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## Cow urine prominence to humanity

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### Abstract

Cow is worshiped as “mother of mankind”. It is very respectful animal in Hinduism. Cow urine and cow dung are described as important excretions of animal origin. Cow urine contains many active compounds like phenols, amino acids, volatile and non-volatile substances which show marvelous antimicrobial activities. Ayurveda also described the traditional use of cow urine in cure of many harmful diseases. Cow is also considered as economically important animal. This article provides the available review of literature in regards to its properties in various fields like therapeutics, agricultural and other biological activities which encourages the use of cow urine.

**Keywords:** Therapeutics effect, humanity, antimicrobial activity, biological effect and immune modulators

### Introduction

Cow with a scientific name ‘*Bos indicus*’, is considered as a valuable and holy animal in the Indian Vedas. Cow is worshiped as “mother of mankind”. The five ingredients from cow namely, cow urine, cow dung, milk, ghee and curd in an appropriate concentration known as “*Panchyagavya*” is capable of treating many curable and incurable diseases. Central Council for Research in Ayurvedic Sciences had revealed that the *Panchyagavya* was “safe, non-toxic and effective immunostimulant”. It stimulates the immune system and protects the body from invading germs. Cow urine inhibits the growth of micro-organism thus also show antibacterial, antiviral, antifungal, antihelminthic activity. CSIR- constituent laboratory, the Central Institute of Medicinal and Aromatic Plants, Lucknow, found that cow urine or *gomutra* is a bio-enhancer for medicines prescribed for infections and cancers. *Gomutra* increases the efficacy and medicinal properties of these medicines and makes them potentially effective to fight with the diseases.

### Religious Aspects of Cow

By 2000 BC, the cow was worshiped in the Hindu society and it has been regarded as “*Kamadhenu*” which means it provides all pleasure to humanity. Cow is a symbol of grace, abundance, ever-giving, undemanding provider who nourishes the humanity like a mother thus it is also called as “*Gomata*” (cow as mother). Lord Krishna one of the major deity of Hinduism, grew up as cow herder. He is also known by the popular names Gopala and Govinda which means “friend and protector of cows”. Hindu scriptures regard cow excreta as purifier and an important source of spiritual blessings. A Hindu writer says in this regard: “Earth becomes pure by sweeping, by burning, by time, by a cow walking over it, by sprinkling it with milk, cow’s urine, cow dung and water”. In Hindu culture, no function can be religiously successful without the use of cow’s urine and cow dung.

### Ayurvedic Aspects of Cow urine

Cow urine is considered as sacred urine in Ayurvedic literature. It has been found to possess various valuable properties since from ancient time. According to Indian Ayurvedic literature, *Sushruta sutra* of *Sushruta Samhita*, cow urine has pungent, sharp, hot and alkaline qualities which promote intellect and digestive power, beneficial in colic, useful as purgative and for non – lubricant enema <sup>[1]</sup>. The *Charaka* of *Charaka Samhita* from oldest Ayurvedic literature described the cow urine as sweet drink which helps to decrease the problems related to Vata, Pitta and Kapha <sup>[2]</sup>. It is helpful to reduce the ill effects of itching, eczema, diarrhoea, jaundice, constipation, cough oral and ear diseases. In Ayurveda cow urine is called as *Madhya* and *Hridya* means it protects heart and brain from damaged caused by mental tension.

### Composition

Cow urine alone has all such chemical properties, potentialities and constituents which can treat all ill effects and imbalances of human body <sup>[3]</sup>.

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Fresh cow urine is also reported to contain 50 – 100 mg oestrogens/100 ml; 20 – 200 µg of corticosteroids/100 ml and 0.05 – 0.15 mg of 17- ketosteroids/100 ml [4]. Research also show that at different stages there was a different biochemical composition of cow urine. The result of this research indicated that urea, phenol and amino acid content were higher in pregnant cows followed by milking cows [5].

Healthy cow urine has volume of 17-45 ml/kg/day with specific gravity ranging from 1.025-1.045. Its pH ranges from 7.4 to 8.4 with seasonal variations. Urea nitrogen and total nitrogen varies between 23-28 ml/kg/day and 40-45 ml/kg/day respectively. Healthy cow urine doesn't contain protein, glucose and haemoglobin.

**Table 1:** Chemical components of healthy cow urine

Ammonia nitrogen	1-1.7 ml/kg/day
Allantoin	20-60 ml/kg/day
Calcium	0.1-1.4 ml/kg/day
Chloride	0.1-1.1 mmol/kg/day
Creatinine	15-20 mg/kg/day
Magnesium	3.7 mg/kg/day
Potassium	0.08-0.15 mmol/kg/day
Sulphate	3-5 mg/kg/day
Sodium	0.2-1.1 mmol/kg/day

<http://samvadsetu-gaumata.blogspot.in/2010/12/cow-urine-content.html>.

Cow urine contains number of chemical constituents which play significant role in cure of various diseases; these are

given below in a Table 2 (ServeCows.org/ Chemical Composition of Distilled Cow Urine).

**Table 2:** Effects of chemical constituents present in cow urine

S. No.	Name of Chemical	Effect of chemical on diseases
1)	Ammonia (NH <sub>3</sub> )	Stabilize bile, mucous, air of the body and blood formation
2)	Aurum hydroxide (AuOH)	It is germicidal, increases immune power. It is highly antibiotic and antitoxic
3)	Calcium (Ca)	Blood purifier, Bone strengthener, germicidal
4)	Carbolic Acid (HCOOH)	Germicidal, stops growth of germs and decay due to gangrene
5)	Copper (Cu)	Controls build up of unwanted fats
6)	Creatinin (C <sub>4</sub> H <sub>9</sub> N <sub>2</sub> O <sub>2</sub> )	Has germicidal properties
7)	Enzymes	Produces healthy digestive juice, increase immunity
8)	Hippuric Acid (C <sub>9</sub> H <sub>9</sub> NO <sub>3</sub> )	Removes toxins through urine
9)	Iron (Fe)	Maintains balance and helps in production of red blood cells & hemoglobin. Stabilizes working power
10)	Lactose (C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> )	Gives satisfaction. Strengthens Mouth, strengths heart, removes thirst and nervousness
11)	Manganese (Mn)	Germicidal, stops growth of germs, protects decay due to gangrene.
12)	Nitrogen (N <sub>2</sub> ), (NH <sub>2</sub> )	Removes blood abnormalities and toxins, Natural stimulant of urinary track, activate kidneys and it is diuretic
13)	Other minerals	Improves immunity thus increase resistance of body towards pathogen
14)	Phosphates (P)	Helps in removing stones from urinary track
15)	Potassium (K)	Cures hereditary rheumatism. Increases appetite. Removes muscular weakness and laziness
16)	Salt (NaCl)	Decreases acidic contents of blood, germicidal
17)	Sodium (Na)	Purifies blood. Antacid
18)	Sulfur (S)	Supports motion in large intestines. Cleanses blood.
19)	Urea CO (NH <sub>2</sub> ) <sub>2</sub>	Affects urine formation and removal, germicidal thus protects the body from pathogenic bacteria and thus protects the body
20)	Uric Acid (C <sub>5</sub> H <sub>4</sub> N <sub>4</sub> O <sub>3</sub> )	Removes heart swelling or inflammation. It is diuretic therefore destroys toxins
21)	Vitamins A, B, C, D, E	Provides energetic life and saves from nervousness and thirst, strengthens bones and reproductive ingredient

### Cow as a Donor

Cow is world's most widely domesticated cattle since from ancient times. The humped zebu and hump less European Highland cattle are two main types which are domesticated very first. Around 3000 BC, Ancient Sumerians used to made cheese and butter from the cow's milk. By 6500 BC, the remains of domesticated cattle have been found in Turkey and other sites in the Near East. Their presence in India was indicated by the humped cattle remains which were found in Mohanjodaro site of Indus valley, which proved their domestication even before the arrival of Aryans [6]. Today, the rearing of cow is a good source of income for poor farmers; the dairy business helps to raise the economic level of the nation. India is the largest milk producer country in the world. It is responsible for more than 13% of world's total milk production [7]. The production of other important products like

curd, ghee, butter, cheese is also depending on milk. The cow urine and cow dung are also used to make biogas, fuel and electricity [8]. Using biogas plant is common practice because it's less costly, environment friendly and doesn't produce any harmful waste in the end.

### Cow urine concoction (CUC)

It is the herbal preparation of cow urine administrated to children having convulsion in the southern part of Nigeria [9, 10]. Previous studies revealed that CUC has a shelf life of well over two year if stored at normal room temperature [11]. It is prepared from the leaves of tobacco, garlic and basil; lemon juice, rock salts and bulb of onion. The later items are soaked in cow urine which acts as the vehicle to dissolve the active principles of these constituents. Over fifty chemical compounds are reported from CUC; benzoic acid,

phenylacetic acid, p-cresol, thymol and nicotine being the major compounds. It is one of the toxic preparation of cow urine which may leads to death <sup>[12]</sup>.

### Role of Cow urine in Agriculture

Cattle urine has a good manurial value thus it can be used as bio fertilizer <sup>[13]</sup>. Cow excreta make soil rich in nitrogen thus suitable for farming. Cow urine and cow dung both are used to increase the nutrients of soil. Cow urine contains nitrogenous compounds such as urea which is an essential component in agriculture to increase the fertility of soil and growth of plants. Also cow urine contains sodium, phosphates, sulfur, iron, manganese and other important minerals which are required by plant for its normal growth. It can be a potential alternative for fertigation which is becoming important in most of the crops <sup>[14]</sup>.

The nutritional effect of cow urine on *Trigonella foenum-graecum* (Methi) and *Abelmoschus esculentus* (Bhindi) showed increased chlorophyll and protein content with increased concentration of urine as compared to control <sup>[15]</sup>. The increased nitrogen concentration and potassium concentration of grass and clover on the use of cow urine had been reported after studies <sup>[13]</sup>. Cow urine with combination of plant parts like neem (*Azadirachta indica*) based commercial products had been found to show significant synergistic effect to enhance product toxicity resulting in pest mortality <sup>[16]</sup>. A mixture of cow urine with water extract of neem leaves Protects soyabean crops from the attack of pest <sup>[17]</sup>.

It has been found that cow urine has potential to control *Meloidogyne incognita* in *Solanum lycopersicum* <sup>[18]</sup> and aphids and pickleworms in watermelon cultivation <sup>[19]</sup>. Cow urine has inhibitory effect against several plant pathogens such as *Sclerotium* <sup>[20]</sup>, *Fusarium solani* f. sp. *Cucurbitae* <sup>[21]</sup>, *Bipolaris sorokiniana* <sup>[22]</sup> and *Xanthomonas oryzae* pv. *Oryzae* <sup>[23]</sup>.

The powdery mildew of mustard leaf can be reduced by applying the diluted cow urine on its broad leaves <sup>[24]</sup>. In another study it was revealed that cow urine is effective against seed borne fungal species include *Aspergillus* sp, *Rhizopus* sp, *Mucor* sp, *Penicillium* sp, *Alternaria* sp, *Macrophomina* sp, and bacterial species include *Bacillus subtilis*, *Pseudomonas* sp, *Streptococcus* sp. From this study it is also confirmed that fresh cow urine was more effective antimicrobial agent than photo activated cow urine <sup>[25]</sup>. Cow urine can be used in various concentrations (1:2 to 1:5) to protect the plants against aphids of cowpea and bean and late blight of potato and tomato <sup>[26]</sup>.

### Therapeutic values of Cow urine

Cow urine has been found to exhibit number of therapeutic values of human importance. It is used in the cure of many diseases. Also it can be used for the treatment of eczema, burns, hepatitis, jaundice, cancer, dysentery, immunological disorders and diabetes <sup>[27]</sup>. Cow urine helps to reduce the early ageing in human beings. The pathogenic effect of the free radicals that cause damage to various tissues and attack enzymes, fat and proteins disrupting normal cell activities or cell membranes can be prevented through cow urine therapy <sup>[28]</sup>. These radicals cause the destruction that leads to ageing process of a person. By regular use of cow urine one can get the charm of a youth as it prevents the free radicals formation. Daily consumption of cow urine improves immunity due to the presence of swarnkshar (aurum hydroxide) and fastens the wound healing process which is due to the allantoin <sup>[29]</sup>. It is observed by researchers that cow urine has been found to

possess antiseptic properties in wound healing and the healing time of cow urine is less than the antiseptic cream applied on the wound <sup>[30]</sup>. It can be used as a good germicidal agent due to the presence of different components in it, the presence of amino acids and urinary peptides enhances the germicidal property of cow urine because they are instrumental in increasing the bacterial cell wall and hydrophobicity <sup>[31]</sup>.

Cow urine has anti-urolithiatic effect because of its diuretic and nephroprotective action. It probably exerts its action by reducing oxalate excretion and by crystallization inhibition <sup>[32]</sup>. Cow urine is successful treatment in non-surgical cure of hemorrhoids. Oral administration of cow urine in hemorrhoids patients has replaced the difficult, painful and costly surgical treatment. Out of the patients who underwent the cow urine therapy, 83% of the patients were cured, 10% of them have substantial improvement and the rest 7.33% showed partial or nil (0.66%) improvement <sup>[33]</sup>. Cow urine helps to reduce the blood sugar level by increases the glucose transport across cell membrane thus it promotes peripheral glucose utilization. It increases glycogen synthesis from glucose and also increases the insulin release from beta cells. Cow urine enhances sensitivity of insulin receptor by decreasing insulin resistance and decrease insulin absorption from intestine. It shows anti-hyperglycaemic effect due to the presence of herbal metabolites <sup>[34]</sup>.

### Antimicrobial Properties of Cow urine

Cow urine is an effective antibacterial agent against a broad spectrum of Gram negative and Gram positive bacteria and also against some drug resistant bacteria. It acts as a bio enhancer of some antimicrobial drugs <sup>[31]</sup>.

Antibacterial activity of PhCU against human pathogenic strains including *Staphylococcus aureus*, *Salmonella typhimurium*, *Bacillus cereus*, *Aeromonas hydrophila*, *Enterobacter aerogenes* and *Micrococcus luteus* found to be effective at 30 µl dose which was comparable to that of standard tetracycline. The maximum antibacterial activity was observed in *A. hydrophila* and minimum antibacterial activity observed in *E. aerogenes*. The antimicrobial activity of cow urine is due to its richness in mineral content. The antibacterial activity in this project was observed at mildly alkaline pH which was attributed to the presence of ketones, formaldehyde and sulfinoles on photoactivation of cow urine <sup>[35]</sup>.

It had been revealed that silver nanoparticles from cow urine showed significant antibacterial activity against *Pseudomonas* spp. isolated from contact lenses as compared to honey <sup>[36]</sup>. The synergistic effect of cow urine and *Azadirachta indica* found to be effective against the test organisms. It shows remarkable synergistic effect against bacterial species *Pseudomonas aeruginosa* and *Streptococcus aureofacies* and yeast species namely: *Candida tropicalis*, *Candida glabrata* <sup>[37]</sup>.

A comparative study of CUD shows that it has greater activity than ampicillin against *B. subtilis*, *P. aeruginosa*, *S. typhi*, *K. pneumonia*. Among all these the maximum antibacterial activity was found in *P. aeruginosa* and *S. typhi* <sup>[38]</sup>. However an *in-vitro* study of CUD shows less antibacterial activity assessed by well diffusion method, when compared with chlorohexidine against periodontal pathogens namely *P. gingivalis*, *P. intermedia*, *A. actinomycetemcomitans* <sup>[39]</sup>. Fresh cow urine has highest antibacterial activity against *E. coli* than sterile, PhCU, and CUD <sup>[40]</sup>. Other forms of cow urine also observed to show significant antibacterial activity against *E. coli*, *S. typhi*, *P. vulgaris*, *S. aureus* and *B. subtilis*.

CUD found to be susceptible to 75.7% of clinical isolates of *Candida* species including *C. albicans*, *C. parapsilosis* which are resistant to the routinely used antifungal agents [41]. Cow urine based poly herbal conditioner was found to be effective against *Malassezia furfur* which is isolated from the dandruff sample. The herbal powder of *Sapindus foliatus*, *Acacia concinna* and *Trifala* are used in the preparation of conditioner with cow urine [42]. Cow urine was found to be more effective than neem leaves extract and lemon juice extract. It is highly stable and capable of inhibiting the growth of *Malassezia* fungi (90-95%) than rice water (due to *B. cereus* growth in rice water) which was stably capable of inhibiting 85-90% of the growth for 3-4 days [43].

An *in-vitro* study revealed that urine of outdoor grazing cow possesses more antifungal effect than indoor feeding cow. It is may be due to the variety of grasses and medicinal herbs which are taken by the outdoor cow. This antifungal activity was dependent on the concentration used. No growth of the *Penicillium notatum*, *Trichoderma viridae* and *Alternaria solanii* was observed with 10% outdoor cow urine and with 20% indoor cow urine and that of *Claviceps purpurea*, *Rhizopus oligosporius*, *C. albicans* and *A. candidus*, no growth was observed with 20% of outdoor cow urine only [44].

### Anticancer Properties of Cow urine

Cow urine has anticancer properties because it's a free radical scavenger and possesses antioxidant properties. Research conducted by the workers of Go-Vigyan Anusandhan Kendra (Cow Science Research Center) at Nagpur revealed that Cow urine is a potential source that possesses therapeutic values in treatment of cancers. Scientists have proved that the pesticides cause apoptosis (cell suicide) of lymphocytes of blood and tissues at very low doses through fragmentation of DNA. CUD helps in rapid repair of DNA damaged by pesticides [45]. It also protects the chromosomal abbreviation by mitocycin in human leukocyte [46]. The effect of cow urine therapy also studied on various cancer patients in Mandasaur district, India. These patients suffer from throat cancer, breast cancer, cervix, uterine, buccal cavity and sinus cancer, lung cancer, lymphoma and bone cancer, both throat and buccal cancer, and other cancers. The symptoms like pain, inflammation, burning sensation, irritation, difficulties in swallowing were found to decrease on day 1 to day 8 with CU therapy. After CU therapy, many patients who had cancer for the last 4 years will able to live a healthy life [47].

### Cow urine as Bio-enhancer Agent

Cow urine also acts as bio-enhancer as it improves the efficacy of antibiotics against infectious agents. Cow urine is the only secretion of animal origin which acts as bio-enhancer of antimicrobial, antifungal and anticancer agents [48]. The indigenous Cow urine contains 'Rasayana' tatva, which is responsible for modulation of immune system and also acts as a bio-enhancer [49].

Cow urine distillate is more effective bio-enhancer as compared to cow urine as it increases the effectiveness of antimicrobial, antifungal and anticancer drugs [50]. It increases the bioactivity of rifampicin, tetracycline and ampicillin by enhancing the transport of antibiotics across gut wall by 2-7 folds [51]. It also leads to an increase in the activity of gonadotropin releasing hormone conjugate with bovine serum albumin and zinc [52, 53]. Bioenhancement has also been observed with other drugs viz. ampicillin, isoniazid, clotrimazole, cyanocobalamine etc. Bioenhancer activity has found to reduce the antibiotic dose per day and duration of

treatment in tuberculosis patients [54]. In cadmium chloride toxicity cow urine is used as a bio-enhancer of zinc [55].

Cow urine has been granted US patents (No. 6,896,907 and 6,410,059) for its medicinal properties, particularly as bio-enhancer and as an antibiotic, antifungal and anticancer agent. The activity of rifampicin, a front-line anti-tubular drug used against tuberculosis, increases by about 5-7 fold against *E. coli* and 3-11 fold against gram positive bacteria. As an anticancer agent it has been observed to increase the potency of "Taxol" (paclitaxel) against MCF-7, a human breast cancer cell line, in *in-vitro* assays (US Patent No. 6, 410, 059) [56, 57].

### Cow urine as Immunomodulatory Agent

The immunomodulatory activity of cow urine has been found in plants and animals. Recently researchers showed that cow urine enhances the immunity of an individual by activating the macrophages and augmenting their engulfment power as well as bactericidal activity. Cow urine has been found to enhance the immunocompetence of birds and provide better protection along with vaccination and increase egg production and egg quality [8]. The up regulated proliferation activity of lymphocytes has been found in developing chicks in *in-vivo* cow urine treatment [58]. The cow urine can be used as a feed additive for layer birds in order to get good quality eggs and immune enhancer [59]. The distillation of cow urine is a potent and safe immunomodulator, which increase both humoral and cell mediated immunity in mice [60, 61]. It was observed that cow urine enhances both T and B cell proliferation and also increases the titre level of IgG, IgA and IgM antibodies. Cow urine increases the white blood cells counts and reduces the red blood cells counts to certain extent hence it helps to boost the immune functions [62].

### Hepatoprotective Activity of Cow urine

Protective effects of cow urine distillate in three dose levels and standard drug silymarin on liver function were studied in intoxicated rats. The cow urine distillate decrease the levels of SGOT, SGPT, ALP, GGT and total bilirubin in a dose dependent manner as silymarin pretreatment with cow urine distillate reduced the elevated enzyme levels in a dose dependent manner, indicating that it interferes with the action of CCl<sub>3</sub> free radicals produced [63]. This action of cow urine distillate may be attributed to its antioxidant property contributed mainly by volatile fatty acids and free radical scavenging [64]. The histopathological study of liver from different groups also revealed that *Bramhi Ghrita* a formulation belonged to the *Panchagavya* when used in combination with herbs significantly decreased the levels of serum marker enzymes, SGOT, SGPT, alkaline phosphatase and acid phosphatase elevated during carbon tetrachloride induced hepatotoxicity [65].

### Anthelmintic and Anti-Protozoal Activity of Cow urine

A comparative anthelmintic assay of cow urine concentrate and a standard drug piperazine citrate was performed on the adult Indian earthworm *Pheretima posthuma* due to its resemblance with intestinal roundworm parasite found in human. Cow urine concentrate and standard drug exhibited marked anthelmintic activity in terms of causing paralysis and death of worms, in a dose dependent manner. The cow urine concentrate take less time than standard drug which is may be attributed to the presence of active constituents in it. The time taken for paralysis of worm was 48 minute and 13 minute at concentration of 1% and 5% respectively while standard drug

paralysed the worm in 53 minute and 16 minute at concentration of 1% and 5% respectively [48].

Leishmaniasis or kala-azar, a disease which is highly endemic in the Indian sub-continent, is caused by an intracellular protozoan parasite *Leishmania donovani*. The faetal calf serum (FCS) is used as a growth supplement for *in-vitro* maintenance of this parasite. Cow urine distillate has been found to show anti-protozoal *Leishmania donovani* effect *in vitro* while searching for the alternatives of FCS [66].

### Acceptance of Cow urine Therapy by Public

The rural population of India use cow urine as folklore remedy in almost all the states. The fresh and sterile cow urine preparations are marketing in Gujarat by Agencies with prices ranging from Rs. 20 to Rs. 30 per bottle. Urine therapy was not only used in India, for several centuries in many parts of the globe [67]. Sudan is a very poor country and the residents of Sudan unable to get any modes of modern health care. They use herbs and other locally available products as medicine for any sickness according to the folk practices. Tribals of this area also use cow urine to obtain mineral, carbohydrate and vitamin content that fulfill the requirement of the body. They also stored the cow urine, due its sterile nature it can be used against microbial sickness. They use a mixture of fresh cow urine and its fermented /stored version which is rich in all ingredients required for the normal functioning of the body [68]. Prominent natural health care centre in Indore, India are Cow Urine Therapy and Research Centre and Swarnim Nature Science Limited led by a leading cow urine therapist, Mr. Virendra Kumar Jain, are pioneering institute to propagate cow urine therapy. These centers provide vital and cheap or free treatment to thousand of populace. The Government of India, the patent office awarded Mr. V. K. Jain a patent (Patent No. 189078) for his discovery and innovation of cow urine therapy and therapeutic ayurvedic composition [69]. Various patient taking cow urine therapies have been found to survive better and healthy life.

### Adverse Effects of Cow urine

**In Agriculture:** Cow urine is used in agriculture, but there is also some risk factor to use cow urine as bio fertilizer. In Brittany, France, it was found that excessive nitrogen released from the cow urine leached into the soil because plants took up the nitrogen from the fertilizers. Urea as urine deposited on the soil in the form of small patches, it hydrolyzed within 22 hours and free nitrogen is taken up by plants or retained unused for the future uptake or it may evaporate in the environment in form of ammonia gas under high temperature. But low temperature does not cause its evaporation and allow the nitrogen to percolate in the soil where it contaminates the ground water sources. So it is important to maintain the coordination between livestock grazing and the use of nitrogenous fertilizers in farming; as the lesser use of nitrogenous fertilizers will lead to a lowering of agriculture costs and on the other hand will prevent ground water pollution [70].

**On Environment:** Cow urine may also contribute to global warming because its urine causes emission nitrous oxide (N<sub>2</sub>O) which is 300 times more powerful than CO<sub>2</sub> and it can cause serious dangers to our environment. It is also considered as a minor green house gas. Most times when cow urine is used in degraded pastures, which is commonly seen in India, N<sub>2</sub>O emissions are tripled, says a study conducted in

Colombia, Argentina, Brazil, Nicaragua, Trinidad and Tobago and published in the latest edition of the peer-reviewed *Scientific Reports* [71].

**On Human health:** Cow urine concoction which is an herbal preparation given to the teen in Nigeria was found to be harmful to them. It causes death of many Nigerian children [10, 72]. Observations of cow urine concoction poisoning in man and experimental animals showed that the main effects of cow urine concoction are severe depression of respiration, cardiovascular system, the central nervous system and hypoglycaemia. These toxic effects acting singly or in combination are believed to be the cause of death [12].

### Conclusion

Cow urine has a great importance to humanity. The traditional use of cow urine for different purposes has been proved scientifically. In India, the secretions from cow either it is cow milk, cow urine and cow dung - are in great demand due to their wide use in religious and other medical fields. The important components from cow urine can be obtained for various useful pharmaceutical, therapeutic and agricultural uses. But the use of cow urine should be limited due to its adverse effect on our environment and human health.

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