There has been an increase in the number of papers concerned with the application of TLC in toxicology during the last few years. The deoxynucleotide composition of strawberry samples was used to demonstrate a chromatographic method for quantifying the difference between pesticide- and toxin-exposed strawberries. The samples were analyzed by ^{32}P labeling and 2-D TLC (256). TLC has been used as a rapid screening method for the detection of 46 common pesticides in serum and gastric lavage solutions (257). To elucidate the insecticidal activity of spider toxins, metal ions in venoms and in the body were determined by TLC, MS, ion-chromatography, and ICP. It was suggested that metal chelates play an important role in the intoxication and detoxification of spider toxins (258). A simple HPTLC method for the simultaneous determination of eight anticoagulant rodenticides in liver samples was reported (259). Identification, confirmation, and distribution of toxic pesticides that can cause the poisoning of domestic animals or wild fauna was carried out with TLC and HPLC techniques (260). An investigation was made of a rapid screening method for the identification of pesticides in the case of toxicosis using TLC. Thirty common pesticides were selected and analyzed using hexane–acetone (4:1) and chloroform–acetone (9:1) as the mobile phases and fluorescent silica gel as the sorbent (261). The metabolism of 2,4-dichlorophenoxyacetic acid (2,4-D), the exposure to which results in an increased risk for certain malignant disorders, was investigated with TLC followed by NMR and IR spectroscopy (262). A new HPTLC method for the analysis of liver and crop samples in suspected poisoning cases was reported; the toxicity of imidacloprid in wild birds was evaluated (263). Three cases involving acute poisoning fatalities due to benfuracarb ingestion and forensic toxicological application were described. Benfuracarb, a carbamate insecticide, and its main metabolite, carbofuran, were detected using TLC and GC/MS (264). Toxicological interactions of chlorpyrifos and methylmercury in the amphipod *Hyalella azteca* were investigated (265). The carbamate insecticides furathiocarb (266) and carbofuran (267) were detected in gastric contents after poisoning by use of TLC and GC/MS.

C. Organochlorine Insecticides

Organochlorine (OC) insecticides are very stable and persistent compounds. Their capability to accumulate in the environment makes them very toxic. Therefore, numerous research projects have been devoted to their identification and determination.

HPTLC on silica with toluene–acetone (8:2) was used for pentachlorophenol determination in leather (268). Optimized mobile phase gradients were designed for the AMD separation of OC pesticides and phenols (98,99). A method was described for the determination of 2,2-bis(*p*-methoxyphenyl)-1,1,1-trichloroethane isomer in the insecticide methoxychlor by using TLC (269). A report was published on a TLC method that provided 80–100% recovery for 26 OC pesticides in milk and milk powder (263). Isolation and identification of endosulfan in biological materials on silica gel plates were reported (270). Determination of pentachlorophenol and cymiazole in water and honey by RP-TLC was also reported. Recoveries from water were 97.7–100.0% for pentachlorophenol and 89.5–94.9% for cymiazole, and those from honey were 94.0–96.1% and 91.9–93.7%, respectively (272). Separation of certain OC insecticides on mixed oxide sorbents was mentioned earlier (75). The *Mucor thermo-hyalospora* MTCC 1384 fungus was found to bring about the transformation of endosulfan, whose metabolites were identified by TLC (273). The research was aimed at optimizing chromatographic conditions for simultaneous separation and identification of OC and OP insecticides. The OC insecticides examined were DDT and methoxychlor, lindane, chlordane, and endosulfan (274).

An approach to insect control using sodium trichloroacetate to inhibit synthesis of the hydrophobic cuticular lipids that protect insects from dehydration was tested on *Triatoma infestans*. TLC and scanning electron microscopy showed disruption of the cuticular lipid layer in treated insects (276). Certain insect repellents in cosmetic products were determined using HPTLC (277). Time-dependent sorption of various insecticides in two different soils was investigated (278).

Chromatographic systems for OC pesticide determination are listed in Table 3 and Fig. 1.