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Evaluation of Diuretic activity of marketed Polyherbal syrup: "Uriflux"

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ABSTRACT

Marketed polyherbal syrup is made from five crude drug decoction, which acting with essential diuretic principles, which are *Mimusops elengi, Santalum album, Crateva nurvala, Tribulus terrestris, Andropogon muricatus*. The aim of this study is to evaluate diuretic activity of such marketed polyherbal formulation in wistar albino rat. Dose of marketed polyherbal syrup is 1ml/200gm, Frusemide10mg/kg. Evaluation of diuretic effect is done by measuring urine volume, sodium potassium and chloride excretion. We can conclude that marketed URIFLUX syrup produced notable diuretic effect which appeared to be comparable that produced by reference standard diuretic Frusemide.

Keywords: Diuretic activity, Digital flame photometer, *Tribulus terrestris*, URIFLUX syrup.

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INTRODUCTION

Man has been using herbs and plant products for its medicinal use since times immemorial. However, it is imperative that the traditional systems should be scientifically supported for their treatment of hypertension, congestive heart failure, ascites & pulmonary edema. Two widely used diuretics, thiazides and the high ceiling loop diuretic Frusemide, have been associated with a number of adverse effects, such as, electrolyte imbalance, metabolic alterations, development of new-onset diabetes, activation of the renin-angiotensin-neuroendocrine systems and impairment of sexual function. Many indigenous drugs have been claimed to have diuretic effect in ayurvedic system of medicine. *Tribulus terrestriss* is major diuretic in this formulation *Crateva nurvala* (varuna), *Andropogon muricatus* (wala mool), *Mimusops elengi* (Bakul) also act as diuretic. *Santlum album* used as antimicrobial agent. Here Wala also gives cooling effect. This proprietary formulation made by "Granth" process by decoction. The purpose of this study is to evaluate or to standardize marketed formulation. There is no report for preclinical studies of such marketed diuretic syrup so it considered worthwhile to take up such investigation in detail.

MATERIALS AND METHOD[1]:

Drugs and Chemicals[7]:

Marketed "URIFLUX" syrup collected from BEWELL Pharmaceuticals A-215, 5 Star MIDC, Kagal, Kolhapur, Maharashtra, India. Frusemide purchased from Arihant Medical Store, Ichalkaranji, Kolhapur. All the other chemicals used in the study were of analytical grade.

Company's method for preparation of diuretic formulation:

On large scale 5kg crude drug 20 liters purified water used for decoction and final volume made 3 liters, 60% sucrose used for preparation of syrup.

Following plant parts used for decoction

1. Moolsari Phool(7gm) : flowers
2. Gokhru(5gm) : seeds
3. Varuna(5gm) : coverings of bark
4. Wala mool(3gm) : roots
5. Chandan(1gm) : bark

Animals[2]:

Adult female Wistar albino rats, each in the weight range of 150-240gm used the animals were randomly allocated to three treatment groups of six animals each and kept in cages with paddy husk bedding at standard envoi mental conditions. All the animals were allowed to free access to waters and feed, the standard commercial pelleted chaw. The experimental protocol was

approved by the IAEC (Institute Animal Ethical Committee) of CPCSEA (Committee for the Purpose of Control and Supervision of Experiment on Animals)

Diuretic activity[3,4]:

Diuretic activity was determined by the methods of Lipschitz et al (1943). Female albino rats weighing between 150-240 gm deprived of water for 16 to 18 hrs before the test drugs are administered. The dose calculated from proprietary human dose. The rats were randomly divided into three groups of six animals each as follows.

Group1: Purified water (control) - 5ml/kg

Group2: Frusemide (Reference standard) - 10mg/kg

Group3: Marketed polyherbal UREX syrup - 4ml/kg

Urine volume and electrolytes analysis[5,6]:

Immediately after the respective treatments the animals were placed in metabolic cages specially designed for to separate urine and feaces and urine was collected in the measuring cylinder up to 6 hrs. The volume of urine, Na, K and Cl were estimated in the urine for assessing diuretic activity. The Na, K concentration estimated by Digital Flame photometer by Chemline, CL-410, and Cl estimation done by argentometric titration by Volards method

Statistical Analysis[7]:

All results are expressed as mean ±standard error. The data was analyzed using two ways of analysis of variance (ANOVA). The statistical significance of the difference of the means was evaluated by Dunnet's test.

RESULT AND DISCUSSIUON:

Diuretic activity:

Results of effect on urine volume are shown in table 1. The marketed diuretic syrup of dose 4ml/kg of body weight showed marked diuresis during the 6 hours versus control but, did not show marked diuresis than reference standard**.**

Table 1: Results of effect on urine volume.

Treated group	Dose	Urine volume in ml	Sodium(Na)ion conc. in mEq/L	Potassium(K) ion conc. in mEq/L	Chlorine(Cl) ion conc. in millimoles
Distilled water	5ml/kg	0.75ml±0.07638	17±0.4216	21±0.7032	0.103±0.04216
Frusemide	10mg/kg	5.11±0.04773	51±0.9458	73±1.897	0.210±0.08028
Marketed polyherbal syrup	4ml/kg	3.65±0.2029	101±2.704	152±1.897	203±0.09545

Values are expressed as +- S.E.M, n=6 compared with vehicle control (ANOVA followed by Dunnet t-test), P<0.01(urine volume, electrolyte conc.)

Urinary electrolyte excretion:

The marketed diuretic syrup of dose 4ml/kg produced significant increase in Na excretion ($P < 0.001$) and potassium excretion when compared to control group, Chloride excretion of marketed diuretic syrup is near to standard frusemide and more than control. Marketed diuretic syrup shows better natriuretic effect and It shows elevated level of potassium excretion in rat urine than frusemide. But there is risk of hypokalemia hence potassium sparing capacity has to be investigated. Result of present investigation shows that Marketed diuretic syrup is most effective in increasing urinary electrolyte concentration. Active principles such as flavonides, saponins and terpenoides are known to be responsible for diuretic activity.

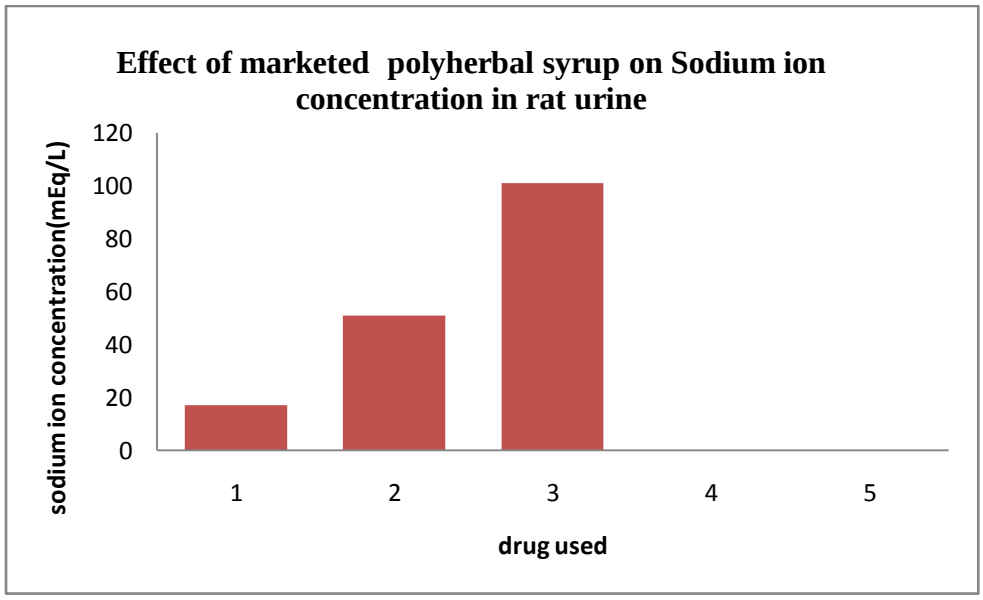

Figure 1: Effect of marketed poly herbal syrup on Sodium ion concentration in rat urine

1: Distilled water, 2: Frusemide, 3: Marketed polyherbal syrup

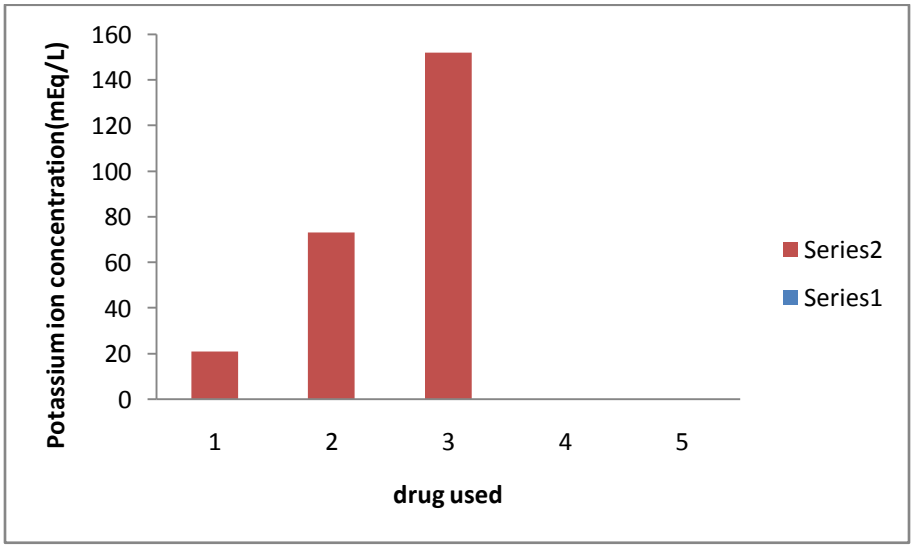

Figure 2: Effect of marketed poly herbal syrup on potassium ion concentration in rat urine

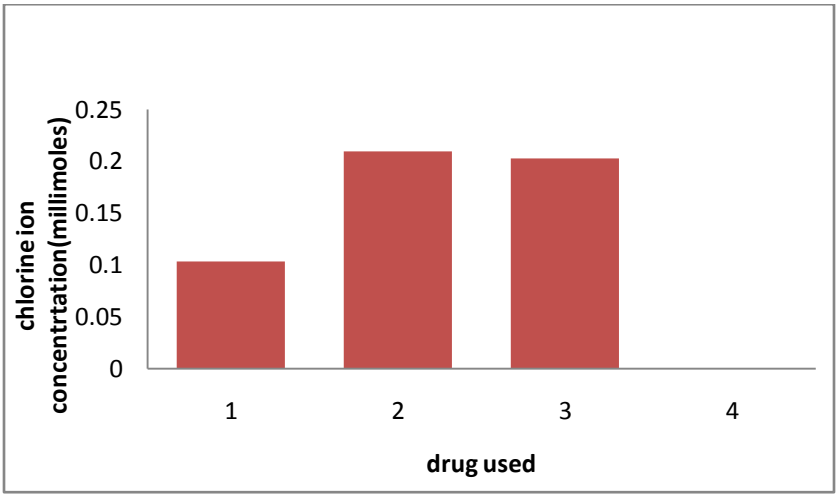

Figure 3: Effect of marketed poly herbal syrup on Chlorine ion concentration in rat urine

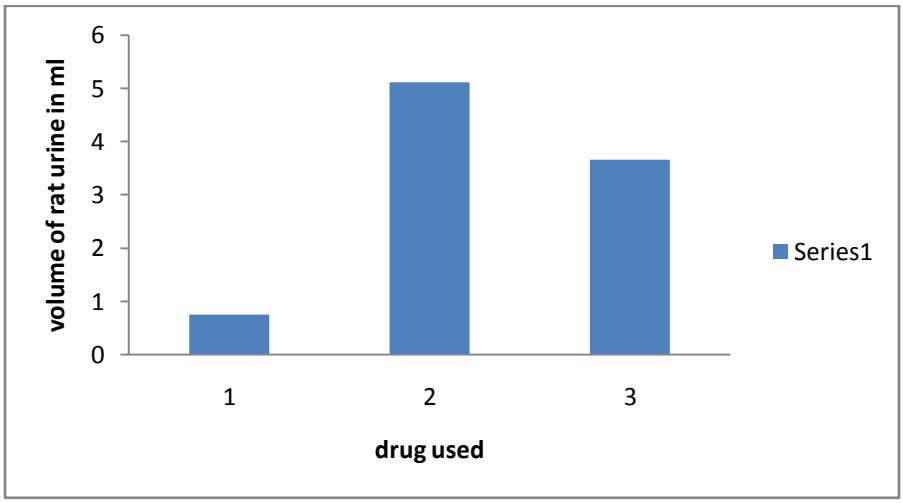

Figure.4 Effect of marketed poly herbal syrup on volume of rat urine

CONCLUSION:

Diuretic activity was performed for marketed polyherbal syrup, which exhibited very good urine output, electrolyte excretion Diuretic action and Diuretic activity higher than that of the standard frusemide. It may be due to the presence of Flavonoids. Formulation (Simple syrup) exhibited better diuretic activity when compared with the standard. Finally it was concluded that the marketed diuretic syrup proved to be a potential nutraceutical diuretic. And further scope has to explored for suitable formulation other than the syrups.

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