ORIGINAL RESEARCH PAPER

Microbiology

ANTIBACTERIAL ACTIVITY OF WHEATGRASS (*Triticum Aestivum L.*) EXTRACT AGAINST DIFFERENT HUMAN PATHOGEN.

KEY WORDS: Antioxidant, Astringent, Diuretic, Laxative, *Triticum aestivum.*

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ABSTRACT

Wheatgrass (*Triticum aestivum L.*) Common wheat or bread wheat belongs to the family Poaceae and kingdom plantae. The plant *Triticum aestivum* L. is mentioned in ayurveda, herbal system of medicine and its used as antioxidant, immuno-modulator, astringent, laxative, diuretic, antibacterial and also used in the important medicinal treatment such as swelling wounds, acidity, colitis, kidney malfunction. The present investigation deals with the antibacterial activity of wheatgrass (*Triticum aestivum* L.) extract against different human pathogen.

As we know, from ancient time human beings are using a plant as a medicine for healing disease and disorder. After 18th century discovery and development of drugs started with a scientific approach. Before those medicines where only plants and animal derived with some minerals. Early 1600 B.C. Egyptian Edwin Smith Papyrus wrote a book about surgery, treatment, diagnosis. after that babylonians gave some text on medicines. In early iron age it is seen that ayurveda also contain description of herbs for various aliment. among all these Ayurveda and Unani developed 8 branches of medicines. Ayurveda and Unani are very close to each other it was focusing on balancing of body fluid present in human body. In late 17th century digitalis William withering introduce digitalis which is an extract from the plant foxglove for treatment of character treatment and Jones hunter in 1768 noted that Scurvy was caused by deficiency of vitamin C. he prescribed consumption of lemon juice to treat scurvy in 19 centuries, Chinese set up the Hong Kong college of medicine for Chinese in 1887. In Greece and Egypt hypocrites and his followers where first to describe many diseases and medical condition. Roman army physician in 40-90 AD wrote encyclopaedia which describe over 600 herbal cross farming influential pharmacopeia which was used for the next 1500 years. A medicine was revolutionized in the 19th century and beyond by advance in chemistry and laboratory techniques and equipment old ideas of epidemiology were replaced with the bacteriology and virology.

Although synthetic medicine has been highly effective in prevention and treatment of many illnesses which helps in dramatically increased like span of individual not only has this but it also helps to allow more people healthy and more fulfilling life. (Rimple, 2016) There is negative side which has some different factor are observed, amongst then side effect as well as resistance of microorganism towards most available drugs has been drastically increased it also has been seen that the side effects which results from synthetic medicine main dangerous and sometimes life-threatening. at present situation scientist are more interested in developing medicines which does not have any side effects but it able to cure diseases. Remembering "old is gold" - science has been moved towards herbal medicines like Ayurveda and Unani.

We are using some herbal medicines in our daily life. Neem tree leaves has been used for years for this infection and it also has been added to grains to keep away insects. Aloe vera is being use for removing dark spot by acne and burn. it also helps to cure menstrual problem. Papal tree e lives powder also regulate menstrual cycle and gums which is present in pipal tree along with garden cress seeds if taken in appropriate age helps in increasing height. Turmeric powder is been used while cooking it has healing power. The Tamarind is an antipyretic agent as well as it is used to treat brown serial disorder and girl lying with tamarind water recommended for sore throat. It is antiseptic used in bath and for the treatment of ulcer. Indian ayurveda consider ginger as a universal medicine because it relieves in digestion gas pain and diarrhoea. most of the indian spices how medicinal uses. Mexican yams 47 uses for reducing inflammation and birth control. Opium poppy having morphine used as a potent painkiller. KeyonNain from bark of Shambhu Nath Re controls fever and muscle spasms induced to treat malaria.

Nutritional Properties Of *Triticum Aestivum L.*:

Now a day's peoples are getting more attracted towards herbal medicines the most popular reported herbal medicines which cure disease purify blood and act as a nutritional additive. Wheatgrass is also known as green blood. Wheatgrass that is (*Triticum Aestivum L.)* which belongs to family hello antioxidant diuretic anticarcinogenic antipyretic antibacterial and antifungal amino modulator astringent anti hyper glycaemic. Fresh wheatgrass juice richest source of vitamins A, B, C, D, E, K, Calcium potassium iron, magnesium sodium sulphur and 17 forms of amino acids full stop according to some researcher's wheatgrass juice also have an antibacterial activity.

METHODS AND MATERIALS:

1. Selection, Cultivation And Harvesting

From local market sharbati wheat was selected which is also known as *Triticum aestivum L.* Sharbati wheat is produced in Punjab India the unique features of sharbati is that it is harvested in such a state which have special Geography climate and high Potash containing soil.

2. Selection And Culturing Of Bacteria For Antibacterial

Bacterial cultures were obtained from MTCC, Chandigarh from these cultures master culture where prepared and after every 3-4 weeks sub culturing was done for every experiment 24 hours actively growing culture has been used.
Escherichia coli (MTCC-1687)
Salmonella typhi (MTCC-98)
Staphylococcus aureus (MTCC-96)
Enterococcus faecalis (MTCC-6854)

3. Growing And Harvesting OfWheat

Similar sized 3 trays having size 55 cm into 52cm were taken containing soil of height 3 cm 100 grams of wheat shown in

each tray and allowed to grow for 15 days and water daily. Each tray was label day wise like 6th, 7th and 9th according to days grass was harvested 1 cm above from soil surface grass leaflet was surface sterilize with 4% sodium hypochlorite harvested and surface sterilized grass leaves where homogenized by using grinder for 1-gram leaves 2 ml of distilled water was added during grinding. Obtained homogenized mixture was sieved by using muslin cloth then the filtrate was distributed indifferent 5 aliquots. in each aliquot 10 ml of filtrate along with 3 ml of solvent was added. Different organic solvents used name as ethanol, methanol, ethyl acetate, distilled water and hexane denote as A, B, C, D, and E respectively. 5 respected tubes were centrifuged at 5000 rpm for 10 minutes at 4 degrees celsius. supernatant was collected and operated at 50-degree celsius overnight dried powder termed as extract walls resuspended in 3 ml dms for each gram of powder.

4. Antibacterial Activity

Nutrient Agar and Borosil glass Petri plates where autoclaved at 121 degrees Celsius at 15 lbs for 20 minutes. 30 ml of nutrient agar was poured in each plate and allowed to solidify. The suspension of above culture was prepared and hundred micro litre of suspension was spread plated on nutrient agar containing plates. Culture spread plates were kept for 10 minutes. The antimicrobial activities were carried out by using agar well diffusion method. Diameter of well was 1 cm, and height was 1.5cm. and the volume of well is 0.78 Cubic inch 100 micro litre of extract was added into each well and the plates were kept in refrigerator for 15 minutes to defuse the extract. Further plates were incubated for 24 hours at 37 degrees Celsius. The activity of extract was determined by observing zone of inhibition around the wells.

RESULT

The preliminary extraction of wheat grass is carried out by using distilled water and its antimicrobial activity was check which shows zone of inhibition. To explore all possible compound present in Wheatgrass extract which may show antibacterial activity was investigated by using different solvents. wheatgrass is cultivated in tray and water for 3days.On 3rdday wheatgrass extract check for antibacterial activity but in present experiment it does not show any activity. Hence further testing was carried out.

Table No. 1: Zone Of Inhibition On Day 6th

Day	Microorganisms	A	B	C	D	E
6	P-1	1.3	1.4	-	1.2	-
	P-2	2.0	1.6	-	1.2	-
	P-3	1.8	1.7	-	-	-
	P-4	1.5	1.7	-	-	-

(**A**-Ethanol, **B**-Methanol, **C**-Ethyl acetate, **D**-Distilled water and **E**-Hexane)

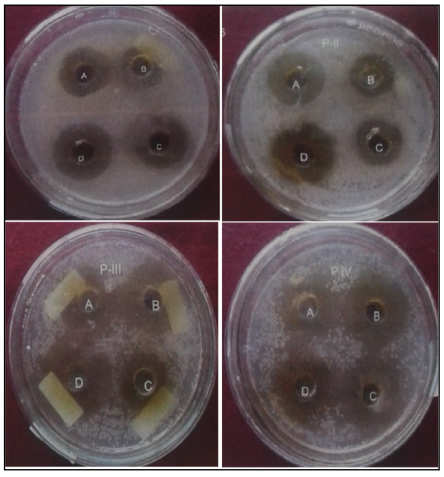

Fig. 1:- Zone Of Inhibition On Day 6th

Table No. 2 : Zone Of Inhibition On Day 7th

Day	Microorganisms	A	B	C	D	E
7	P-1	2.7	2.5	2.3	1.7	-
	P-2	2.0	2.8	2.5	2.0	-
	P-3	2.8	3.0	3.3	2.4	-
	P-4	2.5	2.6	3.0	2.6	-

(**A**-Ethanol, **B**-Methanol, **C**-Ethyl acetate, **D**-Distilled water and **E**-Hexane)

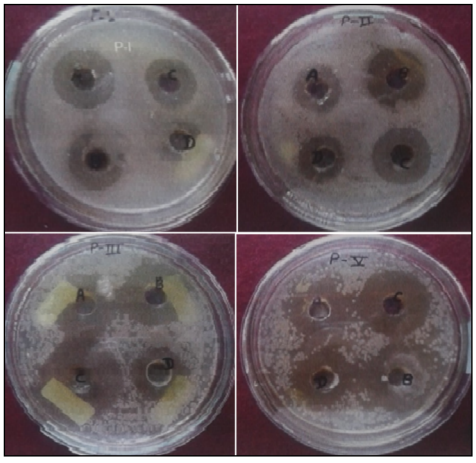

Fig. 2:- Zone Of Inhibition On Day 7th

Table No. 3: Zone Of Inhibition On Day 9th

Day	Microorganisms	A	B	C	D	E
9	P-1	2.5	1.5	1.5	1.3	1.0
	P-2	1.8	1.7	1.4	1.8	1.1
	P-3	2.0	1.8	1.8	1.7	1.7
	P-4	1.9	1.6	1.6	1.6	1.8

(**A**-Ethanol, **B**-Methanol, **C**-Ethyl acetate, **D**-Distilled water and **E**-Hexane)

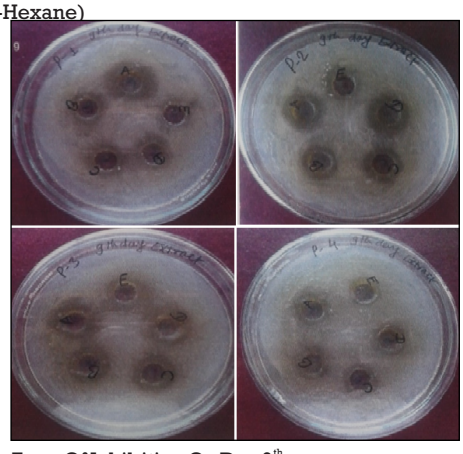

Fig. 3:- Zone Of Inhibition On Day 9th

Estimation in several reports from ancient time wheatgrass is used as herbal medicine as well as an antibacterial and also used for variety of other purposes like increasing haemoglobin as anti-hyperglycaemic for weight loss and also anti-cancer risk agent it is full stop results obtained in present study are in accordance to previous studies showed antibacterial activity. this was with the expectation of third day age from Sewing where no zone of inhibition reported against any used bacterial culture this may due to lack of or underdeveloped or a mature non-functional nature of bio compounds are responsible for antibacterial activity wheat grow for a duration of 7 to 21 days age from Sewing and at a regular interval harvested to check antibacterial activity. Among all sample age 7 days with extracts show maximum and seductive activity in terms of zone of inhibition also when extract using a different solvent ethanol, methanol, ethyl acetate and distilled water eggs and highest antibacterial

activity zone of inhibition noted for eternal extract the highest antibacterial activity in ethanol is probably due to alkaloid and s which are soluble in ethanol most valuable than other solvents with this view the compound showing active bacterial activity are maybe of saponins and alkaloids types.

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