1,2-DIBROMO-3-CHLOROPROPANE (Group 2B)

A. Evidence for carcinogenicity to humans (*inadequate*)

Among a cohort of 550 chemical workers exposed to many compounds including 1,3-dibromo-3-chloropropane, a moderate, statistically nonsignificant increase in mortality from cancers at all sites was found (12 observed, 7.7 expected), due mainly to deaths from respiratory cancer. The slight excess was not removed after controlling for exposure to arsenicals[1].

A group of some 3500 workers classified as having had exposure on a 'routine' or 'nonroutine' basis to several brominated chemicals, including 1,2-dibromo-3-chloropropane, was studied in four facilities in the USA. Among the 1034 workers ever exposed to 1,2-dibromo-3-chloropropane, a slightly increased, statistically nonsignificant mortality rate from cancer was observed. Nine respiratory cancers were observed, whereas 5.0 would have been expected; of these, seven were due to lung cancer (4.8 expected). Among 238 workers exposed on a 'routine' basis, no cancer death was observed[2].

In view of the numbers involved and the lack of control of confounding factors, the studies were considered to be inadequate.

B. Evidence for carcinogenicity to animals (*sufficient*)

1,2-Dibromo-3-chloropropane has been tested by oral administration and inhalation in mice and rats. After oral administration, it produced squamous-cell carcinomas of the forestomach in animals of each species and adenocarcinomas of the mammary gland in female rats[3]. After inhalation, it induced nasal cavity and lung tumours in mice, and nasal cavity and tongue tumours in rats of each sex and adrenal cortex adenomas in females[4].

C. Other relevant data

Several reports indicate that occupational exposure to 1,2-dibromo-3-chloropropane may result in azospermia[5].

1,2-Dibromo-3-chloropropane induced dominant lethal mutations in rats, but not in mice, and DNA strand breaks in rat testicular cells and unscheduled DNA synthesis in mouse testicular cells, but not abnormalities in sperm morphology in mice treated *in vivo*. In studies *in vitro*, it induced chromosomal aberrations and sister chromatid exchanges in Chinese hamster cells and DNA strand breaks in rat testicular cells. In *Drosophila*, it induced aneuploidy and sex-linked recessive lethal mutations; heritable translocation was seen in one study but not in another, although crossing-over was found in the latter. It was mutagenic to bacteria but did not cause DNA damage[5].

References

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[2]Wong, O., Brocker, W., Davis, H.V. & Nagle, G.S. (1984) Mortality of workers potentially exposed to organic and inorganic brominated chemicals, DBCP, Tris, PBB, and DDT. *Br. J. ind. Med., 41*, 15-24

[3]*IARC Monographs, 20*, 83-96, 1979

[4]National Toxicology Program (1982) *Carcinogenesis Bioassay of 1,2-Dibromo-3-chloropropane (CAS No. 96-12-8) in F344 Rats and B6C3F$_1$ Mice (Inhalation Studies) (NTP Technical Report 206; NIH Publ. No. 82-1762)*, Research Triangle Park, NC

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