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ANALYTICAL RESEARCH DIVISION -  
RESEARCH DIRECTORATE

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Analysis/Evaluation of Leaf Pieces

A shipment designated 109270(4), also identified with TH930513-39DL, was received by the Analytical Research Division, Research Directorate, 3 June 1983, from FSTC. Information concerning the sample indicated it could have been from an area subjected to chemical attack. The sample consisted of one large and one small leaf piece each with yellow spots approximately 3 to 5mm diameter (Figure 1). The pieces were enclosed in a glass bottle fitted with a rubber septum closure.

A vapor sample withdrawn from within the bottle was subjected to analysis by gas chromatography/mass spectrometry (GC/MS). One portion of the sample was leached in chloroform. Another portion was leached in 1:1 methanol:water. The solvent soluble materials were analyzed by GC/MS, ion chromatography (IC), thin layer chromatography (TLC) and infrared spectrometry (IR). In addition, a yellow spot on a leaf piece was evaluated by scanning electron microscopy (SEM).

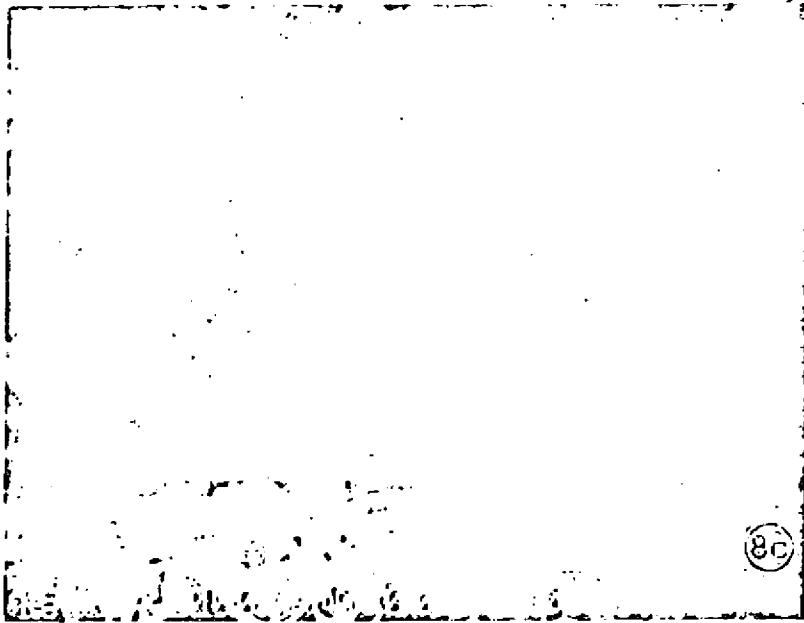
The GC/MS spectra of the vapor associated with the leaf pieces identified ethyl caproate, ethyl butanoate and iso-pentanol as major components with caproic acid, ethyl propanoate and an unidentified compound  $M/Z = 115, 89, 71, 70, 55$  and  $43$  as minor components and a fluoride as a possible trace component. The GC/MS spectra of the chloroform solubles identified the aliphatic hydrocarbons  $C_{25}, C_{27}$  and  $C_{29}$ , with the  $C_{27}$  having the highest concentration. In addition, methyl - - butenol, caproic acid and two unidentified components having base peaks of 71 and 69 were detected. Ion chromatography detected no ions of interest. No detectable components were separated by TLC. Derivatization with negative ion chemical ionization, MS detection was negative for trichothecenes. Gas chromatography detected components which could possibly be beeswax; however, the concentration was too low for confirmation. IR spectra identified the presence of aliphatic hydrocarbons and a carbonyl. SEM evaluation showed the yellow spots consisted primarily of two pollen species overgrown with hyphae and spores (Figure 2).

Conclusion: No evidence of any known CW agent, agent degradation product or trichothecene was detected. The presence of a fatty acid and several fatty acid esters could be natural components of the large, waxy leaf. The pollen and fungal growth detected could be from natural sources, since no trichothecenes were detected.

Classified by: CIA

Declassify: OADR

FIGURE 1



B(H)-A

127B(4)

FIGURE 2