Sindh Univ. Res. Jour. (Sci. Ser.) Vol.47 (3): 473-476 (2015)

SINDH UNIVERSITY RESEARCH JOURNAL (SCIENCE SERIES)

Biochemical and Phytochemical Analysis of Typha Pollens (Cattails)

A. B. GHANGHRO[++], U. CHANNA, I. H. GHANGHRO*, M. J. CHANNA, A. H. LANJWANI

Institute of Biochemistry, University of Sindh, Jamshoro

Received 4th November 2014 and Revised 24th April 2015

Abstract: The typha is a plant which mostly grow on wetlands areas of Asia and it belongs to typhaceae family. With the usage in the folk medicine and being nutritive, most of the biochemical and phytochemical aspects are studied in the present study. The sample of typha pollen was purchased from Lahori Mohala of Larkana Sindh, Pakistan, Methanol, Ethanol, Chloroform and aquous extract were used for qualitative analysis whereas metals were detected by Perkin elmer AA Analyst 800 Atomic absorption spectrophotometer. Qualitative analysis showed the presence of phenolic compounds, tannins, saponins, carbohydrates and non-reducing sugars as well as reducing sugars, protein and amino acids whereas absence of alkaloids, flavonoids , glycosides and keto sugars were observed. 32% carbohydrates, 4.27% total protein were quantitatively determined from typha pollen (cattails) plant. Potassium (193mg/kg), Magnesium (933mg/kg), Zinc (38.3 mg/kg), Copper (13.4 mg/kg), Iron (14.3mg/kg) were also detected. Study revealed that active components of Typha pollen is rich source of carbohydrates and proteins and phytochemicals, which are basic need of human body, and biochemical analysis results indicates that it can be used as a food source. Present work also enhance the awareness about the Typha Pollens medicinal and nutritional value which enoromously meet with human needs.

Keywords: Biochemical, Phytochemical, Typha, Pollen, Analysis.

1. INTRODUCTION

The Typha is a grass - like plants and commonly grow on wetlands in all most every part of Asia, cattails' is botanical name of typha and it belongs to the family typhaceae and commonly known as of Patera or Sarpat. (Duke and wain,1981), and is vigorous 2-4 m tall, perennial plant and its common three species are T. latifolia, T. angustifolia and T. elephantina. The young shoot, rhizome, marrow of immature inflorescence are consumed as food and its pollens are used to made different sweets Typha possess refrigerant, aphrodisiac and is wind tolerant and used to treat calculus, dysuria, burning of skin and diseases of bile, behave as medicated cotton wool in local dressing to wounds and ulcer .The roots of typha plant is sun dried and ground finly to powder ,this powder is rich in proteins and used in making biscuits or added to cereal flours and also used as a thickener in soups (Facciola,1990). Young flowering raw stem (Usher, 1967), cooked or tastes like sweet corn flour used in making bread, porridge etc. (Harrington, 1974). Whereas the pollens of typha are diuretic, emmenagogue and homeostatic, astringent, desiccant, vulnerary and using in treatment of nose bleeding, hematuria, dysmenorrhea, postpartum abdominal pain, gastralgia, scrofula and abscesses (Duke and wain,1981; Morton, 1975). There are two kinds of minerals macro minerals and trace minerals. Macros minerals are needed in larger amount included calcium, phosphorous, magnesium, sodium, potassium, chloride and sulfur. Trace minerals are needed in small amounts these included copper, iodine, zinc, cobalt, fluoride and selenium. Although our body uses at least 80 different minerals to perform its daily functions, the 4 most common and most recognizable are sodium, potassium, magnesium and calcium. Some preliminary studies on antioxidant and antibacterial potential of the pollen of typha plants have been carried out in Pakistan, but it most of the physiochemical and phytochemical aspects are untouched. Keeping in the view an effort has been taken for explore the different biochemical parameters and phytochemical evaluation of *Typha angustifolia.*

2. MATERIAL AND METHODS

Collection, Identification and sample preparation: The sample of typha pollen was purchased from Lahori Mohala of Larkana Sindh, Pakistan packed in polyethylen bags and brought to laboratory for analysis. Pollens were ground to make fine powder and stored in air tight plastic bag and was used for qualitative phytochemical , biochemical and metal analysis.

Extraction of sample: 10g of the powdered plant was dissolved in 100 ml of different solvents (ethanol, methanol, distilled water and chloroform. then kept in shaking water bath for 24 hours after this the solution was filtered by whatman no. 1 filter paper, filtered sample was stored in an air tight bottles.

Sample preparation for metal by wet acid digestion method: 0.5 g of powdered pollen was dissolved in

[++]Correspondence Email : allah.bux@usindh.edu.pk 03003049628
*Water Testing and Surveillance Laboratory, LUMHS, Jamshoro

5 ml concentrated HNO_3. It was heated on a hot plate by covering with watch glass, digested until they become clear semisolid solution. 2 ml of H_2O_2 was added and heated again until clear and transparent solution was observed then filtered through Whatman No. 42 filter paper and the final volume was made up to 25 ml with deionized water (Yeng,1985). Analysis were done with Perkin elmer AA Analyst 800 Atomic absorption spectrophotometer.

Qualitative and quantitative analysis from pollen plant extracts.

Qualitative analysis of phytochemical by different method (Lanjwani *et al.,* 2015) , estimation of total carbohydrate was by anthrone method (Hodge and Hofeiter, 1962) , total protein by lowry's method by (Lowery *et al.*,1951). and some selected metals were also detected by Perkin elmer AA Analyst 800 Atomic absorption spectrophotometer method.

3. RESULT AND DICUSSION

The pollens of Typha (cattail) studied for preliminary phytochemical screening and biochemical analysis . Pollen of typha plant are medicinally important , it may be used in pharmaceutical industries. Phytochemicals screening was done by standard methods and the results revealed in **(Table.1)** that the pollens contain phenolic compounds, tannins, saponins, fixed oils and fats, and some phytochemicals are not present in Typha pollen (cattails) i.e; alkaloids, glycosides and flavonoids, and results in **(Table. 2, 3).** Showed that the pollen of typhae plants are rich source of Carbohydrates and Protein i-e 32g and 4kg respectively. The present results are in coinstant with previously reported articles that pollen of T*ypha Latifolia* gives 1,040 cal/kg, 4.9% protein, 18.2% carbohydrates, 6.4% Ash, 1.50% fat and 69% moisture. The major 97% soluble sugar in typha pollen is sucrose which accounts for 25% of pollen dry weight. Further cattail pollen can also be a fine substitute for flours and can be used to make pan cakes, cookies and biscuits. The nutrition value of the cattails comes from its rhizomes. (Kazi, *et al.,* 1999).

Table. 1. Qualitative Analysis From Pollen Typha Plants

SOLVENTS					
Parameters	**Tests**	**Ethanol**	**Methanol**	**Chloroform**	**D.Water**
Carbohydrates	Molich's test	++	++	+++	+
	Fehling test	++	+++	+++	++
	Benedict's test	++	++	++	+++
	Iodine test	++	++	++	++
	Barfoed's test	+++	++	++	++
	Picric acid test	-	-	-	-
	Seliwanoff's test	_	_	_	_
Proteins	Biuret test	-	-	+++	-
	Millon's test	-	-	-	-
	Hopkin's test	+	+	+	+
	Ninhydrin test	+++	+++	-	+++
	Xanthoproteic test	+++	-	-	-
	Lead sulphate test	-	-	-	-
Alkaloids	Mayer's test	-	-	-	-
	Hager's test	-	-	-	-
	Dragendorff'Test	-	-	-	-
	Wagner's test	-	-	-	-
Glycosides	Borntrager's test	-	-	-	-
	Legal's test	-	-	-	-
Phenolic compounds and tannins	Ferric chloride test	++	++	-	++
	Lead acetate test	-	-	-	+++
	Alkaline reagent rest	-	-	-	-
Fixed oils and fats	Saponification test	++	+	+++	+
Flavanoids	Sodium hydroxide test	–	–	–	-
Saponins	Foam's test	+	+	++	+

(Note: + present**,** ++ prominent,+++ most prominent, - absent)

Table.2. Estimation of biochemical analysis from pollen of typha plants

Serial No	Biochemical Parameter	Gram /100g
1	Total Carbohydrates	32g/100g
2	Total Protein	4.27g/100g

Table. 3. Estimation of some selected minerals analysis from pollen of typha plants.

Serial No	Minerals Name	mg/Kg
1	Magnessium	933mg/Kg
2	Potassium	193mg/Kg
3	Iron	14.3mg/Kg
4	Copper	13.4mg/Kg
5	Zinc	38.3mg/Kg

Some selected metals (Mg, K,Fe,Zn,and Cu) were analysed and results revealed in Table.3. that Potassium (193mg/kg), Magnesium (933mg/kg), Zinc (38. mg/kg), Copper (13.4 mg/kg), Iron (14.3mg/kg) were observed, the present study results are in resemblance with Kurzawska, (2013)

4. CONCLUSION

Present study revealed the necessary information regarding the active components of Typha pollen and it is rich source of carbohydrates and proteins and phytochemicals as analyzed components are basic need of human to sustain healthy body. Typha plant can be used as good medicine because of the rich amount of plant secondary metabolites availbilty. Pollen having medicinal properties due to the presence of specific phytochemicals which prevent from many diseases like Alzheimer's disease and myocardial infarction, therefore it is suggested that properly intake of Typha pollen helps in the treatment of myocardial infarction and very effective against serious human diseases. The pollen may also be used as a high-protein food. Current study proposed that Typha pollen can be used as nutrtitve human dietary food source which sustain healthy human and cope with situation of Malnutrition.

5. AKNOWLEDGMENT

This research paper is the part of thesis for partial fulfilment of the B. S. degree supervised under corresponding author Prof. Dr. Allah Bux Ghanghro.

REFERENCES:

Duke J. A, and K. K. Wain (1981). Medicinal plants of the world 3 vol. 126-134.

Facciola S. (1990). Cornucopia- A source book of edible plants. Kampong publications. New York.

Harrington H. D (1967). Edible native plants of the Rocky Mountains. University of the New Mexica press.
Hodge J. E. and B. T. Hofreiter (1962). In methods in carbohydrates chemistry, (Eds.Whistler, R. L. and Be Miller, J.N.), Academic Press, New York.

Kazi S., T. G. Kazi and G. H. Kazi (1999). Atomic absorption spectrometric study of copper in biological samples. ACGC Chem. Res. Commun. 9: 57Pp.

Kurzawska, A (2013), Evaluation of the possibilities of using cattail (Typha ssp.) as the ingredient of functional food (in Polish): Ocena możliwości wykorzystania pałki wodnej (Typha ssp.) jako składnika żywności funkcjonalnej). Ph.D Thesis. Poznań University of Life Sciences.

Lanjwani A.H., I. H. Ghanghro A. B. Ghanghro T. M. J. Khuhawar M. J. Channa (2015). Qualitative Examination of Phytochemicals from some Indiginous Medicinal Plants. Sindh Univ. Res. Jour. (Sci. Ser.) Vol.47 (2):261-264

Lowry O. H., N. J. Rosebrough A. L. Farr, R. J. Randall (1951). Protein measurement with the Folin phenol reagent. J.Biol.Chem.,193:1265-275.

Morton, J. F. (1975). "Cattails (*Typha* spp.) – Weed Problem or Potential Crop?". *Economic Botany* **29** (1): 7–29. doi:10.1007/bf02861252.

Yeng, H. C., (1985). Handbook of Chinese herbs and formulas. Institute of Chinese medicine; Los Angeles.