Coccobacillary on non-selected agar. Rods predominate in fluid media	Gram-negative rod	*Acinectobacter baumanii*
Non-hemolytic colonies on sheep blood agar	Gram-negative commercial bacterium	*Enterococcus facealis*
	Gram-negative gamma proteobacteria	*Pseudomonas aeruginosa*

Table 6: Biochemical test and identification of isolates

Isolate	*Pseudomonas aeruginosa*	*Staphylococcus aureus*	*Proteus mirabilis*	*Klebsiella pneumoniae*	*Escherichia coli*	*Acinectobacter baumanii*	*Salmonella typhi*	*Enterococcus facealis*
Oxidase	-	-	-	-	-	+	-	-
Motility	-	-	-	-	-	-	-	-
Nitrate	-	-	-	-	+	-	-	-
Lysine	+	+	-	+	+	+	+	+
Ornithine	-	-	+	-	-	-	-	-
H_2S	-	-	-	-	-	-	-	+
Glucose	+	+	+	-	+	-	+	+
Mannitol	+	+	-	-	+	-	+	+
Xylose	-	-	+	-	+	-	-	+
ONPG	-	-	+	+	+	-	-	+
Indole	-	-	-	-	-	-	-	-
Urease	+	-	+	+	-	-	-	+
V-P	-	-	+	+	-	-	-	+

Citrate	+	-	-	+	-	-	-	+
TDA	+	-	+	-	-	-	-	+
Gelatin	-	-	-	-	-	-	-	-
Malonate	-	-	-	-	-	+	-	+
Inositol	-	-	-	-	-	-	-	-
Sorbitol	-	+	-	-	+	-	+	+
Rhamnose	-	-	-	-	+	-	-	+
Sucrose	-	-	-	-	-	-	-	+
Lactose	-	-	-	-	-	-	-	-
Arabinose	-	-	+	-	+	+	-	+
Adonitol	-	-	-	-	-	-	-	-
Raffinose	-	-	-	-	-	-	-	+
Salicin	-	-	-	-	-	-	-	-
Arginine	+	-	+	-	+	-	-	-

This study revealed the effect of plectasin 4431-s on eight bacterial isolates comprising of *Staphyloccus aureus, Klebsiella pneumoniae, Escherichia coli, Salmonella typhi, Proteus mirabilis, Acinectobacter baumanii, Pseudomonas aeruginosa, Enterococcus faecalis* . Five of the isolates are Gram-negative and three of isolates organisms are Gram-positive.

Different classes of antibiotics such as levofloxacin-15µg, ceftriaxone-30µg, ciprofloxacin-5µg, imepenem-30µg, cefuroxime-30µg were tested one each of the isolated bacteria. (*E.coli* 33S, *S.aureus* 24S,*P.aeruginosa* 22S, *S.typhi* 22S, *K.pneumoniae* 17S*)* were susceptible to levofloxacin while, *(A.baumanii* 12R and *P.mirabilis* 6R*)* were resistant. *(E.coli* 30S, *S.aureus* 25S, *S.typhi* 22S, *S.aureus* 36S, *K.pneumoniae 30S*) were susceptible to ceftriaxone while *(P.aerugino sa* 6R, *A.baumanii* 12R*)* were resistant. *(E.coli* 26S, *S.aureus* 26S, *A.baumanii* 29S , *P.aeruginosa* 22.5S, *K.pneumoniae* 22S*)* were susceptible to ciprofloxacin, (*P.mirabilis* 6R and *S.typhi* 17I*)* resistant. *(E.coli* 33S, *S.typhi* 26S, *P.aeruginosa* 24S, *K.pneumoniae* 24S, *A.baumanii* 25S*)* were susceptible to imipenem while *(S.aureus* 21I and *P.mirabilis* 6R*)* resistant. (*E.coli* 6R, *S.typhi* 6I, *P.aeruginosa 6R, A.baumanii 6R,*

K.pneumoniae 6R, P.mirabilis 6R) were resistant to cefuroxime, *S.aureus 31S* was susceptible.

Plectasin is a defensin that has shown promise but has not had its potentially negative effects clarified (Quiros, 2011). Investigations (MIC and MBC) were performed to test against genetically diverse clinical isolates of *Enterococcus faecalis, Staphylococcus aureus, Klebsiella pneumoniae, Escherichia coli, Proteus mirabilis, Acinectobacter baumanii, Salmonella typhi, Pseudomonas aeruginosa* on plectasin 4431-s.

Minimum Inhibitory Concentrations (MIC) was carried out and determined by the broth micro dilution method. The Minimum Bactericidal Concentration was also determined by subculturing 0.01ml of the highest concentration of the agent that shows visible growth and the other wells with no visible growth in the MIC dilution wells to sterile media. The MIC is between plectasin concentrations 0.007mg/ml to 1.8mg/ml.

MIC for *Enterococcus faecalis* was at 0.056mg/ml, MIC for *Staphylococcus aureus* was at 0.113mg/ ml, MIC for *Klebsiella pneumoniae* was at 1.8 mg/ ml. There was no inhibitory effect on *Escherichia coli* between plectasin concentration 0.007mg/ml to 1.8mg/ml while similarly *Proteus mirabilis, Acinectobacter baumanii, Salmonella typhi, Pseudomonas aeruginosa* MIC was nil. Results show that Plectasin 4431-s showed significant antimicrobial activity against some gram positive bacteria such as *Staphylococcus aureus* at conc. 0.113mg/ml to 1.8mg/ml and *Enterococcus faecalis* at conc. of 0.056mg/ml to 1.8mg/ml. For gram-negative bacteria, Plectasin 4431-s showed negligible inhibitory effect on the growth of *Escherichia coli, Proteus mirabilis, Acinectobacter baumanii, Salmonella typhi, Pseudomonas aeruginosa*. The minimum bactericidal concentration of plectasin against *Enterococcus faecalis, Staphylococcus aureus* and *Klebsiella pneumoniae was* 0.056mg/ ml, 0.113mg/ ml andconc.1.8 mg/ ml respectively.

This shows that plectasin can be synthesized, and fully processed active plectasin can be effectively produced at high yields (Mygind *et al.,* 2005). The results indicate that plectasin offers promise as a new antibiotic against Gram-positive bacteria without side effects for systemic use. It is also noteworthy that similar activities have been demonstrated against Gram-negative bacteria (*Escherichia coli and Pseudomonas aeruginosa)* and other antibiotics which include levofloxacin-15µg, ceftriaxone-30µg, ciprofloxacin-5µg, imipenem-30µg, cefuroxime-30µg. Some were resistant while others were sensitive to these antibiotics.

Result suggested that plectasin could be an alternative antibiotic for clinical application and fight against bacterial infection mostly gram-positive bacteria that plectasin have antibacterial activity on.

RECOMMENDATION

This is a novel organic antibiotic that can have major clinical implications in fight against bacterial infections. The development of effective antimicrobial agents to treat these infections is an area of intense research. Peptide antimicrobial agents represent a promising new class of compounds which collectively act at a number of different bacterial targets and have demonstrated potency against these emerging pathogens. It is therefore recommended that more research should be done on the peptide plectasin and tested on fungi and more bacteria, which may include a new therapeutic concept of the conventional anti-bacterial therapy, used as an alternative antibiotic for clinical application and fight against bacterial infection. It is also recommended that the drug concentrations should be increase in other to check for the antimicrobial effect of plectasin on the organisms.

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