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Phytochemical analysis of ethanolic kernel extract of *Zea mays*

R. Srideviazhagammal[1], S. Sivakrishnan[1*], S.Vigil Anbiah[2]
M.Pharm (Pharmacology), Department of Pharmacy, FEAT, Annamalai University, AnnamalaiNagar-608002, Tamilnadu, India[1]
Assistant Professor, Department of Pharmacy, FEAT, Annamalai University, AnnamalaiNagar-608002, Tamilnadu, India[1*]
Associate Professor and Head i/c, Central Animal House, Rajah Muthiah Medical College,Annamalai University, AnnamalaiNagar-608002, Tamilnadu, India[2]
[1*]Corresponding Author E-mail: sivacdm82@gmail.com

ABSTRACT
Plants play an important role in health-care system of almost all countries. Approximately 80% of the world's population relies on traditional medicine, which is primarily based on plant materials. Plants use phytochemicals as a defence mechanism against diseases and other external threats. They also give plants their distinct colour, aroma, and flavour. They are metabolites found in plants (primary or secondary). The primary step in drug evaluation is the detection of phytoconstituents in plants. Preliminary phytochemical studies on the Corn kernel were carried out in this study (Zea mays).Using Soxhlet apparatus, coarse powder of Corn kernel leaves was extracted with ethanol by hot percolation. For 24 hours, the extraction has been worked out. The solvent was extracted out for acquiring a concentrated extract following extraction. The condensed extract was then vacuum dried and the dry extract was processed for specific bioactive compounds investigation in an air tight container. The existence of alkaloids, carbohydrates, proteins & amino acids, hormones, phenols, tannins, flavonoids, glycosides and saponins was revealed in ethanolic extract of Corn kernel (EECK).
KEYWORDS: *Corn kernel, Phytochemicals,Metabolites, Ethanol, Extraction*

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INTRODUCTION

Phytochemicals are a class of non-nutritional [1] bioactive compounds [2] that are naturally synthesised by plants. They can be found in flowers, buds, leaves, fruits, roots, barks, kernels, and spices. Primary metabolites and secondary metabolites are two types of biomolecules [3]. Primary metabolites are metabolic products that are found in all living systems and play an important role in the energy requirement process. Primary metabolites include proteins, carbohydrates, lipids, and nucleic acids. Secondary metabolites [4,5] originate from primary metabolites. They are present in trace amounts and play non-essential role but are highly specialized chemicals that perform a specific function,such as curing a specific disease or having germicidal effect etc [6]. Secondary metabolites, including alkaloids, glycosides, terpenes, flavonoids, saponins, phenols, tannin etc, are pharmacologically important. There have been approximately1 lakh 20,000 secondary metabolites. They are stored in various plant organ and also vary from organ to organ in percentage accumulation. Secondary metabolites make a plant medicinally important.

Corn (Zea Mays),[7,8] which is also referred to as Indian corn or maize [9], cereal plant of the grass family (Poaceae) and its edible grain[10]. The domesticated crop originated in America and is one of the largest food crops in the world. Corn is employed in industry as cattle feed, human food, biofuel and raw material. Corn also supplies essential minerals like zinc, magnesium [11], copper, iron and manganese for our bodies. Corn kernels are used for medicinal purposes to reduce risk of anaemia, energy enhancement, low blood sugar and cholesterol. It has several advantages for mothers and babies during pregnancy. Corn, which is rich in folic acid, has zeaxanthin and pathogenic acid which decreases the risk of baby birth defects[12]. It can protect babies against muscular and physiological degeneration. It also soothes constipation, which is a common concern for expecting mothers, due to its high fibre content. Corn contains vitamin C and lycopene (antioxidants) whichh enhance collagen production and prevent the damage of free radicals produced by UV to the skin[13]. In addition to its consumption of corn oil, corn

starch can also be applied directly to the skin, and frequently used in many cosmetics [14,15] as an ingredient. The plant profile of *Zea mays* were showed in table 1.

Scientific name: *Zea mays L.*

Table 1:Plant profile of *Zea mays*

Species	*Zea mays*
Family	Poaceae
Sub family	Panicoideae
Kingdom	Plantae
Genus	Zea
Common Names	
Tamil	Makkacholam
Germany	Mais
English	corn; Indian corn
Indonesia	Jagung
Italy	maiscommune
Laos	khauzSali
Malaysia	Jagong
Netherlands	gewoonemais

MATERIAL AND METHODS

Collection of plant materials

Corn kernel was collected from various rural places in Tamil Nadu. It was authentified by pharmacognosist Dr. N.Srinivasan. M.Pharm., Ph.D., Assistant Professor, Department of pharmacy, Annamalai University. They were shade dried and grinded into coarse powder.

Extraction of plant materials

Coarse corn kernel powder (*Zeamays*) was extracted with ethanol using the Soxhlet apparatus by hot percolation method [16]. The extraction was carried out 24 hours. The solvent was distilled for a concentrated extract after extraction. Then the concentrated extract was dried up vacuum and dry extract for further phytochemical analysis was placed in an airtight container. [17]

Phytochemical screening of ethanolic extract of*Zea mays*

The EEZM was subjected to qualitative chemical analysis for the detection of various phytochemical constituents viz., flavonoids, carbohydrates, tannins, saponins, steroids, phenols, proteins, alkaloids and terpenoids using standard procedure [18].

RESULTS

Preliminary Phytochemical screening of Corn kernel revealed the presence of following phytoconstituents shown in table 2.

Nature is a unique source of structures with a wide range of phytochemical diversity. The needs of the human body can be supplemented by plants containing beneficial phytochemicals. Phytochemicals play vital roles in protecting various organs against various toxic compounds. The ethanolic extract of kernel of *Zea mays* contain bioactive phytoconstituents like carbohydrates, flavonoids, proteins, saponins, tannins, phenolic compounds and glycosides. All the above bioactive compounds have been reported to be medicinally active. So, it can be used in the treatment of several ailments [13-18].

Table 2: phytochemical constituents present in *Zea mays* (corn kernel)

S.NO	Test	Ethanolic extract of EEZM
1.	Carbohydrates	+
2.	Alkaloids	_
3.	Flavonoids	+
4.	Proteins	+
5.	Saponins	+
6.	Tannins	+
7.	Phenolic compounds	+
8.	Glycosides	+
9.	Steroids	_

(-) indicates the absence of compounds; (+) indicates the presence of compounds

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CONFLICT OF INTEREST
The authors declare no conflict of interest.

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