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# DIURETIC ACTIVITY OF *ANANAS COMOSUS* EXTRACT BY USING WISTAR RATS

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## ABSTRACT

*Ananas comosus* are commonly known as the pine apple belongs to the family Bromeliaceae. It is the most edible fruit having various pharmacological properties mainly the antioxidant properties. This study is to evaluate the diuretic activity of the phenolic and flavonoid compounds that can be used in treating the various ailments to remove the excess of fluid from the body, hypertension, kidney failure cases. Quantitative analysis is done to identified the content of phenolic and flavonoid compounds in the ethanolic extract. The content was estimated in the extract and evaluated the diuretic activity by using the Lipschitz test. The extract of 500 mg/kg shows the significance therapeutic effect when compared with the control groups. Thus we can concluded that the ethanolic extract was having the significant diuretic effect that can be used for various ailments.

## INTRODUCTION

[1]Herbal medicines are one of the most ancient traditional system to cure diseases in India. Now a days the people are gaining awareness in the natural herbs and its role in the treating of various diseases. Although there are several diuretic agents from the synthetic origin there is a need to explore more drugs because of its adverse drug reactions. The natural origin drugs are having less adverse drug reactions and easily compatible with the body systems. Diuretics are the agents which are widely used in the treatment of various ailments like hypertension, liver cirrhosis, chronic and acute kidney failure.[2-9] *Ananus comosus* is a topical plant grown widely in the Asian countries. It is a herbaceous perennial plant 1.0-1.5 meters tall and produces 200 flowers.[10,11] Bromelain is the main constitute and also contains the variety of chemical constituents includes the polyphenols, flavones, tannins etc. The poly phenols and flavones are having the high antioxidant property.

## MATERIALS AND METHODS

**Preparation of Extract:[12,13,14]** The fruits are collected from the local market and washed thoroughly to remove the foreign material. After cleaning the peel is removed and cut into small pieces uniformly. The pieces are dried in the oven at 35oC for three to four days. The dried material was pulverized into the coarse powder then soaked in the ethanol to obtain the extract through maceration process. The fresh ethanol was added in between the days by occasional stirring for about 72 hrs. The mixture was passed through a muslin cloth and the extract was concentrated through the vacuum evaporator. The obtained extract was subjected to the phytochemical screening to identifying the phenolic and flavonoid chemical constituents.

**Estimation of Total phenolic Content:[15]** The total phenolic content of the extract was determined by the Folin -Ciocalteu method by using the UV - Spectrophotometer at 650 nm and expressed as mg of gallic acid equivalent per gram dry weight.

**Estimation of the Total flavonoid content:[15]** The total flavonoid content of the extract was determined by the Aluminum chloride colorimetric method by using the colorimetry at 510 nm. The total flavonoid content was expressed as mg rutin equivalent per gram dry weight.

**Diuretic Activity:[17,16]** The diuretic activity was performed by using the lipschitz test. The experimental study was designed comprising of 150-170gm albino wistar rats of either sex. The rodents were taken from animal house of Department of Pharmacology, Bapatla College of Pharmacy where they were housed at room temperature of 25 ± 20 C. They were then familiarized with laboratory environment and were kept at room temperature 25 ± 20 C under 12 hours light and dark cycle. Prior to the experimentation the procedure was approved by IAEC committee with the reference number of IAEC 1032/PO/S/03/CPCSEA. The animals were given water and standard diet (food) freely. Food and water was withdrawn 18hrs before the start of the experiment. Rats from each group was placed in a metabolic cage designed to keep the urine and feces separate. The urine samples were collected after 24 hours in cylinder and its volume was measured. The fresh urine samples pH was evaluated using PH meter. The urine

samples were then diluted (1:1000 in deionized water) to estimate the concentration of electrolytes [Na, K, Cl and P) in urine by using flame photometer.

## RESULTS AND DISCUSSION[18]

The results shows the diuretic activity of ethanolic extract of pine apple with a total phenolic and flavonoid content was found to be 40.71±0.15 & 30.62±1.63.

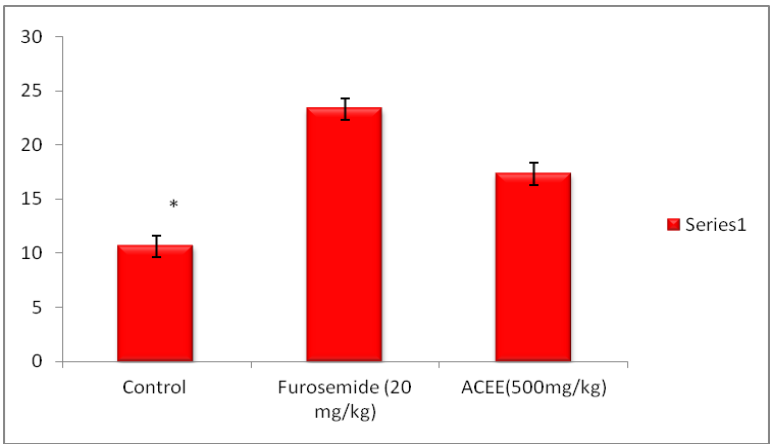
The phenolic and flavonoids were found to be playing a major role in the diuretic process as well as potent anti oxidant property. The results of ethanolic extract of *Ananas comosus* at 5th hour was shown in Table 1 and graph 1**.** From the result it can be observed that alcoholic extract of *Ananas comosus* has shown a significant increasing urinary output at 5th hour when compared with the control group. From the table 2 and graph 2 it was observed that there is an increased excretion of sodium, potassium, chloride when compared to control. The excreted sodium, potassium, chloride was expressed in the mean deviations. The extract shows the significant value same as of standard group. Further there was no effect on the other electrolytes. As the pine apple extract also shows the various number of activities for the phenolic and flavonoid compounds like anti cancer, anti inflammatory, hepatoprotective, anti oxidants effect. Different doses and different extraction methods might result in variation of therapeutic effect. More studies including the effect of such combination on histopathology of the kidney will be useful.

**Tables 1: Diuretic activity of Ethanolic Extract of *Ananas comosus.***

| S.No | Drugs | Urine collected at 5th hour(ml/kg) |
|---|---|---|
| 1 | Control (water) | 10.66±1.36 |
| 2 | Furosemide (20mg/kg) | 23.33±1.96** |
| 3 | ACEE (500 mg/kg) | 17.33±5.04** |

**Table 2: Electrolyte excretion on the Ethanolic Extract of *Ananas comosus.***

| S.No | Drug | Sodium (mmol/L) | Potassium (mmol/L) | Chloride (mmol/L) |
|---|---|---|---|---|
| 1 | Control(water) | 113.3±1.86 | 50.0±2.28 | 77.16±2.56 |
| 2 | Furosemide (20mg/kg) | 193.5±2.81** | 84.35±3.4** | 124.5±5.82** |
| 3 | ACEE (500 mg/kg) | 175.3±5.46** | 71.33±3.61** | 119.83±3.48** |




**Graph 1: Diuretic activity of ethanolic extract of *Ananus comosus.***

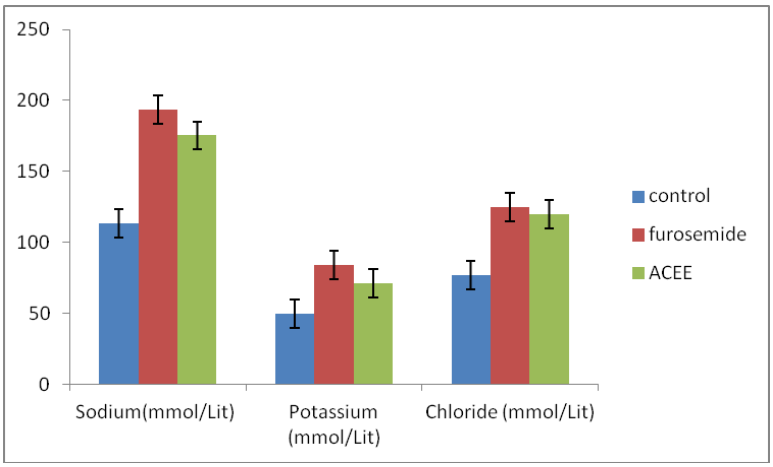



**Table 2: Electrolyte excretion on the ethanolic extract of *Ananus comosus.***

## CONCLUSION

The result will pave the way for further studies, including drug herb interactions, to investigate the diuretic effect of different drugs along with the *Ananas comosus* in acute or chronic kidney pathological entities where oxidative process plays a major role in the pathogenesis.

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