CHAPTER - II
HISTORICAL RESUME
PESTICIDE induced histopathological changes in the mammalian tissues is of utmost importance. By reviewing the literature it was noticed that a lot of work has been done on the effect of chemicals viz. pesticides, heavy metals and other carcinogen chemicals on different groups of mammals.

The work done by various workers in the field so far are as follows:

Cameron and Cheng (1951), Ortega (1966), Kimbrough et al. (1971), Laws (1971), Kashyap et al. (1977), Cabral et al. (1982) reported changes in the liver of rats induced by DDT.

Ortega et al. (1957), Ricker et al. (1970) reported hepatic changes due to pesticides in rats.

Studies of Legator et al. (1969), Mark (1969), Collins and William (1971), Palmer et al. (1972, 1973) and Kelly-Gavert and Legator (1973) have shown the possible kind of cytogenetic and tetratogenic damage caused by the potentially toxic chemicals.
Kashyap and Gupta (1971) reported toxicity studies of DDT in albino rats. Dikshith and Datta (1972), Datta and Dikshith (1973) reported pathological changes induced by pesticides in the liver of rats. Jonsson et al. (1981) observed several changes due to dietary DDT and PCB on the rat liver morphology. Histopathological changes on the hepatic cells of albino rats by DDT have been reported by Baronia and Sahai (1987).

Liver changes in Balb/c mice or mice during pesticidal effect have also been shown by Tannenbaum (1945), Andervont and Dunn (1948), Della Porta et al. (1961), Heston and Vlahakis (1961, 1966), Davis and FitzHugh (1962), Song and Harville (1964), Deringer (1965), Toth and Shubik (1966), Kemeny and Tarjan (1966), Halver (1967), Weisburger and Weisburger (1967), Madison et al. (1968), Keplinger et al. (1968), Shubik and Hartwell (1969), Kagan et al. (1969), Innes et al. (1969), Deichmann et al. (1970), Smith and Pilgrim (1971), Tomatis et al. (1972), and Terracini et al. (1973). Hurkat (1977) reported histological changes in the liver of rats during the administration of dieldrin (HEOD). Singh et al. (1984) investigated several pathological changes in the goat’s tissues (Liver, kidney, heart, spleen, lymphnode, brain, adrenal gland, lungs and thyroid) by aldrin pesticides.
Changes in the liver of rats or mice due to the effect of BHC have also been studied by Doisy Jr. and Bocklage (1949), Duve Dec (1963), Nagasaki et al. (1971, 1972), Goto et al. (1972), Ito et al. (1973), Kashyap et al. (1976), Dikshith et al. (1978), Bhatt et al. (1981), Nigam et al. (1981), Shivanandappa and Krishnakumari (1981), Nigam et al. (1982), Kandarkar, et al. (1983) and Nigam et al. (1984).

Trainin (1963) studied, neoplastic nature of liver "blood cysts" induced by urethan in mice. Krishnamurthy et al. (1964) noted malathion toxicity in the tissues of rats. Insecticides causes pathological and biochemical changes in the liver of mammals as reported by Munro et al. (1974), and Sarin and Saxena (1978). Dikshith et al. (1980) reported morphological changes in the liver, kidney, and testis by various pesticide. Ali and Abdul (1981; Recd 1983) demonstrated toxicity of malathion in organs of rabbit (liver and blood). Anthony et al. (1966), Bhatnagar and Jain (1986), reported several pathological changes in the liver of rats and mice after treatment with diazinon and phosphamidon pesticides respectively.

Several investigators reported morphological changes in the liver of rats or rhesus monkey's or mice treated

Boyd and Bereczky (1966), Davidson and Eastham (1966), Boyd et al. (1968), Dixon et al. (1971), Dixon et al. (1975), Gazzard et al. (1977), Johnson and Tolman (1977), Barker et al. (1977), Mehrotra et al. (1982, 1983), Sharma et al. (1983), reported pathological changes in the liver of rats exposed to paracetamol (Acetaminophen) treatment. Devries et al. (1984) reported changes in the rats liver affected by ASA (Acetylsalicylic acid) and paracetamol, while Tredger et al. (1985) noted damages in the liver of paracetamol and ethanol induced mice, Vikas et al. (1988) noted pathological changes in the liver of rats by para-
cetamol toxicity.

Thomas and Schmahl (1964), Jasmin and Riopelle (1969), Riopelle and Jasmin (1969) reported changes in the structure of kidney of rats by dimethylnitrosoamine. Many workers reported changes in the kidney of rats or mouse by various
after perinatal treatment with lead and disulfiram. Ellermann et al. (1987) described ultrastructural changes in the kidney of rat following a large dose of estrogen and by CAS (cyclosporine A). Llobet et al. (1988) mentioned several histological changes in the kidney of rats induced by zinc.

Conney et al. (1967), Kuntzman et al. (1967) Welch et al. (1967) reported changes in the testis of rat and other mammals induced by pesticides. Mark (1969), Collins et al. (1971) have shown effect of pesticides in different test system. Starr and Clifford (1972) reported, effect on male reproductive system by various organochlorine derivatives. Dikshith and Datta (1972), Conney et al. (1972), Datta and Dikshith (1973), Krause et al. (1975), Fishbein (1979) reported changes in the testis of rat and mammals induced by pesticides. Nigam et al. (1979) showed changes in the testicular tissue of mice affected by hexachlorocyclohexane (HCH). Balash et al. (1987) have been histological changes in the testis of mice after chlordane (chlorinated hydrocarbon) pesticide. Roy Choudhury et al. (1987) demonstrated testicular changes of rats under lindane (Y-isomer) treatment. Structural changes in testis of rats and mammals induced by various chemicals have been reported by many such as Murthy et al. (1980) reported testicular changes in monkeys induced by manganese and


Bitman et al. (1968), Ottoboni (1969), Bitman and Cecil (1970), Cecil et al. (1971), Wren et al. (1971) have studied the effects on the ovary of mammals by DDT. Heinrichs et al. (1971) and Jonsson, Jr. et al. (1975/76) described various changes in the ovary of rats after administration of DDT and DDT and PCB.

Some workers investigated ovarian changes in the mammals by different chemicals. Batra (1966) described ovarian histology in mice treated with a chemical carcinogen. Poult et al. (1973) showed histological studies of the rat’s ovary after biotin treatment. Jayabharathi et al. (1973) noticed structural changes in the ovaries and histological changes in the adrenal cortex of rats after administration of oral contraceptive agents. Sindgi and Rao (1975), showed structural changes in the ovary of rats exposed to barbiturates, Yamaguchi et al. (1978) described calcium diet changes in guinea pigs. Mattison (1980)


Smith et al. (1949) described adrenal medullary tumors (Pheochromocytomas) in mice, Platt and Steward (1967) reported pathological changes in the adrenal glands (endocrine glands of pigs during protein calorie deficiency), Dunn (1970) did the normal and pathologic anatomy of the adrenal gland of mouse including neoplasm, Rao and Sarkar (1975) observed histology of the adrenal gland of the Indian False Vampire Bat, Hasan et al. (1977), histological studies of adrenal gland exposed to 60Co irradiation, Bedwal and Mathur (1980), cytological and enzymological changes in the male reproductive organs and the endocrine glands (Adrenal) in rat tailed bat, induced by chlorpromazine.

Carpenter et al. (1961), Khomich (1962), Moreinis and Estrin (1963) reported general toxicity of carbaryl on mammals. Dale et al. (1963) studied, on poisoning by DDT: Relation between clinical signs and concentration in the rat brain. Woolley and Rnnells (1967) studied distribution of DDT in brain and spinal cord of the rat. Shtenberg and Rybakova (1968) described histopathological changes in the hypophysis, testis, ovary and adrenal gland exposed to carbaryl. Mallack et al. (1975) had shown the effects on brain acetylcholinesterase levels in chickens and rabbits exposed to ground applications of the ULV malathion. Hasan et al. (1979) studied changes in the cerebellum and spinal cord during organophosphate pesticide DDVP (electron microscopical study). Matin and Agarwal (1982) studied the effect of acetylcholine acetylhydrolase (E.C. 3.1.1.7) inhibition of the accumulation of PP/DDT in various brain regions of rats. Soliman et al. (1983), histological changes in the spinal cord and brain of sheep exposed to organophosphorus compounds.

The haematological studies are done by the following workers.

in a group of workers exposed to pesticides, Rajini et al. (1987), haematological changes in albino rats by primiphosmethyl (an organophosphorus insecticides), Baronia and Sahai (1987), haematological study of albino rats after exposure to malathion.

The observations of other workers on the mammalian blood by different chemicals are as follows.

Chandorkar (1973), haematological changes in the rats effected by Vinblastine and Vincristine, Gopalakrishna and Chitale (1973), normal cell counts in the blood of the Indian false Vampire, Hurket and Jain (1973), haematological changes in boys and girls during exercise, Pande et al. (1975), haematological changes on the rats and guinea pigs under the treatment of oflatoxin B1, Singh et al. (1977), counting of leucocyte, serum protein, etc. induced by Angiotension II in the dogs, Singh and Khanna (1979), changes in the blood and testis of rats fed orange II Gupta et al. (1979) haematological changes in the mice produced by Ochratoxin A, Parker et al. (1981) light microscopical, haematological, serum chemistry studies under the effect of conventional versus shale-derived JP5, Jet fuel, Marrs et al. (1984) counting of R.B.C., W.B.C., haemoglobin and differential blood counts and histology of the tissues in mice, rats and guinea pigs exposed to 4-dimethylaminophenol
(DMAP), Walia et al. (1986) haematological study in albino rats during gossypol. In buffalo calves, haematological values were reported during urethral by Pandey et al. (1986), Bilgrami et al. (1987) haematological changes in citrinin-administered mice. Woolley and Runnells (1967) studied, distribution of DDT in brain and spinal cord of the rat. Ragab (1967) reported thin layer chromatography (TLC) of organophosphorus pesticides and their breakdown products. Vlieger et al. (1968) studied the organochlorine insecticide content of human tissues. Ramasamy (1969) observed, the identification and determination of organophosphorus and carbamate insecticides by thin layer chromatography. Mendoza et al. (1969) reported effect of bromine and ultraviolet light on eight pesticides detected with liver esterases of five species. Morgan and Roon (1970) reported, chlorinated hydrocarbon pesticide residue in human tissues, Mendoza and Shields (1970) discussed a comparison of pig and beef liver extracts for the detection of twelve carbamates on thin layer plates. Fehringer and Westfall (1971) reported separation and identification of DDT analogs in the presence of polychlorinated biphenyl compounds by two dimensional thin layer chromatography. Ernst (1972) studied, degradation of $^{14}C$ DDT on silica gel G chromatograms under laboratory conditions. Bishara et al. (1972) reported TLC of DDT and some related compounds.
Katkar and Sarve (1976) demonstrated TLC for the identification and determination of organophosphorus insecticides.

Tewari and Sharma (1976, 1977) reported TLC of the chlorinated organic pesticides in autopsy tissues and biological materials. TLC (thin layer chromatography) in autopsy tissues or human tissues or albino rats tissues during different pesticides have also been reported by Tewari and Harpalani (1977), Mukherjee et al. (1980), Verschoyle et al. (1982) and Baronia and Sahai (1988).

Hammarstrom (1966-67) demonstrated detection of ascorbic acid-l-C\textsuperscript{14} and dehydroascorbic acid-l-C\textsuperscript{14} in the mice tissue by thin layer chromatography. Gokani et al. (1979) reported TLC method for estimation of y-aminobutyric acid from the brain of rat.