Effect of some plant extracts on the Pyocyanin Production from *Pseudomonas Aeruginosa* which Isolated from clinical samples

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Effect of some plant extracts on the Pyocyanin Production from *Pseudomonas Aeruginosa* which Isolated from clinical samples

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Abstract. In this study, the effect of some plant extracts on the production of the Pyocyanin dye from the bacteria of *Pseudomonas aeruginosa* was known. This study included the use of two types of plants, ginger and ginkgo. These two plants were extracted in a waterway by the Sxolite apparatus. The raw extract of these plants was used, and several concentrations were made of it 20%, 40% and 80%, after which the Pyocyanin concentration was measured. After adding these extracts, the results showed that there were significant differences in the decrease in the production of the Piocyanin dye compared to the control by the bacteria. The decrease in the production varied according to the concentration, and the 80% concentration gave better results. The decrease in dye production compared to the rest of the treatments and compared to control.

***Keywords*:** pyocyanin, production, Ginko, Ginger.

1. Introduction

Pseudomonas aeruginosa (PA) is an opportunistic pathogen responsible for numerous ailments in people, and it is one of the significant reasons for hospital-acquired contamination exhibiting a high drug-resistance profile[3-1]. Pyocyanin is synthesized with the resource of a sequence of complicated steps mediated thru viable of gene products encoded via the functionality of two phzABCDEFG operons[4-6]. The phzH, phzM, phzS genes the pyocyanin synthetic pathway, chorismic ought to be converted into phenazine-1-carboxylic acid via the PhzA-G proteins firstly[7-9]. Subsequently, phenazine-1-carboxylic acid could be converted to pyocyanin with the aid of PhzM andPhzS[10-12]. PYO is accountable for the blue-green coloration typically decided in PA cultures[13, 14]. Besides the virulence difficulty and quorum sensing functions, PYO is moreover a signalling molecule and a redox-active metabolite concerned in a range of giant organic things to do alongside with gene expression, benefiting bacterial cells and biofilm formation[15-17].

2. Material and methods

2.1. Collection of bacterial samples:
Fifty scientific samples had been gathered from Ramadi Teaching Hospital, which had been from several sources along with burns, wounds, UTI infections, and these samples had been amassed through sterile cotton swabs. While urinary tract infections, two (UTI) samples were gathered through the way of a sterile container.

2.2. Bacterial isolation and identification:
Bacterial isolates have been subjected to a variety of cultural and biochemical tests for identification of these isolates[18].

2.3. Ginger extract
Ginger cut into tiny pieces using a mixer device, weighing 40 grams and extracted with cellulite using 200 ml of distilled water. Filter the extract and store in the refrigerator until use[19].

2.4. Ginkgo biloba extract
Weigh 50 g of Ginkgo biloba powder, then add it to 250 ml of distilled water, then heated to a boiling point, then cooled, filtered, and stored in the refrigerator until use

2.5. Pyocyanin Production:
3 ml from the bacterial suspensions have been filtrated by 0.20 μm pore size. Then absorbance was measured at four hundred nm in a Spectrophotometer. The results have agreed with the following equation. [19].

$$\textit{Pyocyanin activity (U/ml) = Absorption of the sample test - Absorption of control (broth only).} \quad (1)$$

3. Result and Discussion
Table 1 shows the number of isolated isolates from pathological samples, where the number of isolated isolates from burn cases was 20 isolates with an isolation rate of 40%. As for isolates that were isolated from urinary tract infections ten isolates with an isolation rate of 20% and 15 isolates from wounds by 30% As for the isolates obtained from middle ear infections, five isolates increased by 10%.

Table 1. Number of isolates isolated from different pathological samples and their percentage.

Source of sample	Number	percentage
Burn	20	40%
Urine	10	20%
Wound	15	30%
Ear	5	10 %
Total	50	100%

Table 2 shows the effect of ginger extract on the production of pyocyanin, where several concentrations of ginger extract were prepared and studied its effect on the production of this dye. The best results are for a reduction in pyocyanin production compared with control and other treatments.

Table 2. The impact of ginger extract on pyocyanin production of P. aeruginosa.

Concentration	pyocyanin production U/ml				
	Frequency	Frequency	Frequency	Frequency	Frequency
20 % of ginger extract	o.55	0.57	0.58	0.54	0.52
40 % of ginger extract	o.44	o.45	o.46	0.43	0.42
80 % of ginger extract	0.22	0.20	0.19	0.18	0.19

Control	1.5	1.4	1.3	1.2	1.6

Table 3 shows the statistical analysis of the effect of ginger plant extract on the production of pyocyanin dye from Pseudomonas aeruginosa bacteria, where the results of the table showed significant differences for all treatments with the treatment of the control in the low dye of the pyocyanin.

Table 3. ANOVA table of the impact of ginger extract on pyocyanin production of P. aeruginosa.

ANOVA
production of pyocyanin (U/ml)

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		5.866	3	1.955	451.306	.000
	Linear Term	Contrast	4.610	1	4.610	1063.961	.000
		Deviation	1.256	2	.628	144.979	.000
Within Groups			.069	16	.004		
Total			5.935	19			

Table 4 shows the effect of an extract on the production of the pyocyanin tincture produced by the bacterium Pseudomonas aeruginosa where the results demonstrated significant differences for the effect of this extract on the production of this dye and the percentage of decrease in the production of this dye increased with an increase in the concentration of the extract compared to the control, the concentration of 80% of the extract He gave the best results in the decrease in the production of this dye, compared with the rest of the treatments and with control.

Table 4. The impact of Ginkgo biloba extract on pyocyanin manufacturing of P. aeruginosa.

Concentration	pyocyanin production U/ml				
	Frequency	Frequency	Frequency	Frequency	Frequency
20 % of Ginkgo biloba extract	o.77	0.73	0.72	0.76	0.73
40 % of Ginkgo biloba extract	o.55	o.51	o.53	0.57	0.54
80 % of Ginkgo biloba extract	0.33	0.32	0.31	32	0.30
Control	1.9	1.8	1.9	1.7	1.8

Table 5 shows the effect of Ginkgo biloba extract on the production of pyocyanin, where several concentrations of ginger extract were prepared and studied its effect on the production of this dye. The best results are for a reduction in pyocyanin production compared with control and other treatments.

Table 5. ANOVA table of the effect of Ginkgo biloba extract on pyocyanin manufacturing of P. aeruginosa

ANOVA
production of pyocyanin (U/ml)

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		4.788	3	1.596	362.302	.000
	Linear Term	Contrast	4.166	1	4.166	945.671	.000
		Deviation	.622	2	.311	70.617	.000
Within Groups			.070	16	.004		
Total			4.858	19			

4. Conclusions

The impact of certain plant extracts on Pyocyanin dye production from Pseudomonas aeruginosa bacteria has been identified here. Two different plant kinds, ginger and ginkgo, were used in this survey. The Sxolite device mined both plants in a waterway. The raw extract from these plants was

used with several levels of 20%, 40% and 80%, the measurement of the pyocyanin concentration also followed that. The researchers found that the decreased output of PIOcyanine dye in contrast with the control of the bacteria was significant after the introduction of those extracts. The decline in the output was centred on the dosage, with 80% improved results as compared to the rest of the therapies and regulation, the decrease in the development of teint. The results were higher.

5. References

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