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Investigation on Polyherbal Antipyretic Syrup for Fever

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ABSTRACT

Fever is an important and notable sign and symptom of many diseases that are caused in the human body. They are the result of any inflammatory condition, infection or any other disease occur due to any external agents. There are a lot of drugs that are used to control pyrosis in the body. Fever is simply elevation of the body temperature. The chemical constituents isolated from the plants were effective in treating many diseases and were seemed to be potent against all the conditions. Even with the advent of the synthetic drugs, herbal leads have been the drugs of choice in many diseases like CHF, Cancers and more. The plant vitex was extracted using the ethanol water mixture and this extract was used to produce the poly herbal antipyretic syrup. This was investigated on the yeast induced pyrexia and it showed a better activity compared to the standard paracetamol drug and also a marketed formulation. This can be supported by the antioxidant and antibacterial properties of vitex and also supported by the *Piper longum* that contains piperine which as usually acts as a penetration enhancer in pharmaceutical applications.

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INTRODUCTION

Fever is an important and notable sign and symptom of many diseases that are caused in the human body. They are the result of any inflammatory condition, infection or any other disease occur due to any external agents. There are a lot of drugs that are used to control pyrosis in the body. Fever is simply elevation of the body temperature. There are many drugs that treat fevers like NSAID's that show many side effects like ulcers, gastric perforations, gastric bleedings and obstructions etc. this makes the effective and safe usage of the drugs questionable [1, 2]. There areother drugs like COX inhibitors that are known to relive from various types of pyresis and they cause CV problems, and heart issues like CVD but are efficient in treating pain and swelling but these side effects are causing their use controversy [3, 4]. Usually, fevers are caused due to infections and microbes attack. The antibiotics used to treat these are known to involve with some psychology conditions like stress, addiction and resistance to a stage where the drug no longer works on the disease [5, 6].

Plants have been the sources of the molecules that were used to treat many diseases effectively and there were numerous investigations where there are scientific proofs for the mechanism and activity of the medicinal molecules. There had been recorded evidences of their use in the traditional systems of medicine in Ayurveda and Siddha medicines [7]. The chemical constituents isolated from the plants were effective in treating many diseases and were seemed to be potent against all the conditions. Even with the advent of the synthetic drugs, herbal leads have been the drugs of choice in many diseases like CHF, Cancers and more [8].

Among the plants, *Vitex leucoxylon* had been investigated for its antipyretic activity earlier and a is found potent in controlling the fever that are the result of inflammation and wounds [9]. So this plant extract was used to prepare an antipyretic syrup which also incorporated extract from black pepper (*Piper longum*) which enables the easy absorption of the vitex extract which facilitates the early recovery from the fever.

EXPERIMENTAL SECTION

Herbal collection

The plant of vitex were identified near a pond in the farm and were prepared into herbarium and were aunthetified. The plant stems were collected and dried properly in an oven and powdered finely. This fine powder was extracted using ethanol using maceration process. 10gm of drug was taken in an beaker and macerated with 70%ethanol of 200ml and with occasional stirring for about 24 hrs and then it is filtered off using filter paper. This filtrate was collected and evaporated in a water bath. the obtained extract was dessicated and stored. The same process was repeated with the piper longum too. The dried fruits were collected from the market and extracted using ethanol and water mixture of 50%v/v and the extract as collected.

The syrup was prepared using the specific quantities as per table 1. The extracts were mixed with the sugar syrup base as per specified quantities and are then dissolved properly with continuous stirring in a mechanical stirrer. The resultant solution is an antipyretic syrup and was tested directly on the rats for antipyretic activity.

Invivo activity

Animal segregation

Albino swiss rats were selected for the activity which weighed around 130-140gm. They were followed their regular protocol as per CPCSEA guidelines for animal acclimatization of animals.in the laboratory they were allowed with free access for food and water in their own cages. All the animals were induced with the pyresis in the yeat method. 15%w/v solution of yeast was suspended in the methyl cellulose solution and it was injected into the skin of the rats and allowed to sit alone in their cages for 12 hrs [9]. the rats were selected on the basis that the rats that showed only a gain in temperature of at least 0.6^0C were selected for the study [10].

METHODOLOGY

The animals which showed an induction of pyrexia were then divided into 4 groups out of which one group served as negative control group. animals in this groups received only saline at 0.9%w/v and 1.6ml of this solution was administered to each rat. For the second group a standard drug paracetamol was suspended and administered to the rats at a dose of 150mg/kg of rats [11]. To the third group a marketed formulation with antipyretic property has been selected and administered via oral route at the dose specified int eh label claim and instructions sheet. To the last group, the prepared poly herbal antipyretic syrup had been administered orally at a dose of 1ml/kg body weight of the rats [12]. The rectal temperature was recorded using a digital thermometer for every 1hr, 2hr and 4hr and 6hr

RESULTS AND DISCUSSIONS

The prepared poly herbal syrup was thick and the pH was about 5.5-5.9 which was slightly acidic in nature and tasted sweet and cirusy. The viscosity of the syrup was also acceptable in nature. The colour of the syrup was thick brownish yellow colour. Overall, it was acceptable and comparably similar to the marketed syrup formulation. Tables 1 and 2

Table 1: Preparation of Poly Herbal syrup

Sl.No	Materials	Quantities
1	Vitex ethanol extract	100mg
2	Piper ethanol extract	100mg
3	Sugar	10g
4	Distilled water	qs
5	Citric acid and regulators	10mg

The prepared antipyretic formulation was tested against the pyrexia induced using the breawers yeast. The induction of the yeast it not he subcutaneous layer resulted in the rectal temperature of the rats. There was a significant raise in the rectal temperature. The prepared syrup significantly lowered the temperature to normal as compared to the normal temperature of the rats. The marketed formulation also lowered the body temperature of the rats significantly but not less that the paracetamol standard drug. The experiment continued to note the rectal temperature for 4hrs and all the drugs showed a normalization of the temperature to a normal body temperature of the rats.

Yeast induced fever was a typical example of the infection induced elevation of the temperature. It was suggested and evident that the paracetamol

Table 2: Effect of Poly Herbal Syrup on temperature

Group	Temp^0 c	Temp after drug ^{0} c			
		1hrs	2hrs	4hrs	6hrs
Negative group	40.72±0.53	44.52±0.84	42.43±1.29	43.84±0.67	44.96±1.01
Standard drug	39.84±0.91	42.05±0.62	43.51±1.14	41.42±0.28	40.63±0.73
Marketed forumation	40.06±1.15	42.73±1.26	41.32±0.72	40.65±0.89	39.50±0.61*
Polyherbal antipyretic syrup	42.67±0.76	44.29±0.58	40.58±0.83	41.06±1.35	39.15±0.42*

inhibits the elevation in the temperature by inhibiting the prostaglandins that are produced due the infection in the body. This also releases cytokinins into the blood stream that causes the rise in the rectal temperature. The herbal syrup also lowered the temperature compared to the syrup so it is advocated that the syrup also acts in the same mechanism of action by inhibiting the prostaglandins and cytokinin [13, 14].

CONCLUSION

The plant Vitex was extracted using the ethanol water mixture and this extract was used to produce the poly herbal antipyretic syrup. This was investigated on the yeast induced pyrexia and it showed a better activity compared to the standard paracetamol drug and also a marketed formulation. This can be supported by the antioxidant and antibacterial properties of vitex and also supported by the *Piper longum* that contains piperine which as usually acts as a penetration enhancer in pharmaceutical applications.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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