**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

**SCREENING AND QUANTITATIVE ESTIMATION OF PHYTOCHEMICAL AND
BIOCHEMICAL COMPONENTS OF *CASSIA SENNA* (LINN.) GROWN AT
THARPARKAR**

**CHANNA U¹, SHAH AM¹, WASSAN SM², BHATTI S², GHANGHRO AB^{*3} AND
GHANGHRO IH⁴**

¹Institute of Biochemistry, University of Sindh, Jamshoro

²Department of Community Medicine Gambat Medical College, Gambat

³PAQSJ Institute of Medical Sciences, Gambat

⁴Water Testing and Surveillance Laboratory, LUMHS, Jamshoro

***Corresponding Autor: Dr. Allah Bux Ghanghro: E Mail: allah.bux@usindh.edu.pk;
ghanghroirshad@gmail.com; +92-2003049628**

Received 28th July 2019; Revised 28th Aug. 2019; Accepted 27th Sept. 2019; Available online 1st Jan. 2020

<https://doi.org/10.31032/IJBPAS/2020/9.1.4849>

ABSTRACT

Cassia Senna botanically belongs to *Caesalpinaceae* family, local name: *Sana Makai*. Plants are recognized to play a crucial role as protective agent, major parts of the plant flowers leaves and roots have been used as conventional drugs since hundreds of years. Phytochemicals are non-nutritive compounds and contain disease prevention properties, most phytochemicals wide-ranging of flavonoids, carotenoids and polyphenols, source of antimicrobial agents towards pathogens. In the present work the fresh root, stem, depart, flower and seed of *Cassia Senna* were collected from Chachro Taluka Chachro, District Tharparker, Sindh, Pakistan. This study was designed to analyzed the biochemical profile, medicinal and antibacterial properties of *Cassia senna* Linn. that's grown in Sindh, Pakistan. The plant parts (Roots, Leaves, Flowers, seed Stem) contain Total Moisture% (45-75%), Total Ash% (6.5-15%), Total Carbohydrates (11-17.76 g/100g), Total Protein (3.13-15.2 g/100g), Total Phenolic Contents (1.52-2.66 g/100g),

Total tannin (0.052-0.67 g/100g), Total Flavonoid (0.43-1.17 g/100g), Total antioxidative contents(0.48-0.66 g/100g). The *Cassia Senna* medicinally rich source of macro-micro molecules and antioxidative components, these research findings will contribute in the pharmaceutical industries.

Keywords: Quantitative, Phytochemical, Biochemical, *Cassia Senna*, Tharparkar.

INTRODUCTION

Various plants have an important role in the field of medicine, variety of medicines are made up of medicinal flora. In the developing countries (80%) of humans rely on traditional medicinal treatment. *Cassia Senna* botanically belongs to *Caesalpiniaceae* family, local name: *Sana Makai*, more than four hundred species of *Cassia* are found in the world. *Cassia acutifoliata* instinctive to Egypt, Middle East, and *Cassia angustifolia* grown in India and China (C. A. Vahl and C. S. L.; 2007, J. P. Yadav et al; 2010). Plant parts (Roots, Leaves, Flowers, seed Steam) are rich source of biologically active metabolites and secondary metabolites. Fresh root, stem, depart, flower and seed of *Cassia Senna* have numerous industrial applications and Food and Drug Administration (FDA) recognized the tablets. The plant-derived material used in drug synthesis. *C. alata* plant is most effective against the skin infections agents in humans & animals (Igoli et al., 2005). A research study conducted (seed, leaves and roots) on same family plant (*C. alata*) have

active therapeutic applications against the antihelminthic, uterus disorder haemorrhoids, constipation, blennorrhagia, syphilis and diabetes, inguinal hernia, intestinal parasitosis, (Abo et al., 1998, Adjanahoun et al., 1991, Kochar, 1981). These research findings estimated the responsible components from the leaves, roots flowers and steam of this plant. Subsequently; the *Cassia Senna* may be useful in pharmaceutical industries due their medicinal application.

MATERIALS AND METHODS

Sample Collection

All parts (leaves, roots flowers and stem) of the *Cassia Senna* (linn). plant were collected from the taluka Chachro District: Tharparker. The plant was identified at Institute of Plant Sciences, University of Sindh Jamshoro.

Extraction, Qualitative and Quantitative (Biochemical Phytochemical & Antimicrobial) Analysis

Dried and 10 grams (powder) of (*Cassia Senna*) plant were dissolved in a hundred ml of 80% methanol, on shaking for 24 hours.

Filtered the solution, extract were collected and store at refrigerator for qualitative and quantitative Biochemical (Total Moisture %, Total Ash %, Total Carbohydrates, Total Protein) Phytochemical (Total Phenolic Contents, Total tannins, Total Flavonoids, Total antioxidative contents) examination, methods were followed by (Ghnaghro, I. H et al. 2015). Research work was carried out at Institute of Biochemistry, University of Sindh Jamshoro.

RESULTS & DISCUSSION

Phytochemical and Biochemical Screening (qualitative analysis) of the *Cassia Senna* shown in the **Table 1**. Qualitative analysis results shown in table (-) indicated the Completely absent, (+++) indicated the appreciable, (++) moderate and (+) indicated the trace amount of Carbohydrates, Proteins, Alkaloids, Glycosides, Phenolic Compound, Tannins, Flavonoids and Saponins are present in the 80% methanol extract. Alkaloids in most of the parts (stem, flowers, seed, leaves and roots) of the *Cassia Senna* were absent. Phytochemical components in the *Tamarix* (leaves) were used for the treatment of various disorders.

Phytochemical and Biochemical screening resulted the sufficient amount of medically important ingredients in the *Tamarix* (leaves) reported by Nizamani et

al; 2014, Mohammedi Z. & Atik. F, 2011). Our research findings were also correlate with study conducted in 2013 by Najafi. S. (Najafi. S, 2013).

The presence of complex chemical substances as secondary metabolites referred as curative properties of medicinal plants. (Karthikeyan A; et al, 2009). In **Table 2** the Quantitative (Biochemical & Phytochemical) analysis of *Cassia Senna* (leaves, root, flowers and stem) revealed that the minimum Moisture% 45 were observed in stem and maximum moisture 75% was recorded in flowers and root of the *Cassia Senna*, Total Ash% was ranged from 6.5 -15% in the different parts. Lower moisture content increases shelf existence and protecting from microbial growth (Akpabio. U; et al; 2012). The ash contains inorganic elements, high % of ash shows high mineral content (Lethika. D et al. 2012, Compaoréet Al. W; 2011). The minimum (11g/100g) total Carbohydrates and maximum (17.76g/100g) total carbohydrates were observed in the methanolic extract of flowers and leaves. Total protein value (g/100g) was observed in different parts of *Cassia Senna*. Stem Contain (4.286), flowers (4.386), Seed (15.2), leaves (3.844) and roots (3.138) shown in **Figure 1 & 2**.

Table 1: Qualitative (Biochemical & Phytochemical) analysis of <i>Cassia Senna</i> (leaves, roots flowers and stem)						
Phytochemicals	Tests	Roots	Stem	Leaves	Seeds	Flowers
CARBOHYDRATES	Molich's Test	+++	++++	++++	++++	++++
	Fehling Test	++++	++++	++++	++++	++++
	Benedict's Test	++++	++++	+++	++	+++
	Iodine Test	+	++	++	++	++++
	Barfoed's Test	+++++	+++++	++++	++++	++++
	Picric Acid Test	+++++	+++++	+++	++	+++
PROTEINS	Seliwanoff's Test		----	-----	-----	-----
	Biuret Test	+++	+++	++++	++++	++
	Millon's Test	+++	++	++	++	++
	Hopkin's Test	+++	+++	+++	++	++
	Ninhydrin Test	+++	+++	+++	++++	++
	Xanthoproteic Test	++	++	+++	+++	+++
ALKALOIDS	Lead Sulphate Test	+++	+++	+++	++	++
	Mayer's Test	-	-	-	-	-
	Hager's Test	-	-	-	-	-
	Dragendorff's Test	-	+	-	-	+
GLYCOSIDES	Wagner's Test					++
	Borntrager's Test	++	++	++	++	+++
PHENOLIC COMPOUND AND TANINS	Legal's Test	++	++	++	++	++
	Ferric Chloride Test	++++	+++	+++	+++	+++
	Lead Acetate Test	+++	++	++	+++	+++
FIXED OILS AND FATS	Alkaline Reagent Test	+++	+++	+++	+++	+++
	Saponification Test	+	+	+	++	++
FLAVANOIDS	Sodium Hydroxide Test	+	++	+	+	++
SAPONINS	Foam's Test	+	+	++	+	+

(+++ Appreciable amount; (++) Moderate amount; (+) Trace amount and (-) Completely absent

Figure 1

Figure 2

Table 2: Quantitative (Biochemical & Phytochemical) analysis of <i>Cassia Senna</i> (leaves, root, flowers and stem)					
Plants	<i>Cassia Senna alaxedrina</i>				
Parts of the plant	root	stem	Seeds	Leave	flower
Total Moisture %	75	45	72	65	75
Total Ash %	12	15	9.6	11	6.7
Total Carbohydrates g/100g	13.12	15.45	17.60	17.76	11.0
Total Protein g/100g	3.138	4.286	15.2	3.844	4.386
Total Phenolic Contents g/100g	1.52	1.572	2.66	2.39	1.74
Total tannin/g/100g	0.628	0.067	0.678	0.052	0.075
Total Flavanoid g/100g	1.176	0.432	1.172	0.972	0.556
Total antioxidative contents g/100g	0.4846	0.566	0.654	0.529	0.666

Carbohydrates play a critical role in presenting power to cells which include the brain, muscle groups and blood. It helps fats metabolism and retains protein as a source of energy, with slight laxative effects on human beings. (S. Eze and O. Ernest 2014). Plants contain phenolic compounds, flavonoids dietary protein, antioxidant compound consumption of plant proteins helps in formation and maintenance of human tissues, enzymes, hormones, atherosclerosis and cancer. And other critical fitness substances (Hayat. R; et al 2013). Total Phenolic Contents, Stem Contain (1.572), flowers (1.74), Seed (2.66), leaves (2.39) and roots (1.52), Total tannin Roots (0.628), Stem (0.067), Seeds (0.678), Leaves (0.052), Flowers (0.075). Total Flavonoid Roots (1.176), Stem (0.432), Seeds (1.172), Leaves (0.972), Flowers (0.556). Total antioxidative contents Roots (0.4846), Stem (0.566), Seeds (0.654), Leaves (0.529), Flowers (0.666). The flavonoids, Tannins play an essential role and have medicinal applications which includes anti-tumor, anti-ulcer, anti-inflammatory, anti-bacterial, anti-thrombotic and anti-viral. (Ashok P and Upadhyaya K. 2012.). Antioxidant are predominant position is to inhibit and take away unfastened radicals that cause oxidative pressure, which causes human infections and

degenerative diseases. Antioxidants have the capability to provide their hydroxyl purposeful groups to electrons to prevent oxidation in different compounds (Banso; 2007). These research findings estimated the responsible components from the *Cassia Senna* (leaves, roots, flowers, seeds and steam), subsequently; the *Cassia Senna* may be useful in pharmaceutical industries due their medicinal applications.

CONCLUSION

The presence of complex chemical substances as secondary metabolites referred as curative properties of this medicinal plant. These research findings estimated the responsible components from the *Cassia Senna* (leaves, roots, flowers, seeds and steam), subsequently; the *Cassia Senna* may be useful in pharmaceutical industries due their medicinal applications.

ACKNOWLEDGMENT

This article is the part of Ph.D thesis of 1st Author Ms. Umedan Channa

REFERENCES

- [1] Abo, K.A., Adediwura, A.A. and Ibikunle, A.J. (1998). 1st International Workshop on Herbal Medicinal Products, University of Ibadan, Ibadan, Nigeria. pp. 22 - 24.
- [2] Adjanahoun E., Ahyi, M.R.A., Ake-Assi, L., Elewude, J.A., Fadoju, S.O.,

- Gbile, Z.O., Goudole, E., Johnson, C.L.A., Keita, A., Morakinyo, O., Ojewole, J.A.O., Olatunji, A.O. and Sofowora. E.A. (1991). Traditional medicine and pharmacopoeia. Contribution to ethnobotanical floristic studies in Western Nigeria, Pub. Organization of African Unity, Scientific Technical and Research Commission Lagos, Nigeria. p. 420.
- [3] Akpabio. U, D. Udiong, And A. Akpakpan, (2012). "The Physicochemical Characteristics Of Plantain (*Musa Paradisiacal*) and banana (*Musa Sapientum*) Pseudo Stem Wastes," Adv. Nat. Appl. Sci, Vol. 6, No. 2, Pp. 167–172.
- [4] Ashok. P And K. Upadhyaya, (2012) "Tannins Are Astringent," J Pharmacog. phytochem, Vol. 1, P. 45, 2012.
- [5] Bansa, (2007) "Evaluation Of Antibacterial Properties Of Tannins Isolated From *Dichrostachys cinerea*," African Journal Of Biotechnology, Vol. 6, No. 15, Pp. 1785–1787, Aug. 2007.
- [6] Compaoré Al, W., (2011) "Chemical Composition And Antioxidative Properties Of Seeds Of *Moringa Oleifera* And Pulps Of *Parkia biglobosa* And *Adansonia digitata* Commonly Used In Food Fortification In Burkina Faso," . Current Research Journal of Biological Sciences, Vol. 3, No. 1, Pp. 64–72.
- [7] C. A. Vahl and C. S. L, (2007) "Assessment Report On *Cassia Senna* L. And *Cassia Angustifolia* Vahl, Folium," No. April, 2007.
- [8] Eze. S, and O. Ernest, (2014) "Phytochemical and Nutrient Evaluation Of The Leaves And Fruits of *Nauclea latifolia* (Uvuru-Ilu)," Comm. Appl. Sci, Vol. 2, No. 1, Pp. 8–24.
- [9] Ghanghro, I. H., A. B. Ghanghro, M. J. Channa, (2015). Nutritional assessment of non-conventional vegetable *Cappris decidua* flowers. Rawal medical journal. 40 (2): 214-216.
- [10] Hayat. R, I. Ahmed, J. Paek, M. Ehsan, M. Iqbal, and Y. Chang, (2013) "A Moderately Boron-Tolerant Candidatus Novel Soil Bacterium *Lysinibacillus pakistanensis* Sp. Nov.C and., Isolated from Soybean (*Glycine Max* L.) Rhizosphere," Pak. J. Bot, No. 45, Pp. 41–50.

- [11] Igoli, J.O., Ogaji, O.G., Igoli, N.P. and TorAnyiin, T.A. (2005). Traditional medicinal practices among the Igede people of Nigeria (part II). Afr. J. Traditional Compliment. Altern. Med. 2(2): Pp.134-152.
- [12] J. P. Yadav, V. Arya, S. Yadav, M. Panghal, S. Kumar, And S. Dhankhar, (2010) "Cassia Occidentalis L.: A Review On Its Ethnobotany, Phytochemical And Pharmacological Profile," *Fitoterapia*, Vol. 81, No. 4, Pp. 223–230.
- [13] Karthikeyan A, Shanthi V, Nagasathaya A (2009) Preliminary phytochemical and antibacterial screening of crude extract of the leaf of *Adhatoda vasica*. L. Int J Green Pharm (3): 78-80.
- [14] Kochar, S.L. (1981). Tropical Crops: A Textbook of Economic Botany. London: McMillan, International College Editions, p. 416.
- [15] Lethika. D, K. Santhosh, A. Arun, And M. Deepak, (2012) "A Comparative Study On Proximate Analysis Conducted On Medicinal Plants Of Chhattisgarh," *Cg, India.Res, J. Chem. Sci, Vol. 2, No. 9, Pp. 18–21.*
- [16] Mohammedi Z, Atik F (2011) Impact of solvent extraction type on total polyphenols content and biological activity from *Tamarix aphylla* (L.) Karst. Int J Pharma & Bio Sci 2: 609-615.
- [17] Makinde A. A., Igoli J. O., TA'Ama L., Shaibu S. J., Garba A. (2007). Antimicrobial activity of *Cassia alata*. Afr. J. Biotechnol. 6(13): 1509-1510.
- [18] Nizamani RA, Khan SA, Awan MS, Khan MM, Khan MT (2014) Nutritive Evaluation of *Acacia nilotica indica* forage for growing kids. J Anim & Plant Sci 24: 55-58.
- [19] Najafi, S; (2013); Phytochemical screening and antibacterial activity of leaf Extract of *Ziziphus mauritiana* Lam. Int Res J Appl Basic Sci 4: 3274-3276.