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Go mutra (Cow urine) and its uses: An overview

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Abstract

Gomutra (Cow urine) is an important part of Indian tradition. From the ancient period cow's urine has been used as a medicine. Cow (*Bos indicus*) urine/Gomutra has been elaborately explained in Ayurveda and described in "Sushruta Samhita", "Ashtanga Sangraha" and other Ayurvedic texts as an effective medicinal substance/secretion of animal origin with innumerable therapeutic properties. It has various important medicinal and therapeutic values. Cow urine is one of the five contents of *Panchagavya* which obtain from cow (Urine, milk, ghee, curd and dung). The treatment done by using *Panchgavya* products of cow called, Cowpathy (*Panchgavya chikitsa*). Several diseases like cancer, autoimmune diseases, diabetes, AIDS, GI disturbances etc. are increasing day by day. Indiscriminate use of antibiotics in higher amount is also responsible for increase in antibiotic resistant infectious diseases like Tuberculosis. Gomutra (Cow urine) is scientifically proven to act as Bioenhancer. Various actions and researches on cow urine are summarized in this article. However, more studies experimental as well as clinical trials can throw better light on it.

Keywords: Bioenhancer, cow urine, cow urine distillate, Gomutra, *panchgavya*

Introduction

In *Vedas*, the classical hindu literature, cow is considered the most valuable animal and is called Mother of all [24]. Cow is believed as gift of god for the people. Now a day's several diseases are occurring in human and animals which are found incurable. *Panchgavya*, is a term used to describe five major substances, obtained from cow, which include cow's urine, milk, ghee, curd and dung. All the five products possess different medicinal properties against many disorders and are used for the medicinal purpose singly or in combination with some other herbs. This kind of treatment is called *Panchgavya* therapy or cow pathy. Cow pathy is a system of medicine just like as homeopathy, allopathy or naturopathy. Cow is the backbone of Indian culture and rural economy, and sustains our life, represent cattle wealth and bio-diversity. It is known as "Kamdhenu" and "Gaumata" because of its nourishing nature like mother, the giver of all providing riches to humanity and is a store of medicines The Ayurveda, the ancient Indian system of medicine, has detail mentions of importance of cow's milk, curd, *ghee*, urine in the treatment of various human ailments. Every product has distinct qualities and uses in health, animals, agriculture and other fields. *Panchgavya* has many beneficial implications in agriculture, organic farming as good quality natural manure and bio-pesticides, as alternate energy resources and high medicinal values. Bio-fertilizer and pest repellants obtained from cow urine and dung restores micro-nutrients and fertility of the soil and provides food free from health hazards of chemical fertilizers and pesticides. No other fertilizer in the world is as cheap and harmless as dung fertilizer. Dung and urine also provide valuable alternate source of energy in the form of biogas, fuel and electricity [4].

Cow urine has a unique place in Ayurveda and has been described in 'Sushruta Samhita' and 'Ashtanga Sangraha' to be the most effective substance of animal origin with innumerable therapeutic values. It has been recognized as water of life or "Amrita" (beverages of immortality), the nectar of the God [12]. Cow urine therapy is used to treat weight loss, reversal of certain cardiac and renal diseases, indigestion, stomach ache, thyroid, asthma, psoriasis, eczema, diarrhoea, piles, prostrate, arthritis, migraine, constipation, edema, jaundice, anaemia, gynaecological problems, hemorrhoids and skin diseases including vitiligo. Cow urine distillate is an effective antibacterial agent against a broad spectrum of Gram-negative and Gram-positive bacteria and also against some drug-resistant bacteria [19, 21, 22, 24].

Cow urine distillate (Hindi: *Gau Mutra Ark*) is useful for many diseases. A number of ailments could be treated and this therapy is being used even for dreaded diseases like cancer, AIDS, diabetes and skin problems. Practitioners of Ayurvedic medicine (from India) routinely use

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urine as a remedy. It is antibacterial antifungal, antiviral, antineoplastic (anticancer), anticonvulsive, antispasmodic and non-toxic. Cow urine distillate fraction has been identified as a bioenhancer of the activities of commonly used antibiotics, anti-fungal and anti-cancer drugs [4]. As bioenhancer, it increase the nitrogen content of the soil, for better rearing of honey bees, hasten the pubertal age of the heifers exposed to bull's urine and as pesticide and larvicide for the fodder crops.[19]

Cow urine contains all substances, which are naturally present in the human body. Thus, consumption of cow urine maintains the balance of these substances and this helps cure incurable diseases. It is natural, eco-friendly with no residual effects, economical and easily available, hence can be harnessed as potential therapeutic agent [19].

Gau mutra (cow urine) therapy provides an especially rich and provocative research topic. The ancient scriptures of ayurveda consider cow urine to be the elixir of life. It is the most effective natural remedy and the safest method of treatment bestowed upon us by nature. However, there is still a need to explore further research possibilities to prove Cow urine as a potential medicine which in turn would reduce the pressure on the existing use of chemicals and antibiotics [22].

Cow urine distillate as Bioenhancer

Several authors reported cow urine distillate is used as a bioenhancer [1, 3, 4, 10, 11, 16, 19, 21, 22, 25, 26]. It is an animal origin bioenhancer that at low doses promote and augment the bioavailability or biological activity of drugs by reducing the dose of drug, shorten the treatment period and thus reducing drug-resistance problems [7, 27]. Cow urine distillate is the residue which is left out when the cow urine is subjected to complete distillation. It is used in the treatment of diseases caused by pathogenic bacteria, opportunistic fungi and parasitic helminthes [12].

As a bioenhancer, Cow urine distillate has demonstrated capability to improve the pharmacokinetic parameter of several potent Active Pharmaceutical Ingredients. It is easily available, safe and free from side effects, minimizes drug toxicity, shortens the duration of treatment, lowers the drug resistance problems and minimizes the cost of treatment.[2] Cow urine distillate is more effective as a bioenhancer than cow urine. It enhances the transport of antibiotics like rifampicin, tetracycline and ampicillin across the gut wall by two to seven folds. It also enhances the potency of taxol against MCF-7 cell lines. It enhances the bioavailability of rifampicin by 80 fold in 0.05 $\mu\text{g}\cdot\text{ml}^{-1}$ concentration, ampicillin by 11.6 fold in 0.05 $\mu\text{g}\cdot\text{ml}^{-1}$ concentration and clotrimazole by five fold in 0.88 $\mu\text{g}\cdot\text{ml}^{-1}$ concentration [15]. Cow urine also has antitoxic activity against the cadmium chloride toxicity and it can be used as a bioenhancer of zinc [13]. The bioenhancing ability is by facilitating absorption of drugs across the cell membrane [19, 28]. Cow urine distillate formulation has been granted US Patents (6,410,059 B1, 2002 and No. 6,896,907 B2, 2005) [14, 15] for its medicinal properties [3, 4, 5, 6, 11, 16, 17].

Cow urine distillate, having bioenhancing properties, got US patent, was the result of a joint enterprise by the centrally funded CSIR and the *Vishwa Hindu Parishad's Go-Vigyan Anusandhan Kendra* (cow science research centre) in Nagpur. A manufacturing unit of "Panchgavya Ayurveda Medicine" is commissioned at Sevadham Deolapar, Nagpur (INDIA) [4]. According to a recent online report of 'Love 4 Cow Trust', researchers at Central Institute of medicinal and Aromatic Plants (CIMAP), Lucknow have identified a fraction of cow

urine distillate as bioenhancer of commonly used antibiotics and anticancer drugs. In the study at CIMAP, Lucknow, researchers found that Cow urine distillate fraction enhances the activity of antibiotic Rifampicin, the front-line anti tubercular drug used against tuberculosis, increasing its action up to seven fold against *Escherichia coli*, and up to eleven fold against Gram-positive bacteria [6].

Other studies of Cow urine

Antibacterial activity: The antibacterial activity of cow urine distillate (5, 10 and 15 μl) against the *B. subtilis*, *P. aeruginosa*, *K. pneumonia* and *S. typhi* was reported. Antibacterial activity (mean zone of inhibition in mm) was observed against *B. subtilis* (7.6 ± 0.04 , 8.6 ± 0.17 , 8.8 ± 0.17 , respectively) *P. aeruginosa* (12.6 ± 0.04 , 13.6 ± 0.17 , 15.4 ± 1.23 , respectively) and *S. typhi* (12 ± 1.23 , 13.6 ± 0.17 , 15.4 ± 1.23 , respectively). This antibacterial activity was more than the positive control of ampicillin (30 mg.disc⁻¹), which was 7.1 ± 0.01 mm against *B. subtilis*, 11.2 ± 0.01 mm against *P. aeruginosa* and 9.6 ± 0.02 mm of inhibition zone against *S. typhi*. Antibacterial activity against *K. pneumonia* was 11 ± 0.14 mm with 15 μl of cow urine distillate, which was more than the activity (9.5 ± 0.05 mm) with Ampicillin [21, 23].

Studies on Antibacterial effects of Cow urine distillate have revealed it to be toxic to and inhibitive to growth of *Staphylococcus aureus*, *E. coli*, *Pseudomonas species*, *Bacillus subtilis*, *Proteus vulgaris*, *Streptococcus species*, *Klebsiella pneumonia* and *Salmonella typhi* in culture. Antifungal activity on aspegillus species was also observed [26].

Cow urine was tested by agar well method using the microbes like *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas fragi*, *Bacillus subtilis*, *Streptococcus agalactiae* and *Proteus vulgaris*. The cow urine was found effective against these microorganisms and show antimicrobial activity [1].

Cow urine distillate alone caused more inhibition of Gram-positive bacteria. Inhibition caused by streptomycin (1 mg.ml⁻¹) alone was higher (31-34 mm) than that of cow urine distillate alone (19-22 mm). With the combination of *Pinguicula longifolia*, cow urine distillate and streptomycin together, *S. aureus* was inhibited to a more extent (38 mm) followed by *P. aeruginosa* (37 mm) and an equal inhibition was exhibited by *B. subtilis* and *E. coli* (36 mm) [20].

Antifungal: Various studies have found good antimicrobial activity of cow's urine comparable with standard drugs such as ofloxacin, cefpodoxime, and gentamicin, against a vast number of pathogenic bacteria, more so against Gram-positive than negative bacteria. Interestingly antimicrobial activity has also been found against some resistant strains such as multidrug-resistant (MDR) *Escherichia coli* and *Klebsiella pneumoniae*. Antimicrobial action is enhanced still further by it being an immune-enhancer and bioenhancer of some antibiotic drugs. Antifungal activity was comparable to amphotericin B. Cow urine also has anthelmintic and antineoplastic action. It has, in addition, antioxidant properties, and it can prevent the damage to DNA caused by the environmental stress. In the management of infectious diseases, cow urine can be used alone or as an adjunctive to prevent the development of resistance and enhance the effect of standard antibiotics [21].

Various experiments show fungicidal effect against various species of *C. tropicalis*, *Aspergillus Malassezia*, and *C. glabrata*. CU (Cow urine) inhibits the growth of *Malassezia*

fungi (90-95%) which is responsible for causing dandruff for a longer time (4-5 days). Also CU shows significant effect in various microorganisms which is responsible different diseases in crops. Study found that Lemon Juice extract and Neem leaves extract less effective than CU 21. CUC (cow urine concoction) 5% showed maximum antifungal activity against *A. niger* (93%), *A. oryzae* (92.67%) and *A. flavus* (83%)^[12].

Immunomodulator: A study mentions the determinative role of cow urine distillate in helping the immunodeficient subjects in obtaining higher level of cell-mediated and humoral immune protection for better protection for overcoming different infections. Gomutra Ark is obtained from distillation process of the cow urine. Results from Gomutra ark (cow urine distillate) and Cow urine are near about similar. It found that the chemical and medicinal properties of cow urine are preserved in Gomutra ark. There is very negligible content of ammonia in Gomutra ark of cow urine and it is easy to palatable and acceptable for patients. Study found that cow urine distillate that is Gomutra ark has antioxidant and immunomodulatory effect^[8].

Antioxidant: Cow urine tested for antioxidant and antimicrobial activities and it exhibited the mentioned activities. The revealed antioxidant property of cow urine its distillate may provide potential therapeutic intervention against oxidative threats, both in health and disease. The result suggests that the antioxidant action is attributed to the free radical scavenging activity of the urine components and these components may prevent the process of aging^[10].

Wound healing: Cow urine shows significant effect in wound healing activity in Wistar albino rats. Study found that Cow urine heals wound faster than 1% w/w nitrofurazone ointment locally^[21]. Study demonstrated that cow urine ark significantly increases wound healing in diabetic wound patient. Thus, it helps in accelerating wound healing in diabetic patients because of its property of enhancing granulation tissue formation^[9].

Anti-urolithiatic effect: Cow urine ark showed significant effect against renal calculi and restoration of compromised renal function. This type of action of CU might be due to it reduce excretion of calcium oxalate and inhibit process of

crystallization. Further experimental studies are needed to know its mechanism of action^[8].

Mechanism of action

The prominent antimicrobial/germicidal/antifungal property of cow urine is due to it containing different volatile and non-volatile components like urea, creatinine, aurum hydroxide, phenol, carboxylic acid and salts of calcium and manganese. This germicidal property is even more enhanced due to the presence of different amino acids and urinary peptides which are instrumental in increasing the bacterial cell wall and surface hydrophobicity. The antioxidant property of uric acid and allantoin present in early morning voided cow urine is maximum, which is useful in the treatment of cancer. This early morning voided urine has been observed to be more sterile and has more micro and macro nutrients, enzymes, and other components, which render it to be most effective. Cow urine has been found to reduce apoptosis in lymphocytes, thus increasing their rate of survival. This action is attributed to the free radical scavenging activity of the components, which ultimately are helpful in slowing down the process of aging^[18].

Research has been carried out on cow urine distillate and has found to have immune modulation in mice. It has been found that it helps to enhance T-cell and B-cell growth, and also enhances the level of IgG. Cow urine distillate has synergistic properties with antibiotics, antifungal and anticancer drugs. Hence, CUD acts as a bio-enhancer. It has been found that CUD increases B and T lymphocyte blastogenesis. This study led to the investigation of effect of CUD on humoral and cell mediated immune response against NDV vaccination^[18].

Composition of Cow urine

Cow urine is a liquid discharge consisting of nontoxic waste material from the cow body. The main constituents of cow urine are Water: 95 per cent, followed by Urea: 2.5 per cent, and the rest 2.5 per cent is a mixture of different minerals, salts, hormones, and enzymes. Antimicrobial and germicidal properties of cow urine are due to the presence of urea, creatinine, aurum hydroxide, carbolic acid, phenols, and salts of calcium, and manganese. Its anticarcinogenic effect is due to uric acid, which has antioxidant property. Aurum hydroxide improves immunity, and allantoin promotes wound healing. Cow is hence considered a live dispensary; a store house of medicines^[18].

Table: Type of cow urine

Substance present in Cow Urine	Positive effects on the human body
Ammonia; NH ₃	Helps in stabilizing the three properties: bile, mucous and air of body. Also improves blood formation.
Aurum Hydroxide; AuOH	It has a germicidal nature; AuOH is also antibiotic and anti-toxic, thus increases immunity power of the body.
Calcium; Ca	Imparts basic strength to bones, and has also germicidal power with blood purification improvement.
Carbolic acid;	HCOOH It has a germicidal nature, preventing the growth of germs and is also able to prevent gangrene.
Copper; Cu	Improves the absorption power of magnetic rays and also controls buildup of excessive fats.
Creatinine; C ₄ H ₉ N ₂ O ₂	Improves action against germs.
Enzymes	Improves digestion and increases immunity.
Hipuric acid; C ₉ H ₁₃ N ₃ O ₆	Helps in the removal of toxins through urine.
Iron; Fe	Maintains balance and helps in production of red blood cells & hemoglobin.
Lactose; C ₆ H ₁₂ O ₆	Helps in strengthening the heart; decreases nervousness.
Manganese; Mn	It imparts better germicidal power. Avoids decay leading to gangrene as it stops growth of germs.
Nitrogen; N ₂ , NH ₂	Prevents abnormalities in blood and prevents the effect of toxins, its diuretic nature makes it to be a natural stimulant of urinary track, and activates the kidneys.
Phosphate; P	Helps in preventing urinary tract stone formation.
Potassium; K	Cures hereditary rheumatism. Increases appetite. Removes muscular weakness and laziness.
Sodium; Na	It helps in purification of blood as NaCl decreases the acidic content of blood; also has an antacid nature.

Sulphur; S	Improves bowel action of the intestines. Cleanses blood.
Urea; CO(NH ₂) ₂	Improves urine formation and exhalation action. Also has a germicidal action
Uric Acid; C ₅ H ₄ N ₄ O ₃	Prevents the swelling of heart inflammation. It is diuretic therefore destroys toxins.
Vitamins A,B,C,D,E	Vitamin B is active ingredient for energetic life and prevents the effects of nervousness and thirst. It also helps in boosting the bone strength and reproductive power of the individual.
Water; H ₂ O	It maintains fluidity of blood, and helps in controlling the body temperature.
Other Minerals	Help in boosting immunity power of the body.

(Source: Minocheherhomji, 2016) ^[18]

Conclusion

After screening of various results on cow urine and its distillate in various research articles it concludes that cow urine is a really multidimensional drug. As it is anti-cancerous, antimicrobial, anti-diabetic, anti-urolithiatic, anti-psychotic drug and also enhances the immunity of animals and humans. *Ayurveda* already told that fresh cow urine of indigenous cow is the best.

Nowadays resistance to antibiotics is a major concern to world but as a bioenhancer cow urine distillate is found very effective to overcome such kind of issues.

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