UTAH STATE UNIVERSITY · LOGAN, UTAH 84321
COLLEGE OF AGRICULTURE

DEPARTMENT OF
ANIMAL SCIENCE

July 3, 1969

Dr. Cummings Paton
Organic Division Development
Monsanto Chemical Company
800 North Lindberg Boulevard
St. Louis, Missouri 63166

Dear Dr. Paton:

Through collaboration with Dr. Francis A. Gunther, University of California-Riverside, I obtained samples of the Arochlor products from your company which have been studied for effectiveness in induction of hepatic microsomal enzymes. The enclosed abstract which summarizes our work to date, has been submitted for the program of the Pesticide Division, American Chemical Society for its next annual meeting. Dr. Gunther asked that I keep you informed of our studies, hence this letter.

My primary interest in studying substituted biphenyls has been in connection with a sizable endeavor to identify significant structure-activity relationships in compounds capable of inducing hepatic microsomal enzymes. We had earlier investigated a considerable series of bridged and unbridged diphenyl compounds involving a variety of substituent groupings. The activities of the Arochlors seem to fit reasonably well with that predicted on the basis of our earlier studies, allowing for the crude composition of the Arochlor products. We are most anxious to obtain pure compounds in the chlorinated biphenyl family and would appreciate any assistance you and your company might be able to provide in obtaining such.

In regard to the possible significance of PCB materials in the environment, I am presently fairly openminded. I am impressed with the potency of the higher members of the Arochlor family as enzyme inducers. However, I am by no means committed to the view that this is a serious hazard in itself to the health of any organism, including the wildlife species that have been the subject of so much recent concern because of pesticide residues. The scientific questions remaining in this area are extremely complex and much more research information is needed before a clear understanding emerges. Toward that end the continued assistance of your company will be most appreciated and, of course, acknowledged in our presentations and publications.

Sincerely yours,

Joseph C. Street

Joseph C. Street
Professor

JCS:jw

DSW 199946

STLCOPCB4058010

COMPARATIVE EFFECTS OF POLYCHLORINATED BIPHENYLS AND ORGANOCHLORINE PESTICIDES IN INDUCTION OF HEPATIC MICROSOMAL ENZYMES. J.C. Street, F.M. Urry, D.J. Wagstaff, and A.D. Blau. Dept. of Animal Science, Utah State University, Logan, Utah 84321

Polychlorinated biphenyls (PCBs) are of interest because of their recent identification with residues of organochlorine pesticides in tissue samples of fish and certain birds where their presence causes some interference with routine GLC analysis of the pesticide residues. Moreover, some PCB products have been reported to induce liver microsomal enzymes, as do many organochlorine pesticides. The microsomal enzyme inducing activity of a series of PCB products (Arochlors) has been evaluated and compared to that of many organochlorine pesticides. The 10 products ranged from 21 to 68 percent chlorine and included two chlorinated triphenyls. Female rats were fed the test products at levels of 50 and 100 ppm in the diet for 15 days. Microsomal enzyme activity was assayed with liver homogenates using p-nitroanisole, aniline, EPN and progesterone as substrates. In addition, indirect measurements of hexobarbital and dieldrin metabolism, in vivo, were made. Administration of each PCB product induced metabolism of all substrates; the amount of stimulation measured increased regularly with percentage chlorination of the product. Products containing over 50% chlorine were as potent in enzyme induction as DDT, heptachlor epoxide and other highly active pesticides. Since certain hazardous aspects of pesticide residues in the environment toward wildlife may derive from their induction of hepatic microsomal enzymes, the presence and equally high activity of some PCB materials in mixed residues is of greater significance than merely a source of analytical interferences.

DSW 199947

STLCOPCB4058011