• *Short Communication*

Stable Basic Lead Soaps of alpha-Disubstituted Carboxylic Acids

NATURALLY OCCURRING as well as synthetic carboxylic acids, such as naphthenic, tall oil, 2-ethyl hexanoic, and α-disubstituted carboxylic acids all yield drier metal soaps, which are soluble in vehicles and thinners used in paints. As drying catalysts they are generally supplied in hydrocarbon solvents at standard metal contents.

Fischer reports (1) that a commercial acid consisting of a mixture of α-disubstituted C_{10} acids yield insoluble basic lead soaps at a 1.4 mole ratio of acid to metal.

At a ratio of 1.7 moles of acid to metal, very stable basic lead soaps of α-disubstituted acids can be prepared. These were done by using conventional methods and exhibited excellent stability over a three-year, shelf-life study at various dilutions, e.g., 24% and 1.3% by weight of metal.

Enjay Chemical Company neodecanoic acid, a mixture of isomers (all α-disubstituted) possessing 10 carbon atoms, Varsol 3 (Humble Oil and Refining Company), litharge (PTX lead oxide, National Lead), and anhydrous magnesium sulfate (Matheson, Coleman, and Bell) were used.

For preparation of basic lead neodecanoate (24% metal) neodecanoic acid (172 g; 1.0 moles) and 206 g of Varsol 3 were charged to a 1-liter, 4-necked flask fitted with a condenser, stirrer, water trap, and thermometer. Litharge was added (131.7 g; 0.59 moles) slowly at 40C with stirring. After complete addition, the temperature was slowly raised to 190C and maintained until a clear solution was obtained. Water and solvent were removed after cooling by vacuum distillation (70C). If a somewhat hazy solution resulted, a small amount of anhydrous magnesium sulfate was added, the drier filtered, and the metal content adjusted to 24 wt % lead. After three years there was no evidence of hazing, cloudiness, or settling.

Basic lead neodecanoate (1.3 wt %) was prepared from the 24 wt % metal drier by diluting with Varsol 3 to a metal content of 1.3 wt %. Again, after three years, there was no evidence of hazing, cloudiness, or settling.

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Aflatoxin Contamination. Electron Microscopic Evidence of Mold Penetration

IT HAS BEEN KNOWN for several years that the presence of aflatoxins in peanut kernels can be attributed to infection by the mold *Aspergillus flavus* (1). This mold is occasionally visible on the outer surface of shelled peanut kernels. When these kernels are cut open, an abundance of sporulating mold is often observed in the cavity between the cotyledons.

Since aflatoxins are elaborated by the mold and it is easily observed on the outer and inner surfaces, on first consideration one would expect the production of toxins to be mainly at the surface. If this were the case, there should be more toxins detected near the outer surface as well as in the area adjacent to the inner cavity. If so, treatment with a mild alkaline wash which would open the lactone ring and solubilize the aflatoxins might be used to remove aflatoxin from any contaminated kernels. However analysis of individual peanuts and peanut sections (2) indicated that toxins are distributed throughout the entire cotyledon. A schematic diagram of one-half of a typical highly contaminated kernel is shown in Figure 1. The values shown for aflatoxin B_1 content were obtained by assaying separately individual layers cut to follow the contour of the kernel. The micro aqueous-acetone technique developed by Cucullu et al. (2) was used in all cases. The other half of the kernel, assayed separately, contained 1,000,000 ppb aflatoxins. In this kernel the level of toxin was highest in the heart or germ (h) Figure 1 and lowest

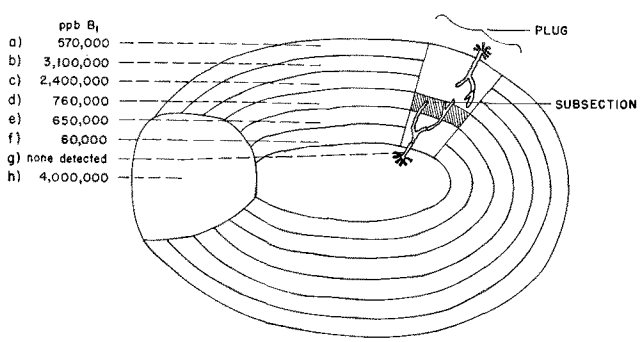

FIG. 1. Schematic diagram depicting mold penetration and aflatoxin content in half of an infected peanut kernel. The view is of the cut face, showing half of two cotyledons. The numbers indicate parts per billion aflatoxin B_1 found in each layer: a) abaxial layer, b-e) mesophyll layers, f) adaxial layer, g) mycelia and spores from adaxial surface (1.1-mg sample assayed), h) axial tissue.

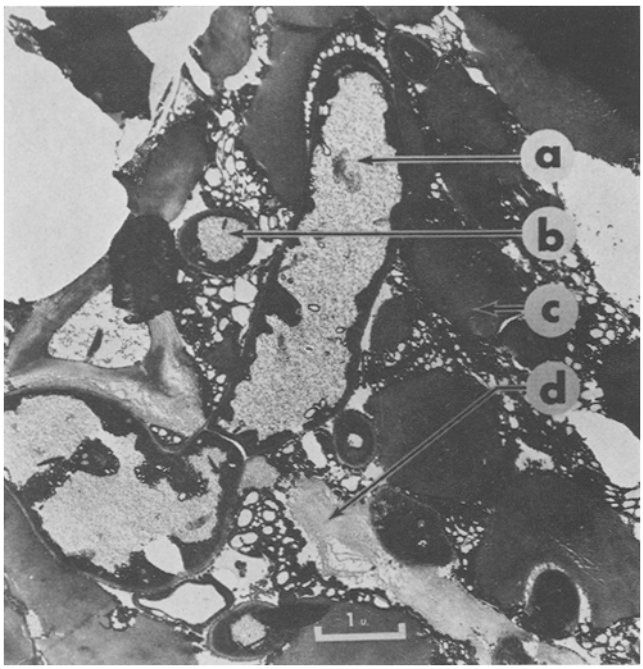

FIG. 2. An electronmicrograph of a portion taken from the subsection depicted in Figure 1. Magnification 27,000 times: a) longitudinal section of a mycelium, b) cross-section of a mycelium, c) aleurone grain, d) cell wall.

near the cavity between the faces of the cotyledon (f) Figure 1. Green, sporulating mold completely filled this cavity. A culture made from a portion of the mold positively identified it as *A. flavus* (2) and, under the culture conditions used, no other strains of mold were detected.

Two possibilities are presented to explain the existence of toxins at all levels in the kernel: diffusion of the toxins from the inner and outer surface areas toward the interior portions of the kernel, or actual elaboration of the toxins well within the interior portion of the cotyledon. In the latter case, there should be evidence of mold penetration into the kernel. Accordingly a small plug was cut from a portion of the half kernel shown in Figure 1. This plug contained portions of each layer from the outer to the inner surface. Subsections approximately 0.3 mm^3 were cut from the plug and fixed in 2% aqueous potassium permanganate at 0C for one hour. The sections were serially dehydrated in graded aqueous acetone solutions and embedded in Maraglas according to the method of Spurlock et al. (3). Thin sections were cut on a Porter-Blum microtome with a diamond knife and stained with 1% uranyl acetate, followed by a lead citrate stain (4). The sections were observed in the Phillips EM-200 electron microscope. A typical electronmicrograph is shown in Figure 2. Part (b) in this figure is a cross-section of a mycelium. This section was cut close to the center of the plug and thus represented an interior portion of the kernel (d) Figure 1. There is, then, microscopic evidence of mold penetration into the peanut kernel. This, rather than diffusion from the surfaces, must account for the presence of aflatoxins at all levels.

Superficial surface washing therefore would not completely eliminate aflatoxins from highly contaminated peanut kernels even if these kernels were split prior to such a wash.

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