Introduction: nose, respiratory tract, and on the skin.

INTRODUCTION: Increase in multi drug resistantbacteria had led to the need to search for new antimicrobials has increased. Currently there has been increase in natural and herbal medicine because of itslesser side effects and reduced toxicity. 1 Curry leaves scientifically known as Murraya koenigii are a popularleaf-spice. It is a tropical to sub-tropical tree in the family Rutaceae.

It has a distinct aroma due to thepresence of volatile oil. The leaves have a slightly pungent, bitter in taste, and acidic in nature. Curry leaf is also used in many traditional culturesnamely Indian, Ayurvedic and Unani prescriptions. 2 Thecurry leaves contain proteins, carbohydrate, fiber, minerals, carotene, nicotinic acid, Vitamin C, Vitamin A, calcium and oxalic acid. It also containscrystalline glycosides, carbazole alkaloids, koenigin, girinimbin, iso-mahanimbin, koenine, koenidine and koenimbine, Triterpenoid alkaloidscyclomahanimbine, tetrahydromahanimbine. Murrayastine, murrayaline, pyrayafoline carbazole alkaloids and many other chemicals are present.

3They contain several medicinal properties such as antidiabetic, antioxidant, antimicrobial, anti-fungal, anti-inflammatory, anti- carcinogenic andhepato-protective properties. Bacteria are the etiological agents of periodontaldiseases, which remain the primary cause of tooth loss in adults. Periodontal diseases are usually initiated by plaque biofilm formationwhich in turn gets mineralized into calculus. This plaque biofilm and calculusact as a resident for many pathologic and physiologic bacteria including Porphyromonasgingivalis, Staphylococcus aureus, Streptococcus sanguis, Streptococcus oralisTreponema denticoli etc. Many researches have proved the presence of Staphylococcusaureus in calculus. Staphylococcus aureus is

a gram-positive, round-shaped bacterium that is a member of the Firmicutes, and it is a member of the normal flora of the body, frequently found in the nose, respiratory tract, and on the skin. It is a facultative anaerobe. Staphylococcus aureus produces various enzymessuch as coagulase which clots plasma and coats the bacterial cell, probably to prevent phagocytosis.

Hyaluronidase breaks down hyaluronic acid and helps in spreading it. Staphylococcus aureus also produces deoxyribonuclease, which breaks down the DNA, lipase to digest lipids, staphylokinase to dissolve fibrin and aid in spread, and beta-lactamase for drug resistance. Antibiotic resistant strainof Staphylococcus aureus is methicillin resistant Staphylococcus aureus4which has become a clinical problem worldwide. It is important to bring out newantibiotics against staphylococcus species. Chlorhexidine is a biguanide compoundused as an antiseptic agent with topical antibacterial activity.

Chlorhexidine is positively charged and reacts withthe negatively charged microbial cell surface, thereby destroying the integrityof the cell membrane. Subsequently, chlorhexidine penetrates into the cell and causesleakage of intracellular components leading to cell death. Since gram positivebacteria are more negatively charged, they are more sensitive to this agent. Itwas found to be bacteriocidal at higher concentration and bacteriostatic atlower concentration. 5 It shows the anti-plaque and anti-gingivitisproperty.

6The aim of the study is to know the antibiotic effectof curry leaves on Staphylococcus aureus. MATERIALS AND METHOD: Extract preparation: Fresh

curry leaves are collected and cleaned properlywith water. Leaves are dried completely and powdered.

30g of powder iscollected. 15 g of powder is mixed with 50 ml of water and other 15 g toethanol. The mixture is kept for 24 hrs with periodic shaking thenfiltered and collected. Culture Media: Nutrient agarwas used as culture media. 14 gms of nutrient agar is mixed in 500 ml ofdistiller water and heated till the agar is completely dissolved. The mixtureis autoclaved for 15 minutes for 121. After autoclaving the mixture is poured in culture plates using micropipetteand the mixture is allowed to set. Microbial Assay: A subculture forstaphylococcus aureus was made by rubbing the swab containing staphylococcusaureus strain over nutrient agar.

The culture plate is left for 24 hours. Aftersub culture the study contained 2 groups. Group 1 consist of curry leavesextract with water and group 2 consist of curry leaves extract with ethanol. Zone ofinhibition test- Agar well diffusion test was used to check the antimicrobialactivity of curry leaves against staphylococcus aureus. In each culture plate 3wells were made and each well was filled with saline, chlorohexidine mouth washand last one with extract at 50 concentration. These culture plates wereincubated for 24 hours in hot air oven at 37.

Once the zone of inhibition is formed it is measured using ruler inmillimeters. A- SalineB- ChlorohexidineC- Ethanolic extractZONEOF INHIBITION WITH ETHANOLIC EXTRACT A- SalineB- ChlorohexidineC- Aqueous extract ZONEOF INHIBITION WITH AQUEOUS EXTRACT RESULT: Theantimicrobial activity of the curry leaves extract at 50 concentration was

screened by agar welldiffusion method and the zone of inhibition was measured in millimeters. Plate1 – with water extract showed no changes except of chorohexidine with zone ofinhibition of 26mm whereas in plate 2- with ethanolic extract shows zone ofinhibition of 25 mm and chlorohexidine with 24 mm of zone of inhibition. DISCUSSION: Theantimicrobial activity of the curry leaves extract at 50 concentration was screened by agar welldiffusion method and the zone of inhibition was measured in millimeters. Plate1 – with water extract showed no changes except of chorohexidine with zone ofinhibition of 26mm whereas in plate 2- with ethanolic extract shows zone ofinhibition of 25 mm and chlorohexidine with 24 mm of zone of inhibition. Manyresearch proved the presence of staphylococcus aureus in sub – gingival andsupra – gingival calculus.

Ohara-Nemoto et al. 7found numbers of staphylococci ranging from 102 to 105 CFUg-1, albeit from supra-gingival plaque. In the study they collected salivaand supra-gingival calculus and isolated 9 Staphylococcus species and334 isolates were identified.

Heller et al. 8 analyzedthe prevalence and infection levels of 51 microbial species in the subgingivalbiofilm of 260 patients with chronic or aggressive periodontitis. They observedthat Staphylococcusaureus wasmore prevalent in the subgingival biofilm of patients with chronicperiodontitis. In the study they analysed that chronic periodonditis patientare usually individual leass than or equal to 35 age of years and are non-smokers. Fritschi BZ et al. 9 found a strong association between Staphylococcus aureus and aggressive periodontitis in non-smokers. Althoughthey hypothesized that the

subgingival microbiota does not differbetween sites in individuals with chronic or aggressive periodontitis, or bysmoking status.

Murdochet al. 10 who isolatedstaphylococci from at least one diseased site in 54% of periodontal patients, and Loberto et al. 11 who isolated staphylococci from the subgingivalbiofilm in 37. 5% of subjects with chronic periodontitis. Rams et al. 12 isolated staphylococcifrom 50. 4% of patients with advanced adult periodontitis, and Dahlén andWikström 13
isolated Staphylococcus from 54. 4% of patients.

Few studies have found staphylococci in subgingivalbiofilms samples, but they are impossible to show if staphylococcus hassignificant role in periodontal disease or not. 14, 15 Tulika Pandit et al. 16 proved that methanolicextract>> ethanolic extract> aqueous extract of papaya and curry leavesshowed antimicrobial activity against the tested organism.

Prathyusha Akula etal. 17 proved the anti-bacterial effect of Murraya Koenigii againststaphylococcus aureus followed by Proteus vulgaris and Enterobacter aerogens. ManishVats et al. 18 proved the antimicrobial effect of Murraya Koenigiiagainst staphylococcus aureus, Micrococcus luteus, Bacillus subtilis, Escherichia coli, Pseudomonas aeruginosa, Candida albicans and Aspergillus niger. Ito et al, 19 statedthat antimicrobial activity of roots of M. koenigii is due to presenceof carbazole alkaloids.

Ethanol has a property to dissolve active component ofcurry leaves to enhance its anti-microbial activity. Mylarappa et al202010 proved APCeffectively inhibited Escherichiacoli, Staphylococcus
aureus, Vibriocholerae, Klebsiellapneumoniae, Salmonella typhi and Bacillus

subtilis. Theinhibition is comparable to that of commercial antibiotics chloramphenicol, streptomycin and gentamycin.

CONCLUSION: Plantsare believed to have potential therapeutic effect. The secondarymetabolites of plants were found to be source of various phytochemicals thatcould be directly used as intermediates for the production of new drugs. It is important to bring about the use ofherbs in dentistry to decrease the side effects of synthetic medicine. Ethanolic extract of curry leaves expressed antimicrobial activity at 50 concentration.

But the exact mechanism behind is still unknown.