Fire Cured Tobacco

Fire Cured Tobacco: unburned chemistry studies

Stepanov, Irina; Villalta, Peter W.; Knezevich, Aleksandar; Jensen, Joni; Hatsukami, Dorothy K.; Hecht, Stephen. (2009) ''Analysis of 21 polycyclic aromatic hydrocarbons in smokeless tobacco by gas chromatography-mass spectrometry'' Abstracts of Papers, 238th ACS National Meeting, Washington, DC, United States, August 16-20, 2009,

Smokeless tobacco contains 28 known carcinogens and causes precancerous oral lesions and oral and pancreatic cancer. We recently analyzed 8 different polycyclic arom. hydrocarbons (PAH) in moist snuff, extending for the first time in over 2 decades the range of chems. analyzed in U.S. smokeless tobacco beyond nicotine and nitrosamines. Fire-curing of tobacco is the most likely source of its contamination with PAH, some of which are strong toxicants and carcinogens. In this study, we used gas chromatog.-mass spectrometry to analyze 21 different PAH in some of the most popular U.S. smokeless brands. The sum of 19 PAH detected in 15 products analyzed here averaged 6.85 (±1.22) μg/g wet wt. Among the detected PAH, eight are IARC carcinogens, their sum averaging 0.46 (±0.31) μg/g wet wt. This is the first study to render PAH one of the most prevalent groups of carcinogens in smokeless tobacco, along with tobacco-specific nitrosamines.

Fire Cured Tobacco: Toxicology of unburned tobacco

Hoffmann, Dietrich; Harley, Naomi H.; Fisenne, Isabel; Adams, John D.; Brunnemann, Klaus D. (1986) ''Carcinogenic agents in snuff'' Journal of the National Cancer Institute, 76(3), 435-7.

The oral use of snuff has been assocd. with an increased risk for cancer of the oral cavity and pharynx. The 5 most popular US snuff brands were analyzed for alkaloids, volatile and tobacco-specific N-nitrosamines (TSNA), benzo[a]pyrene [50-32-8], and 210Po. The carcinogenic TSNA in the 5 snuff brands ranged from 9600 to 289,000 ppb. These concns. exceed the nitrosamine concns. of other consumer products by at least 2 orders of magnitude. Po amounted to 0.16-1.22 pCi/g dry snuff. Trace amts. of benzo[a]pyrene (0.1-63 ppb) were indicative of contamination of the tobacco with thermal degrdn. products, probably due to fire curing or flue curing. The findings from this study, the biol. activity of snuff in animal models, and the epidemiol. studies on snuff use and oral cancer strongly suggest the need for redn. of carcinogens and esp. of nitrosamines and 210Po in snuff.

Fire Cured Tobacco: *In vitro* studies

Hayes, J. R., D. R. Meckley, et al. (2007). "Effect of a flue-curing process that reduces tobacco specific nitrosamines on the tumor promotion in SENCAR mice by cigarette smoke condensate." Food Chem Toxicol **45**(3): 419-430.

A 30-week dermal tumor promotion study was conducted to evaluate the dermal tumor-promoting potential of cigarette smoke condensate (CSC) collected from cigarettes containing flue-cured tobacco cured by a heat-exchange process (HE) relative to that of cigarettes containing flue-cured tobacco cured by the traditional direct-fire process (DF). Heat-exchange process cured tobacco contains significantly lower concentrations of tobacco specific nitrosamines (TSNAs) compared to traditional direct-fire cured tobacco. Mainstream CSCs were collected by cold trap from smoke generators using the Federal Trade Commission puffing regimen. Groups of 40 female SENCAR mice were initiated by a single application of 75 micro g 7,12-dimethylbenz[a]anthracene (DMBA) to the shaved dorsal skin. CSCs were then applied to the skin three times/week for 29 weeks at 9, 18, or 36mg tar/application. End-points included body weights, clinical observations, organ weights, dermal tumor development and histopathology. The numbers of dermal tumors and the numbers of tumor-bearing mice for each CSC were statistically different from the DMBA/acetone control group and increased with increasing dose. When corresponding doses of each CSC were compared, only the DMBA/mid-dose HE CSC group was statistically significantly different (lower) from the corresponding DMBA/mid-dose DF CSC group. In this assay, the dermal tumor-promotion potential of CSC from heat-exchange flue-cured tobacco did not differ from that of traditional direct-fire flue-cured tobacco CSC.