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RESEARCH ARTICLE

FTIR SPECTRAL ANALYSIS, PHYTOCHEMICAL AND BIOLOGICAL ACTIVITY OF RICINUS COMMUNIS

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Abstract

Ricinus Communis is an industrial oil seed crop, frequently appearing widely distributed spontaneously in the Pakistan that is bio resources of traditional medicine for the treatment of different diseases as well as economically most important commodity. The fresh root, seed, stem, flower and leaf has been selected, collected and extracted. The FTIR Spectroscopic study was revealed the characteristic peak values between 4000-500 cm⁻¹ for the various functional group. The peak at 2919 wave number cm⁻¹ due to the asymmetric stretching of C-H group of aromatic compound including glycoside, tannin, flavonoid and saponin. The strong Peak at 1600 - 1660 cm⁻¹ region indicated the presence of amino acids and protein. The band at 1030 cm⁻¹, in the leaf is attributed to phosphodiester stretching bands region including glycogen, collagen and DNA. The leaves for this study showed appreciable bio resources of phytochemical such as phenolic compound, flavonoid, tannin and protein content; whereas seed showed the appreciable sources of mineral composition including Ca, Mg, Na, K. The antibacterial activity including the *Escherichia coli* and *Bacillus cereus* were found to be the most sensitive while *Staphylococcus aureus* least sensitive present study. The growth of *Escherichia coli* was inhibited by the mostly all parts of plant whereas flowers and leaves showed good inhibition zone against *Escherichia coli*. The presence of these Phytochemicals that will be sources of new drugs for treatment of various types disorders

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Introduction:-

Ricinus Communis Linn (Castor oil) is an industrial oil seed crop belonging to the Family Euphorbiaceae, widely distributed in the tropical regions spontaneously and cultivated in the China, India, Brazil (Rosiane LS et al.,(2011). The seed of Castor oil has been possessed important sources in the economics. Castor oil has been used in the various manufacturing processes to produce plastics, paints, lubricants, varnishes, cosmetics other products (David M et al.,(2015). *Ricinus Communis* L Traditionally the plant that have been utilized as fertilizer, laxative, fungicide,

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purgative etc. whereas the also possess beneficial effects including anti inflammatory, anti-oxidant, antimicrobial, antihistamic, central nervous system stimulant, Antinociceptive, lipolytic, wound healing, antiasthmatic, antidiabetic, antiulcer, hepatoprotective, immune modulatory , Antifertility, insecticidal properties possesses due to most valuable phytochemical including alkaloid, flavonoid, steroid, saponin and glycosides (Jitendra J, Gupta AK., 2012). A stem of plant is possessed Antidiabetic, Anticancer and Antiprotozoal properties whereas the leave, root and seedoil have been used for the healing the liver disorders, inflammation, hypoglycaemic and laxative (Manpreet R et al.,(2012). The root is beneficial for treatment of pains, fever, night blindness, inflammation, burns, ascites, glands, earache, asthma eructation, intestinal worms, leprosy, bronchitis, disease of rectum and head, Fresh leaves are useful for nursing mother to increase milk flow, Flower for treatment of glandular tumors, vaginal pain, anal troubles and arthralgia. Fruits are beneficial for treatment of tumor, piles, pain, liver and spleen diseases, cathartic and aphrodisiac. Oil is used for ailment of tumor, heart disease, slow fever, typhoid, and inflammation, pain in the back, ascites, and leprosy whereas Castor oil is an good solvent of pure alkaloids including atropine and cocaine solution etc that are used in the ophthalmic surgery (Ladda PL and Kamthane RB , 2014).

Material And Methods:-

Sample Preparation:

The root, stem, flower, seed and leave *Ricinus Communis* were being selected and collected from Pakha village near to Wagan City taluka Nasirabad, district Kamber, Sindh, Pakistan. Plants were placed in the Research laboratory at Institute of Biochemistry, University of Sindh, Jamshoro. Sindh, Pakistan. Plant materials had been dried about 15-30 days under shade and converted into powdered form after complete dryness by Pestle & Mortar. Further stored in the air tightbags.

Proximate analysis:

Total content of moisture was estimated through oven and ash content was determined through muffle furnace (Umadevi KJ et al.,(2012).

Fourier transforms infrared spectrophotometer (FTIR):

The infrared spectroscopy was used for detection of the functional groups of phytochemicals in the medicinal plant sample mixture. The plant powdered was put into IR spectrometer. The results were recorded on a FTIR spectrometer between the range 4000-500cm⁻¹. The wavelength of light absorbed was characteristic of the chemical bonds which can be seen in the annotated spectrum (Divya B et al., (2015).

Determination of total protein by method Lowry:

Reagent preparation:

Reagent A: (2%) Na₂CO₃, Reagent B: CuSO₄ (1%), Reagent C: (2 %) Sodium Potassium Tartrate, Reagent D: Reagent A, B and C were mixed including 100:1:1 ratio respectively, Standard: BSA 2 mg BSA/ml was prepared.

Plant sample preparation:

1 g of plant materials were taken and dissolved in the 10 ml of phosphate buffer. It was kept on shaking water bath for overnight. Solutions were filtered through whatmann filter paper no-1 and filtrated were collected for further estimation of protein.

Procedure:

In this procedure, 100 µl of sample or standard was taken and dissolved in the 100 µl 2N NaOH and kept on boiling water bath at 100 °C for 10 minutes. The solution was cooled and freshly prepared reagent D was added and placed for 10 minutes at room temperature. Folin Reagent 100 µl was added and mixed then further placed at room temperature for 30-60 minutes and absorbance was measured at 550 nm (Naidu MP et al.,(2013).

Determination of Total carbohydrate by Anthrone method:

Reagent:

200 mg of the reagent anthrone was measured and dissolved in the 100 ml of ice cold concentrated H₂SO₄.

Sample preparation:

For this, 100 mg of the plant powdered materials were dissolved in the 5 ml of 2.5 N HCL. Placed on the Boiling Water Bath at 100 °C for 3hours, then cooled solid Na₂CO₃ was added until effervescence ceases. Final volume 100 ml was made with double distilled water.

Procedure:

For this procedure, 1 ml of sample was taken and dissolved in the 4 ml of reagent anthrone and kept on boiling water bath for 8 minutes. Further cooled and rapidly absorbance was taken at 630nm. The D-Glucose standard curve was prepared arranged as (10, 20, 40, 60, 80, 100 µg/ml) (Rawat A et al., (2012).

Estimation of Total Phenolic Compound by Folin Ciocalteu Reagent Method:**Preparation of Sample:**

For this, 10 gram of sample was taken and dissolved in the 100 ml of 80% methanol in aqueous. It is kept on shaking water bath at room temperature for 24 hours. The solution was filtered through whatmann filter paper no 1 and centrifuged 20 minutes at 6000 rpm. The filtered material was stored in the refrigerator for further analysis of total phenolic compound, tannin and flavonoid.

Standard Solution:

100 µg/ml of the gallic acid was prepared in the 80% of gallic acid was prepared in the 80 % methanol in aqueous. Standard was arranged including (10, 20, 40, 60, 80 and 100µg/ml).

Procedure:

For this procedure, 0.5 ml plant sample or Standard dissolved in the 2.5 ml of reagent folin-ciocalteu (10 fold diluted in the distilled water). Further 2ml of 7.5% Na_2CO_3 was added in solution. It is placed in the incubator at room temperature for 30 minutes then absorbance was taken at 760 nm (Maurya S, 2010).

Estimation of flavonoid by Aluminum chloride method:**Standard Solution:**

500 µg/ml of quercetin in the 80% aqueous methanol was prepared. Standard was arranged as (100, 200, 300, 400, 500µg/ml).

Procedure:

1 ml of extract or standard was taken and diluted with 4 ml of distilled water. 0.3 ml of 5% sodium nitrate was added and placed for 5 minutes. 0.3 ml 10% AlCl_3 was added and to stand for six minutes. Further 2 ml of 1MNaOH was added and final volume 10 ml was made by distilled water and then absorbance was measured at 510 nm (Domidar et al., 2011).

Estimation of tannin by modified Prussian method:**Standard tannic acid:**

For this, tannic acid in the 80% aqueous methanol was arranged as (200, 400, 600, 800 and 1000 µg/ml).

Procedure:

In this test, 0.1 ml of sample was diluted in the 6.9 ml of distilled water. For this, 1 ml of 0.008M of the potassium ferric cyanide was added. Further 1 ml of 0.2 M of ferric chloride in 0.1HCL was added and shaken well. The solution colour blue was formed. Absorbance was taken at 700 nm by spectrophotometer (Sathishkumar T, Baskar R, 2014).

Estimation of total alkaloid by Dragendorff's method:**Dragendorff's reagent:**

Solution A for this solution, 0.8 gram of the Bismuth Nitrate pentahydrate was dissolved in the 40ml of distilled water then 10 ml glacial acetic acid was added.

Solution B for this, 8 gram potassium iodide was taken and 30 ml of water distilled was added. Further solution B and A were mixed.

Standard Solution:

In this, 10 mg of Bismuth Nitrate Pentahydrate was dissolved in the 5 ml concentrated HNO_3 was added and then final volume 100 ml was made in the double distilled water. The standard arranged as (200, 400, 600, 800 and 1000 µg/ml).

Preparation of extract:

For this, 10 g of plant fine powdered was taken and dissolved in 50 ml of 2% aqueous acetic acid and kept on

boiling water bath for 30 minutes. Solution was filtered through whatmann filter paper no-1. The filtrate was collected and residue was extracted again repeated procedure respectively whereas both solutions were mixed and then 100 ml final volume was prepared and the pH 2.5 of extract was maintained.

Procedure:

For this procedure, 5 ml of extract or standard was taken and treated with 2 ml of the reagent Dragendorff's. The precipitates were formed wait few minutes for full precipitation. Further solutions were centrifuged at 4000 rpm for ten minutes. The precipitate was collected and remaining solution was again treated by dragendorff's reagent for checking the precipitation more, if precipitate was formed further precipitates were mixed and washed by alcohol. The precipitates were dissolved in the 2 ml Disodium sulfide after addition brownish black precipitates were formed remaining solution was discarded. The precipitates were treated with 2ml of HNO_3 and 10 ml of double distilled water was added. 1 ml was taken out from prepared solution and 5 ml of thiourea was added and absorbance was measured at 435 nm (Sonal P et al., (2011).

Preparation of Mineral Sample by wet acid digestion method:

For this, 0.5 g of fine powdered plant was taken in the volumetric flask and 5 ml of the (Conc:) HNO_3 were added. Place at room temperature for three hour. Volumetric flask was covered by watch glass and heated at 100 °C on a hot plate. Further 5 ml of concentrated HNO_3 were added and heated. Further 2 ml of H_2O_2 were added and well shaken heated until transparent clear solutions were obtained and heated until near to dryness. 10 ml of deionized water were added and shaken well. Filtered through whatmann filter paper 42 and final volume 25 ml was made in the deionized water and concentration was taken by atomic absorption spectrometer (AA.800 perkinelmer) (Lanjwani, AH et al., (2016).

.Estimation of antimicrobial activity by agar well diffusion method:

Media for bacterial cultures:

The medium was neutralized at 37 °C for 30 minutes and filtered further then sterilized at 15 lbs for 20 minutes at 121 °C.

Procedure:

Suspension of 24 hours cultures of staphylococcus aureus, bacillus cereus, Escherichia coli and Klebsiella pneumonia was made and sterilized with normal saline. Medium each plate was inoculated by test organism and sterilized by swab rolled of cotton in the suspension to the strip plate surface in form that lawn growth were formed. The 5 mm diameter cork borer were used for formation of well in the medium plates. 50 µl of plant extract (80 % methanol) were dropped into the each well. The each agar plate was incubated at 37 °C for 24 hours (Banjar G et al., (2014).

Estimation of antioxidant content by ferric reducing antioxidant power method:

Procedure:

For this procedure, 2.5 ml of plant extract was diluted with buffer phosphate (pH 6.6) and 1 ml potassium ferric cyanides (1%) were added. It was kept in the incubator at 50 °C for 20 minutes. It was cooled and diluted with 2.5 ml of Trichloroacetic acids (10 %) and then centrifuged for ten minutes. From above solution, 2.5 ml was taken and diluted in the 2.5 ml of water distilled, further, 0.5 ml of ferric chlorides (0.1%) were added. Above solutions color green was formed. It was stand for ten minutes and absorbance was measured at 593 nm by spectrophotometer (Patel A, 2010).

Result And Discussion:-

Medicinal plants have been used from generation to generation in the traditional system of medicine for treatment various types of diseases. There is a broad range of plant parts possessing a variety of pharmacological properties. The peak at 2926 wave number cm^{-1} was investigated in the seed and flowers are due to the asymmetric stretching of C-H group of aromatic compounds. This peak indicated the presence of glycoside, tannin, flavonoid and saponin. The peak at 1030 cm^{-1} indicated the S=O group. It is indication of organosulfur compounds such as, allicin, alliin and diallyl disulphide (Songsungkan J, 2011). The very strong absorption at the region between 2933– 2922 cm^{-1} is due to N–H stretching. The lone C=O stretching vibration band which is corresponding to saturated aliphatic ester present in the all selected parts of the plant. The bands at 900–1350 cm^{-1} , 1030 cm^{-1} , in the leaves and 1027 cm^{-1} in the stem and flowers are attributed to phosphodiester stretching bands region. This peak absorbance due to glycogen, collagen and DNA. The functional group C–O stretch associated with phosphate, glycogen and

oligosaccharides PO-2 stretching modes (Fabian H et al., (1995). The strong band absorption is observed between 1600 - 1660 cm⁻¹ region which indicated the presence of amino acids. The very strong absorption 1601 cm⁻¹, 1605, 1615 were investigated in the selected parts. This result gives the evidence that all parts of solanum surattense indicate the high content of the protein. There is no evidence in the between the region 2220-2260 cm⁻¹ indicates no presence of the cyanide groups in all parts whereas cyanide have toxic effect for consumer (Manju S., (2011). The present screening of phytochemical finding showed that the appreciable amount of phytochemical including, carbohydrate, glycoside, phenolic compounds, tannin, flavonoid, saponin, steroid, terpenoid, glycosides amino acid, proteins, fat and oil were investigated whereas the moderate amount of vitamin C and trace of alkaloid was investigated. Present finding showed similarity reported that presence of phenolic compound, flavonoid, tannin, steroid, alkaloid in the stem of Ricinus Communis (Ramesh KS et al., (2010). The dried leaves of Ricinus Communis showed the presence of flavones glycosides, kaempferol -3-O-, kaempferol-3-O-β-D-glucopyranoside, kaempferol-3-O-β-rutinoside, quercetin-3-O-β-D-xylopyranoside, quercetin-3-O-β-D-glucopyranoside, quercetin-3-O-β-D-rutinoside, alkaloid, ricinine and N-demethylricinine. The monoterpene (1, 8-cineole, camphor), α sesquiterpene (β-caryophyllene), quercetin, gallic acid, gentisic acid, epicatechin, rutin and ellagic acid are the major phenolic compound that is isolated from leaves (Darmanin S et al., (2009), (Singh PP, Ambika Chauhan SMS, 2009).

Table 1:- FTIR Peak Values of Ricinus Communis leaf.

Wave number cm ⁻¹	Bond	Functional Group Assignment	Group Frequency, cm ⁻¹
3284.87	O-H	Hydrogen bonded alcohols, phenols	3200-3600
2918.74	C-H	Alkanes	2850-2970
2850.25	C-H	Alkanes	2850-2970
1633.27	N-H bend	Secondary amine	1550-1650
1543.58	N-O stretch	Nitro compounds	1458-1591
1412.86	C-H	Alkanes	1340-1470
1315.98	C-N	Alkyl ketone, Amines, Amides	1215-1325
1235.45	C-N	Alkyl ketone, Amines, Amides	1215-1325
1027.00	C-F stretch	Aliphatic Fluoro compounds	1000-1150

Table 2:- FTIR Peak Values of Ricinus Communis flower.

Wave number cm ⁻¹	Bond	Functional Group Assignment	Group Frequency, cm ⁻¹
3281.51	O-H	Hydrogen bonded alcohols, phenols	3200-3600
2921.34	C-H	Alkanes (Aromatic compounds)	2850-2970
2851.36	C-H	Alkanes (Aromatic compounds)	2850-2970
1604.82	N-H bend	Secondary amine	1550-1650
1539.92	C-H	Alkanes	1340-1470
1361.04	C-N	Alkyl ketone, Amines, Amides	1215-1325
1223.66	C-N	Alkyl ketone, Amines, Amides	1215-1325
1031.80	C-F stretch, S-O Stretch	Aliphatic Fluoro compounds, sulfoxides, Polysaccharide	1000-1150

Table 3:- FTIR Peak Values of Ricinus Communis stem.

Wave number cm ⁻¹	Bond	Functional Group Assignment	Group Frequency, cm ⁻¹
3345.77	O-H	Hydrogen bonded alcohols, phenols	3200-3600
2917.26	C-H	Alkanes (Aromatic compounds)	2850-2970
1732.87	C=O	Aldehydes, Ketones, Carboxylic acids, Esters	1690-1760
1506.00	C-H	Aromatic ring	1432-1621
1421.31	C-N	Alkyl ketone, Amines, Amides	1450-1350
1371.39	C-N	Alkyl ketone, Amines, Amides	1450-1350
1318.77	NO ₂	Nitro Compounds	1300-1370
1238.90	C-N	Alkyl ketone, Amines, Amides	1215-1325
1027.61	C-F , S-O Stretch	Aliphatic Fluorocompounds , sulfoxides, Polysaccharide	1000-1150

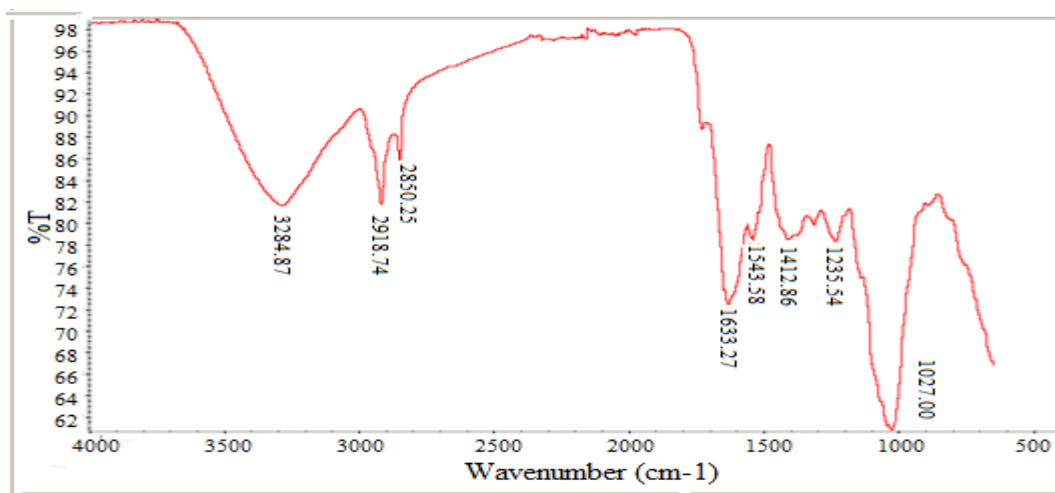


Figure1:- FTIR Spectrum of Ricinus Communis (Leaves).

FTIR Peak Values of Ricinus Communis leaf is shown in the figure1. The peak at 3284.87 wave number cm^{-1} due to the O-H group of hydrogen bounded alcohols and phenols. The peak at 2918.74 wave number cm^{-1} due to the asymmetric stretching of C-H group of aromatic compound. It is indicated the presence of glycoside, tannin, flavonoid and saponin. The peak at 1633 wave number cm^{-1} is due to secondary amine which is evidence the presence of amino acids. The peak at 1543.58 wave number cm^{-1} is due to N-O stretch (Nitro compound). The peak at 1315.98 and 1235.45 is due to C-N bonds showed Alkyl ketone, Amines, Amides. The strong band absorption at 1027 cm^{-1} in the leaf is attributed to phosphodiester stretching bands region. It is indicated the presence of glycogen, collagen and DNA.

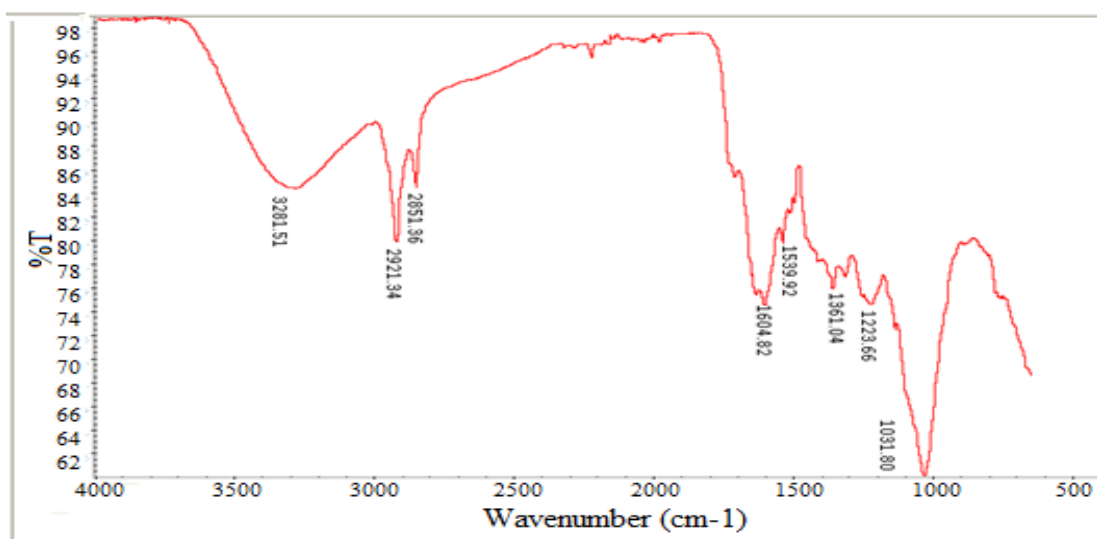


Figure 02:- FTIR Spectrum of Ricinus Communis (Flowers).

FTIR Peak Values of Ricinus Communis flower is shown in the figure 2. The peak at 1361.04 and 1223.66 is due to C-N bonds showed Alkyl ketone, Amines, Amides. The strong band absorption at 1031.80 cm^{-1} in the flower is attributed to phosphodiester stretching bands region. It is indicated the presence of glycogen, collagen and DNA. The peak at 3281.51 wave number cm^{-1} due to the O-H group of hydrogen bounded alcohols and phenols. The peak at 2921.34 and 2851.36 wave number cm^{-1} due to the asymmetric stretching of C-H group of aromatic compounds. It is indicated the presence of glycoside, tannin, flavonoid and saponin. The peak at 1604.82 wave number cm^{-1} is due to secondary amine which is evidence the presence of amino acids. The peak at 1539.92 wave number cm^{-1} is due to N-O stretch (Nitro compound).

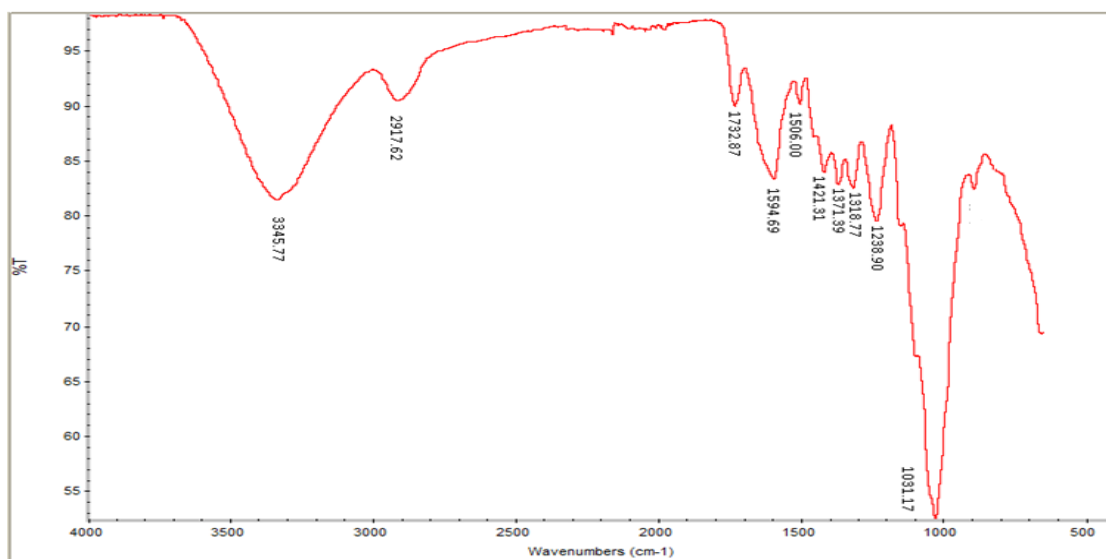


Figure 3:- FTIR Spectrum of Ricinus Communis Stem.

FTIR Peak Values of Ricinus Communis stem is shown in the figure 3. The peak at 3345.77 wave number cm^{-1} due to the O-H group of hydrogen bonded alcohols and phenols. The peak at 2917.74 wave number cm^{-1} due to the asymmetric stretching of C-H group of aromatic compounds. It is indicated the presence of glycoside, tannin, flavonoid and saponin. The peak at 1732.87 wave number cm^{-1} is due to C=O stretch which is evidence of Aldehydes, Ketones, Carboxylic acids, Esters functional group. The peak at 1506 wave number cm^{-1} is due to C-H (Aromatic ring). The peak at 1421.31, 1371.39 and 1238.90 is due to C-N bonds showed Alkyl ketone, Amines, Amides. The strong band absorption at 1027 cm^{-1} in the stem is attributed to phosphodiester stretching bands region. It is indicated the presence of glycogen, collagen and DNA.

Table 4:- Proximate Composition (%) of different parts of Ricinus Communis plant.

Parts	Moisture	Ash	Carbohydrate	Protein
Root	81	18	22	7.1
Stem	80	9	29.4	3.2
Leave	52	10	10	15.9
Flower	76	12	13	10.8
Seed	60	10	10	11

Proximate composition is shown in the table 4. Roots showed highest amount of ash that is good sign because ash possessed minerals deposition in the plants. The stem and root of plants showed rich bio resources of carbohydrate; whereas the highest percentage of protein was observed in the leaves. These parts can play key role to against malnutrition because of Protein and carbohydrate is biggest challenge in Pakistan. Food insecurity of household may be related the protein energy malnutrition. It is evident in the underweight, stunting and wasting whereas affects one-quarter of the world's children (Nations., 2012). One child out of every three children has been malnourished. The 6.2-8.3 million Pakistani children 30-40% have low height for their age called stunting whereas more than 2.9 million Pakistani children greater than 40% have low weight for their height called wasting (Mujib SA et al., (2004).

Table 5:- Phytochemical content and antioxidant Content (g/100g) of Ricinus Communis.

Parts	Phenolic compound	Flavonoid	Tannin	Alkaloid	Antioxidant Content
Root	1.531	0.88	0.597		0.51
Stem	1.6	0.97	0.61		0.18
Leave	2.15	1.46	0.61		0.57
Flower	1.26	0.59	0.61		0.66
Seed	1.4	0.81	0.57	0.89	0.24

Phytochemical content and antioxidant content are shown in the table 5. The leaves for this study showed appreciable sources of phytochemical including phenolic compound, flavonoid, tannin; whereas seeds for alkaloid and flowers for antioxidant. It is reported that phytochemical have adverse beneficial effects in the human beings for treatment of different types of diseases. Phenolic compound, flavonoid, phenolic acid and tannin are possessed diverse medicinal properties including antioxidant anti-inflammatory, anti-atherosclerotic and anti- carcinogenic activities (LI HB et al., 2007). Tannins have antioxidant, antimicrobial, antineoplastic agents and cytotoxic activities. Saponins are possessed anticancer, anti-inflammatory, antifungal, antioxidant properties, whereas used in hyperglycemia, hypercholesterolemia and weight loss etc (Surendra K et., (2012).

Table 6:- Mineral Composition (mg/Kg) of Ricinus Communis plant.

Nutrients	Root	Stem	Leave	Flower	Seed
Calcium	2960	4664	2048	8100	9760
Iron	211.2	371.7	169.9	207.2	169.2
Potassium	1235.2	1333.6	1093.6	866.4	1245.6
Magnesium	693.9	767.2	757.3	1039.3	1122.6
Sodium	1384.8	1056.8	972.2	1100	1576.8
Zinc	BDL	1.1	1.2	54	BDL
Manganese	BDL	BDL	BDL	BDL	BDL
Cobalt	BDL	BDL	BDL	BDL	BDL
Lead	BDL	3.2	1.2	10.54	BDL
Copper	64.8	49.1	22.5	20.2	20.8
Chromium	BDL	BDL	BDL	BDL	BDL
Nickel	1.2	1.92	2.08	1.12	1.68
Cadmium	BDL	BDL	BDL	BDL	BDL

Note: (BDL) Below Detection Limit.

Mineral Composition is shown in the table 6. It is investigated that appreciable sources of principle essential macro minerals including Calcium, iron, magnesium, sodium and potassium whereas seeds showed the appreciable sources of mineral composition including Calcium, sodium, magnesium, potassium and iron. The content of minerals in the medicinal plant that depends on the soils abundance, intensity of fertility. The concentration of cadmium, chromium, lead has been indicated below detection limit which is toxic highly even at concentration low. Calcium play most important role to maintaining and building strong teeth and bone as well as important for normal function of blood coagulation, regulation of cell permeability, milk clotting and cardiac muscle (RD, 1994). Magnesium has played most important role in the formation and function of bone and muscle and prevention of high blood pressure and depression (Smith WD and Hammarsten JF, 1958). Sodium and potassium play key role in the ionic balance of the body, carry normal muscle contraction, maintain tissue excitability and formation of gastric juice in the stomach whereas iron is possessed essential function for formation of Blood haemoglobin, carry oxygen in body, and to make body tendons and ligaments (Shivraj H, Nile and CN N Khobragade, 2009).

Table 7:- Antibacterial Activity (Inhibition Zone in mm diameter) of the Ricinus Communis.

Parts of plants	Name of Bacteria			
	Bacillus cereus	Escherichia coli	Staphylococcus aureus	Klebsiella pneumonia
Roots	12	2	5	NG
Stems	8	3	NG	NG
Leaves	10	13	3	NG
Flowers	12	28	NG	NG
Seeds	NG	1	5	NG

Antibacterial activity (Inhibition Zone in mm diameter) indicated in the table-7. Present study that the Escherichia coli, Bacillus cereus, were showed to be the maximum sensitive and Staphylococcus aureus least sensitive whereas Klebsiella pneumonia growth was not inhibited by all parts of plant. The Bacillus cereus and Escherichia coli growth are inhibited by the mostly parts. Present findings was showed higher inhibition zone than reported studies Escherichia coli 4mm and Bacillus cereus 6 mm in the leave (Zied Z et al., (2012). Present findings was compared to another reported study showed similarity lower inhibition zone than reported studies Escherichia coli 16mm and

staphylococcus aureus 12 mm in the roots (Abhishek, 2011). Castor oil is rich bio resources of antibacterial active phytochemical that can be useful for inhibition the growth of microorganism This plant are rich bio sources of antibacterial phytochemical that can be useful for inhibition the growth of life threatening pathogenic including Escherichia coli leads hemorrhagic colitis Syndrome and haemolytic uremic syndrome whereas flowers of present finding showed very good zone of inhibition Escherichia coli (Zhou B et al., (2017).

Conclusion:-

In the present conclusion it can be noticed that this plant is wealthy resources of active phytochemical that is strongly emphasized and can be accessible bio-resources plants derived new drugs. Therefore, the parts this plant could be seen as the rich sources of for useful drugs. Extracts from this plant could be seen as a good source for useful drugs. The traditional medicine practices are strongly recommended and further research work should be carried out isolation, purification and characterization of phytochemical.

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