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RECORD TYPE : P
SUB TYPE : S
SECURITY CODE :
FUNDING BODY :
ORGANIZATION : ITEL CANADA
GROUP NUMBER : 444
LOCAL PROJECT NUMBER(S) : T-7708;04
PROJECT TITLE : Biological Effects of Tobacco Smoke and Tobacco Extracts in Short Term Tests
PERSON RESPONSIBLE : BILIMORIA, M.H.
EFFECT : 1988
PROJECT DESCRIPTION : Bacterial tests will be employed to study the mutagenicity of smoke condensates from ITEL and opposition brands, as well as new market entries, to ensure that ITEL products rank favourably in a comparative study. By determining the mutagenicity of smoke condensates and fractions from different cigarettes smoked under different conditions, the aim is to identify those parameters which affect mutagenicity. The effect of additives on condensate mutagenicity will also be studied as will smokeless tobacco products.

SCOPE : GROUP
DEPTH : APPLIED/DEVELOPMENT
FUNCTION : PUBLIC AFFAIRS
OBJECTIVE : REGULATORY
CLUSTER : BIOLOGY

DATE REVIEW WRITTEN : January 1989
REVIEW TITLE : In the last 6 months of 1988 the following three aspects of this project were dealt with:

- 1) Mutagenicity of Cigarettes Containing Tropical Fruit Casings
Cigarette samples containing fruit extracts, made for Project SATURN, have been tested for mutagenic activity. The results indicate that tropical fruit casings do not influence the mutagenicity of the condensate. Consideration may be given to exploring differently prepared fruit and vegetable extracts for their effect on cigarette smoke condensate mutagenicity.
- 2) Screening of Antioxidants and Other Chemicals for Their Ability to Reduce Smoke Condensate Mutagenicity
The protective effects of antioxidants *in vivo* has prompted us to study the effect of smoke exposure on levels of these chemicals in small animals.

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Results from in vitro studies indicate that many antioxidants reduce the mutagenicity of smoke condensate. Recent studies have shown that catechol, rescreinol and phytic acid are not mutagenic in the Salmonella system, but reduce the mutagenicity of smoke condensate, whereas rutin and quercetin while reducing the mutagenicity of condensate are mutagenic in themselves (less than additive). Catechin and uric acid did not have any effect on smoke mutagenicity nor were they mutagenic. Such studies might reveal an antioxidant with potential for reducing the mutagenicity of cigarette smoke condensate.

Of the chemicals tested in a standard screening procedure and found to reduce the mutagenicity of smoke condensate, two, sodium selenite and eugenol were applied to flue-cured tobacco cigarettes to investigate whether condensates of reduced biological activity were produced. Our study shows that application of either selenium or eugenol to tobacco does not reduce the mutagenic activity of the smoke condensate. Thus, the earlier reduction of smoke condensate mutagenicity observed in the standard screening procedure was most probably due to the effect of these chemicals on the oxidative enzymes in the liver S9 activation system. Whether animals treated with these chemicals will produce liver extracts with a reduced capacity to activate smoke condensate will be investigated in the near future.

3) Mutagenicity of Sidestream Smoke Condensates

Considerable interest exists in reducing the mutagenicity of sidestream smoke as well as its visibility. An earlier study carried out using a single cigarette type (plain-end, flue-cured) showed that both mainstream and sidestream smoke condensates were similar in Ames activity. This study was extended to include a low tar commercial brand

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(Medallion), a plain-end (Check 28) and an experimental low sidestream cigarette (S-3). The results obtained show that the sidestream condensates from all three cigarettes were significantly lower than the corresponding mainstream condensates. More studies should be undertaken.

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