc. In rural houses, people dilute cow's urine with water and use it as a natural disinfectant to purify their premises. With an approximate shelf life of around 5 years, this can prove to be the most effective natural antiseptic and disinfectant, when compared to the synthetic chemicals that are currently available to the consumers. It strengthens the fact that cow's urine is not a toxic effluent, 95% of its content being water, 2.5% of urea, and the remaining 2.5% a mixture of minerals, salts, hormones and enzymes^[8] It has again been observed that cow urine enhances the phagocytic activity of macrophages and thus helpful against bacterial infections. It also facilitates the synthesis of interleukin-1 and interleukin-2.^[9] While externally it has been used as lotion, ointments and bath, but, internally it has been used in preparation of oral medications and drinks. There is existence of innumerable instances in various ancient medical texts of the curative properties of cow urine for a horde of human ailments. In ancient Indian system of medicine, urine of cow was accepted, used almost as a broad spectrum antibiotic quite akin to that of twenty first century. The cow urine not only used against

ailments of diseases as therapeutic agents but also have several other uses as in agriculture and sericulture sectors. So this article attempts to bring forth the diversified use of this heretical potion as was in vogue in ancient Indian system of medicine as gleaned from the ancient medical texts and current scientific findings.^[10]

Cow urine composition

The biochemical estimation of cow urine has shown that it contains sodium, nitrogen, sulphur, Vitamin A, B, C, D, E, minerals, manganese, iron, silicon, chlorine, magnesium, citric, succinic, calcium salts, phosphate, lactose, carbolic acid, enzymes, creatinine and hormones. Any deficiency or excess of these substances inside the body causes disorders. Cow urine contains all of these substances with having a balanced proximate composition. Therefore, consumption of cow urine restores the balance of these substances and thus helps in curing from incurable disease Experimentally it has been concluded that fractions of cow urine obtained by solvent extraction possess antimicrobial activity due to presence of aforesaid components those are solely responsible for the action. It has again been observed that cow urine enhances the phagocytic activity of macrophages and thus helpful against bacterial infections.^[14]

S.NO.	Chemical Constituent	Uses
1	Nitrogen	Removes blood abnormalities and toxins, Natural stimulant of urinary track, activates kidneys and it is diuretic
2	Sulphur	Supports motion in large intestines. Cleanses blood
3	Ammonia	Stabilize bile, mucus and air of body. Stabilizes blood formation
4	Copper	Controls built up of unwanted fats.
5	Iron	Maintains balance and helps in production of red blood cells & haemoglobin. Stabilizes working power
6	Urea	Affects urine formation and removal. Germicidal.
7	Uric Acid	Removes heart swelling or inflammation. It is diuretic therefore destroys toxins.
8	Phosphate	Helps in removing stones from urinary track
9	Sodium	Purifies blood. Antacid
10	Potassium	Cures hereditary rheumatism. Increases appetite. Removes muscular weakness and laziness.
11	Manganese	Germicidal, stops growth of germs, protects against decay due to gangrene
12	Carbolic acid	Germicidal, stops growth of germs and decay due to gangrene.
13	Calcium	Blood purifier, bone strengtheners, germicidal.
14	Salt	Decreases acidic contents of blood, germicidal
15	Vitamins A, B, C, D, E	Vitamin B is active ingredient for energetic life and saves from nervousness and thirst, strengthens bones and reproductive ingredient for energetic life and saves from nervousness and thirst, strengthens bones and reproductive power
16	Other Minerals	Increase immunity
17	Lactose	Gives satisfaction.,strengths heart, removes thirst and nervousness.
18	Enzymes	Make healthy digestive juices, increase immunity
19	Water	It is a life giver. Maintains fluidity of blood, maintains body

		temperature
20	Hippuric acid	Removes toxins through urine
21	Creatinin	Germicide.
22	Aurum Hydroxide	It is germicidal and increases immunity power. AuOH is highly antibiotic and antitoxic.

Composition of cow dung

Nowadays cow dung is accepted as a fertilizer and has an important role to protect the harmful radiation and preserve environment. It is used as disinfectant and the popular use to burn cow dung is thought to repel mosquito but mechanism is not get elucidated. Low C:N ratio indicates good source of protein for microbes involved in decomposition of organic matter. Cow dung contains the three major plant nutrients, nitrogen, phosphorus and potassium (NPK), as well as many essential nutrients such as Ca, Mg, S, Zn, B, Cu, Mn etc. That, in addition to supplying plant nutrients, manure generally improves soil tilt, aeration, and water holding capacity of the soil and promotes growth of beneficial soil organisms. The application of cow dung manure and vermin compost increases soil organic matter content, and this leads to improved water infiltration and water holding capacity as well as an increased cation exchange capacity. If inorganic fertilizer, especially nitrogen, is combined with manure, the manure reduces soil acidification and improves the nutrient buffering capacity and the release of nutrients. The soil productivity is also related to available nutrient source in either through manures (dung) or chemical fertilizers (superphosphate etc). Dung increased pH, CEC, total N, organic C, loss on ignition, and exchangeable Mg and Ca. It decreased sulphate sorption. Moreover, cow dung manure plays a significant role in maintaining the nutrient status of the plant. Vermi composting of cow manure using earthworm species favoured nitrification, resulting in the rapid conversion of ammonium-nitrogen to nitrate-nitrogen. Therefore it improves the nutrient cycling and helping to convert unavailable nitrogen in available forms to plants.^[12] Its dung is known as best manure and best soil fertilizers throughout the world. Indian Cow has been considered as symbol of wealth since ancient time. The crop grown in soil which has used cow manure have high yield and have better quality grains as compared to artificial manure. In this research property of soil was checked before and after adding of cow dung. Cow dung can play an important role in treatment of soil polluted with lubricant oil and concluded that bioremediation can play an important role in treating soil polluted with petroleum hydrocarbon.^[13]

They have discussed that in cases of metal contamination, accumulation of heavy metals from regular application of inorganic fertilizer to soils cultivated with oil palm, cow dung can be used to immobilize the heavy metals in the contaminated soil.^[14]

Addition of cow dung will increase the organic carbon content of degraded soil which may lead to the increasing activity of beneficial soil microorganisms. The activity of nitrogen fixing bacteria like *Azotobacter* (*Azotobacter chroococcum*) etc. will increase and more

atmospheric nitrogen may be accumulated in soil, which may lead to increase available nitrogen content as well as the fertility status of soil. More over the availability of nutrients for the plants from the soil will also increase. Increased porosity of soil will also increase aeration in soil and produce a favourable condition for plant growth.

Cow dung application increase the organic matter in the soil which regulate the soil reaction (pH). In acidic soil its application increase the pH where as in alkali soils it decrease the pH. and thus create favourable conditions for availability of maximum nutrients to plants (pH range 6.5 to 7.8). Of course it is beneficial to most of the physical & physico-chemical properties of soil.

Glorification and Benefits of Cow Urine

Amongst urines, cow urine is best. In Ayurveda where ever urine is mentioned, it is to be understood as cow urine. Statements of scriptures confirm this. Cow is our mother and we are her children. Therefore, cow urine is beneficial. Cow urine has amazing germicidal power to kill varieties of germs. All germ generated diseases are thus destroyed. According to Ayurveda the cause of all diseases is the imbalance in three faults (tri-dosas) i.e. mucous, bile and air. Cow urine balances the tri-dosas, thus diseases are cured. Cow urine corrects functioning of liver. So, liver makes healthy pure blood. It gives disease resistance power to the body. There are some micronutrients in our body, which give life strength. These micronutrients are flushed out through urine. Therefore gradually ageing steps in our body. Cow urine has all elements, which compensate for deficiency of nutrients in our body, which are required for healthy life. Thus Cow urine stops ageing process. So it is called an elixir and also life giving. Cow urine contains many minerals especially Copper, gold salts, etc. It compensates for bodily mineral deficiency. Presence of gold salts protects body against diseases. Mental tension hurts nervous system. Cow urine is called *medhya* and *hradya*, which means it, gives strength to brain and heart. Thus cow urine protects heart and brain from damages caused by mental tension and protects these organs from disorders and diseases.

Excessive use of any medicine leaves some residue in our body. This residue causes diseases. Cow urine destroys the poisonous effects of residues and makes body disease free. Electric currents (rays) which are present in the environment keep our body healthy. These rays in form of extremely small currents enter our body through Copper in our body. We get Copper from cow urine. To attract these electric waves is quality of Copper. Thus we become healthy. By acting against the voice of soul (immoral & sinful action), the heart and

mind become narrow minded. Due to this the functioning of body is effected and causes diseases. Cow urine provides mode of goodness. Thus helps us to perform correct activities by mind. Thus protects from diseases. In scriptures some diseases are said to be due to sinful actions performed in previous lives which we have to bear. Ganga resides in cow urine. Ganga is destroyer of sins, thus cow urine destroys such previous sins and so diseases are cured. In scriptures some diseases are said to be due to sinful actions performed in previous lives which we have to bear. Ganga resides in cow urine. Ganga is destroyer of sins, thus cow urine destroys such previous sins and so diseases are cured. The diseases caused by entrance of ghosts in body are cured by intake of cow urine. The Master of ghosts is Lord Shiva. Lord Shiva holds Ganga on his head. Ganga is in cow urine also. Thus by taking cow urine, the ghosts get to see Ganga over their master's head. So they are calmed and become peaceful. So they do not trouble the body. Thus, diseases caused by entrance of ghosts are also destroyed. By regularly taking cow urine before sickness, we get so much immunity that any attack of diseases is repulsed. Cow urine being miraculous poison destroyer, destroys the disease caused by poison (Toxin). Extremely dangerous chemicals are purified by cow urine. Cow urine provides immunity power by increasing resistance power against diseases in human body. It is anti toxin. Sarve rogaah hi mandagnau" All diseases begin with mandagni (Low fire i.e. digestive capacity). If fire is strong, diseases won't occur. Cow urine keeps the fire strong.

Cow urine is believed to have therapeutic value and used in many drug formulations. Essentially, cow urine is used as disinfectant and for purification. With an approximate shelf life of around 5 years, this can prove to be the most effective natural antiseptic and disinfectant, when compared to the synthetic chemicals those are currently available to the consumers. Thus, it strengthens the fact that cow's urine is not a toxic effluent as 95% of its content being water, 2.5% urea and the remaining 2.5%, a mixture of minerals, salts, hormones and enzymes. In the rural villages in India, cow's urine is being used since a very long time as an effective antiseptic for wounds, skin diseases, bathing, etc. Ancient Indian Vedic Scriptures including Manu Smriti, Charaka Samhita and Sushruta Samhita and present day researchers have quoted that rational use of this animal product eliminates any non-functionality of respiratory systems, hepato-gastro-intestinal systems, cardiovascular systems, cancer and many others [15,16]. Distilled Cow urine Sodium ,nitrogen and sulphur Vitamins A,B,C,D and E Treatment of vitamin deficiency patients minerals, manganese, iron, silicon, chlorine and magnesium Blood purification phosphate, lactose, carbolic acid and enzymes Stimulate pepsin Citric, succinate calcium salts Anti aging effect Creatinine Maintains the bilirubine concentration Hormones Treatment hormonal imbalance patients

As therapeutic agent

Cow urine is basically an excellent germicide and a potent antibiotic. Therefore, cow urine therapy destroys all the pathogenic organisms and if it is taken on a daily basis, it boosts immunity. Some of the diseases that are proven to be cured by cow urine are Cough, Dysmenorrhoea, Migraine or headache, Constipation, Thyroid and Skin diseases like eczema, ringworm, and itching, Acne, Cancer, Heart Diseases, Musculoskeletal Disorders, Male Sexual Disorders, AIDS, Diabetes Mellitus, Blood Disorders, Respiratory Disorders, Gastrointestinal Disorders, Endocrine Disorders, Gynaecological Disorders, Ophthalmic Disorders, Psychiatric Disorders, Urological Disorders, Asthma, Kidney Shrinkage, Hepatic Disorders and Cancer etc. Presence of urea, creatinine, swarnkshar (aurum hydroxide), carbolic acid, phenols, calcium and manganese have strongly explained for exhibition of antimicrobial and germicidal properties of cow urine. On the other hand uric acid's antioxidant property and allantoin correlates with its anticancer effect. Urine consumption improves immunity is due to presence of swarnkshar and fastens wound healing process which is due to allantoin. Cardiovascular system is maintained by a number of its attributes as kallikrein acts as a vasodilator, the enzyme urokinase is a fibrinolyte, ammonia maintains the structural integrity of blood corpuscles, nitrogen, sulfur, sodium and calcium components act as blood purifiers, while iron and erythropoietin stimulating factor maintain hemoglobin levels. It contains nitrogen in very high concentration which acts as a renal stimulant, whereas uric acid, phosphates and hippuric acid act as diuretic agents. Presence of copper and calcium promote its anti-obesity and skeletal/ bone health effect. Aurum hydroxide and copper act as antidotes for various poisons in the body as certain poisons can be refined and purified if soaked in go-mutra for 3 days. Guggul (Commiphora mukul), bhalataka (Semecarpus anacardium), loha (iron) and silver can be purified and aconite (Aconitum napellus) detoxified using this cow urine therapy. Apart from curing diseases, cow urine also helps in maintaining the homeostasis of body where it affects certain body functions by lowering cholesterol level, relieving tension, improving memory, enhancing the functioning of liver, slowing the aging process, giving strength to brain, heart and also destroying the toxic effects of medicinal residues in the body. In fact, if cow urine is taken regularly even without having any illness, it keeps our body healthy by boosting immunity, by eliminating toxic substances through generation of antioxidants and scavenging of free radicals. Recent study have proved that cow urine, distillate, re-distillate and residues, all exhibit antioxidant activity and that cow urine could be a potential source of natural antioxidant that could have greater importance as supportive therapy in preventing or slowing oxidative stress related degenerative diseases. [17-21]

As A pesticide

Panchgawya' made up of five cow products; milk, curd, ghee, urine and dung, is also used as fertilizers and pesticides in agricultural operations. As per recent studies cow urine has proved to be an effective pest controller and larvicide when used alone and also in combination with different plant preparations by enhancing the efficacy of different herbal preparations. The recent invention related to cow urine was its role as a bioenhancer. Distillate cow's urine is an activity enhancer and availability facilitator for bio active molecules (antibiotic, antifungal and anticancer drugs). The distillate helps in absorption of antibiotic across the cell membrane in animal cells, gram positive and gram negative bacteria at 40-50°C, transport across the gut wall by two to seven times. It also increases the activity of gonadotropin releasing hormone conjugate with bovine serum albumin (GnRH-BSA) and zinc. The GnRH-BSA conjugate has a deleterious effect on reproductive hormones and estrous cycles of female mice. So, concentrated cow urine acts as a bio-enhancer of immunization efficacy to modulate these effects. Cow urine has been granted US Patents (No. 6,896,907, 6,410,059 and 6,410,059) for its medicinal properties. It acts as a bio-enhancer of anti-infective, anticancer agents/nutrients from compounds, antibiotics drugs, therapeutic, nutraceuticals, ions, and also independently as a bioactive agent.^[22-25]

In agriculture

Cow's urine boosted the annual rye grass yield by causing an increase in nitrogen (N) component of the soil and a marked depression in nitrogen fixation by 10% annually in clovers particularly in winter. The effects on yield lasted 2-3 harvests and were followed by a decrease in clover growth. Total Nitrogen content in the cow urine is very high ranging from 6.8 to 21.6 g N/l, out of which an average of 69% is urea. Urine increased the N concentration of grass (particularly the nitrate fraction) and increased the potassium concentration of grass and clover. Increased pasture growth from urine patches has been observed even following high N fertilizer application which may be due to greater amount of N applied or to some interaction with one of the other elements in urine such as potassium or sulphur.^[26] Estimation of nitrogen content by using khejldal method.^[27]

For better rearing of honeybees

Scientists in Uttarakhand are making use of cow urine to save bees from microbial diseases during the rearing process. Cow urine facilitated rapid and holistic recovery in disease infected combs, promoted the growth of brood, enhanced the efficiency of the worker bees in the colonies, thus revealed that the cow urine can serve as a potential eco-friendly measure for management of European foulbrood (EFB), a serious, bacterial disease of honeybee brood found throughout the world in honeybee

colonies and also as an indirect control of mite diseases in colonies.^[28]

The Effects of Bull Urine on Puberty and Calving Date in Crossbred Beef Heifers

Earlier studies have proposed for the presence of a priming pheromone in bull urine that can hasten the onset of puberty in beef heifers. If heifers calve earlier in the calving season, then they can be expected to continue to calve early throughout their lifetime. It also allows for more effective management of the calf crop through early weaning more efficiently and simultaneously allows a longer period to re-establish ovarian cycle before the next breeding period. Thus, treatment with bull urine has potential applications for abbreviating the calving season in beef heifers.^[29]

The effect of cow urine on ovipositor cues to mosquitoes

Study the seasonal evaluation of the efficiency of cow urine in producing ovipositor cues to *Anopheles gambiae* and *Culex quinquefasciatus*. Cow urine both fresh and 7 days aged had a positive influence on oviposition behavioral response as measured using Oviposition Activity Index (OAI) in mosquitoes. The OAI was positive in both the species of mosquito which differed species wise as well as under experimental conditions, but was maximum in rainy season than dry months of the year. They inferred that due to microbial activities, the chemical compounds could have been produced due to ageing in cow urine as by-products that might influence ovipositor attraction and/ or deterrence cues for each mosquito species. Furthermore, the presence of chemicals and continued decomposition of cow urine increases microbial colonies which might have generated more volatile compounds that attract gravid mosquitoes' to oviposit. Thus, cow urine may act as an effective oviposition attractant, which is locally available, economical and reliable, hence can be deployed in aggregating mosquitoes' larval habitats for use in the therapeutic planning and management of effective control of malaria.^[30-33]

Antioxidant activity

The antioxidant activity of fresh urine and its distillates was carried out using two methods, DPPH radical scavenging activity and incubated at 37°C for 24 h and Superoxide scavenging activity. Ascorbic acid was used as the standard.^[34] DPPH radical scavenging activity was measured by spectrophotometric method. To a methanolic solution of DPPH (100 µM, 2.95 ml), 0.05 ml test compound dissolved in methanol was added at different concentrations (1-5 mg ml⁻¹). Equal amount of methanol was added to the control. Absorbance was recorded at 517 nm at regular intervals of 10 minutes for 20 minutes. The percentage reduction was calculated as per the formula-

$$\% \text{ Reduction} = \frac{\text{Control absorbance} - \text{Test absorbance}}{\text{Control absorbance}} \times 100$$

Superoxide scavenging activity was carried out by using alkaline DMSO method. Solid potassium superoxide was allowed to stand in contact with dry DMSO for at least 24 hours and the solution was filtered immediately before use. Filtrate (200 μ l) was added to 2.8 ml of an aqueous solution containing nitro blue tetrazolium (56 μ M), EDTA (10 μ M) and potassium phosphate buffer (10

mM). Sample of urine 1 ml at various concentrations (1-5 mg ml⁻¹) was added and the absorbance was recorded at 560 nm against a control in which pure DMSO has been added instead of alkaline DMSO. The percentage reduction was calculated using the formula.

$$\% \text{ Reduction} = \frac{\text{Control absorbance} - \text{Test absorbance}}{\text{Control absorbance}} \times 100$$

Antimicrobial activity

The antimicrobial activity of cow urine and its distillates was tested by agar well diffusion method for the following strains of microbes like *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermitis*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Proteus vulgaris*. Size of the well was 10 mm and 0.5 ml of urine and its distillate was introduced. Ofloxacin 10 μ g ml was used as the standard for the study. The petri dishes were then incubated at 37°C for 24 h and the zone of inhibition was measured.^[35]

It has again been observed that cow urine enhances the phagocytic activity of macrophages and thus helpful against bacterial infections. It also facilitates the synthesis of interleukin-1 and interleukin-2, augments B- and T-lymphocyte blastogenesis, and IgA, IgM and IgG antibody titers.

Cow dung and soil productivity

Soil provides numerous essential ecosystem services such as primary production (including agricultural and forestry products); regulation of biogeochemical cycle (with consequences of the climate); water filtration, resistance to diseases and pests and regulation of above ground biodiversity. Soil fertility depletion is the single most important constraint to food security. Manure is an important input for maintaining and enhancing soil fertility. The application of cow dung manure and vermin compost increases soil organic matter content, and this leads to improved water infiltration and water holding capacity as well as an increased cation exchange capacity. Manure and urine raise the pH level and accelerate the decomposition of organic matter and termite activity. If inorganic fertilizer, especially nitrogen, is combined with manure, the manure reduces soil acidification and improves the nutrient buffering capacity and the release of nutrients.^[12] The soil productivity is also related to available nutrient source in either through manures (dung) or chemical fertilizers (superphosphate etc). Dung increased pH, CEC, total N, organic C, loss on ignition, and exchangeable Mg and Ca. It decreased sulphate sorption. Moreover, cowdung manure plays a significant role in maintaining the

nutrient status of the plant. Vermi composting of cow manure using earthworm species *E. Andrei* and *E. foetida* favoured nitrification, resulting in the rapid conversion of ammonium-nitrogen to nitrate-nitrogen. Therefore it improves the nutrient cycling and helping to convert unavailable nitrogen in available forms to plants. The soil biological attributes are also responsible for determination & maintenance of physical properties of soil. The physical properties of soil in its own turn control not only the quantum of chemical properties, but also the rate of their release and availability to plants essential for metabolic processes. Thus, it may be said that soil biology is the door to maintenance of soil health. There is a positive relationships between relevant soil properties and enzyme activities and suggested that addition of organic matter increased microbial activity/diversity and turnover, which subsequently leads to greater enzyme synthesis and accumulation in the soil matrix. The effects of cattle dung on soil microbial biomass are also studied and compared to controlled condition of soil (no any dung application). When dung was mixed with grassland soil under controlled conditions the size of the SMB increased ($P < 0.001$). Respiration rate also increased ($P < 0.001$) and specific respiration was higher ($P < 0.05$) in soil treated with beef cattle dung than in that treated with dairy cow dung.

Cowdung and Environment

The over-dependence on fossil fuels as primary energy source has led to myriads of problems such as global climatic change, environmental degradation and various human health problems. Global warming caused by energy generation from fossil fuel has accelerated the deployment of renewable fuels such as biogas. Biogas is one of the renewable and sustainable alternative resources that significantly reduce greenhouse-gas emission compared to the emission of landfill gas to the atmosphere. Biogas is produced by the anaerobic digestion or fermentation of such biodegradable materials as biomass, manure, sewage, municipal waste, green waste, plant material and crops. Biogas is also generated by converting cow manure via anaerobic digestion into methane biogas. One cow can produce enough manure in one day to generate three kilowatt

hours of electricity whereas only 2.4 kilowatt hours of electricity is needed to power one hundred watt light bulb per one day.

It also has the advantage of contributing to the solution of environmental problems, because it substitutes fossil fuels

Cowdung as energy resource

Shortage of fuel wood is a major problem which forces the rural people to use a cowdung for their fuel purpose, which effects on the productivity status of cultivated land. Cowdung is a good resource for maintaining the productivity status and enhance the beneficial microbial population of soil. The share of the Indian population relying on traditional biomass for cooking stands at 72% per cent. In the states of Bihar, Haryana, and Punjab, the percentage distribution of rural households using dung cakes as the primary cooking fuel is reaching 22%–33% per cent. This practice has a negative effect on the soil nutrient balance and consequently affects agricultural productivity. As per Bekele annually, 943, 11, 34 and 229 metric tonnes of wood, dung, charcoal, crop residue and tree residues, respectively were used by the studied households. As a result, 17.3, 4.3, 20.6, 15.6, 5.4, and 10.2 tonnes of N, P, K, Ca, Mg and Fe nutrients were lost per year in burning dung and crop residue. This improper use of cowdung should be stopped and use as organic manure for maintaining productivity and health of soil.

Cow dung and disease prevention

Cowdung is very effective's manures for reducing the bacterial and fungal pathogenic disease. It showed positive response in suppression of mycelial growth of plant pathogenic fungi like *Fusariumsolani*, *F. oxysporum* and *Sclerotiniasclerotiorum*. Similarly as per Mary cow dung extract spray was also reported to be effective for the control of bacterial blight disease of rice and was as effective as penicillin, paushamycin and streptomycin. Cowdung as organic manure increase vigour of plant and reduce the disease incidence of root rots in cotton caused by *Phymatotrichumomnivorum*. Organic manure reduce disease incidence caused by a wide range of plant pathogens including, fungi, and nematode species. Therefore, application of cowdung in proper and sustainable way can enhance not only productivity of yield but also minimizing the chances of disease' cow dung has Antiseptic properties Alternate to tooth paste, Kills malaria & TB pathogens Antifungal agent, Skin tonic, cures eczema, psoriasis.

Cow dung and radiation hazards

Dung on the outside walls of houses absorb the harmful gamma rays. Cow dung, in fact, can absorb all the three rays -- alpha, beta and gamma. Among these, alpha rays cannot penetrate the layers of cloths whereas beta falls after hitting the same but the Gamma rays penetrate the body tissue and is the most harmful,". If the outer walls of houses are coated with thick layers of cow dung, it will absorb the gamma rays and in turn people would be

safe. Cow dung, in fact, can absorb all the three rays -- alpha, beta and gamma. Among these, alpha rays cannot penetrate the layers of cloths whereas beta falls after hitting the same but the Gamma rays penetrate the body tissue and is the most harmful,". Mixed in water and applied as thin washes, it works as a good disinfectant. Dung collected in a special vat creates biogas, which may be used to provide a stable source of electricity in villages.

CONCLUSION AND FUTURE PERSPECTIVES

Indian scriptures tell us that the cow is a gift of the gods to the human race. It is a celestial being born of the churning of the cosmic ocean. Guias the cow is called in Hindi, is symbolic of Earth itself (similar to Gaia, the Greek goddess of earth). It follows that the cow represents the Divine Mother that sustains all human beings and brings them up as her very own offspring. Much as a mother shows the highest mark of affection for her young, the passion of the cow for her calf is just as legendary and often referred to in Indian literature. Cow's product is positively an encouraging solution for various diseases of humans and animals with immense biomedical applications along with other beneficial usages. Its usage would further expand through scientific validation and research supports, clinical trials, commercialization, and popularity in the society and the public. Awareness about the benefits of cow urine and dung can solve problems of shortage of food grains, fuel, shelter, good health, nutrition, poverty alleviation, and unemployment, and as an alternate source of cheaper energy. Application of cowpathy in animal disease therapy needs many efforts regarding establishing scientific evidences and validation since scant literature is available. A combined effort of scientists, researchers and clinicians will strengthen this alternate low-cost therapy which is safe, and thus inspire confidence in the public about its virtues.

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