Observation
OBSERVATION:

I. CYTOGENETICAL:

A) CHROMOSOME ABERRATIONS (CA)

Various types of chromosome aberrations (CA) were observed mainly in the carcinogen fed mice. For convenience of data analysis, the CA's were grouped into two types. The "major CA" and "other CA." In normal healthy mice, the overwhelming majority of cells had their bone marrow chromosome spreads consisting of forty acrocentric chromosomes of different size classes (PM-1A). However, in many carcinogen fed mice and a few normal healthy mice, various types of CA's could be observed. The major CA's observed were break (PM-1B), translocation, fragmentation, ring, terminal association (PM-1B), centric fusion (PM-1B), polyploidy (PM-1C) and Aneuploidy (PM-1D). On the other hand, a few other types of aberration occasionally encountered were erosion, constriction, gap (PM-1E), precocious centromeric separation (PM-1E), stretching (PM-1E), stickiness (PM-1F), C-mitotic effect, etc. The detailed data of chromosome aberrations at different fixation intervals in different series of mice have been furnished in Table-1A-1B and Histogram-1. The total percentages of CA in the normal negative controlled mice were 4.11 at 30 days, 4.10 at 60 days, 4.13 at 90 days, and 4.12 at 120 days. In normal mice fed with alcohol, the total percentages of CA were 4.30 at 30 days, 4.41 at 60 days, 4.52 at 90 days, and 4.60 at 120 days. The total CA frequencies were substantially elevated. In p-DAB+PB fed mice as the frequencies were 17.60 at 30 days, 18.95 at 60 days, 20.40 at 90 days, 22.60 at 120 days. In the p-DAB+PB+Alcohol fed series, the frequencies of CA were 19.00 at 30 days, 21.80 at 60 days, 24.30 at 90 days, and 28.50 at 120 days. Therefore, alcohol in combination with the carcinogen produced more number of aberrations than what the carcinogen alone could produce. In the p-DAB+PB+Myrica mother fed series, the frequencies of aberration were 17.90 percent, 14.44
percent, 12.67 percent and 11.33 percent, respectively, at 30 days, 60 days, 90 days and 120 days. Therefore, the Mynca mother tincture feeding reduced the chromosome frequencies as compared to that of p-DAB+PB+Alcohol fed control. In p-DAB+PB+Mynca mother+Cholestennum-200 fed mice, the frequencies of CA were 17.00 at 30 days, 13.67 at 60 days, 14.33 at 90 days and 13.67 at 120 days, thus as compared to only Mynca fed mice with Mynca mother+Cholestennum-200 fed mice showed slightly reduced CA frequencies at 30 days and 60 days but not at 90 days and 120 days. In p-DAB+PB+Mynca mother+Carcinosin-200 fed mice, the CA frequencies are 18.33 percent at 30 days, 13.33 percent at 60 days, 14.00 percent at 90 days and 13.95 percent at 120 days. Therefore, as compared to p-DAB+PB+Mynca mother fed series, the frequencies were slightly elevated at all fixation intervals, except at 60 days. In p-DAB+PB+Mynca mother+Cholestennum-200+Carcinosin-200 fed mice, the CA were 18.67 percent at 30 days, 16.67 at 60 days, 14.67 percent at 90 days and 15.33 percent at 120 days. Therefore, the feeding of two nosodes combinedly did not yield the better results as compared to only Mynca fed mice or nosode fed along with Mynca mother individually. In p-DAB+PB+Mynca-30 fed mice, the chromosome aberrations were 15.67 percent at 30 days, 13.00 percent at 60 days, 11.57 percent at 90 days and 10.67 percent at 120 days. Thus, Mynca-30 appeared to reduce the chromosome aberrations quite significantly at all fixation intervals. In p-DAB+PB+Mynca-30+Cholestennum-200 fed mice, the percentages of CA were 17.67 at 30 days, 14.33 at 60 days, 14.33 at 90 days and 11.67 at 120 days. Therefore, Cholestennum-200 in additional to Mynca-30 actually could not reduce the aberrations more than what the Mynca-30 alone could reduce. In fact, the same trend of no additional effect of Carcinosin-200 was found in terms of reduction of chromosome aberrations. In p-DAB+PB+Mynca-30+cholestennum-200+Carcinosin-200 fed mice, the aberration frequencies were increased than p-DAB+PB+Mynca-30 fed mice. There was no change in the situation when both the nosodes were applied along with Mynca-30. In p-DAB+PB+Mynca-200 fed mice, the aberration frequencies were 17.33 at 30 days, 13.87 at 60 days, 11.13 at 90 days and 9.80 at 120 days. Thus, in this series, the aberration frequencies were reduced marginally, particularly at
longer fixation intervals in p-DAB+PB+Myrica-200+Cholesterum-200 fed series there was more chromosome aberrations as compared to p-DAB+PB+Myrica-200 fed mice at all intervals, except at 30 days. The same trend was also noticed in p-DAB+PB+Myrica-200+Carcinosin-200 fed mice. However, with combined nosode fed group along with Myrica-200 the frequencies of aberrations were found to increase rather than decrease (Table-1A-1B, Histogram-1)
PM- 1A-1F: Photomicrographs of somatic metaphase spreads showing: normal chromosomes (1A); centric fusion, terminal association, break (1B); polyploidy (1C); Aneuploidy (1D); gap, precocious centromeric separation, stretching (1E); stickiness (1F)

PM- 1G-1L: Photomicrographs of micronucleated erythrocytes (1G-1H); non-dividing and dividing cells (1I-1J); sperm with normal head morphology (1K) and sperm with abnormal head morphology (1L)
Histograms showing percentages of chromosome aberration (CA) in different series of mice at 30 days and 60 days.

Histograms showing percentages of chromosome aberration (CA) in different series of mice at 90 days and 120 days.

Histogram-1: Showing percentages of chromosome aberration (CA) in different series of mice at 30, 60, 90 and 120 days.
B) MICRONUCLEI STUDY (MN)

The detailed data of induction of micronuclei have been presented in Table-2A-2B, Histogram-2 and PM-1G-1H. In normal healthy mice the percentages of MN were recorded to be 0.180 at 30 days, 0.190 at 60 days, 0.195 at 90 days and 0.185 at 120 days. In Normal+Alcohol fed mice the frequencies of MN were 0.195, 0.210, 0.215 and 0.225, respectively, at 30 days, 60 days, 90 days and 120 days. The frequencies were found to increase in p-DAB+PB fed mice, being 0.955 at 30 days, 0.975 at 60 days, 0.955 at 90 days and 1.00 at 120 days. In the p-DAB+PB+Alcohol fed series the percentages of MN were slightly increased at all fixation intervals as compared to p-DAB+PB fed series. In the p-DAB+PB+Myrica mother fed mice the frequencies were found to be reduced at all fixation intervals. However, in p-DAB+PB+Myrica mother+Cholesterinum-200 fed mice, the frequencies of MN were slightly increased at all fixation intervals as compared to p-DAB+PB+Myrica mother fed series at all fixation intervals, except at 30 days. In p-DAB+PB+Myrica mother+Carosinosin-200 fed mice the MN frequencies were slightly elevated than that of p-DAB+PB+Myrica mother fed mice at all fixation intervals. The same trend of increase of MN frequencies was also found in p-DAB+PB+Myrica-Mother+Cholesterinum-200+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-30 fed mice the MN frequencies were significantly reduced as compared to p-DAB+PB+Alcohol fed controls. In p-DAB+PB+Myrica-30+Cholesterinum-200 fed mice the frequencies were slightly increased in respect of p-DAB+PB+Myrica-30 fed series, more appreciably at 30 days. In p-DAB+PB+Myrica-30+Carcinosin-200 fed series the MN frequencies were higher than that of p-DAB+PB+Myrica-30 fed series and the same was true for p-DAB+PB+Myrica-30+Cholesterinum-200+Carcinosin-200 fed series. Therefore, apparently Cholesterinum-200+Carcinosin-200 did not have any additional effect in reducing MN. In p-DAB+PB+Myrica-200 fed series the frequencies of MN were slightly more reduced than in p-DAB+PB+Myrica-30 fed mice at 90 days and at 120 days. In p-DAB+PB+Myrica-200+Cholesterinum-200 fed mice the frequencies of MN were generally increased than in p-DAB+PB+Myrica-200 fed mice, except at 30 days. In p-
DAB+PB+Myrica-200+Carsinosin-200 fed series the frequencies were increased at all fixation intervals, except at 30 days. In p-DAB+PB+Cholesterinum-200+Carcinosin-200 fed mice the frequencies were higher than that of either Myrica-200 or Myrica-200+Cholesterin-200 or Myrica-200+Carcinosin-200 fed mice (Table-2A-2B, Histogram-2)
Histograms showing percentages of micronuclei (MN) in different series of mice at 30 days and 60 days.

Histograms showing percentages of micronuclei (MN) in different series of mice at 90 days and 120 days.

Histogram-2: Showing percentages of micronuclei (MN) in different series of mice at 30, 60, 90 and 120 days.
C) MITOTIC INDEX (MI)

In normal healthy mice the mitotic indices recorded were 0.70 at 30 days, 0.66 at 60 days, 0.76 at 90 days and 0.68 at 120 days (Table-3, Histogram-3 and PM-11 -1J). In Normal+Alcohol fed mice the indices were slightly increased at different fixation intervals. In p-DAB+PB fed mice there was a palpable increase of mitotic indices, which were 3.76 at 30 days, 4.40 at 60 days, 5.90 at 90 days and 7.39 at 120 days. There was further increase of MI in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed mice there was a significant decrease of MI at all the fixation intervals as compared to p-DAB+PB+Alcohol fed control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed mice there was further decrease of MI at 30 days and at 60 days but an increase at 90 days and 120 when the data were compared to p-DAB+PB+Myrica mother fed series. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice the mitotic indices were slightly reduced at 60 days but at other intervals they were marginally more than that of Myrica mother fed series. However, in combined nosodes fed series of Myrica mother the mitotic indices were generally higher than other drug fed series of Myrica mother and single nosode. In the p-DAB+PB+Myrica-30 fed mice there was significant decrease of mitotic index than positive control. In the p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was a little increase in MI as compared to that of p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice more or less the same trend was also noticed. In p-DAB+PB+Myrica-30+Cholesternum-200+Carcinosin-200 fed mice there was further increase in the percentages of MI at all fixation intervals. In p-DAB+PB+Myrica-200 fed mice the mitotic indices were reduced at 90 days and at 120 days but slightly increased at earlier intervals as compared to p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice the mitotic index was increased at all fixation intervals, except at 30 days. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice the same trend was observed. However, in the combined nosode fed series with Myrica-200, mitotic indices were further increased at all fixation intervals (Table-3, Histogram-3).
Histograms showing percentages of mitotic index (MI) in different series of mice at 30 days and 60 days

Histograms showing percentages of mitotic index (MI) in different series of mice at 90 days and 120 days.

Histogram-3: Showing percentages of mitotic index (MI) in different series of mice at 30, 60, 90 and 120 days.
D) SPERM HEAD ABNORMALITY (SHA)

The sperm head abnormality in normal healthy mice varied from 0.35 percent to 0.40 percent (Table-4, Histogram-4 and PM-1K-1L). In Normal+Alcohol fed mice the SHA frequency was slightly higher. In p-DAB+PB fed mice, however, there was an increase of SHA gradually with the lapse of time. In p-DAB+PB+Alcohol mice there was a further increase in SHA. In p-DAB+PB+Myrca mother fed mice there was a significant decrease in SHA at all fixation intervals as compared to p-DAB+PB+Alcohol fed control. In p-DAB+PB+Myrca mother+Cholesternum-200 fed mice there was marginal decrease up to 90 days and after that there was a slight increase. In p-DAB+PB+Myrca mother+Carcinosin-200 fed mice there was a marginal decrease of SHA at all fixation intervals, except at 60 days as compared to only Myrca mother fed mice. In p-DAB+PB+Myrca mother+Cholesternum-200+Carcinosin-200 fed mice the SHA frequencies were increased at all fixation intervals. In p-DAB+PB+Myrca-30 fed series there was an appreciable decrease in SHA, highly significant if compared to positive control. In p-DAB+PB+Myrca-30+Cholesternum-200 fed mice, however, there was a slight increase of SHA as compared to p-DAB+PB+Myrca-30 fed series. The more or less same trend of increase of SHA was also noted in p-DAB+PB+Myrca-30+Carcinosin-200 fed mice as compared to p-DAB+PB+Myrca-30 fed series. In p-DAB+PB+Myrca-30+Cholesternum-200+Carcinosin-200 fed mice the frequencies were further increased. In p-DAB+PB+Myrca-200 fed mice the frequencies of SHA were marginally greater at all the fixation intervals, except at 120 days, when it was less than that of p-DAB+PB+Myrca-30 fed series. In p-DAB+PB+Myrca-200+Cholesternum-200 fed mice there was further increase of SHA frequencies at all fixation intervals, except at 30 days if data were compared with that of p-DAB+PB+Myrca-200 fed mice. The same trend was also observed in p-DAB+PB+Myrca-200+Carcinosin-200 fed mice. In p-DAB+PB+Myrca-200+Cholesternum-200+Carcinosin-200 fed mice there was generally an increase of SHA at all fixation intervals as compared to p-DAB+PB+Myrca-200 fed mice. The levels of statistical significance have been shown in Table-4, Histogram-4.
Histogram- 4: Showing percentages of sperm head anomaly (SHA) in different series of mice at 30, 60, 90 and 120 days.
II. BIOCHEMICAL:

Results of biochemical parameters will be recorded under the following major sub-headings

A) Activities in Liver
B) Activities in Spleen
C) Activities in Kidney
D) Activities in Blood Serum
E) Activities of Some other Enzymes

A) ACTIVITIES IN LIVER

(i) Aspartate Aminotransferase (AST) –

The mean activity of aspartate aminotransferase (AST) in liver of normal healthy mice was estimated at about 0.011 (nM/100 mg protein/min) (Table-5A, Histogram-5A). In Normal+Alcohol fed mice the activity varied between 0.013 and 0.018 (nM/100mg protein/min), which would suggest an increase in the activity in an increased order with the lapse of time. In p-DAB+PB fed mice there was an increase in the activity of AST which was slightly more increased in the p-DAB+PB+Alcohol fed series. In p-DAB+PB+Mynca mother fed mice there was a significant decrease in AST activity particularly at 60 days onward. In p-DAB+PB+Mynca mother+Cholestennum-200 fed mice, however there was a little increase in mean activities of AST more appreciably at 60 days onward. In p-DAB+PB+ Mynca mother+Carcinosin-200 fed mice the same trend prevailed. In p-DAB+PB+Mynca mother+Cholestennum-200+Carcinosin-200 fed mice there was a little further increase in the activity of AST. However, in p-DAB+PB+Mynca-30 fed mice there was significant reduction of AST as compared to p-DAB+PB+Alcohol fed control. In p-DAB+Mynca-30+Cholestennum-200 fed mice the activity was increased at all fixation intervals as compared to p-DAB+PB+Mynca-30 fed mice. The same trend was also noticed in p-DAB+PB+Mynca-30+Carcinosin-200 fed mice, which was also similar in trend noticed in p-DAB+PB+Mynca-
30+Cholesterenum-200+Carcinosin-200 fed mice. On the other hand, there was a quite appreciable decrease in AST activity in p-DAB+PB+Myrica-200 fed mice as compared to p-DAB+PB+Alcohol fed series. In p-DAB+PB+Myrica-200+Cholesterenum-200 fed mice, the activity was increased at all fixation intervals, except at 30 days. The same trend was also observed in p-DAB+PB+Myrica-200+Carcinosin-200 fed mice. There was a further increase in AST activity in p-DAB+PB+Myrica-200+Cholesterenum-200+Carcinosin-200 fed mice (Table-5A, Histogram-5A).
Observations

Histograms showing the activities of aspartate aminotransferase (nM/100 mg protein/min) in liver of different series of mice at 30 days and 60 days

Histograms showing the activities of aspartate aminotransferase (nM/100 mg protein/min) in liver of different series of mice at 90 days and 120 days

Histogram- 5A: Showing the activities of Aspartate Aminotransferase (AST) (nM/100 mg protein/min) in liver of different series of mice at 30, 60, 90 and 120 days.
(ii) Alanine Aminotransferase (ALT) –

The mean activity of alanine aminotransferase (ALT) in liver varied between 0.003 and 0.004 (nM/100 mg protein/min) of normal healthy mice (Table-5B, Histogram-5B). In Normal+Alcohol fed mice there was an appreciable increase. However, in p-DAB+PB fed mice there was considerable increase in the activities of ALT. In p-PAB+PB+Alcohol fed mice the activity was marginally increased. In p-DAB+PB+Myrica mother fed mice the activity was significantly decreased as compared to p-DAB+PB+Alcohol fed control. In p-DAB+PB+Myrica mother+Cholestennum–200 fed mice there was a marginal increase in ALT activity at 60 days onward. In p-DAB+PB+Myrica mother+Carcinosin–200 fed mice the same trend was maintained. In p-DAB+PB+Myrica mother+Cholestennum–200+Carcinosin–200 fed mice again there was a marginal increase in ALT activity as compared to p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica–30 fed mice there was a significant decrease of the ALT activity at all fixation intervals. In p-DAB+PB+Myrica–30+Cholestennum–200 fed mice there was a marginal increase of ALT activity as compared to p-DAB+PB+Myrica–30 fed mice. In p-DAB+PB+Myrica–30+Carcinosin–200 fed mice a more or less same trend prevailed. In p-DAB+PB+Myrica–30+Cholestennum–200+Carcinosin–200 fed mice there were further increases of mean activity of ALT at all fixation intervals as compared to p-DAB+PB+Myrica–30 fed series. In p-DAB+PB+Myrica–200 fed series there was significant reduction of ALT activity as compared to p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica–200+Cholestennum–200 fed mice there was a marginal increase of ALT activity at all fixation intervals, except at 30 days. The same trend was maintained in p-DAB+PB+Myrica–200+Carcinosin–200 fed mice. There was a further increase of mean activity of ALT in p-DAB+PB+Myrica–200+Cholestennum–200+Carcinosin–200 fed mice (Table-5B, Histogram-5B).
Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in liver of different series of mice at 30 days and 60 days.

Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in liver of different series of mice at 90 days and 120 days.

Histogram- 5B: Showing the activities of Alanine Aminotransferase (ALT) (nM/100 mg protein/min) in liver of different series of mice at 30, 60, 90 and 120 days.
(III) Acid phosphatase (AcP) –

The mean activity of acid phosphatase (AcP) in liver was found to vary between 0.012 and 0.015 (nM/100mg protein/min) (Table- 5C, Histogram-5C). The activity was slightly elevated in Normal+Alcohol fed mice. In p-DAB+PB fed mice the AcP activity was quite strikingly increased, which was further increased marginally in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed mice there was significant decrease of AcP activity at 60 days onward. In p-DAB+PB+Myrica mother+Cholesternum–200 fed mice, however there was a slight increase of AcP activity at 60 days onward, as compared to p-DAB+PB+Myrica mother fed series. Similar trend was also noted in p-DAB+PB+Myrica mother+Carcinosin-200 fed mice. There was a further increase in AcP activity in p-DAB+PB+Myrica mother+Cholesternum–200+Carcinosin-200 fed mice. There was a considerable decrease of AcP activity in p-DAB+PB+Myrica–30 fed mice as compared to positive control. However, when the Cholesternum–200 was additionally given along with p-DAB+PB+Myrica–30 the AcP activity was increased for all intervals. The same was true for DAB+PB+Myrica–30+Carcinosin–200 fed mice. In DAB+PB+Myrica–30+Cholesternum–200+Carcinosin–200 fed mice the AcP activity was further increased. In p-DAB+PB+Myrica–200 fed mice there was considerable decrease in AcP activity as compared to positive control. In p-DAB+PB+Myrica–200+Cholesternum–200 fed mice the AcP activity increased at all fixation intervals, except at 30 days. In p-DAB+PB+Myrica–200+Carcinosin–200 fed mice the same trend was noted. The AcP activity was found to be further increased in p-DAB+PB+Myrica-200+Cholesternum–200+Carcinosin–200 fed mice (Table- 5C, Histogram-5C).
Histogram- 5C: Showing the activities of Acid phosphatase (AcP) (nM/100 mg protein/min) in liver of different series of mice at 30, 60, 90 and 120 days.
(iv) Alkaline phosphatase (AlkP) –

The mean activities of alkaline phosphatases (AlkP) in liver of normal healthy mice ranged between 0.010 and 0.012 (nM/100 mg protein/min) (Table-5D, Histogram-5D). The activity was slightly increased in Normal+Alcohol, but it was considerably increased in p-DAB+PB fed mice. In the p-DAB+PB+Alcohol fed mice the mean activity of alkaline phosphatases was further increased slightly. In the p-DAB+PB+Mynca mother fed mice the activity was decreased at 60 days onward although at 30 days there was no appreciable change. In p-DAB+PB+Mynca mother+Cholestennum–200 fed mice although there was a decrease in alkaline phosphatase activity at 30 days and it was increased slightly at all subsequent intervals as compared to that of p-DAB+PB+Mynca mother fed series. In p-DAB+PB+Mynca mother+Carcinosin–200 fed mice the same trend was noticed. In p-DAB+PB+Mynca mother+Cholestennum–200+Carcinosin–200 fed mice there was an increase of alkaline phosphatase activity at all fixation intervals. However, in p-DAB+PB+Mynca-30 fed mice the activity was significantly reduced as compared to positive control. In p-DAB+PB+Mynca–30+Cholestennum–200 fed mice there was a slight increase in alkaline phosphatase activity as compared to that of p-DAB+PB+Mynca-30 fed mice. In p-DAB+PB+Mynca–30+Carcinosin–200 fed mice the same trend was also noted. In the p-DAB+PB+Mynca–30+Cholestennum–200+Carcinosin–200 fed mice there was an increase in AlkP activity at all fixation intervals. In the p-DAB+PB+Mynca–200 fed mice there was a significant decrease in AlkP activity at all fixation intervals. In p-DAB+PB+Mynca–200+Cholestennum–200 fed mice the activity was slightly increased at 60 days onward, although there was a little decrease at 30 days. In p-DAB+PB+Mynca–200+Carcinosin–200 fed mice the same trend was noted. In p-DAB+PB+Mynca–200+Cholestennum–200+Carcinosin–200 fed mice the AlkP activity was found to be further increased at all fixation intervals (Table-5D, Histogram-5D).
Observations

Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in liver of different series of mice at 30 days and 60 days.

Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in liver of different series of mice at 90 days and 120 days.

Histogram- 5D: Showing the activities of Alkaline phosphatase (AlkP) (nM/100 mg protein/min) in liver of different series of mice at 30, 60, 90 and 120 days.
(v) Lipid peroxidation (LPO) –

The mean lipid peroxidation (LPO) in liver of normal healthy mice ranged between 0.050 and 0.062 (nM/MDA/mg wet tissue) (Table-5E, Histogram-5E). The values in Normal+Alcohol fed mice were gradually increased along with the lapse of time. In p-DAB+PB fed mice LPO levels were considerably increased. In the p-DAB+PB+Alcohol fed mice marginally higher values of LPO were obtained as compared to p-DAB+PB fed mice. In p-DAB+PB+Myrica mother fed mice there was a significant decrease of LPO. However, in p-DAB+PB+Myrica mother+Cholestennum-200 fed mice there was a little increase in LPO at all fixation intervals, except at 30 days. A marginal increase in LPO was also observed in p-DAB+PB+Myrica mother+Carcinosin-200 fed mice. The LPO was further increased at all fixation intervals in p-DAB+PB+Myrica mother+Cholestennum-200+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-30 fed mice there was a significant decrease in LPO as compared to positive control. In p-DAB+PB+Myrica-30+Cholestennum-200 fed mice, however, some increase in LPO was noticed when the data were compared with that of DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice there was an increase of a greater extent in LPO values was noticed as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Cholestennum-200+Carcinosin-200 fed mice, the values were marginally increased further. In p-DAB+PB+Myrica-200 fed mouse there was a quite appreciable decrease in LPO as compared to that of positive control. In p-DAB+PB+Myrica-200+Cholestennum-200 fed mice there was an increase of LPO at all fixation intervals, except at 30 days when the data were compared to that of p-DAB+PB+Myrica-200 fed mice. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice the same trend was noted. In p-DAB+PB+Myrica-200+Cholestennum-200+Carcinosin-200 fed mice the values of LPO were also generally increased at most fixation intervals (Table-5E, Histogram-5E).
Histograms showing the lipid peroxidation (nM/MDA/mg wet tissue) in liver of different series of mice at 30 days and 60 days.

Histograms showing the lipid peroxidation (nM/MDA/mg wet tissue) in liver of different series of mice at 90 days and 120 days.

Histogram- 5E: Showing the Lipid peroxidation (LPO) (nM/MDA/mg wet tissue) in liver of different series of mice at 30, 60, 90 and 120 days.
Observations (vii) Reduced glutathione (GSH) –

The mean reduced glutathione (GSH) content in liver of normal mice ranged between 0.010 and 0.012 (nM/mg tissue) (Table-5F, Histogram-5F), which appeared to be marginally less in Normal+Alcohol fed mice. In p-DAB+PB fed mice, the values appeared to be much reduced than in normal healthy mice. However, in p-DAB+PB+Alcohol fed mice, the values were more or less similar to that of p-DAB+PB fed mice. In p-DAB+PB+Myrica mother fed mice, the reduced glutathione contents were marginally increased, particularly at later fixation intervals. In p-DAB+PB+Myrica mother+Cholestennum-200 fed mice, there was no significant difference found if the data were compared with p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother+Carcmosin-200 fed mice, also the same was true. However, in p-DAB+PB+Myrica mother+Cholestennum-200+Carcmosin-200 fed mice, there was a further decrease of reduced glutathione (GSH) content particularly at 30 days and 60 days. On the other hand, in p-DAB+PB+Myrica-30 fed mice, there was an appreciable increase in reduced glutathione content as compared to positive control. In p-DAB+PB+Myrica-30+Cholestennum-200 fed mice, there was a little decrease in values as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carcmosin-200 fed mice, there was a decrease in reduced glutathione content as compared to that at p-DAB+PB+Myrica-30 fed mice. The same was also true for p-DAB+PB+Myrica-30+Cholestennum-200+Carcmosin-200 fed mice. In p-DAB+PB+Myrica-200 fed mice, there was some significant increase in reduced glutathione content particularly at 60 days onward. However, when Myrica-200 and Cholestennum-200 were fed in combination to carcinogen fed mice, there was some decrease in reduced glutathione content after a marginal increase at 30 days. In p-DAB+PB+Myrica-200+Carcmosin-200 fed mice, there was a further decrease in GSH content, particularly at 30 days and at 60 days. In p-DAB+PB+Myrica-200+Cholestennum-200+Carcmosin-200 a further decrease in GSH was noticed (Table-5F, Histogram-5F).
Histograms showing the contents of reduced glutathione (nM/mg tissue) in liver of different series of mice at 30 days and 60 days.

Histograms showing the contents of reduced glutathione (nM/mg tissue) in liver of different series of mice at 90 days and 120 days.

Histogram- 5F: Showing the contents of Reduced glutathione (GSH) (nM/mg tissue) in liver of different series of mice at 30, 60, 90 and 120 days.
B) ACTIVITIES IN SPLEEN

(i) Aspartate Aminotransferase (AST) –

The mean activities of aspartate aminotransferase (AST) in spleen of normal healthy mice ranged between 0.007 and 0.009 in (nM/100mg protein/min) (Table-6A, Histogram-6A). In Normal+Alcohol fed mice the activities were slightly increased. In p-DAB+PB fed mice the activities were considerably increased along with time. In p-DAB+PB+Alcohol fed mice the activities of AST were slightly increased further. In p-DAB+PB+Myrica mother fed mice there was significant decrease in AST activity at all fixation intervals, except at 30 days as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed mice there was a slight increase in activity at all fixation intervals, except at 30 days as compared to p-DAB+PB+Myrica mother fed series. In p-DAB+PB+Myrica mother+Carinosin-200 fed mice there was an increase in activity at all fixation intervals. The same trend of further increase in AST activity has been noted in p-DAB+PB+Myrica mother+Cholesternum-200+Carinosin-200 fed mice. A significant decrease in activity was noted in p-DAB+PB+Myrica-30 fed mice when the data were compared with that of positive control. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was some increase in activity as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carinosin-200 fed mice the similar trend of increase was noted. In p-DAB+PB+Myrica-30+Cholesternum-200+Carinosin-200 fed mice there was a little more increase was noted at all fixation intervals. In p-DAB+PB+Myrica-200 fed mice there was a significant decrease of AST activity as compared to positive control. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice there was a little increase of AST activity at all fixation intervals, except at 30 days. In p-DAB+PB+Myrica-200+Carinosin-200 fed mice the same trend was also noted. In p-DAB+PB+Myrica-200+Cholesternum-200+Carinosin-200 fed mice there was further increase in AST activity (Table-6A, Histogram-6A).
Observations

Histograms showing the activities of aspartate aminotransferase (nM/100 mg protein/min) in spleen of different series of mice at 30 and 60 days.

Histogram- 6A: Showing the activities of Aspartate Aminotransferase (AST) (nM/100 mg protein/min) in spleen of different series of mice at 30, 60, 90 and 120 days.
Observations

(n) Alanine Aminotransferase (ALT) –

The mean activities of alanine aminotransferase (ALT) in spleen of normal healthy mice varied between 0.003 and 0.004 (nM/100 mg protein/min) (Table-6B, Histogram-6B). There was a marginal increase of activity in Normal+Alcohol fed mice. In p-DAB+PB fed mice activity was appreciably increased. In p-DAB+PB+Alcohol fed mice the activity was further increased. However, in p-DAB+PB+Myrica mother fed mice there was a significant decrease of ALT activity, particularly at 60 days onward. In p-DAB+PB+Myrica mother+Cholesterenum-200 fed mice the activity was marginally increased at all fixation intervals, except at 30 days. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice there was not much of a change in the activity, although a marginal increase was noted at certain intervals. But in p-DAB+PB+Myrica mother+Cholesterenum-200+Carcinosin-200 fed mice the increase was more palpable at 60 days onward. In p-DAB+PB+Myrica-30 fed mice there was an appreciable decrease in ALT activity at all fixation intervals and the differences were statistically highly significant when the data were compared with positive control. In p-DAB+PB+Myrica-30+Cholesterenum-200 fed mice there was an increase of ALT activity at all fixation intervals. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice, similar trend was also noted. In p-DAB+PB+Myrica-30+Cholesterenum-200+Carcinosin-200 fed mice there was further increase in ALT activity at most fixation intervals. However, in p-DAB+PB+Myrica-200 fed mice there was a significant decrease in ALT activity. In p-DAB+PB+Myrica-200+Cholesterenum-200 fed mice there was some increase in ALT activity after an initial decrease at 30 days. That same trend was also true for mice fed with p-DAB+PB+Myrica-200+Carcinosin-200. In p-DAB+PB+Myrica-200+Cholesterenum-200+Carcinosin-200 fed mice there was further increase in ALT activity (Table-6B, Histogram-6B).
Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in spleen of different series of mice at 30 days and 60 days.

Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in spleen of different series of mice at 90 days and 120 days.

Histogram- 6B: Showing the activities of Alanine Aminotransferase (ALT) (nM/100 mg protein/min) in spleen of different series of mice at 30, 60, 90 and 120 days.
(iii) Acid phosphatase (AcP) –

The mean activity of acid phosphatase (AcP) in spleen of normal diet fed mice ranged between 0.015 and 0.017 (nM/100mg protein/min) (Table-6C, Histogram-6C), which was found to be increased in Normal+Alcohol fed mice along with the lapse of time. In p-DAB+PB fed mice there was substantial increase and it was further increased marginally in the p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed mice there was significant decrease in AcP activity as compared to positive control. In p-DAB+PB+Myrica mother+Cholestennum-200 fed mice there was appreciable increase in data at 60 days onward. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice there was a little increase, more appreciable at longer intervals, as compared to that of p-DAB+PB+Myrica mother fed series. In p-DAB+PB+Myrica mother+Cholestennum-200+Carcinosin-200 fed mice there was appreciable increase of AcP activity. In p-DAB+PB+Myrica-30 fed mice, however, there was significant decrease of AcP activity, which was increased in p-DAB+PB+Myrica-30+Cholestennum-200 fed mice particularly at 90 days and at 120 days. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice the increase was more appreciable at 30 and at 60 days, although there was an overall increase also at 90 days and at 120 days. In p-DAB+PB+Myrica-30+Cholestennum-200+Carcinosin-200 fed mice there was an increase in AcP activity at all fixation intervals as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-200 fed mice there was significant reduction in AcP activity as compared to positive control. In p-DAB+PB+Myrica-200+Cholestennum-200 fed mice there was a little more increase particularly at 60 days onward, as compared to p-DAB+PB+Myrica-200 fed mice. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice a more or less similar trend was observed. In p-DAB+PB+Myrica-200+Cholestennum-200+Carcinosin-200 fed mice there was a further increase in AcP activity (Table-6C, Histogram-6C).
Histograms showing the activities of acid phosphatase (nM/100 mg protein/min) in spleen of different series of mice at 30 days and 60 days.

Histograms showing the activities of acid phosphatase (nM/100 mg protein/min) in spleen of different series of mice at 90 days and 120 days.

Histogram- 6C: Showing the activities of Acid phosphatase (AcP) (nM/100 mg protein/min) in spleen of different series of mice at 30, 60, 90 and 120 days.
(iv) Alkaline phosphatase (AlkP) –

The mean activity of alkaline phosphatase (AlkP) in spleen of normal mice varied between 0.011 and 0.012 (nM/100 mg protein/min) in normal mice (Table-6D, Histogram-6D). The values were slightly increased in mice fed Normal+Alcohol. In p-DAB+PB the activity was substantially increased depending on the lapse of time. In p-DAB+PB+Alcohol fed mice there was a little more increase in activity. However, in p-DAB+PB+Myrica mother fed mice the activity of AlkP was significantly decreased particularly at 60 days onward. In p-DAB+PB+Myrica-mother+Cholesterinum-200 fed mice there was a little increase of AlkP activity, except at 30 days. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice there was a little further increase of AlkP activity. In p-DAB+PB+Myrica mother+Cholesterinum-200+Carcinosin-200 fed mice the AlkP activity was further increased. On the other hand in p-DAB+PB+Myrica-30 fed mice there was significant decrease in AlkP activity. In p-DAB+PB+Myrica-30+Cholesterinum-200 fed mice there was an increase in activity, as compared to p-DAB+PB+My-30 fed series. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice there was a similar trend. In p-DAB+PB+Myrica-30+Cholesterinum-200+Carcinosin-200 fed mice there was a further increase in AlkP activity except at 120 days. In p-DAB+PB+Myrica-200 fed mice again there was a significant decrease in activity at all fixation intervals. In p-DAB+PB+Myrica-200+Cholesterinum-200 fed mice there was an increase in AlkP activity after an initial decrease at 30 days. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice similar trend was observed. In p-DAB+PB+Myrica-200+Cholesterinum-200+Carcinosin-200 fed mice there was an increase of AlkP activity at all fixation intervals (Table-6D, Histogram-6D).
Observations

Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in spleen of different series of mice at 30 days and 60 days

Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in spleen of different series of mice at 90 days and 120 days

Histogram-6D: Showing the activities of Alkaline phosphatase (AlkP) (nM/100 mg protein/min) in spleen of different series of mice at 30, 60, 90 and 120 days.
(v) Lipid peroxidation (LPO) –

The mean lipid peroxidation (LPO) in spleen of normal healthy mice ranged between 0.072 and 0.075 (nM/MDA/mg wet tissue) (Table-6E, Histogram-6E). In Normal+Alcohol fed mice the LPO level was increased gradually with the lapse of time. In p-DAB+PB fed mice LPO levels were considerably increased. In p-DAB+PB+Alcohol fed mice the levels of LPO were increased with marginal higher values compared with p-DAB+PB. In p-DAB+PB+Myrica mother fed mice the level of LPO significantly decreased when they were compared with p-DAB+PB+Alcohol fed series. However, in p-DAB+PB+Myrica mother+Cholesterenum-200 fed mice the LPO values were decreased at 30 days but increased at later fixation intervals as compared to p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice the LPO appeared to increase at all fixation intervals, as compared to p-DAB+PB+Myrica mother fed series. This was further increased in p-DAB+PB+Myrica mother+Cholesterenum-200+Carcinosin-200 fed mice. Lipid peroxidation was significantly reduced in p-DAB+PB+Myrica-30 fed mice at all fixation intervals, as compared to positive control. In p-DAB+PB+Myrica-30+Cholesterenum-200 fed mice the same trend was also noticed. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice LPO levels were marginally increased at 30 days and at 60 days but considerably increased at 120 days. In p-DAB+PB+Myrica-30+Cholesterenum-200+Carcinosin-200 fed mice the values were further increased at all fixation intervals, except at 120 days. p-DAB+PB+Myrica-30 fed mice showed much reduced LPO particularly at longer fixation intervals. In p-DAB+PB+Myrica-200+Cholesterenum-200 fed mice there was increased LPO at all fixation intervals, except at 30 days. The same trend was also noticeable in p-DAB+PB+Myrica-200+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-200+Cholesterenum-200+Carcinosin-200 fed mice the LPO was further increased (Table-6E, Histogram-6E).
Histogram- 6E: Showing the Lipid peroxidation (LPO) (nM/MDA/mg wet tissue) in spleen of different series of mice at 30, 60, 90 and 120 days.
(vi) Reduced glutathione (GSH) –

The mean activities of reduced glutathione (GSH) in spleen of normal diet fed mice ranged between 0.009 and 0.010 (nM/mg tissue) (Table-6F, Histogram-6F), which was more or less similar to that found in Normal+Alcohol fed mice. In p-DAB+PB fed mice GSH contents were appreciably reduced at all fixation intervals. In p-DAB+PB+Alcohol fed mice GSH contents were reduced further as compared to p-DAB+PB fed mice. In p-DAB+PB+Mynca mother fed mice there was appreciable increase only at 60 days onward. In p-DAB+PB+Mynca mother+Cholesterinum-200 fed mice there was a little decrease in GSH content. In p-DAB+PB+Mynca mother+Carcinosin-200 fed mice the levels of GSH contents were slightly decreased at 90 days and at 120 days and slightly increased at 60 days. In p-DAB+PB+Mynca mother+Cholesterinum-200+Carcinosin-200 fed mice this trend was more or less maintained, except at the fact that GSH content was slightly reduced at some other intervals. On the other hand in p-DAB+PB+Mynca-30 fed mice there was some increase particularly at longer fixation intervals. In p-DAB+PB+Mynca-30+Cholesterinum-200 fed mice there was some decrease in GSH content as compared to p-DAB+PB+Mynca-30 fed mice. In p-DAB+PB+Mynca-30+Carcinosin-200 fed mice there was a marginal decrease at all fixation intervals as compared to p-DAB+PB+Mynca-30 fed mice. In p-DAB+PB+Mynca-30+Cholesterinum-200+Carcinosin-200 fed mice there was marginal decrease at the longer intervals only. In p-DAB+PB+Mynca-200 fed mice there was significant increase in GSH content as compared to positive control. In p-DAB+PB+Mynca-200+Cholesterinum-200 fed mice there was slight increase at 30 days followed by that at all subsequent intervals. In p-DAB+PB+Mynca-200+Carcinosin-200 fed mice a similar trend was also observed. In p-DAB+PB+Mynca-200+Cholesterinum-200+Carcinosin-200 fed mice there was appreciable decreased as compared to p-DAB+PB+Mynca-200 fed mice (Table-6F, Histogram-6F).
Observations

Histograms showing the contents of reduced glutathione (nM/mg tissue) in spleen of different series of mice at 30 days and 60 days.

- Normal
- p-DAB+PB
- p-DAB+PB+Myrica mother
- p-DAB+PB+Myrica mother+Car-200
- p-DAB+PB+Myrica-30
- p-DAB+PB+Myrica-30+Car-200
- p-DAB+PB+Myrica-200
- p-DAB+PB+Myrica-200+Car-200
- Normal+Alcohol
- p-DAB+PB+Alcohol
- p-DAB+PB+Myrica mother+Chole-200
- p-DAB+PB+Myrica mother+Chole-200+Car-200
- p-DAB+PB+Myrica-30+Chole-200
- p-DAB+PB+Myrica-30+Chole-200+Car-200
- p-DAB+PB+Myrica-200+Chole-200
- p-DAB+PB+Myrica-200+Chole-200+Car-200

Histograms showing the contents of reduced glutathione (nM/mg tissue) in spleen of different series of mice at 90 days and 120 days.

- Normal
- p-DAB+PB
- p-DAB+PB+Myrica mother
- p-DAB+PB+Myrica mother+Car-200
- p-DAB+PB+Myrica-30
- p-DAB+PB+Myrica-30+Car-200
- p-DAB+PB+Myrica-200
- p-DAB+PB+Myrica-200+Car-200
- Normal+Alcohol
- p-DAB+PB+Alcohol
- p-DAB+PB+Myrica mother+Chole-200
- p-DAB+PB+Myrica mother+Chole-200+Car-200
- p-DAB+PB+Myrica-30+Chole-200
- p-DAB+PB+Myrica-30+Chole-200+Car-200
- p-DAB+PB+Myrica-200+Chole-200
- p-DAB+PB+Myrica-200+Chole-200+Car-200

Histogram- 6F: Showing the contents of Reduced glutathione (GSH) (nM/mg tissue) in spleen of different series of mice at 30, 60, 90 and 120 days.
C) ACTIVITIES IN KIDNEY

(i) Aspartate Aminotransferase (AST) –

The mean activities of aspartate aminotransferase (AST) in kidney of normal mice ranged between 0.009 and 0.011 (nM/100mg.protein/min) (Table-7A, Histogram-7A). There was a slight increase in Normal+Alcohol fed mice. In p-DAB+PB fed mice there was palatable increase in AST activity, more pronounced at longer fixation intervals. In p-DAB+PB+Alcohol fed mice the activity was further increased. However, in p-DAB+PB+Myrica mother fed series there was a significant reduction in AST activity as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum–200 fed mice there was a marginal decrease in AST activity at 30 days after which the activity was found to increase at subsequent intervals. In p-DAB+PB+Myrica mother+Carinosin–200 fed mice the same trend of increase was noted as compared to p-DAB+PB+Myrica mother fed mice. There was a further increase in AST activity in p-DAB+PB+Myrica mother+Cholesternum-200+Carinosin-200 fed mice. In p-DAB+PB+Myrca-30 fed mice, however, there was a significant decrease in AST activity as compared to positive control. But in p-DAB+PB+Myrica-30+Cholesternum–200 fed mice the activity was marginally increased at all fixation intervals and the increase was more noticeable in p-DAB+PB+Myrica–30+Carinosin–200 fed mice. The similar trend of increase was also noticed in p-DAB+PB+Myrica-30+Cholesternum-200+Carinosin–200 fed mice, although they were less in level if the data were compared with positive control. In p-DAB+PB+Myrica–200 fed mice again there was significant reduction in AST activities as compared to positive control. In p-DAB+PB+Myrica–200+Cholesternum–200 fed mice after an initial decrease at 30 days there was an increase in AST activities at subsequent intervals. In p-DAB+PB+Myrica–200+Carinosin–200 fed mice the same trend was found. In p-DAB+PB+Myrica–200+Cholesternum–200+Carinosin–200 fed mice there was a further increase in AST activity (Table-7A, Histogram-7A).
Observations

Histograms showing the activities of aspartate aminotransferase (nM/100 mg protein/min) in kidney of different series of mice at 30 days and 60 days.

<table>
<thead>
<tr>
<th>Normal</th>
<th>Normal+Alcohol</th>
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<tr>
<td>DAB+PB+Myrica mother</td>
<td>DAB+PB+Myrica mother+Chole-200</td>
</tr>
<tr>
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<td>DAB+PB+Myrica mother+Chole-200+Car-200</td>
</tr>
<tr>
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<td>DAB+PB+Myrica-30+Chole-200</td>
</tr>
<tr>
<td>DAB+PB+Myrica-200</td>
<td>DAB+PB+Myrica-200+Chole-200</td>
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<td>DAB+PB+Myrica-200+Car-200</td>
<td>DAB+PB+Myrica-200+Chole-200+Car-200</td>
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</tbody>
</table>

<table>
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<tr>
<th>Fixation intervals in days</th>
<th>30 Days</th>
<th>60 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>(nM / 100 mg protein / min)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Histograms showing the activities of aspartate aminotransferase (nM/100 mg protein/min) in kidney of different series of mice at 90 days and 120 days.

<table>
<thead>
<tr>
<th>Normal</th>
<th>Normal+Alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAB+PB+Myrica mother</td>
<td>DAB+PB+Myrica mother+Chole-200</td>
</tr>
<tr>
<td>DAB+PB+Myrica mother+Car-200</td>
<td>DAB+PB+Myrica mother+Chole-200+Car-200</td>
</tr>
<tr>
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<tr>
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<tr>
<td>DAB+PB+Myrica-200+Car-200</td>
<td>DAB+PB+Myrica-200+Chole-200+Car-200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixation intervals in days</th>
<th>90 Days</th>
<th>120 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>(nM / 100 mg protein / min)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Histogram- 7A: Showing the activities of Aspartate Aminotransferase (AST) (nM/100 mg protein/min) in kidney of different series of mice at 30, 60, 90 and 120 days.
(ii) Alanine Aminotransferase (ALT) –

Mean activities of alanine aminotransferase (ALT) in kidney of normal mice ranged between 0.003 and 0.004 (nM/100mg protein/min) (Table-7B, Histogram-7B). There was a marginal increase of ALT activity in Normal+Alcohol fed mice. In p-DAB+PB fed mice there was a considerable increase and in p-DAB+PB+Alcohol fed mice the values were slightly greater particularly at longer intervals. In p-DAB+PB+Myrica mother fed mice there was a palpable reduction at the longer intervals. In p-DAB+PB+Myrica mother+Cholesterennum-200 fed mice there was a little increase in ALT activity from 60 days onward, but there was a slight decrease at 30 days. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice there was a marginal increase in ALT activity, as compared to p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother+Cholesterennum-200+Carcinosin-200 fed mice there was a further increase of ALT activity. However, in p-DAB+PB+Myrica-30 fed mice there was a significant decrease as compared to the positive control. In p-DAB+PB+Myrica-30+Cholesterennum-200 fed mice there was a marginal increase in ALT activity at all fixation intervals, as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice the same trend was noticed. In p-DAB+PB+Myrica-30+Cholesterennum-200+Carcinosin-200 fed mice there was a further increase in ALT activity, more pronounced at earlier fixation intervals. In p-DAB+PB+Myrica-200 fed mice there was a significant reduction, as compared to positive control. In p-DAB+PB+Myrica-200+Cholesterennum-200 fed mice there was an increased in ALT activity at 60 days onward after an initial reduction at 30 days as compared to p-DAB+PB+Myrica-200 fed mice. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice similar trend was noticed. In p-DAB+PB+Myrica-200+Cholesterennum-200+Carcinosin-200 fed mice there was a further increase in ALT activity (Table-7B, Histogram-7B).
Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in kidney of different series of mice at 30 days and 60 days.

Histogram- 7B: Showing the activities of Alanine Aminotransferase (ALT) (nM/100 mg protein/min) in kidney of different series of mice at 30, 60, 90 and 120 days.
(iii) Acid phosphatase (AcP) –

Mean activities of Acid phosphatase (AcP) in kidney of normal mice ranged between 0.010 and 0.012 (nM/100mg protein/min) (Table-7C, Histogram-7C)

In Normal+Alcohol fed mice the activity was slightly increased along with the lapse of time. In p-DAB+PB fed mice there was a considerable increase of AcP activity which was positively correlated with time. In p-DAB+PB+Alcohol there was a little more increase than p-DAB+PB fed mice. However, in p-DAB+PB+Myrica mother fed mice there was a significant decrease at 60 days onward after an initial increase at 30 days, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum–200 fed mice there was some increase in AcP activity at 60 days onward, although there was a little decrease at 30 days. In p-DAB+PB+Myrica mother+Carcinosin–200 fed mice there was a marginal increase in AcP activity at all fixation intervals as compared to p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother+Cholesternum–200+Carcinosin–200 fed mice there was a further increase in AcP activity. In p-DAB+PB+Myrica-30 fed mice there was a significant reduction in AcP activity at all fixation intervals. In p-DAB+PB+Myrica-30+Cholesternum–200 fed series there was a noticeable increase. The trend was similar in p-DAB+PB+Myrica-30+Carcinosin–200 fed mice in which the activity was increased. In p-DAB+PB+Myrica-30+Cholesternum–200+Carcinosin–200 fed mice there was a further increase in AcP activity at all fixation intervals, except at 120 days. In p-DAB+PB+Myrica-200 fed mice there was a significant reduction in AcP activity at all fixation intervals, except at 30 days, as compared to positive control. In p-DAB+PB+Myrica-200+Cholesternum–200 fed mice there was an increase in activity at all fixation intervals, except at 30 days as compared to p-DAB+PB+Myrica-200 fed mice. The similar trend was also noticed in p-DAB+PB+Myrica–200+Carcinosin–200 fed mice. In p-DAB+PB+Myrica-200+Cholestern-200+Carcinosin -200 fed mice there was a further increase in AcP activity (Table-7C, Histogram-7C).
Histograms showing the activities of acid phosphatase (nM/100 mg protein/min) in kidney of different series of mice at 30 days and 60 days.

Histograms showing the activities of acid phosphatase (nM/100 mg protein/min) in kidney of different series of mice at 90 days and 120 days.

Histogram- 7C: showing the activities of Acid phosphatase (AcP) (nM/100mg protein/min) in kidney of different series of mice at 30, 60, 90 and 120 days.
(iv) Alkaline phosphatase (AlkP) –

Mean activity of alkaline phosphatase (AlkP) in kidney of normal mice varied between 0.010 and 0.012 (nM/100 mg protein/min) (Table-7D, Histogram-7D)

In Normal+Alcohol fed mice the activity was slightly increased with the lapse of time. In p-DAB+PB fed mice there was a substantial increase in AlkP activity at all fixation intervals, gradually increasing with time. In p-DAB+PB+Alcohol fed mice there was only a marginal increase of AlkP activity, which was significantly reduced at all fixation intervals in the p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother +Cholesternum-200 fed mice there was an increase in AlkP activity more pronounced at 90 days, as compared to p-DAB+PB+Myrica mother fed series.

In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice the trend was more or less similar. In p-DAB+PB+Myrica mother+Cholesternum-200+Carcinosin-200 fed mice the AlkP activity was reduced. In the p-DAB+PB+Myrica-30 fed mice there was a significant decrease in AlkP activity, as compared to positive control. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was an increase in AlkP activity at all fixation intervals as compared to p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice this was also true. In p-DAB+PB+Myrica-30+Cholesternum-200+Carcinosin-200 fed mice the increase was more pronounced as compared to p-DAB+PB+Myrica-30 fed series. In p-DAB+PB+Myrica-200 fed mice the AlkP activity was significantly reduced at all fixation intervals, as compared to positive control. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice there was an increase of AlkP activity after an initial decrease at 30 days. The situation was similar in p-DAB+PB+Myrica-200+Carcinosin-200 fed mice. In the p-DAB+PB+Myrica-200+Cholesternum-200+Carcinosin-200 fed mice there was further increase of AlkP activity (Table-7D, Histogram-7D).
Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in kidney of different series of mice at 30 days and 60 days.

Histograms showing the activities of alkaline phosphatase (nM/100 mg protein/min) in kidney of different series of mice at 90 days and 120 days.

Histogram- 7D: Showing the activities of Alkaline phosphatase (AlkP) (nM/100 mg protein/min) in kidney of different series of mice at 30, 60, 90 and 120 days.
(v) Lipid peroxidation (LPO) –

Lipid peroxidation (LPO) in the kidney of normal mice ranged between 0.072 and 0.075 (nM/MDA/mg wet tissue), which was found to be slightly increased in mice fed with alcohol (Table-7E, Histogram-7E). In p-DAB+PB fed mice, there was an appreciable increase of LPO along with the lapse of time. In p-DAB+PB+Alcohol fed mice, there was a marginal increase in LPO. In p-DAB+PB+Myrica mother fed mice, there was a significant reduction as compared to the positive control. In p-DAB+PB+Myrica mother+Cholesterrnum-200 fed mice, there was a little increase in LPO after an initial decrease at 30 days. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice, there was a similar trend, except for the fact that the increase was also noticed at 30 days. In DAB+PB+Myrica mother+Cholesterrnum-200+Carcinosin-200 fed mice, there was a further increase in LPO activity. In p-DAB+PB+Myrica–30 there was a significant decrease of LPO at all fixation intervals as compared to the positive control. In p-DAB+PB+Myrica-30+Cholesterrnum-200 fed mice, there was a little increase in LPO, which was also true for p-DAB+PB+Myrica-30+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice, the LPO was further increased in p-DAB+PB+Myrica–200 fed mice. In p-DAB+PB+Myrica–200 fed mice, there was an appreciable decrease in LPO activity. In p-DAB+PB+Myrica–200+Cholesterrnum-200 fed mice, there was an increase of LPO at all fixation intervals, except at 30 days. The same trend was also noted in p-DAB+PB+Myrica–200+Carcinosin–200 fed mice. In p-DAB+PB+Myrica–200+Cholesterrnum–200+Carcinosin–200 fed mice, there was a further increase of LPO (Table-7E, Histogram-7E).
Observations

Histograms showing the lipid peroxidation (nM/MDA/mg wet tissue) in kidney of different series of mice at 30 days and 60 days.

Histogram- 7E: Showing the Lipid peroxidation (LPO) (nM/MDA/mg wet tissue) in kidney of different series of mice at 30, 60, 90 and 120 days.
(vi) Reduced glutathione (GSH) –

The reduced glutathione (GSH) content in kidney of normal healthy mice ranged between 0.008 and 0.010 (nM/mg tissue) (Table-7F, Histogram-7F). This was found to be marginally decreased in Normal+Alcohol fed mice. In p-DAB+PB fed mice the GSH contents were marginally decreased further. In p-DAB+PB+Myrca mother fed mice there was a marginal increase in GSH content as compared to positive control. In p-DAB+PB+Myrca mother+Cholesterrnum–200 fed mice there was a little increase at 30 days but marginally decreased at 60 days and 120 days. In p-DAB+PB+Myrca mother+Carcinosm–200 fed mice a similar trend was also noticed. In p-DAB+PB+Myrca mother+Cholesterrnum–200+Carcinosm–200 fed mice there was only marginal decrease at 90 days and at 120 days as compared to p-DAB+PB+Myrca mother fed mice. In p-DAB+PB+Myrca–30 fed mice there was some appreciable decrease as compared to positive control. However, there was a marginal decrease more noticeable at 30 days and at 120 days in p-DAB+PB+Myrca–30+Cholesterrnum–200 fed mice. In the p-DAB+PB+Myrca–30+Cholesterrnum–200 fed mice there was actually a small reduction in GSH content at 30 days and at 120 days, as compared to p-DAB+PB+Myrca–30 fed mice. In p-DAB+PB+Myrca–30+Cholesterrnum–200+Carcinosm–200 fed mice there was a little decrease in activity at all fixation intervals, as compared to p-DAB+PB+Myrca–30 fed mice. In p-DAB+PB+Myrca–200 fed mice there was a significant increase in GSH content, particularly at longer intervals. In the p-DAB+PB+Myrca–200+Colesterrnum–200 fed mice there was a little decrease particularly at 120 days as compared to p-DAB+PB+Myrca–200 fed mice. The same was true for mice fed with p-DAB+PB+Myrca–200+Carcinosm–200. In p-DAB+PB+Myrca–200+Colesterrnum–200+Carcinosm–200 fed mice there was some decrease in GSH content (Table-7F, Histogram-7F).
Histograms showing the contents of reduced glutathione (nM/mg tissue) in kidney of different series of mice at 30 days and 60 days.

Histograms showing the contents of reduced glutathione (nM/mg tissue) in kidney of different series of mice at 90 days and 120 days.

Histogram-7F: Showing the contents of Reduced glutathione (GSH) (nM/mg tissue) in kidney of different series of mice at 30, 60, 90 and 120 days.
D. ACTIVITIES IN BLOOD SERUM

(i) Aspartate Aminotransferase (AST) –

The aspartate aminotransferase (AST) activity in blood serum of normal mice ranged between 0.815 and 0.830 (nM/100mg protein/min) in normal mice, which was slightly raised in the Normal+Alcohol fed mice (Table-8A, Histogram-8A). However, in p-DAB+PB fed mice the activity was increased several fold and in p-DAB+PB+Alcohol fed mice it was increased marginally in addition to what has been recorded in p-DAB+PB fed mice. In p-DAB+PB+Mynca mother fed mice a significant amount of decrease was noted. However, in p-DAB+PB+Mynca mother+Cholesternum–200 fed mice the values were slightly more than that of p-DAB+PB+Mynca mother fed mice. In p-DAB+PB+Mynca mother+Carcinosin–200 fed mice there was a further increase in AST activity. In p-DAB+PB+Mynca mother+Cholesternum–200+Carcinosin–200 fed mice there was only a marginal increase at 90 days and 120 days. In p-DAB+PB+Mynca–30 fed mice there was a significant decrease of AST activity. However, in p-DAB+PB+Mynca–30+Cholesternum–200 fed mice there was some increase in AST activity, as compared to p-DAB+PB+Mynca–30 fed mice. The same was true in p-DAB+PB+Mynca–30+Carcinosin–200 fed mice. In p-DAB+PB+Mynca–30+Cholesternum–200+Carcinosin–200 there was a further rise of AST activity. In p-DAB+PB+Mynca–200 fed mice the activity was reduced as compared to positive control. In p-DAB+PB+Mynca–200+Cholesternum–200 the activity was increased at 90 days but decreased marginally at 120 days, as compared to that of p-DAB+PB+Mynca–200 fed mice. In p-DAB+PB+Mynca–200+Carcinosin–200 fed mice there was an increase at 90 days and decrease at 120 days, as compared to p-DAB+PB+Mynca–200 fed mice. However, in p-DAB+PB+Mynca–200+Cholesternum–200+Carcinosin–200 fed mice there were an appreciable increase at 90 days and at 120 days than in p-DAB+PB+Mynca–200 fed mice (Table-8A, Histogram-8A).
Observations

(ii) Alanine Aminotransferase (ALT)-

The serum alanine aminotransferase (ALT) activity in normal mice was found to be 0.460 and 0.445 (nM/100mg protein/min) (Table-8A, Histogram-8B). In Normal+Alcohol fed mice activity was slightly increased, but in p-DAB+PB fed mice the activity was increased several fold. In p-DAB+PB+Alcohol fed mice, the activity was marginally increased as compared to that of that p-DAB+PB fed series. In p-DAB+PB+Myrica mother fed mice, the activity was considerably reduced at both fixation intervals. In p-DAB+PB+Myrica mother+Cholesterenum-200 fed mice, there was a little increase in ALT activity as compared to p-DAB+PB+Myrica mother fed mice. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice, there was a further increase in ALT activity, as compared to p-DAB+PB+Myrica mother fed mice. On the other hand, in p-DAB+PB+Myrica mother+Cholestenum-200+Carcinosin-200 fed mice, there was a further increase in activity at both fixation intervals. In p-DAB+PB+Myrica-30 fed mice, there was a significant decrease in ALT activity. In p-DAB+PB+Myrica-30+Cholesterenum-200 fed mice, there was an increase in ALT activity, as compared to p-DAB+PB+Myrica-30 fed mice. The same was true for p-DAB+PB+Myrica-30+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-30+Cholesterenum-200+Carcinosin-200, there was a further rise in ALT. In p-DAB+PB+Myrica-200 fed mice, there was a substantial reduction in ALT activity. However, in p-DAB+PB+Myrica-200+Cholesterenum-200 and p-DAB+PB+Myrica-200+Carcinosin-200 fed mice, there was an increase in ALT activity. In p-DAB+PB+Myrica-200+Cholesterenum-200+Carcinosin-200 fed mice, the increase was quite palpable (Table-8A, Histogram-8B).
Histograms showing the activities of aspartate aminotransferase (AST) (nM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.

Histogram- 8A: Showing the activities of Aspartate Aminotransferase (AST) (nM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.

Histograms showing the activities of alanine aminotransferase (nM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.

Histogram- 8B: Showing the activities of Alanine Aminotransferase (ALT) (nM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.
Observations

(iii) Acid phosphatase (AcP) –

The serum acid phosphatase (AcP) activity in normal mice ranged between 3,480 and 3,490 (nM/100mg protein/min) (Table-8B, Histogram-8C). In Normal+Alcohol fed mice the activity was slightly elevated. In p-DAB+PB fed mice there was a substantial rise in AcP level, which was further increased slightly in p-DAB +PB+Alcohol fed mice. In p-DAB+PB+Mynca mother fed mice there was a considerable decrease at both fixation intervals as compared to positive control. In p-DAB+PB+Mynca mother+Cholesternum-200 fed mice there was a further increase in AcP activity. In p-DAB+PB+Mynca mother+Carcinosin-200 fed mice the same trend was noticed. In p-DAB+PB+Mynca mother+Cholesternum-200+Carcinosin-200 fed mice there was a further increase in AcP activity. On the other hand in p-DAB+PB+Mynca-30 fed mice there was a significant decrease in AcP activity. In p-DAB+PB+Mynca-30+Cholesternum-200 fed mice there was a considerable increase in AcP activity. The same was true for p-DAB+PB+Mynca-30+Carcinosin-200 fed mice. In p-DAB+PB+Mynca-30+Cholesternum-200+Carcinosin-200 fed mice the increase was even greater. In p-DAB+PB+Mynca-200 fed mice there was a substantial decrease in AcP activity as compared to positive control. In p-DAB+PB+Mynca-200+Cholesternum-200 fed mice the activity was again considerably increased. The same trend but slightly less in magnitude was also noted in p-DAB+PB+Mynca-200+Carcinosin-200 fed mice. In p-DAB+PB+Mynca-200+Cholesternum-200+Carcinosin-200 fed mice there was a further increase in AcP activity, which however, when compared with the positive control was still less (Table-8B, Histogram-8C).
(iv) Alkaline phosphatase (AlkP) –

The serum alkaline phosphatase (AlkP) activity in normal healthy mice ranged between 3 491 and 3 891 (nM/100mg protein/min) (Table-8B, Histogram-8D). In Normal+Alcohol fed mice the level of alkaline phosphatase was slightly increased at 90 days and 120 days. In p-DAB+PB fed series the level of AlkP was substantially increased at both fixation intervals, which was further increased slightly in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed mice there was a considerable decrease in AlkP activity at both fixation intervals, as compared to positive control. In p-DAB+PB+Myrica mother+Cholestenum-200 fed mice there was a marginal increase in AlkP activity, which was also true for p-DAB+PB+Myrica mother+Carcinosin-200 fed mice. In p-DAB+PB+Myrica mother+Cholestenum-200+Carcinosin-200 fed mice the AlkP activity was further increased. On the other hand there was a considerable reduction in AlkP activity in p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Cholestenum-200 fed mice there was a palpable increase in AlkP activity. A more or less similar trend was also found in p-DAB+PB+Myrica-30+Carcinosin-200 fed mice. In p-DAB+PB+Myrica-30+Cholestenum-200+Carcinosin-200 fed mice there was a little increase at 90 days but not at 120 days. In p-DAB+PB+Myrica-200 fed mice there was a significant decrease in AlkP activity. In p-DAB+PB+Myrica-200+Cholesterin-200 fed series the level of AlkP was increased. The same was true for p-DAB+PB+Myrica-200+Carcinosin-200 fed series. In p-DAB+PB+Myrica-200+Cholesterin-200+Carcinosin-200 fed mice there was a palpable increase of AlkP activity (Table-8B, Histogram-8D).
Histograms showing the activities of alkaline phosphatase (mM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.

Histogram- 8D: Showing the activities of Acid phosphatase (AcP) (mM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.

Histogram- 8C: Showing the activities of Alkaline phosphatase (AlkP) (mM/100 mg protein/min) in blood serum of different series of mice at 90 days and 120 days.
(v) Lipid peroxidation (LPO) –

The serum lipid peroxidation (LPO) level in normal mice ranged between 0.140 and 0.159 (nM/MDA/ml sample) (Table-8C, Histogram-8E). In Normal+Alcohol fed mice the lipid peroxidation level increased at 90 days and marginally decreased at 120 days. In p-DAB+PB fed mice the lipid peroxidation level increased substantially and which was further increased slightly in p-DAB+PB+Alcohol fed mice at both fixation intervals. In p-DAB+PB+Myrica mother fed mice the level of LPO was significantly decreased at 90 days and further at 120 days, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed mice the level of LPO increased and the same was true for p-DAB+PB+Myrica mother+Carinosin-200 fed series, the activity was increased at both fixation intervals. In p-DAB+PB+Myrica mother+Cholesternum-200+Carinosin-200 fed series the activity of LPO was further increased. On the other hand there was a significant reduction of LPO activity in p-DAB+PB+Myrica-30 fed mice. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was palpable increase in LPO level at 90 days. In p-DAB+PB+Myrica-30+Carinosin-200 fed mice, a more or less similar trend was also found. In p-DAB+PB+Myrica-30+Cholesternum-200+Carinosin-200 fed mice there was an increase in activity at both fixation intervals. In p-DAB+PB+Myrica-200 fed mice there was a significant decrease of AlkP activity. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice there was a palpable increase in LPO which was also true for p-DAB+PB+Myrica-200+Carinosin-200 fed mice. In p-DAB+PB+Myrica-200+Cholesternum-200+Carinosin-200 fed mice there was a further increase of LPO levels (Table-8C, Histogram-8E).
(vi) Reduced glutathione (GSH) –

The reduced glutathione (GSH) content in serum of normal mice ranged between 1,702 and 1,712 (nM/ml sample) (Table-8C, Histogram-8F). In Normal+Alcohol fed mice the reduced glutathione (GSH) content was marginally decreased at both fixation intervals. In p-DAB+PB fed mice, the GSH content palpably decreased. In p-DAB+PB+Alcohol fed mice the GSH content marginally decreased further. In p-DAB+PB+Myrica mother fed mice the GSH content increased considerably at both fixation intervals as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed mice the serum GSH content was marginally decreased and that was also true for p-DAB+PB+Myrica mother+Carcinosin-200 fed mice, the GSH content was marginally increased at 90 days but decreased at 120 days. In p-DAB+PB+Myrica mother+Cholesternum-200+Carcinosin-200 fed mice the GSH content further decreased marginally. In p-DAB+Myrica-30 fed series the serum GSH content increased at both fixation intervals as compared to positive control. In p-DAB+PB+Myrica-30+Cholesternum-200 fed series the GSH content decreased. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice a more or less same trend was found. In p-DAB+PB+Myrica-30+Cholesternum-200+Carcinosin-200 fed mice the GSH content was marginally decreased. In p-DAB+PB+Myrica-200 fed mice the serum GSH content was significantly increased at both fixation intervals. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice the GSH content decreased. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice the GSH content decreased and the same trend was true for the p-DAB+PB+Myrica-200+Cholesternum-200+Carcinosin-200 fed mice (Table-8C, Histogram-8F).
Histogram- 8E: Showing the Lipid peroxidation (LPO) (nM/MDA/ml sample) in blood serum of different series of mice at 90 days and 120 days.

Histogram- 8F: Showing the contents of Reduced glutathione (nM/ml sample) in blood serum of different series of mice at 90 days and 120 days.
E. ACTIVITIES OF SOME OTHER ENZYMES:

Apart from the above mentioned parameters, activities of some other enzymes like catalase and succinate dehydrogenase have been assayed in liver, spleen and kidney.

A) ACTIVITIES IN LIVER:

(i) Catalase –

The catalase activity in liver of normal healthy mice ranged between 9.25 and 9.35 (unit enzyme/mg protein/min) (Table-9A, Histogram-9A). In Normal+Alcohol fed mice the activity of catalase decreased at both fixation intervals. In p-DAB+PB fed mice the level of catalase was palpably decreased for both intervals, which was further decreased marginally in p-DAB+PB+Alcohol fed series. In p-DAB+PB+Myrica mother fed mice the catalase level was significantly increased at 90 days and at 120 days, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesterinum–200 fed mice the activity of catalase decreased at both fixation intervals and which was also true for p-DAB+PB+Myrica mother+Carcinosin–200 fed mice. In p-DAB+PB+Myrica mother+Cholesterinum–200+Carcinosin–200 fed mice the level of catalase was further decreased. In p-DAB+PB+Myrica–30 fed mice the level of catalase increased at 90 days and which was further increased at 120 days. In p-DAB+PB+Myrica–30+Cholesterinum–200 fed mice the level of catalase was further decreased at both fixation intervals. In p-DAB+PB+Myrica–30+Carcinosin–200 fed mice the level of catalase decreased. In p-DAB+PB+Myrica–30+Cholesterinum–200+Carcinosin–200 fed mice the level of catalase was further decreased. In p-DAB+PB+Myrica–200 fed series the level of catalase was significantly increased at both fixation intervals. In p-DAB+PB+Myrica–200+Cholesterinum–200 fed mice the level of catalase decreased. In p-DAB+PB+Myrica–200+Carcinosin–200 fed mice a more or less similar trend was also found. In p-DAB+PB+Myrica–200+Cholesterinum–200+Carcinosin–200 fed series the level of catalase was decreased further at both fixation intervals (Table-9A, Histogram-9A).
Observations

*(ii) Succinate dehydrogenase –*

The activity of succinate dehydrogenase in liver of normal healthy mice varied from 550 00 to 565 00 (µmol/mg protein/min) (Table-9A, Histogram-9B) In Normal+Alcohol fed mice level of succinate dehydrogenase was marginally decreased. In p-DAB+PB fed series the level of succinate dehydrogenase was considerably decreased and which was further decreased at both fixation intervals in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed series the level of succinate dehydrogenase increased at 90 days and farther 120 days, as compared to positive control. In p-DAB+PB+Myrica mother+Cholestennum–200 fed mice the level of succinate dehydrogenase decreased. In p-DAB+PB+Myrica mother+Carcinosin–200 fed series the level of succinate dehydrogenase was decreased farther. In p-DAB+PB+Myrica mother+Cholestennum–200+Carcinosin–200 fed mice the level of succinate dehydrogenase was further decreased at both fixation intervals. In p-DAB+PB+Myrica–30 fed mice the level of succinate dehydrogenase increased at 90 days and farther at 120 days fixation intervals. In p-DAB+PB+Myrica–30+Cholestennum-200 fed mice the level of succinate dehydrogenase was decreased at both fixation intervals. In p-DAB+PB+Carcinosin-200 fed mice the level of succinate dehydrogenase decreased. In p-DAB+PB+Myrica–30+Cholestennum–200+Carcinosin–200 fed mice the level of succinate dehydrogenase was further decreased at both fixation intervals. In p-DAB+PB+Myrica–200 fed series the level of succinate dehydrogenase was significantly increased. In p-DAB+PB+Myrica–200+Cholestennum–200 fed mice the level of succinate dehydrogenase decreased. In p-DAB+PB+Myrica–200+Carcinosin–200 fed series the level of succinate dehydrogenase decreased at both fixation intervals. In p-DAB+PB+Myrica–200+Cholestennum–200+Carcinosin–200 fed mice the level of succinate dehydrogenase was farther decreased. (Table-9A, Histogram-9B)
Histograms showing the activities of catalase (unit enzyme/mg protein/min) in liver of different series of mice at 90 days and 120 days.

Histogram- 9A: Showing the activities of Catalase (unit enzyme/mg protein/min) in liver of different series of mice at 90 days and 120 days.

Histograms showing the activities of succinate dehydrogenase (μmol/mg protein/min) in liver of different series of mice at 90 days and 120 days.

Histogram- 9B: Showing the activities of Succinate dehydrogenase (μmol/mg protein/min) in liver of different series of mice at 90 days and 120 days.
B) ACTIVITIES IN SPLEEN:

(i) Catalase –

The activity of catalase in spleen of normal healthy mice ranged between 9.60 and 9.65 (unit enzyme/mg protein/min) (Table-9B, Histogram-9C). In Normal+Alcohol fed mice the level of catalase slightly decreased at both fixation intervals. In p-DAB+PB fed mice the level of Catalase was palpably decreased. In p-DAB+PB+Alcohol fed series the level of catalase was marginally decreased. In p-DAB+PB+Myrca mother fed mice the level of catalase was considerably increased at both fixation intervals as compared to positive control. In p-DAB+PB+Myrca mother+Cholestennum-200 fed mice the level of catalase was decreased. In p-DAB+PB+Myrca mother+Carcinosin-200 fed series the level of catalase decreased at 90 days and at 120 days fixation intervals. In p-DAB+PB+Myrca mother+Cholestennum-200+Carminosin-200 fed mice the level of catalase was decreased. In p-DAB+PB+Myrca-30 fed mice the level of catalase was significantly increased at both fixation intervals. In p-DAB+PB+Myrca-30+Cholestennum-200 fed mice the level of catalase decreased. In p-DAB+PB+Myrca-30+Carcinosin-200 fed mice the level of catalase was slightly decreased, as compared to p-DAB+PB+Myrca-30+Cholestennum-200+Carminosin-200 fed mice. The level of catalase was further decreased. In p-DAB+PB+Myrca-200 fed series the level of catalase was more or less similar trend was also observed. In p-DAB+PB+Myrca-200+Cholestennum-200+Carcinosin-200 fed mice the level was further decreased (Table-9B, Histogram-9C).
(ii) Succinate dehydrogenase –

The activity of succinate dehydrogenase in spleen of normal healthy mice ranged between 510 00–615 00 (μmol/mg protein/min) (Table-9B, Histogram-9D). In Normal+Alcohol fed mice, level of succinate dehydrogenase was marginally decreased. In p-DAB+PB fed mice, the level of succinate dehydrogenase was considerably decreased at both fixation intervals, which was further decreased marginally at 90 days and at 120 days in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Myrica mother fed mice, the level of succinate dehydrogenase was marginally decreased at both fixation intervals, which was further decreased marginally at 90 days and at 120 days in p-DAB+PB+Alcohol fed mice. In p-DAB+PB+Mynca mother fed mice, the level of catalase was significantly increased at both fixation intervals, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum–200 fed series, the level of succinate dehydrogenase decreased. In p-DAB+PB+Myrica mother+Carcinosin–200 fed mice, a more or less similar trend was also observed. In p-DAB+PB+Cholesternum–200+Carcinosin–200 fed series, the level was further decreased. In p-DAB+PB+Myrica–30 fed mice, the level of succinate dehydrogenase decreased at both fixation intervals, as compared to positive control. In p-DAB+PB+Myrica–30 fed mice, the level of succinate dehydrogenase decreased at both fixation intervals. In p-DAB+PB+Cholesternum–200+Carcinosin–200 fed series, the level of succinate dehydrogenase decreased. In p-DAB+PB+Cholesternum–200+Carcinosin–200 fed series, the level of succinate dehydrogenase decreased. In p-DAB+PB+Myrica–30+Carcinosin–200 fed mice, the level decreased more at 120 days. In p-DAB+PB+Myrica–30+Cholesternum–200+Carcinosin–200 fed series, the level was further decreased, particularly at 90 days. In p-DAB+PB+Myrica–200 fed mice, the level was significantly increased at both fixation intervals. In p-DAB+PB+Myrica–200+Carcinosin–200 fed series, the level decreased. In p-DAB+PB+Myrica–200+Cholesternum–200 fed mice, the level of decreased at both fixation intervals. In p-DAB+PB+Myrica–200+Cholesternum–200 fed mice, the level of decreased (Table –9B, Histogram-9D)
Histogram- 9C: Showing the activities of Catalase (unit enzyme/mg protein/min) in spleen of different series of mice at 90 days and 120 days.

Histogram- 9D: Showing the activities of Succinate dehydrogenase (μmol/mg protein/min) in spleen of different series of mice at 90 days and 120 days.
C) ACTIVITIES IN KIDNEY:

(i) Catalase –

The activity of catalase in kidney of normal healthy mice ranged between 9.80 and 9.97 (unit enzyme/mg protein/min) (Table-9C, Histogram-9E). In Normal+Alcohol fed mice the level of catalase was slightly increased at 90 days but decreased at 120 days. In p-DAB+PB fed series the level was palpably decreased, which was further marginally decreased in p-DAB+PB+Alcohol fed mice at both fixation intervals. In p-DAB+PB+Myrica mother fed mice the level was significantly increased, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed series the level was marginally decreased at both fixation intervals. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice the level of catalase decreased. In p-DAB+PB+Myrica mother+Cholesternum-200+Carcinosin-200 fed series the activity of catalase was further decreased at 90 days and at 120 days. In p-DAB+PB+Myrica-30 there was a considerable increase of activity particularly at 120 days. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was a little reduction in activity. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice the quantum of reduction was less. In p-DAB+PB+Myrica-30+Cholesternum-200+Carcinosin-200 fed mice the level was further decreased. In p-DAB+PB+Myrica-200 fed mice the level was significantly increased at 90 days and 120 days. In p-DAB+PB+Myrica-200+Cholesternum-200 fed series the level of catalase decreased at both fixation intervals. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice, a more or less similar trend was found. In p-DAB+PB+Myrica-200+Cholesternum-200+Carcinosin-200 fed series the level was decreased farther (Table-9C, Histogram-9E).
Observations

(n) Succinate dehydrogenase –

The activity of succinate dehydrogenase in kidney of normal healthy mice ranged between 535.00 and 541.00 (μmol/mg protein/min) (Table-9C, Histogram-9F). In Normal+Alcohol fed mice the level of was marginally decreased at both fixation intervals. In p-DAB+PB fed series the level was considerably decreased at 90 days and 120 days. In p-DAB+PB+Alcohol fed mice the level was marginally decreased. In p-DAB+PB+Myrica mother fed mice the level was significantly increased, as compared to positive control. In p-DAB+PB+Myrica mother+Cholesterinum-200 fed mice the level of succinate dehydrogenase was decreased. In p-DAB+PB+Myrica mother+Carcinosin-200 fed series the level decreased at both fixation intervals. In p-DAB+PB+Myrica mother+Cholesterinum-200+Carcinosin-200 fed mice the level was further reduced. In p-DAB+PB+Myrica-30 fed mice the level increased at both fixation intervals. In p-DAB+PB+Myrica-30+Cholesterinum-200 fed series the level reduced at both fixation intervals. In p-DAB+PB+Myrica-30+Carcinosin-200 fed mice the level decreased. In p-DAB+PB+Myrica-200 fed mice the level was significantly increased at both fixation intervals. In p-DAB+PB+Myrica-200+Cholesterinum-200 fed series the level decreased. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice the level reduced both fixation intervals. In p-DAB+PB+Myrica-200+Cholesterinum-200+Carcinosin-200 fed series the level was further decreased, particularly at 90 days (Table-9C, Histogram-9F)
Histogram- 9E: Showing the activities of Catalase (unit enzyme/mg protein/min) in kidney of different series of mice at 90 days and 120 days.

Histogram- 9F: Showing the activities of Succinate dehydrogenase (μmol/mg protein/min) in kidney of different series of mice at 90 days and 120 days.
III. HEMATOLOGICAL :

Several hematological parameters were also analyzed

(A) Total count of R B C (T C of R.B C) –

The number of R B C in blood of normal healthy mice varied from 5.25 to 5.40 (million/mm$^3$) (Table-10A, Histogram-10A). In Normal+Alcohol fed control the number of R B C was marginally decreased. In p-DAB+PB fed mice the number was palpably reduced at all fixation intervals and it was further decreased in mice fed with p-DAB+PB+Alcohol except at 60 days. In p-DAB+PB+Myrica mother fed mice the number of R B C was significantly increased, as compared to positive control except at 30 days. In p-DAB+PB+Myrica mother+Cholestennum–200 fed series the number was reduced except at 30 days. In p-DAB+PB+Myrica mother+Carcinosin–200 fed mice the number was decreased. In p-DAB+PB+Myrica mother+Cholestennum–200+Carcinosin–200 fed mice the number was reduced, more appreciably at 90 days onward. In p-DAB+PB+Myrica–30 fed mice the number of R B C was significantly increased. In p-DAB+PB+Myrica–30+Cholestennum–200 fed mice the number was decreased. In p-DAB+PB+Myrica–30+Carcinosin–200 fed mice the more or less same trend was observed. In p-DAB+PB+Myrica–30+Cholestennum–200+Carcinosin–200 fed series the number was further reduced. In p-DAB+PB+Myrica–200 fed mice there was a significant increased of R B C at all fixation intervals. In p-DAB+PB+Myrica–200+Cholestennum–200 fed series the number was slightly reduced except at 30 days. In p-DAB+PB+Myrica–200 fed series the number was decreased at all fixation intervals, as compared to p-DAB+PB+Myrica–200 fed series. In p-DAB+PB+Myrica–200+Cholestennum–200+Carcinosin–200 fed mice the number was farther reduced. (Table-10A, Histogram-10A)
Histograms showing total R.B.C (million/mm³) in different series of mice at 30 days and 60 days:

- **Normal**
- **p-DAB+PB**
- **p-DAB+PB+Myrica mother**
- **p-DAB+PB+Myrica mother+Car-200**
- **p-DAB+PB+Myrica-30**
- **p-DAB+PB+Myrica-30+Car-200**
- **p-DAB+PB+Myrica-200**
- **p-DAB+PB+Myrica-200+Car-200**
- **Normal+Alcohol**
- **p-DAB+PB+Alc**
- **p-DAB+PB+Myrica mother+Chole-200**
- **p-DAB+PB+Myrica mother+Chole-200+Car-200**
- **p-DAB+PB+Myrica-30+Chole-200**
- **p-DAB+PB+Myrica-30+Chole-200+Car-200**
- **p-DAB+PB+Myrica-200+Chole-200**
- **p-DAB+PB+Myrica-200+Chole-200+Car-200**

Histograms showing total R.B.C (million/mm³) in different series of mice at 90 days and 120 days:

- **Normal**
- **p-DAB+PB**
- **p-DAB+PB+Myrica mother**
- **p-DAB+PB+Myrica mother+Car-200**
- **p-DAB+PB+Myrica-30**
- **p-DAB+PB+Myrica-30+Car-200**
- **p-DAB+PB+Myrica-200**
- **p-DAB+PB+Myrica-200+Car-200**
- **Normal+Alcohol**
- **p-DAB+PB+Alc**
- **p-DAB+PB+Myrica mother+Chole-200**
- **p-DAB+PB+Myrica mother+Chole-200+Car-200**
- **p-DAB+PB+Myrica-30+Chole-200**
- **p-DAB+PB+Myrica-30+Chole-200+Car-200**
- **p-DAB+PB+Myrica-200+Chole-200**
- **p-DAB+PB+Myrica-200+Chole-200+Car-200**

Histogram-10A: Showing total R.B.C (million/mm³) in different series of mice at 30, 60, 90 and 120 days.
(B) Total count of W.B C (T C of W B C) –

The number of W.B.C in blood of normal mice ranged between 8.92 and 10.50 (thousand/mm³) (Table-10B, Histogram-10B). In Normal+Alcohol fed mice the number was slightly reduced. In p-DAB+PB fed series the number was considerably reduced. In p-DAB+PB+Alcohol fed mice the number was marginally decreased at all fixation intervals. In p-DAB+PB+Myrica mother fed mice the number was significantly increased, when it was compared with p-DAB+PB+Alcohol. In p-DAB+PB+Myrica mother+Cholesternum-200 fed series the number was reduced. In p-DAB+PB+Myrica mother+Carconsin-200 fed mice, the number was decreased. In p-DAB+PB+Myrica mother+Cholesternum-200+Carconsin-200 fed mice the number was further decreased, more appreciably at 90 days. In mice fed with p-DAB+PB+Myrica-30 there was a significant increased the number of W.B.C at all fixation intervals. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice there was a reduction of the number, which was more appreciable at 120 days. In p-DAB+PB+Myrica-30+Carconsin-200 fed series the number was decreased. In p-DAB+PB+Myrica-30+Cholesternum-200+Carconsin-200 fed mice the number was marginally decreased. In p-DAB+PB+Myrica-200 fed mice, a significant increase of W.B.C was observed. In mice fed with p-DAB+PB+Myrica-200+Cholesternum-200, there was a reduction in number, when compared with p-DAB+PB+Myrica-200 fed series. In p-DAB+PB+Myrica-200+Carconsin-200 fed mice the number was slightly reduced, except at 30 days. In p-DAB+PB+Myrica-200+Cholesternum-200+Carconsin-200 fed series the number was also decreased, except at 30 days. (Table-10B, Histogram-10B)
Histograms showing total W.B.C (thousand/mm³) in different series of mice at 30 days and 60 days

<table>
<thead>
<tr>
<th>Normal</th>
<th>Normal+Alcohol</th>
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<tr>
<td>p-DAB+PB</td>
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<td>p-DAB+PB+Myrica-200+Car-200</td>
<td>p-DAB+PB+Myrica-30+Chole-200+Car-200</td>
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</table>

Histograms showing total W.B.C (thousand/mm³) in different series of mice at 90 days and 120 days

<table>
<thead>
<tr>
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<th>Normal+Alcohol</th>
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<tr>
<td>p-DAB+PB+Myrica-200+Car-200</td>
<td>p-DAB+PB+Myrica-30+Chole-200+Car-200</td>
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</table>

Histogram- 10B: Showing total W.B.C (thousand/ mm³) in different series of mice at 30, 60, 90 and 120 days.
(C) Hemoglobin content –

The amount of hemoglobin in normal healthy mice ranged between 15.67 and 16.00 (mg/dl) in blood (Table-10C, Histogram-10C). In Normal+Alcohol fed mice the amount was slightly decreased. In p-DAB+PB fed mice the level was considerably decreased at all fixation intervals, which was further decreased in mice fed with p-DAB+PB+Alcohol, except at 60 days and 90 days. In p-DAB+PB+Mycrrca mother fed mice the amount was significantly increased at all fixation intervals, as compared to p-DAB+PB+Alcohol fed control. In p-DAB+PB+Mycrrca mother+Cholesternum-200 fed mice there was a reduction in the amount of hemoglobin at all fixation intervals, except at 30 days. In p-DAB+PB+Mycrrca mother+Carcinosin-200 fed mice the amount was decreased more appreciably at 60 days onward. In mice fed with p-DAB+PB+Mycrrca mother+Cholesternum-200+Carcinosin-200 the amount of hemoglobin was reduced. In p-DAB+PB+Mycrrca–30 fed series the amount was increased. In p-DAB+PB+Mycrrca–30+Cholesternum–200 fed mice there was a reduction in the amount of hemoglobin at all fixation intervals. In mice fed with p-DAB+PB+Mycrrca–30+Carcinosin–200 there was only a slight reduction in the amount was also observed. In p-DAB+PB+Mycrrca–30+Cholesternum–200+Carcinosin–200 fed mice a further reduction in the amount was found. In mice fed with p-DAB+PB+Mycrrca–200 the amount was significantly increased. In p-DAB+PB+Mycrrca–200+Cholesternum–200 fed series the level was decreased at all fixation intervals, except at 30 days. In p-DAB+PB+Mycrrca–200+Carcinosin–200 fed mice a more or less similar trend also observed. In mice fed with p-DAB+PB+Mycrrca–200+Cholesternum–200+Carcinosin–200 a further reduction in the amount was observed (Table-10C, Histogram-10C).
Histograms showing blood hemoglobin content (mg/dl) in different series of mice at 90 days and 120 days.

Histogram- 10C: Showing blood hemoglobin content (mg/dl) in different series of mice at 30, 60, 90 and 120 days.
(D) Blood glucose –

The amount of serum glucose in normal mice varied from 92 860 to 94 000 (mg/dl) in blood (Table-10D, Histogram-10D). In mice fed with alcohol the amount of glucose was marginally increased. In p-DAB+PB fed mice the amount was palpably increased at all fixation intervals. In mice fed with p-DAB+PB+alcohol the amount of glucose was further increased. In p-DAB+PB+Myrica mother fed mice the level of glucose was significantly reduced as compared to positive control. In p-DAB+PB+Myrica mother+Cholesternum-200 fed series the amount was increased, except at 30 days when the data were compared to that of p-DAB+PB+Myrica mother. In p-DAB+PB+Myrica mother+Carcinosin-200 fed mice the amount was marginally increased at all fixation intervals. In p-DAB+PB+Myrica mother+Cholesternum-200+Carcinosin-200 fed series the amount was further increased. In p-DAB+PB+Myrica-30 fed series the amount of glucose was significantly reduced at all fixation intervals. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice the level was considerably increased. In p-DAB+PB+Myrica-30+Carcinosin-200 fed series the amount was further increased. In p-DAB+PB+Myrica-30+Cholesternum-200+Carcinosin-200 fed mice the level was further increased, more appreciably at 60 days. In p-DAB+PB+Myrica-200 fed mice the amount of glucose was significantly decreased at all fixation intervals. In p-DAB+PB+Myrica-200+Cholesternum-200 fed mice there was a little increase in the glucose level, except at 30 days. In p-DAB+PB+Myrica-200+Carcinosin-200 fed mice there was an increase in amount, except at 30 days. In p-DAB+PB+Myrica-200+Cholesternum-200+Carcinosin-200 fed series the level was further increased (Table-10D, Histogram-10D).
Histograms showing blood glucose level (mg/dl) in different series of mice at 30 days and 60 days

- Normal
- p-DAB+PB
- p-DAB+PB+Myrica mother
- p-DAB+PB+Myrica mother+Car-200
- p-DAB+PB+Myrica-30+Car-200
- p-DAB+PB+Myrica-200
- p-DAB+PB+Myrica-200+Car-200

Histograms showing blood glucose level (mg/dl) in different series of mice at 90 days and 120 days

- Normal+Alcohol
- p-DAB+PB
- p-DAB+PB+Myrica mother
- p-DAB+PB+Myrica mother+Car-200
- p-DAB+PB+Myrica-30+Car-200
- p-DAB+PB+Myrica-200
- p-DAB+PB+Myrica-200+Car-200

Histogram-10D: Showing blood glucose level (mg/dl) in different series of mice at 30, 60, 90 and 120 days.
(E) Blood Cholesterol –

The amount of cholesterol in serum of normal healthy mice varied from 62.458 to 64.600 (mg/dl) in blood (Table-10E, Histogram-10E). In normal+Alcohol fed mice the amount was marginally decreased. In mice fed with p-DAB+PB the amount was palpably decreased. In p-DAB+PB+Alcohol fed mice the amount was further marginally decreased at all fixation intervals. In p-DAB+PB+Myrica mother fed mice the amount was significantly increased, as compared to p-DAB+PB+Alcohol fed series. In p-DAB+PB+Myrica mother+Cholestennum-200 fed series the amount was decreased, except at 30 days. In p-DAB+PB+Myrica mother+Cholestennum-200+Carcinosin-200 fed mice the amount was reduced. In mice fed with p-DAB+PB+Myrica mother+Cholestennum-200+Carcinosin-200 there was a farther reduction observed, more appreciably at 90 days. In p-DAB+PB+Myrica-30 fed mice the amount was significantly increased. In p-DAB+PB+Myrica-30+Cholestennum-200 fed series the amount was decreased. In p-DAB+PB+Myrica-30+Cholestennum-200+Carcinosin-200 fed mice the amount was reduced. In p-DAB+PB+MY-200+Cholestennum-200+Carcmosm-200 fed series the amount was reduced (Table-10E, Histogram-10E).
Histograms showing blood cholesterol level (mg/dl) in different series of mice at 30 days and 60 days

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Histograms showing blood cholesterol level (mg/dl) in different series of mice at 90 days and 120 days

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<th>Blood Cholesterol (mg/dl)</th>
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Histogram- 10E: Showing blood cholesterol level (mg/dl) in different series of mice at 30, 60, 90 and 120 days.
IV. Cell viability study:

(A) Hepatic Cell Viability –

The percentages of viable hepatic cells in normal healthy mice ranged between 98.75 to 98.93. The percentages of both cell viability and cell death have been shown in the (Table-11). In mice fed with alcohol the number of viable cell was marginally reduced. In mice fed with p-DAB+PB, noticeable decrease in viable cells was observed. In mice fed with p-DAB+PB+Alcohol the percentage of viable cell was marginally decreased. In p-DAB+PB+Myrica mother fed mice the percentage of viable cells increased at both fixation intervals. In p-DAB+PB+Myrica mother+Cholesternum-200 fed mice the percentage of viable cell was reduced in both fixation intervals, when compared with p-DAB+PB+Myrica mother. In p-DAB+PB+Myrica mother+Carinosin-200 fed series the percentage of viable cells was reduced, more appreciably at 90 days. In mice fed with p-DAB+PB+Myrica mother+Cholesternum-200+Carinosin-200 the percentage of viable cell was further reduced at both fixation intervals. In p-DAB+PB+Myrica-30 fed mice the percentage of viable cell was increased. In p-DAB+PB+Myrica-30+Cholesternum-200 fed mice the percentage of viable cell was reduced, more appreciably at 90 days. In mice fed with p-DAB+PB+Myrica-30+Carinosin-200, the percentage of viable cell was reduced at both fixation intervals. In p-DAB+PB+Myrica-30+Cholesternum-200+Carinosin-200 fed mice a more or less similar trend was also observed. In p-DAB+PB+Myrica-200 fed series the percent of viability was increased at both fixation intervals. In p-DAB+PB+Myrica-200+Cholesternum-200 fed series percentage viable cell was reduced at both fixation intervals. In p-DAB+PB+Myrica-200+Carinosin-200 fed mice the percentage of viable cell was reduced, more appreciably at 90 days. In mice fed with p-DAB+PB+Myrica-200+Cholesternum-200+Carinosin-200, a further reduction in the percentage of viable cell was observed (Table -11).
V. Histological Studies:

Scanning Electron Microscopic Studies (SEM)

In normal diet fed mice the hepatic cells are intact in shape and size without any deformities. The cells are arranged in cords and consist of cells with interconnecting plates of hepatocytes that radiate toward central vein. Hepatocytes are polyhedral in shape. Presence of a few RBCs and Kupffer cells was also observed [PM- 2A-2B]

In p-DAB+PB+Alcohol fed series the remarkable morphological changes in hepatocytes were observed. There was a necrosis in hepatic tissue causing appearances of holes. Presence of few scattered RBCs in the parenchymal tissue which was the suggestive breakdown of blood liver barrier. In this series the noticeable morphological deformities amongst hepatocytes, canaliculi and in other cellular organelles were also observed which were the suggestive evidence of tissue necrosis at SEM level. Presence of phagocytes in large numbers was also observed [PM- 2C-2F]

In mice fed with Mynca mother tincture an apparent decrease of tissue necrosis was observed. In this series the hepatocytes are too healthy as compared to positive control. Few numbers of RBCs were present [PM- 2G-2H]

In p-DAB+PB+Mynca-200 fed mice less damages in hepatocytes were also observed. In this level the tissue necrosis was much reduced and hepatic cells were much healthy and more or less distinguishable in shape and size as compared to carcinogen fed control [PM- 2I-2J]

In mice fed with some nosodes (Cholesternum-200 and Carcinosin-200) singly or in combination with Mynca mother tincture and its potentized form the more or less positive alterations were observed in ultra structural level as compared to positive control [PM- 2K-2P]
PM- 2A-2H: Representative photomicrographs of liver under scanning electron microscopy showing features of liver tissue of normal diet fed mice (2A-2B); p-DAB+PB+Alcohol fed mice (2C-2F); Myrica mother tincture fed mice (2G-2H)
PM- 2I-2P: Representative photomicrographs of liver under scanning electron microscopy showing features of liver tissue of Myrica-200 fed mice (2I-2J); Drugs with nosodes (Cholesterinum-200 and Carcinosin-200) fed mice (2K-2P)
Transmission Electron Microscopic Studies (TEM)

In normal diet fed mice (normal control) the cell had a distinct cell outline. Intracellular organelles were normal with distinct membrane. Golgi bodies with prominent vacuoles were present. Mitochondria were present with round shape and orientation of cristae was prominent. Endoplasmic reticulums were distinct and continuous and ribosomes bound to it were also present. In this series the nuclei was euchromatinised with continuous nuclear membrane. Lipid droplets were absent and glycogen granules were also visible. Cell vacuoles were present. Presence of inactive Kupffer cells less in numbers were also observed [PM- 3A-3B]

In p-DAB+PB+Alcohol (positive control) fed series the remarkable damages in intracellular organelles were observed. The nucleus was heterochromatinised with abnormal shape. Golgi bodies were distorted. Mitochondria were small, numerous and looked distorted with dissolve cristae. White and black Kupffer cells were also found when they were compared to normal control [PM- 3C-3F]

In Myrica mother tincture fed series less damages in intracellular organelles were observed as compared to positive control. Nuclei were distinct with nuclear membrane. Golgi bodies and more or less round shaped mitochondria with cristae were observed [PM- 3G-3H]

In mice fed with Myrica-200 the damage in intracellular organelles was too less. In this series the nuclei were distinct with continuous nuclear membrane. Mitochondria were present with more or less round shaped cristae. Endoplasmic reticulums were few in numbers with ribosomes. Small shaped white and black lipid droplets were present but less in number as compared to positive control [PM- 3I-3J]

In mice fed with some nosodes (Cholestennum-200 and Carcinosin-200) singly or in combination with Myrica mother tincture and its potentized form more or less positive alterations were found in ultra structural level when they were compared to positive control [PM- 3K-3P]
PM-3A-3H: Representative photomicrographs of liver under transmission electron microscopy showing features of liver tissue of normal diet fed mice (3A-3B); p-DAB+PB+Alcohol fed mice (3C-3F); Myrica mother tincture fed mice (3G-3H)
PM- 3I-3P: Representative photomicrographs of liver under transmission electron microscopy showing features of liver tissue of Myrica-200 fed mice (3I-3J); Drugs with nosodes (Cholesterinum-200 and Carcinosin-200) fed mice (3K-3P)
VI. Preliminary results

Apart from the above work, the preliminary results of the following cytogenetical assay are included. These works need further extension and confirmation, but as the results appeared to be supportive of the other cytogenetical parameters, these were included.

(A) Comet assay –

The preliminary results of comet assay done on a few mice belonging to different series were conducted only at 120 days. Admittedly this study is being included to show results that would support some positive influences of the homeopathic remedies on modulating tail length (µm) of comet assay. The data have been presented in Table-12, Histogram-11 and PM-4A-4F. In normal healthy mice the migration of tail was 1.70 µm. In mice fed with alcohol, the tail length was increased. In p-DAB+PB fed mice the migration was palpably increased. In p-DAB+PB+Alcohol fed mice the migration of tail was further increased. In p-DAB+PB+Myrica mother fed mice a considerable reduction was observed as compared to positive control. In mice fed with p-DAB+PB+Myrica–30 the level of migration was decreased. In p-DAB+PB+Myrica–200 fed mice the level of migration was reduced (Table-12, Histogram-11).
Diagrammatical representation of Comet assay technique:

1. Swiss albino mice.
2. Liver tissue.
3. (Eppendorf tube) LMA agarose + cell suspension.
4. (Cell suspension + agarose on slide)
5. Third layer of LMA.
6. MGE slide (pre coated).
7. Unwinding sol.
8. Lysis sol.
10. (+) V
11. Horizontal gel box.
12. (Electrophoresis)
13. (-) V
15. Observation under fluorescence microscope.
17. Neutralizing and DNA precipitating sol.

Observation under Neutralizing and DNA fluorescence microscope.
PM- 4A- 4F: Representative photomicrographs of Comet assay from hepatic tissue of both control and treated series of mice at 120 days showing: Normal diet fed mice (4A); Normal+Alcohol fed mice (4B); p-DAB+PB+Alcohol fed mice (4C); p-DAB+PB+Myrica mother fed mice (4D); p-DAB+PB+Myrica-30 fed mice (4E); p-DAB+PB+Myrica-200 fed mice (4F)
Histogram showing Comet tail length (μm) in hepatic tissue of different series of mice at 120 days.

![Histogram showing Comet tail length (μm) in hepatic tissue of different series of mice at 120 days.](image)

Histogram-11: Showing Comet tail length (μm) in hepatic tissue of different series of mice at 120 days.
VII. Development of tumor:

In the present study total 526 mice were used and the differences in the development of tumors were observed among carcinogen and in different drug fed series (Table-13, Fig-1A-1E). In normal diet fed mice (normal control) total 24 mice were used and thus number of 6 mice for each fixation intervals. In this series no tumor like appearances were observed. In normal+alcohol fed series, 6 mice for shorter and 7 mice for longer fixation intervals were used. In p-DAB+PB fed series there were 7 mice at 30 days, 8 mice at 60 days, 9 mice at 120 days and thus total 34 mice were used. In this series tiny tumor like appearances were observed only in one mouse among 7 at 30 days and later, numbers of nodules were observed in 3 mice among 8 at 60 days, in 7 mice among 9 at 90 days and in 9 mice among 10 at 120 days. In p-DAB+PB+Alcohol (positive control) fed series numbers of 7 mice at 30 days, 8 mice at 60 days and 9 mice at 120 days were also used. In this series small tumor like appearances were also observed only in one mouse among 7 at 30 days and later the number of nodules was observed in 4 mice among 8 at 60 days, 8 among 9 at 90 days and in all mice at 120 days. In drug fed groups the numbers of mice were also same at all fixation intervals like carcinogen fed series. In mice fed with Mynca mother tincture the number of mice having tumors were slightly less in number. In this series no mice having tumor among 7 at 30 days, tumors in 2 among 8 at 60 days, 2 among 9 at 90 days and 2 among 10 at 120 days were observed, when it was compared to positive control. In mice fed with Mynca mother tincture with Cholesterin-200, no mice having tumor among 7 at 30 days, 2 among 8 at 60 days, 3 among 9 at 90 days, 3 among 10 at 120 days were observed. In mice fed with Mynca mother with Carcinisin-200, no mice having tumor among 7 at 30 days, 2 among 8 at 60 days, 4 among 9 at 90 days, 3 among 10 at 120 days were found. In mice fed with Mynca mother tincture in combination with two nosodes (Cholesterin-200 and Carcinisin-200), no tumor among 7 at 30 days, 3 among 8 at 60 days, 4 among 9 at 90 days, 5 among 10 at 120 days were also found. In mice fed with Mynca-30, numbers of mice having tumors were further reduced. In this series no mice having tumor among 7 at 30 days, 2
among 8 at 60 days, 2 among 9 at 90 days, 2 among 10 at 120 days were found, when it was compared with positive control. In Mynca-30 with Cholestennum-200, no tumor among 7 mice at 30 days, 2 among 8 at 60 days, 4 among 9 at 60 days, 3 among 10 at 120 days were found. In mice fed with Mynca-30 with Carcinosin-200, no tumor among 7 at 30 days, 3 among 8 at 60 days, 4 among 9 at 90 days, 3 among 10 at 120 days were observed. In mice fed with Mynca-30 in the combination with Cholestennum-200 and Carcinosin-200, no tumor among 7 at 30 days, 3 among 8 at 60 days, 4 among 9 at 90 days and 4 among at 120 days were found. In mice fed with Mynca-200 less numbers of mice having tumors were observed. In this series no mice having tumor among 7 at 30 days, 2 mice among 8 at 60 days, 3 mice among 9 at 90 days and 2 mice among 10 at 120 days were observed. In mice fed with Myrca-200+Cholestennum-200, no mice having tumor among 7 at 30 days, 2 mice among 8 at 60 days, 3 mice among 9 at 90 days and 2 among 10 at 120 days. In mice fed with Carcinosin-200, no mice among 7 having tumor at 30 days, 3 mice among 8 at 60 days, 3 mice among 9 at 90 days and 3 mice among 10 at 120 days. In mice fed with Cholestennum-200+Carcinosin-200, no mice having tumor at 30 days, 3 mice among 8 at 60 days, 4 mice among 9 at 90 days and thus 4 mice among 10 at 120 days were observed (Table-13, Fig-1A-1E)
Fig-1A-1E: Representative photographs of liver of mice showing: Liver of normal diet fed mice without any nodules (1A); p-DAB+PB+Alcohol fed mice with many nodules in liver (1B); Drug fed mice with less number nodules in liver [Myrica mother (1C), Myrica-30 (1D), Myrica-200 (1E)].