Deiitai diseases are among the most common health problems treated with traditional remedies. Therefore, it is crucial to evaluate the potential of herbal remedies for the discovery of novel bioactive compounds that might serve as leads for the development of potent drugs. In our investigation efforts have been made to discover plants possessing antimicrobial agents, as plaque-control for the prevention of dental caries and periodontal diseases. The search for an effective antiplaque agents, project has been done on “Phytochemical investigation and standardization of herbal drugs used in dental care”. The bark of Juglans regia Linn., Mimusops elengi Linn., Symplocos racemosa Roxb., buds of Syzygium aromaticum Linn. and seeds of Zanthoxylum alatum Roxb. have been taken for this purpose.

Among the many plants used as chewing sticks, the stem bark of Juglans regia (Juglandaceae) is very popular and is used as a tooth cleaning device by the people living in all of temperate Europe and in the Himalayas. The concentrated alcoholic extract of bark of J. regia on subjection to silica gel column chromatography led to the isolation of five unreported phytoconstituents named benzjuglansoic acid, naphthjuglansoic acid, juglans benzoate, regiaoleate and regiapalmitate and their structures have been elucidated as 2-methoxy-benzyl-9-benzoicacid,1-methoxy-2-n-octanynaphthyl-9-oic acid, o-undecanly-heptacanly-2-hydroxy-benzoate, n-heneicosanly-9-octadeconoatoe, n-heptyl triacont-12’-enyl hexa decanoatoe. In addition, β-sitosterol, β-sitostero-β-D-glucoside, stigmasterol-β-D-glucopyranosiode and β-sitosterol-β-D-glucuronopyranosiode have been isolated from the bark of this plant.
**Minimus* elengi* (Sapotaceae) is used in the treatment and maintenance of oral hygiene. It prevents bad breath and helps keep the gums healthy. The alcoholic extract of bark on column chromatography yielded eighteen phytoconstituents in which twelve are new phytoconstituents named octadecanyl caprylate, mimusopfarnanol, stigmasterol-β-D-glycoside, elengietrarin, elengigallate, minusopstannin, elengitannin, β-sitosterol diglycosyl naphthoate, gallic acid diglucoside, gallic acid phenoxy diglucoside, elengibenzyl diglucoside, gallic acid diphenoxy diglycoside, and their structures have been characterized as octadecanyl octinoate, farnan-2-one-3p-ol, oIean-18-en-2-one-3-ol, stigmasta-5-22-dien-3β-ol-3β-D-glucopyranosyl-(6β→1")-D-glucopyranoside, 1-cabomethoxy-2-methoxy-3-hydroxytetralin, Phenyl propanoxygallate, β-D-Glucopyranosyl (6′→1")-β-D-glucopyranosyl-4"-(6"-ethylphenyl) gallate, 2′-(1′-Geranilanoxy)-β-D-glucopyranosyl-(6′→1")-β-D-glucopyranosyl-4" phenoxy gallate, β-Sitosterol-3β-(3",6",7" trihydroxynaphthyl-2" carboxyl)-6"-glucopyranosyl(1"→4")-
glucopyranoside, β-D-Glucopyranosyl(6′→1′′)-β-D-glucoopyranosyl 3,4,5-trihydroxybenzoate. β-D-Glucopyranosyl(6′→1′′)-β-D-glucoopyranosyl-4″-(4″-n-butylphenyl)3,4,5-trihydroxybenzoate, β-D-Glucopyranosyl(4′→1″)-β-D-rhamnosyl 3,4,5-trihydroxybenzoate and β-D-(2′-Phenylglucopyranosyl)-(4′→1″)-(2″-4″-diphenyl rhamnosyl)3,4,5-trihydroxybenzoate along with six known constituents named elengifarnone, β-sitosterol, minusopoleanenol, lupeol, elengibenzyl glucoside and β-sitosterol glycoside, identified as farnon-3-one, stigmasta-5-en-3 β-ol, olean-18-en-2-one-3-ol, lup-20(29)-en-3β-ol, β-D-glucopyranosyl-2,4 dihydroxy-6-ethylbenzoate, stigmasta-5-en-3β-ol, stigmasta-5-22-dien-3β-ol-3 β-D-glucoopyranosyl-(6′β→1″)-D-glucopyranoside and stigmasta-5-en-3 β-D-glucopyranoside.

Octadecanyl caprylate (ME-1)

Minusopfarnanol (ME-2)

Stigmasterol-β-D-glycoside (ME-7)

Elengitetralin (ME-8)
Elengigallate (ME-9)

Minusops tannin (ME-10)

Elengitanin (ME-11)
\[ \beta\text{-Sitosterol diglycosyl naphthoate (ME-12)} \]

\[ \text{Gallic acid diglucoside (ME-13)} \]
Gallic acid phenoxy diglucoside (ME-14)

Elengi benzyl glucoside (ME-15)
Gallic acid diphenoxy diglycoside (ME-18)

*Zanthoxylum alatum* (Rutaceae) is known as toothache tree, finds extensive application in the indigenous system of medicine. Its seeds are employed as an aromatic tonic in fever, dyspepsia and dental troubles due to their deodorant, disinfectant and antiseptic properties.

Column chromatography of the alcoholic extract of the seed led to the isolation of one unknown flavonoidal glycoside, named as *zanthoxylum flavone xyloside* and the structure has been established as 3,5,6,7-tetrahydroxy-3',4'-dimethoxy flavone-5-β-D-xylopyranoside along with two new phytoconstituent; diphenyl alatumoic dimethyl ester and hydroxy salicylic acid and identified as 2-methoxy-11-hydroxy-6,8-dimethylcarboxylate biphenyl and 2-hydroxy-4-methoxy benzoic acid reported first time from this plant.
Analysis of volatile oil isolated from the seeds of *Z. alatum* resulted in the identification of 6 components comprising 74.9% of total volatiles. The main constituent of oil were linalool (23%) and β-phellandrene (17.3%) followed by β-myrcene (7.9%), δ3-carene (2.4%), β-caryophyllene (10.5%) and terpene-4-ol (1.6%).

*Syzygium aromaticum* (Myrtaceae) flower buds oil is highly aromatic and extensively used as an ingredient of dentifrices, gargle ad chewing gum. The essential oil isolated from its buds and analyzed by GC and GC-MS. Total 7 components (100%) were identified. The oil contained one oxygenated monoterpenes, pulegone (4.1%) and three sesquiterpenes (62.9%), which consisted of β-caryophyllene (52.7%), α-humulene (8.4%), α-selinene (1.8%). The major non-terpenic component was eugenol (27.1%) followed by palmitic acid (4.3%) and formic acid (1.6%).

The concept of standardization is now being widely welcomed and it is a rational way to increase the acceptance of medicinal herbs among the physicians and patients. All these herbals are standardized for active constituent.

Standardization means adjusting the herbal drug preparation to a defined content of the active constituent. The concept of standardized extracts definitely provides a solid platform for scientific validation of herbals. Phytochemistry deals with the determination of
chemical constituents in plant material. Chemical analysis of the plant material is a critical factor for standardization. Techniques like High Performance Thin Layer Chromatography (HPTLC) is commonly used for chemical fingerprint analysis. Standardized extracts provide a consistent and effective alternative to crude drugs, as they constitute calculated ratio of the active constituents.

The heavy metals such as mercury, lead, arsenic and cadmium have no known vital or beneficial effects on humans, and their accumulation over time causes mental poisoning, liver damage and renal failure. Contamination or adulteration of herbal drugs used in dental care (J. regia, M. elengi, S. racemosa, S. aromaticum and Z. alatum) with heavy metals such as lead, mercury, cadmium, arsenic, nickel, chromium, copper and zinc were analyzed with AAS. The concentrations of all the heavy metals in all five crude drugs were found within the acceptance limits proposed by WHO. Thus these drugs appear to be safe for dental product development.

Antibacterial activity of aqueous and ethanolic extracts of the bark of J. regia, M. elengi, S. racemosa and buds of S. aromaticum and seeds of Z. alatum as well as volatile oil of buds of S. aromaticum and seeds of Z. alatum have been carried out against S. aureus and S. mutans, which was compared with amikacin and chloramphenicol, respectively. Ethanolic extract of J. regia, S. aromaticum and Z. alatum and aqueous extract of S. aromaticum exhibited better antibacterial activity against S. mutans in compared to chloramphenicol. The volatile oil of Z. alatum and S. aromaticum inhibited the growth of bacteria, S. aureus and S. mutans. However the oil of Z. alatum possessed better activity against S. mutans in compared to chloramphenicol.

The aqueous extracts of all drugs have been evaluated for their in vivo anti-inflammatory and analgesic activities at three different doses (250, 500 and 750 mg/kg). All the plant extracts were shown to possess significant anti-inflammatory activity against carragennan induced hind paw edema. Seed of Z. alatum and bark extracts of S. racemosa showed potent anti-inflammatory when compared to control.
All the plant extracts were shown to possessed significant analgesic activity by using thermal stimulus method. Extracts of seed of *Z. alatum* and flower buds of *S. aromaticum* showed potent analgesia when compared to control.