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RED CABBAGE-A REMEDY IN URINARY TRACT INFECTION

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ABSTRACT

Urinary Tract Infection (UTI) affects various part of the urinary tract; commonly cause by Escherichia coli has the property to adhere to the host tissue. The main protein structure related to this phenomenon is the adhesin protein, and its name is based on its shape: pili or fimbriae. Red cabbage contains bioactive components such as isothiocyanates, vitamins A, B, C and anthrocyanins". Anthrocyanin was found to effective against UTI. Hydroalcoholic extraction of red cabbage is tested against E.coli by cup and plate method. The extract B i.e. 2 mg/ml was found to be more effective than extract A i.e. 1mg/ml.

KEY WORD: UTI, Anthocyanins, E.coli

INTRODUCTION

Red cabbage *(Brassica oleracea var. capitata f. rubra)* is type of cabbage, also well-known as purple cabbage, blue kraut, or red kraut and is widespread in the Mediterranean region[1] The principle "bioactive components of red cabbage are isothiocyanates, vitamins A, B, C and anthocyanins".[2,3] Anthrocynanins, a natural pigment present in Red cabbage, were found to have the strongest antioxidant power of 150 flavonoids.[4]

Urinary Tract Infection (UTI) affects various part of the urinary tract. When it affects the lower part it is known as a bladder infection & when it affects the upper part it is known as kidney infection. This occurs due to colonization and multiplication of organisms. Clinically, presence of more than 1 Lakh organisms per ml of midstream sample of urine (MSU) is an indication of urinary tract infection. The most common cause of infection is Escherichia coli, though other bacteria, virus, fungi or parasite. UTI is more common in female due to shorter urethra & lack of defensive bactericidal prostatic gland.[5]

E. coli has the property to adhere to the host tissue. The main protein structure related to this phenomenon is the adhesin protein, and its name is based on its shape: pili or fimbriae.[6] Bacterial adhesion is accomplished by the binding of lectins exposed on the cell surfaces of these fimbriae to complementary carbohydrates on the host tissues. Pili are small filaments that enable bacteria to adhere to the host tissue; these proteins can be either mannose-resistant or mannose-sensitive. The mannose-sensitive pili, called type 1 pili, permit bacterial adhesion to the urothelium.[7]

MATERIAL AND METHOD

Extraction: Leaves were sliced into small pieces and oven-dried at 50ºC. The uses of dry plants can be effective to minimize enzymatic degradation of phonetic compounds inside plant tissues. Then hydro alcoholic extract has taken. After evaporation, dried samples were placed in desiccators over calcium sulfate to remove any remaining water. The resulting dried pigments were then used for further studies.[8]

Nutrient Agar preparation

Ingredients

1. 0.5% Peptone - this provides organic nitrogen
2. 0.3% beef extract/yeast extract - the water-soluble content of these contribute vitamins, carbohydrates, nitrogen, and salts
3. 1.5% agar - this gives the mixture solidity
4. 0.5% Sodium Chloride - this gives the mixture proportions similar to those found in the cytoplasm of most organisms
5. distilled water - water serves as a transport medium for the agar's various substances
6. pH adjusted to neutral (6.8) at 25°C.

Preparation

These ingredients are combined and boiled for approximately one minute to ensure they are mixed and to sterilize them. Then they are cooled to around 50 °C (122 °F) and poured into Petri dishes which are covered immediately. Once the dishes hold solidified agar, they are stored in refrigerated until used

Procedure (Cup and Plate method)

1. Nutrient agar is poured into Petri dishes; allowed it to solidify.

2. Then bacterial culture (E.coli) is spread on the plate.
3. Allow it settle for 10 minutes
4. With the help of borer (6 mm diameter) two wells are prepared; marked it A and B
5. Sample solution A and B about 1ml is poured in the respectively.
6. Allow it to stand for 15 minutes.
7. Then incubate it in incubator for 24 hours.
8. Measure the zone by using antibiotic zone reader

Minimum inhibitory concentration (MIC)

Purple cabbage extract solution was diluted with ethanol to 4, 2, 1, 0.5, 0.25 mg/mL, in sterile Petri dishes were added to 1 ml of different concentrations of diluents then poured into 20ml culture medium, mixed thoroughly, after cooling and solidification take 1.1mL (0.5 the McIntosh turbidity) of the test bacterial suspension, observed in an incubator for 24h, each repeated three times, take average.[10]

OBSERVATIONS

Table. 1: MIC of Red cabbage extract.

Sr. No	Strains	Concentration of Red cabbage extract (mg/mL)				
		0.25	0.5	1	2	4
1	E.coli	-	+	+	++	+++

Based on MIC we have selected two concentration i. e A-1mglml and B- 2mg/ml

RESULT AND CONCLUSION

Table 2: Comparison of Zone of inhibition and concentration at different timings.

Sr. No	Strains	Concentration Of red cabbage extract (mg/mL)	Zone of inhibition	
			O hours	24 hours
1	E.coli	Control	6 mm ± 0.15 mm	6 mm ± 0.55 mm
		1	6 mm ± 0.15 mm	10 mm ± 0.5 mm
		2	6 mm ± 0.15 mm	11 mm ± 0.6 mm

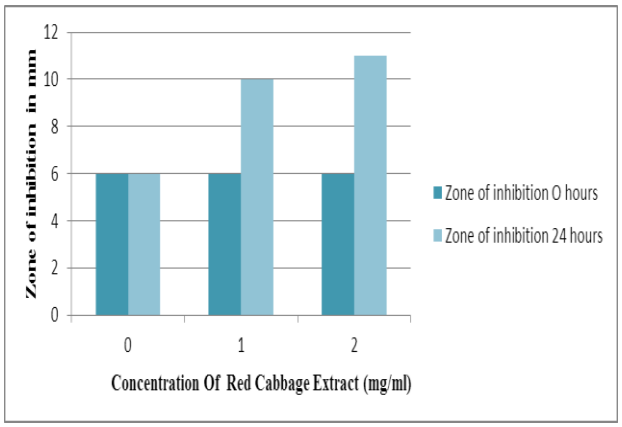

Fig. 1: Comparison of Zone of inhibition and concentration at different timings.

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