For Benignus Meeting - Comments back before Vodden leaves 9/20/74.

USA/ CP/126.

RUABON POND EXPERIMENTS

Objective

To study relative degrees of accumulation of different PCBs in fish kept in open-air ponds.

Experimental

Five self-supporting fish ponds were set up at Ruabon, North Wales. Each had a surface area of about 6 square metres and contained about 1000 litres of water. After stocking with plants and common water snails they were allowed to equilibriate for about two months.

75 goldfish were introduced to each pond and, after a settling-in period, about 2g each of Aroclors 1254, 1242 and 1016 were introduced to three of the ponds.

Measurements showed that after a few weeks the fish in these three ponds had accumulated PCBs to levels of several parts per million (whole fish - wet weight basis). Unfortunately the fish in all five ponds became affected by a fungus disease and most of the fish died, so this particular experiment was abandoned.

The ponds were then emptied, cleaned, re-filled with water, and left for about three months before being re-stocked with goldfish.

Analysis of the pond waters showed levels of around 0.1 ppb for Aroclor 1254 and about 1.0 ppb for Aroclors 1242 and 1016. The effects of these levels on the accumulations in the fish have been studied over a period of about one year.

1254 20,000 bwk
1242 50,000 gr
1000 [illegible]

Results

Only a few packed column gc results are available to date.

These show that after about two weeks the levels of PCB in fish samples (whole fish - wet weight basis) were about 1 ppm in fish from the ponds containing Aroclors 1254 and 1242.

After six weeks the level of Aroclor 1254 had increased to about 2 ppm whereas the level of Aroclor 1242 was below 1 ppm.

After one year the level of Aroclor 1254 was about 5 ppm and the levels of Aroclors 1242 and 1016 had risen to about 2 ppm.

Work on capillary column gc is in progress. Data from this work should enable more accurate estimates to be made and will enable deductions to be made on selective degradation.

Discussion

Until the capillary column gc analyses have been made it is difficult to draw condlusions from this work. In relation to the level of PCB in the water it is clear that accumulation of Aroclor 1254 is much greater than that of Aroclor 1242 or 1016, but the nature of the accumulated residues is also important and this will become evident from the capillary-column chromatograms.