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DATA EVALUATION RECORD

STUDY 25

CHEM 128974 Quinclorac §165-4

FORMULATION--00--ACTIVE INGREDIENT

STUDY ID 40320819
Forbis, A., L. Schoen, and L. Stuerman. 1986. Uptake, depuration, and bioconcentration of ^{14}C-BAS 514H by channel catfish (Ictalurus punctatus). ABC Final Report No. 34507. BASF Registration Document No. 87/5002. Unpublished study performed by Analytical Bio-Chemistry Laboratories; Inc., Columbia, MO, and submitted by BASF Corporation, Parsippany, NJ.

DIRECT REVIEW TIME = 12

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CONCLUSIONS:

Laboratory Accumulation - Fish

1. This study can be used to fulfill data requirements.

2. [^{14}C]Quinclorac residues did not accumulate in channel catfish exposed to [^{14}C]quinclorac at 1 ppm in a flow-through system for 28 days. Maximum concentrations were 0.80 ppm in the whole fish and 0.86 ppm in the nonedible tissue; residues in the edible fillet were not detected (<0.6 ppm) at each sampling interval. No quantifiable [^{14}C]residues were detected in the fish during the 14-day depuration period.

3. This study is marginally acceptable and fulfills EPA Data Requirements for Registering Pesticides by providing information on the accumulation of [^{14}C]quinclorac in laboratory fish.

4. No additional data are needed on the accumulation of quinclorac in laboratory fish at this time.

METHODOLOGY:

Channel catfish (Ictalurus punctatus, mean weight 7 ± 1.7 g, mean length 76 ± 4.8 mm) were held in culture tanks on a 16-hour daylight photoperiod for at least 14 days prior to the initiation of the study. Flow-through aquatic exposure systems were prepared using two 70-L aquaria. Aerated well-water (pH 7.8-8.3, dissolved oxygen 9.2-10.1 ppm, alkalinity 325-375 ppm as calcium carbonate, hardness 225-275, temperature 15-20 °C; Table 1) was provided to the aquaria at a rate of 6.6 turnovers per day. The aquaria were placed in a water bath and maintained at 22 ± 2 °C.

One aquarium was continuously treated with [^{14}C]quinclorac (radiochemical purity 92.5%, specific activity 204 dpm/ug, BASF), which had been diluted approximately 1:440 with unlabeled quinclorac and dissolved in dimethylformamide at 1.0 ppm. Dimethylformamide was added to the control aquarium at the same rate as the test aquarium. After a 24-hour equilibration period, channel catfish (120) were introduced into each aquarium. Following a 28-day exposure period, the water in the treated aquarium was siphoned to a depth of approximately 3 inches and replaced with untreated well water. This process was repeated, and the fish were then maintained in the aquaria for a 14-day depuration period. The water and fish were sampled after 0.17, 1, 3, 7, 14, 21, and 28 days of exposure. During the depuration period, water and fish were sampled after 1, 3, 7, 10, and 14 days. Water and fish samples were stored at <-10 °C prior to analysis.

Radioactivity in the water samples was quantified by direct LSC; the detection limit for [^{14}C]residues was 0.0138 ppm. Three fish from each sampling interval were dissected into edible tissues (body, muscle, skin, skeleton) and nonedible tissues (fins, head, internal organs), and similar tissues were pooled. The pooled tissue samples and additional whole fish samples (3 fish/interval) were analyzed for total radioactivity by LSC following combustion. The detection limits for edible tissues, nonedible tissues, and whole fish were 0.606, 0.62, and 0.609 ppm, respectively. Recoveries efficiencies from fish samples fortified with [^{14}C]quinclorac at 5,000 dpm were 94-100% for edible tissues, 97-104% for whole fish, and 96-106% for nonedible tissues.

DATA SUMMARY:

[^{14}C]Quinclorac residues (uncharacterized) did not accumulate in channel catfish exposed to [^{14}C]quinclorac (radiochemical purity 95.2%) at 1 ppm in a flow-through system for 28 days. Maximum bioconcentration factors were 0.80x for the whole fish and 0.86x for the nonedible tissues; [^{14}C]residues were below the quantifiable limits (<0.6 ppm) in the edible tissues (Table 3). The maximum concentration of [^{14}C]residues (observed on day 7) were 0.80 ppm for the whole fish and 0.86 ppm for inedible tissues. No quantifiable [^{14}C]residues were detected in the fish during the depuration portion of the study (Table 4).

During the study, the water temperature in the treated and control aquaria ranged from 20 to 22 °C, the dissolved oxygen content ranged from 7.1 to 9.0 mg/L, and the pH ranged from 8.0 to 8.3 (Table 7). During the exposure period, the concentration of [^{14}C]residues in the water of the treated aquarium ranged from 0.99 to 1.1 ppm (Table 3). During the depuration period, [^{14}C]residues were not detected (<0.013 ppm) in the aquarium water.

REVIEWERS COMMENTS:

1. Radioactive residues in the fish tissue and the water samples were not characterized. Subdivision N guidelines specify that residues in fish tissue must be characterized only when bioconcentration occurs. Although quinclorac neither hydrolyzes or photolyzes under sterile conditions (Studies 1 and 2), other studies have shown that quinclorac photodegrades under nonsterile aqueous conditions (Studies 3 and 4). Therefore, residues in the water should have been characterized.

2. The minimum quantifiable limit for residues in edible, nonedible, and whole fish samples was reported to be approximately 60% (0.6 ppm) of the application rate. Since LSC analytical methods should be considerably more sensitive than 0.6 ppm, it was assumed that this limit was adjusted to reflect the high percentage of unlabeled quinclorac in the test substance.

3. A preliminary study was conducted to determine the toxicity of quinclorac to channel catfish. The 7-day LC_{50} of quinclorac was determined to be >5 ppm, based on a lack of observed mortality or abnormal effects at this concentration.