ABSTRACT

In recent years, focus on plant research has increased all over the world and evidence show immense potential of medicinal plants used in various traditional systems. Herbal drugs have got tremendous momentum in global health care system. Many plants have been found to have therapeutic potential and are being used since time immemorial. The beneficial therapeutic effect of these medicinal herbs is seen in their continued use and proven scientifically. Bamboo is one of the precious plant resources of the earth. The mention of the traditional use of bamboo in Asian medicine dates back to the 6th century. Popular among the common people as “Poor man’s timber” since ancient times, because of its innumerable applications has attained the status of “Green Gold of forests”. Today bamboo constitutes one of the most important renewable natural resources of India. The use of bamboo is not only restricted as structural and building materials but with the advent of time has become an important ingredient of traditional Asian Medicines in general and Chinese medicine in particular. Bambusa arundinacea (Retz.) Roxb belongs to a family Gramineae (also called Poaceae) a graceful spinous bamboo, distributed throughout the moist parts of India. Several species like rice, wheat, oats, barley and maize belong to this grass family. Bamboos are, however, perennial grasses classified under the sub-family bambusoideae. Traditionally bambusa leaves, stem and root were used as astringent, laxative, diuretics and also it has anti-inflammatory, anti microbial, antifertility, antispasmodic, antidiabetic and antiulcer activity. Leaf buds are used to treat menstrual problems. Roots are used to treat cirrhosis and tumors of liver, spleen and abdomen. Tribal women around Salem in Tamil nadu chew leaves of Bambusa aurundinacea in the morning and evening for 1-3 days to induce abortion of an early conception. A decoction of bamboo joints is said to increase the flow of lochia after delivery.

Bambusa arundinacea seeds - An Unexploited part of the Bambusa tree: Bamboo blossom is a natural phenomenon in which the bamboos in a location blossom and become hung with bamboo seeds. In China and India, "bamboo blossom" was traditionally seen as a curse or an indication of a starvation coming. It flowers gregariously once in the life
time. Bamboos usually have a life-cycle of around 40 to 80 years, varying among species. At infrequent intervals for most species, they will start to blossom. After blossom, flowers produce fruit (called "bamboo rice" in parts of India and China). Following this, the bamboo forest dies out. Since a bamboo forest usually grows from a single bamboo, the death of bamboos occurs in a large area. This belief is older than the Indian epic Mahabharata, written 5000 years ago. In the story, the evil king Jayadrath forcibly abducted Draupadi, the Pandavas wife, and trampled through the forest in his chariot. She cursed the king that he would be destroyed, just as bamboos bring forth instant ruin by their blooming. Flowers in large panicles, sometimes occupying the whole culm; caryopsis oblong 5-8mm long, grooved on one side. The kani tribes of kanyakumari district used the seeds as food and they believe that the seeds of Bambusa arundinacea enhance the fertility. However there is lack of information about the use of bamboo seed. Hence, an attempt has been made to explore the indigenous knowledge about the use of this bamboo seed. Genus bambusa comprising of around 120 species, however, only few species have been investigated systematically. The information on the phytochemicals and pharmacology of bambusa arundinacea seed is limited. No such pharmacological and phytochemical data are available on the plant Bambusa arundinacea seeds. So, the main intention of the current study is to investigate the unexploited plant, Bambusa arundinacea for its ethno medical claims as well as pharmacological activities based on chemotaxonomic tracing and invitro experimental models.

The specific objectives of the investigation are: To exploit and evaluate the physiochemistry, pharmacognosy, qualitative and quantitative analysis of phytochemicals and secondary metabolites, vitamins and minerals of Bambusa arundinacea seeds. Further to exploit various extract of Bambusa arundinacea seeds for their antioxidant, antidiabetic, anticancer, anti-inflammatory, anti-diabetic, anti-arhritic, anti-microbial, antihelminthic activity (Invitro).

The powdered (100gm) was extracted three times by cold percolation method with 300 ml of Hexane, acetone and hydro ethanol at room temperature for 72 hrs the filtrates were concentrated under reduced pressure at 40°C and stored in refrigerator at 2-8°C for use in subsequent experiments. Phytochemical examinations were carried out for the extract as per the standard methods. The amount of total phenol content was determined by
Folin-Ciocalteu reagent method. The amount of total flavonoid content was determined by using HPLC method. The amount of fatty acid were quantified using gas chromatography and estimation of calcium by atomic spectrometry. The Antimicrobial activity was tested against both Gram +ve and Gram -ve microorganism and Antifungal activity using disc diffusion method. The anthelmintic activity was performed according to the standard method. The Anti-Inflammatory was evaluated by invitro method by using standard drug for the invitro, (albumin denaturation technique) method. The Anti-oxidant was evaluated by invitro method by using hydrogen peroxide scavenging method, Nitric oxide radical scavenging activity, DPPH free radical scavenging activity and Reducing assay method. The Antidiabetic was evaluated by invitro method by using α amylase and α glucosidase inhibition activity based on colorimetric method. Anticancer activity of the extracts were evaluated using MTT assay is based on the ability of live but not dead cells to reduce a yellow tetrazolium dye to a purple formazan product.

In the present investigation preliminary phytochemical screening of the H.ethanol, acetone and hexane extracts of Bambusa arundinacea shows the presence of flavonoids, glycosides, phenol, tannin, coumarins, quinones and phytosteroids. In all these extracts alkaloid, saponins and terpenoids were found to be absent. The analysis of seeds of B. arundinacea has shown its potential significance. It has revealed that B. arundinacea seeds are a rich source of carbohydrate, protein, lipid and fibre. The mineral content showed the presence of calcium, magnesium, zinc, Iron, copper, sodium and potassium. Low content of pb, cd, As and Hg showed that the seed is free from toxic metals. From the present study it can be concluded that, contamination of heavy metals and microorganisms did not observed in the extract of Bambusa arundinacea. Various pharmacognostic standards like botanical description, microscopy, ash values, extractive values, microscopic characteristics of powder, heavy metals, pH, solubility, HPTLC and preliminary phytochemical study of Bambusa arundinacea could be useful for the compilation of a suitable monograph for its proper identification. The hydroethanol extract obtained from Bambusa arundinacea exhibit an excellent in-vitro anti-oxidant activity, anti-diabetic, anti-inflammatory, anti cancer, antiarthritic, antibacterial, antifungal and anthelmintic activity. Bambusa arundinacea Retz., by inhibiting α amylase and α glucosidase reduces the digestion of carbohydrates which in turn reduces the blood glucose level. The presence of flavonoids in Bambusa arundinacea Retz., acts as an insulin mimetic to stimulates the
peripheral tissues for increased glucose uptake and regulates the rate limiting enzymes which may be responsible for the antidiabetic activity. In our studies the hydroethanol extracts of Bambusa arundinacea showed moderate and strong antibacterial activity against the pathogen. Tannins were found to be a component of plants that showed antibacterial activity. It could be one of the components responsible for the antibacterial activity. The seeds possess good amount of bioflavonoid compounds such as quercetin and rutin. May be the presence of quercetin and rutin the seed extracts exhibits good anticancer, antioxidant and antiarthritic activity. Both quercetin and rutin are used as medication for various diseases such as cancers, diabetes, heart diseases, arthritis, hemorrhoids, varicosis, micro angiopathy and are ingredients of numerous multivitamin preparations. As the seeds of Bambusa arundinacea possess all the essentials phytoconstituents, amino acids, oils, vitamins and minerals it exhibits great medicinal value. Being non-toxic, having high nutraceutical values when compared with rice and wheat we can develop the seeds of Bambusa arundinacea as an alternative food. However, treatment with plant extracts although may be have some unpredictability in the effectiveness, side effect less alternative, purified plant extracts and their isolated phytoconstituents can be very useful against many diseases.

In conclusion the chemical composition of Bambusa arundinacea shows it can be a potential source of nutraceuticals. They were found to be very good source of Phosphorus, Calcium, Magnesium and Iron. Seeds of Bambusa arundinacea are potential source of, phytochemical, tocopherols, essential fatty acids like oleic acids, linoleic acid and linolenic acid. Evidently, the seed is a rich source of bioactive compounds and may be used to develop value added products and other food applications to enhance the health benefits. The obtained extracts have potent antioxidant, anti diabetic, anticancer, antiarthritic properties and may play an important role in drug development and health supplement. Thus, there is enormous scope for future research and further pharmacological investigation on Bambusa arundinacea seeds.