In Vitro Antiviral Activity of Calcium Elenolate

Calcium elenolate is a multifunctional monoterpene which can be isolated from acid-hydrolyzed aqueous extracts of various parts of olive plants. Viruses tested in this study were: Coxackievirus A21, parainfluenza 3 virus, herpesvirus (MRS), pseudorabies virus, vesicular stomatitis virus, encephalomyocarditis virus, Newcastle virus (GB), poliovirus 1,2,and 3, influenza A virus (PR8), Sindbis virus. This compound has been shown to be virucidal for all viruses against which it has been tested except poliovirus 3 and reovirus. The virucidal activity of this compound was shown to be greatest under alkaline conditions. From the data, it is tentatively concluded that the virucidal activity of calcium elenolate is mediated through an interaction with the protein coat of the viral particle rather than its nucleic acid. Renis, Harold, E; Antimicrobial Agents and Chemotherapy 1969: 167-71.

Antiviral activity of calcium elenolate on parainfluenza infection of hamsters

The in vivo antiviral activity of calcium elenolate was demonstrated in hamster infected with the parainfluenza 3 virus. The drug was virucidal when given within minutes of the viral inoculation. Calcium elenolate also showed a “therapeutic” effect when given 8 hr after infection. This antiviral activity, after establishment of infection, reduced the severity of the infectious process. The minimal effective dose of calcium elenolate produced only minimal histological changes in the sensitive olfactory epithelium of the hamster while exerting significant therapeutic antiviral activity. The effects obtained suggest that calcium elenolate may affect viral components of cellular origin in both free and cell-associated virus. Soret, MG; Antimicrobial Agents and Chemotherapy 1969; 160-65.

Inactivation of DNA Polymerases of Murine Leukaemia Viruses by Calcium Elenolate

The effect of different concentrations of calcium elenolate in varying conditions of assay on the DNA polymerase activity of purified Moloney leukaemia virus was determined. Enzyme activity ceased abruptly whether calcium elenolate was added at 0, 5, or even as late as 40 min by which time, presumably, RNA-DNA hybrids has accumulated. The addition of exogenous templates calf thymus DNA, rA.dT, or rA.rU to the reaction mixtures, did not interfere with the inhibition of enzyme activity by calcium elenolate. There was slight diminuition of enzyme inhibition when the synthetic polynucleotide d(AT) was used in the reaction mixture. The order of addition of template and calcium elenolate did not affect the results. These data suggest that calcium elenolate inhibited the enzyme itself. Hirschman Shalom, Z. Nature New Biology Aug. 1972, vol. 238, 277-278.

The effect of the olive phenolic compound, oleuropein, on growth and enterotoxin B production by Staphylococcus aureus

The presence of low concentrations (0.1% w/v) of oleuropein, a phenolic compound extracted from olives, delayed the growth of Staphylococcus aureus in NZ amine A and brain heart infusion media modified by the addition of growth factors and glucose (NZA+ and BHI+), as indicated by changes in conductance, whilst higher concentrations (0.4-0.6% w/v) inhibited growth completely. Intermediate concentrations of oleuropein (0.2%) prevented growth in BHI+ but allowed growth to occur in NZA+ despite an extended lag phase (30 h). Concentrations of oleuropein > 0.2% inhibited growth and production of enterotoxin B in both types of media. Lower levels (0.1%) did not affect the final viable count and production of toxin in BHI+ but decreased the number of viable organisms and reduced the toxin production in NZA+ by eightfold. An increase in the concentration of oleuropein resulted in a decrease in the amount of glucose assimilated and consequently the amount of lactate produced. In addition, oleuropein prevented the secretion of a number of exoproteins. Addition of oleuropein during the exponential phase appeared to have no effect on the growth of Staph. aureus in NZA+. Tranter HS; Tassou SC; Nychas GJ. J Appl Bacteriol 1993 Mar;74(3):253-9.
The present work was undertaken to investigate the mechanism of antimicrobial action of the phenolic glucoside, oleuropein. Oleuropein is surface active; this and its effect on cell membranes, as demonstrated with human erythrocytes, seems to be the basis of its antimicrobial activity. Oleuropein affected a significant leakage of glutamate, potassium and inorganic phosphate from Lactobacillus plantarum. Oleuropein had no effect on the rate of glycolysis when added to resting cells of L. plantarum but it caused a decrease in the ATP content of cells. Juven B; Henis Y; Jacoby B. J. appl. Bact. 1972, 35, 559-567.

Oleuropein protects low density lipoprotein from oxidation

In experiments with anesthetized cats and conscious dogs, oleuropein exerted a hypotensive action. The maximum fall of systolic pressure in 3 of the dogs with induced hypertension was about 60% (average value); the diastolic pressure still more decreased (by nearly 70%). The second basic feature of oleuropein is its coronary dilatating action (increase of coronary flow) in experiments on isolated rabbit heart, coping with the coronary-constrictory effect of Pituitrin. Manolov, P., Petkov V: Pharmacological Analysis of the Iridoid Oleuropein. Drug Research 1972 (9);1479-85. The Mediterranean diet, rich in fruit, vegetables, grain, and vegetable oil (mainly olive oil) is correlated with a lower incidence of coronary heart disease (CHD). Natural antioxidants contained in the Mediterranean diet might also play a role in the prevention of cardiovascular diseases, through inhibition of LDL oxidation. We tested this hypothesis "in vitro" by inducing LDL oxidation with copper sulphate and preincubating the samples with oleuropein, the bitter principle of olives, that is one of the major components of the polyphenolic fraction of olive oil. Oleuropein 10(-5) M effectively inhibited CuSO4-induced LDL oxidation, as assessed by various parameters. We demonstrate in this investigation that polyphenolic components of the Mediterranean diet interfere with biochemical events that are implicated in atherogenic disease, thus proposing a new link between the Mediterranean diet and prevention of CHD (coronary heart disease). Visioli F; Galli C. Life Sci 1994;55(24):1965-71.

The evaluation of long-term effects of cinnamon bark and olive leaf on toxicity induced by streptozotocin administration to rats

The effects of cinnamon bark and olive leaf have been investigated on streptozotocin-induced tissue injury, and some biochemical and haematological changes in rats. The effects on glycaemia were also evaluated. Long-term administration of olive leaf caused significant improvement in tissue injury induced by streptozotocin treatment; the effect of cinnamon bark was less extent. No effects on blood glucose levels were detected. However, significant decreases in some increased biochemical and haematological parameters of streptozotocin-treated rats were observed. Aspartate aminotransferase, urea and cholesterol levels were significantly decreased by treatment with both plant materials, and alanine aminotransferase by treatment with olive leaf. Cinnamon bark also caused a significant decrease in platelet counts. In addition, any visible toxicity, except decrease in body weight gain, attributable to the long-term use of plant materials was not established in normal rats. The data indicate that long-term use of olive leaf and cinnamon bark may provide benefit against diabetic conditions. Determination of underlying mechanism(s) of beneficial effects, toxicity to other systems and clinical assessments of related plant materials are major topics requiring further studies. Onderoglu S, Sozer S, Erbil KM, Ortac R, Lermioglu F. J Pharm Pharmacol 1999 Nov;51(11):1305-12.