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the Fisher exact test for the high dose group. When those rats having either hepatocellular carcinomas or neoplastic nodules of the liver were combined and evaluated simultaneously, the Cochran-Armitage tests indicated statistically significant associations between increased dosages and elevated tumor incidences in both the males and females. This was supported by the Fisher exact tests for males but not for females. The incidences of one tumor type, subcutaneous fibroma, were found to be statistically significant in both male and female rats. No other tumors occurred in treated animals in statistically significant incidences when compared to controls.

Squamous-cell papillomas and squamous-cell carcinomas of the forestomach were observed only in high dose rats. Although the incidences of these gastric tumors were not statistically significant, historical data indicate that these tumors are rare in Fischer 344 rats. The occurrence of these tumors in high dose rats, together with the frequent occurrence of nonneoplastic proliferative lesions of the forestomach in treated rats, indicates that the occurrence of these tumors was related to administration of 2-methyl-1-nitroanthraquinone. An increased incidence of bladder tumors (papillomas, transitional-cell papillomas, and sarcomas) was observed among female rats.

Evaluation of the results of this bioassay indicates that orally administered 2-methyl-1-nitroanthraquinone is a liver carcinogen in male Fischer 344 rats, producing hepatocellular carcinomas and is also associated with an increased incidence of subcutaneous fibromas in both male and female Fischer 344 rats.

METHOXYCHLOR

A bioassay for possible carcinogenicity of technical-grade methoxychlor was conducted using Osborne-Mendel rats and B6C3F1 mice. Methoxychlor was administered in the feed, at either of two concentrations, to groups of 50 male and 50 female animals of each species. For each species, 20 animals of each sex were placed on test as controls. The time-weighted average high and low dietary concentrations of methoxychlor were, respectively, 845 and 448 ppm for male rats, 1385 and 750 ppm for female rats, 3491 and 1746 ppm for male mice, and 1994 and 997 ppm for female mice. After a treatment period of 78 weeks, the rat groups were observed for an additional 34 weeks and the mouse groups for an additional 15 weeks. A dose-related mean group body weight depression was observed in both rats and mice, but no effect on survival was detected.

Under the conditions of this study, methoxychlor was not found to be carcinogenic in Osborne-Mendel rats or B6C3F1 mice of either sex.

AROCLOR 1254

A bioassay of Aroclor® 1254 for possible carcinogenicity was conducted by administering the test chemical in feed to Fischer 344 rats.

Groups of 24 rats of each sex were administered Aroclor® 1254 at one of three doses, either 25, 50, or 100 ppm, for 104-105 weeks. Matched controls consisted of groups of 24 untreated rats of each sex. All surviving rats were killed at 104-105 weeks.

Mean body weights of males and females receiving mid and high doses and females receiving low doses of the chemical were consistently below those of the corresponding controls, beginning at about week 10 of the study. The decrease in survival among males, but not among females, showed a significant dose-related trend. Adequate numbers of animals of both sexes survived for meaningful statistical analyses of the incidences of tumors.

The combined incidences of lymphomas and leukemias showed a significant dose-related trend in males (controls 3/24, low-dose 2/24, mid-dose 5/24, high-dose 9/24, $P = 0.009$). However, the direct comparisons of each treated group with those of the matched controls were not statistically significant, and the tumors cannot clearly be related to treatment with Aroclor® 1254. Hepatocellular adenomas and carcinomas were found in the treated groups, but not in the controls (males: mid-dose 1/24, high-dose 3/24; females: mid-dose 1/24, high-dose 2/24). Additionally, a high incidence of nonneoplastic hyperplastic nodules was noted in the treated animals (males: controls 0/24, low-dose 5/24, mid-dose 8/24, high-dose 12/24; females: controls 0/23, low-dose 6/24, mid-dose 9/22, high-dose 17/24). Although the incidences of tumors were not significant, the occurrence of the hyperplastic nodules appeared to be related to treatment.

Aroclor® 1254 was not carcinogenic in Fischer 344 rats; however, a high incidence of hepatocellular proliferative lesions in both male and female rats was related to treatment. In addition, the carcinomas of the gastrointestinal tract may be associated with treatment in both males and females.

TRIFLURALIN

A bioassay for possible carcinogenicity of technical-grade trifluralin was conducted using Osborne-Mendel rats and B6C3F1 mice. Analysis of the technical product established the presence of 84 to 88 ppm dipropylnitrosoamine. The product was administered in the feed, at either of two concentrations, to groups of 50 male and 50 female animals of each species. Fifty animals of each sex were placed on test as controls for the rat bioassay, while 20 of each sex were utilized as controls for the mouse study. The time-weighted average high and low dietary concentrations of trifluralin were, respectively, 8000 and 4125 ppm for male rats, 7917 and 4125 ppm for female rats, 3744 and 2000 ppm for male mice, and 5192 and 2740 ppm for female mice. After a 78-week treatment period, there was an additional observation period of 33 weeks for rats and 12 weeks for mice.

For female mice the association between increased dosage and elevated incidence of hepatocellular carcinomas was significant (0/20, 12/47, and 21/44 of the control, low dose, and high dose, respectively) as was the relationship between dose and incidence of alveolar/bronchiolar adenomas. Significance of incidence for both types of tumors was supported by tests for significance at each dose level. Squamous-cell carcinomas of the stomach were observed in dosed female mice, but not in controls. Although incidences of these tumors were not statistically significant, they are unusual lesions in B6C3F1 mice and are considered to be treatment-related.