CHAPTER-VI

SUMMARY AND CONCLUSION
Dermatoglyphic traits show permanency, unchangeability and individuality. Hence these traits are most suitable for the study of personal identification, sexual dimorphism, racial variability, twin diagnosis, inheritance studies and also to find out association with certain diseases. Now various studies are available which show a strong association of dermatoglyphic traits and various diseases. A few important researches are by Cummins (1936), Holt (1963), Penrose (1963b, 1967b), Uchida and Soltan (1963), Walker (1963), Alter (1965), Miller and Giroux (1966), Uchida (1966, 1975), Penrose and Loesch (1969b), Bali (1971), Chaube (1971), Schaumann and Alter (1974), Jantz and Hunt (1986), Kumbnani (1990) who have contributed in this field. These studies prove the possibility of using dermatoglyphic traits as a diagnostic tool for the diseases. Inspired with such studies, the present problem has been taken up to find out whether the dermatoglyphic traits show any association with different type of cancers.

Like other disorders, cancer is also a chronic disorder. It is expected that there may be some association between the different types of cancer and dermatoglyphics traits. Hence, in the present study an attempt has been made to study the different type of cancer and their association with the various dermatoglyphic traits. The present study is mainly concentrated on three types of cancer such as- Mouth cancer, Breast Cancer and Prostate gland cancer. These
three types of cancer are the most commonly found among the human beings.

The material for the present study was collected on the Brahmamin Caste from different hospitals in Madhya Pradesh. The data includes 348, handwise and sexwise palmar prints of fully certified three types of cancer patients. The data is summarized in the following table :-

<table>
<thead>
<tr>
<th>Types of Cancer</th>
<th>Number of Individuals Cancer patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>Mouth Cancer</td>
<td>40</td>
</tr>
<tr>
<td>Breast Cancer</td>
<td>-</td>
</tr>
<tr>
<td>Prostate Gland Cancer</td>
<td>61</td>
</tr>
</tbody>
</table>

Similarly, the bilateral palm prints were also collected in an equal proportion from 174 normal unrelated individuals (Male = 101; Female = 73) of Brahmamin caste to be used as a control group.

The method for taking palm print has been followed as suggested by Cummins and Midlo (1961). The analysis has been done according to the Internationally accepted methods adopted from Cummins and Midlo (1961) with some modifications.

The parameters which are studied in the present study are as follows- principal main line formula, termination of main lines, pattern types on configurational areas, position of axial triradius, \( \alpha \)td, ridge counts between interdigital triradii, the main types and their subtypes of palmar flexion creases.
The main purpose of this study is to investigate whether the dermatoglyphic traits show variations in different types of cancer and the normal individuals.

The results of the present study are summarized as follows:

**Principal Main Line Formulae**

It has been observed that male mouth cancer patients (33.75%) and control group (57.50%) both exhibit the highest frequency of the main line formula 11.9.7.- as compared to the other main line formulae. But there is a great difference in their percentage frequencies. Similarly other main line formulae also show greater differences in the frequencies between cancer patients and the control group. This has been confirmed by the Chi-square value show significant difference.

Similarly the female mouth cancer patients (30.00%) and the control group (46.00%) exhibit the highest frequency of the main line formula 11.9.7.- as compared to the other main line formulae. Here also the control group exhibits higher percentage frequency as compared to the female mouth cancer patients. The other main line formulae also show much difference in percentage frequencies between the cancer patients and the control group. The Chi-square value show non-significant difference.

In case of breast cancer patients (23.95%) and the control group (27.08%), it has again been observed that the main line formula 11.9.7.- show the highest frequency as compared to other main line
formulae. The percentage frequency of this formula among the control group is higher as compared to the breast cancer patients. The other main line formulae also show greater variation in percentage frequencies except main line formula 7.5.5.- in the breast cancer patients and the control group. The Chi-square value exhibit significant result.

Similar results have been shown by the patients of prostate cancer patients (39.34%) and the control group (45.08%). Both group exhibit the highest frequency of main line formula 11.9.7.-. But the next higher frequency is shown by formula 9.7.5.- in prostate cancer patients (18.03%) and in control group by the formula 7.5.5.- (27.86%). Similarly the other main line formulae exhibit much differences in their percentage frequencies. The Chi-square value show significant result.

Termination of Main Line D

The termination of main line D shows in decreasing order of magnitude among the cancer patients and the control group except in case of female mouth cancer patients where the order of magnitude is 9>11>7.

In case of male mouth cancer patients the termination of line D at position 11 is the highest (40.00%). Similarly, among the control group the highest frequency of termination of line D is also at position 11(55.00%). The termination of line D at other positions among cancer patients and the control group show greater variations in their
percentage frequencies. The Chi-square value show non-significant result.

In case of female mouth cancer patients it has been observed that the main line D frequently terminates at position 9 (38.00%), whereas among the control group it terminates quite often at position 11 (50.00%). The next higher frequency of its termination among cancer patients is at position 11 (36.00%), while in case of control group it is at position 9 (26.00%). The termination at position 7 exhibits slight difference in their percentage frequencies among cancer patients and control group. The Chi-square value show non-significant result.

In case of breast cancer patients (37.50%) and control group (33.33%) the highest termination of main line D is observed at position 11 and followed by the position 9 and 7. Here the percentage frequencies of the termination of line D at different positions do not show much difference in cancer patients and control group. The Chi-square value show non-significant result.

Similar findings have been observed in case of prostate cancer patients and the control group. Both exhibit the highest termination of line D at position 11 (Cancer patients -46.72%; Control group -51.63%). The termination of line D at other positions show greater variation in their percentage frequencies among cancer patients and control group. The Chi-square value suggest non-significant result.
**Termination of Main Line C**

Among all the three types of cancer patients and the control group, the termination of main line C is the highest at the position 9. The termination of line C at other positions also maintain similar trend among the cancer patients and the control group.

Among the male mouth cancer patients the percentage frequency of the termination of line C at position 9 (48.75%) is quite low as compared to the control group (68.75) Similarly the termination of line C at other positions also exhibit greater differences in their percentage frequencies between cancer patients and the control group. The Chi-square value show significant result.

Similar results have been obtained in case of the female mouth cancer patients and the control group. Both group exhibit the highest termination of line C at position 9 (Cancer patients 42.00%; Control group- 56.00%). The termination of line C at other positions among cancer patients and the control group show greater variations in their percentage frequencies. The Chi-Square value do not show non-significant result.

Among the breast cancer patients and control group, the line C quite often terminates at position 9 (Cancer patients - 51.04%; Control group - 43.75%). The next higher frequency of its termination is observed among cancer patients at position 5 (27.08%), whereas among control group the next higher frequency of its termination is shown by the position 7 (29.16%). The termination of line C at other
positions among the cancer patients and the control group show greater difference in their percentage frequencies. The Chi-square value show non-significant result.

Similar findings have been observed in case of prostate gland cancer patients and the control group. Both group exhibit the highest frequency of the termination of line C at position 9 (Cancer patients 55.73%; Control group - 54.09%). The prostate cancer patients show next higher frequency of its termination at position 7 (24.59%), whereas the control group shows next higher frequency of its termination at position 5 (30.32%). The Chi-square value show non-significant result.

**Termination of Main Line B**

In case of male mouth cancer patients the termination of main line B show the highest percentage frequency at position 5 (61.25%), while among the control group the highest percentage frequency of its termination is observed at position 7 (60.00%). Similarly, among the cancer patients the next higher frequency of its termination has been shown at position 7 (38.75%), whereas the same has been shown at position 5 (40.00%) among the control group. The Chi-square value show significant result.

Similar findings have been seen in the case of female mouth cancer patients and the control group. The female mouth cancer patients show the highest frequency of the termination of line B at position 5 (62.00%), while the control group shows the highest
frequency of its termination at position 7 (52.00%). The next higher frequency of its termination among the cancer patients is observed at position 7 (36.00%) while the control group show the same at the position 5 (48.00%). The Chi-square value is non-significant result.

Among the breast cancer patients and the control group both the highest frequency of the termination of main line B is observed at position 5 (Cancer patients - 59.37%; Control group - 60.41%). The next higher frequency of the termination of main line B is observed at position 7 in a equal value among both groups (37.50%). In both groups not much variation has been observed in their percentage frequencies. The Chi-square value show non-significant result.

In case of the prostate cancer patients and the control group both the highest termination of main line B in a similar percentage has been observed at position 7 (48.36%). Similarly in both groups the next higher frequency of its termination is observed at position 5 (Cancer patients - 47.54%; Control group - 45.90%). The Chi-square value show non-significant result.

**Termination of Main Line A**

In case of the male mouth cancer patients and the control group both the main line A terminates quite often at position 5 (Cancer patients- 55.00%; Control group- 62.50%). Similarly in both groups the next higher frequency of its termination is observed at positions 3
(Cancer patients - 25.00%; Control group- 15.00%). The Chi-square value show non-significant result.

Similar situation has been shown by the female mouth cancer patients and the control group. Both groups exhibit the highest frequency of the termination of main line A at position 5 (Cancer patients-52.00%; Control group- 64.00%) but there is a great variation in their percentage frequency. The next higher frequency of its termination has been observed at position 3 in both the groups (Cancer patients - 28.00%, Control group - 24.00%). The Chi-square value show non-sigificant result.

Among the breast cancer patients and control group the highest frequency of the termination of line A is shown by the position 5 (Cancer patients- 65.62%; Control group- 58.33%) and the next higher frequency is shown by the position 4 (Cancer patients- 9.37%; Control group -17.70%). In both these positions the percentage frequencies show much difference between cancer patients and control group. The Chi-square value show non-significant result.

In case of prostate cancer patients the main line A often terminates at position 3 (28.68%) as compared to the control group (22.13%). Whereas at position 4 the main line A terminates is higher frequency in control group (18.85%) as compared to the cancer patients (14.75%). The Chi-square value show non-significant result.
PATTERN TYPES

In the present study only the true patterns (whorl, loop and arch) and the open field have been considered in analysis. The vestige patterns have been included in the open field category.

Hypothenar

Among the male mouth cancer patients the frequency of arch, loop and whorl are 11.25%, 16.25% and 5.00% respectively and among the control group the same are 17.50%, 21.25% and 1.25% respectively. This clearly indicates that both these groups exhibit greater variation in their percentage frequencies. Similarly, the frequency of open field among cancer patients is 67.50 percent and in control group it is 60.00 percent. The Chi-square value show non-significant result.

Similar results have been shown by the female mouth cancer patients and the control group. Among the female mouth cancer patients the frequency of arch and loop are 16.00% and 26.00% respectively. While the same among the control group are 18.00% and 14.00% respectively. The frequency of open field among cancer patients is 58.00 percent and in control group it is 68.00 percent. The Chi-square value show non-significant result.

In case of breast cancer patients the frequency of arch, loop and whorl are 12.50%, 20.83% and 4.16% respectively and in control group the same are 16.66%, 25.00% and 2.08% respectively. The frequency of open field in cancer patient is 62.50 percent and in
control group it is 56.25 percent. Percentage frequencies of pattern types again show great variation between cancer patients and control group. The Chi-square value show non-significant result.

Among the prostate cancer patients the frequency of arch, loop and whorl are 11.47%, 16.39% and 2.45% respectively and in control group the same are 13.93%, 14.75% and 0.81% respectively. But the frequency of open field do not vary much in cancer patients (69.67%) and in control group (70.49%). The Chi-square value show non-significant result.

**Thenar**

The percentage frequency of arches and open fields show great variation between the male mouth cancer patients (13.75%, 62.50%) and control group (22.50%, 53.75%). The other patterns do not vary much among both groups. The Chi-square value show non-significant result.

Among the female mouth cancer patients (6.00%) the frequency of whorl is quite high as compared to the control group (2.00%). The other patterns do not show much difference between cancer patients and control groups. The Chi-square value show non-significant result.

In case of breast cancer patients (23.95%) the percentage frequency of arch show high value as compared to control group (16.66%). The other patterns do not show much difference between cancer patients and control group. The chi-square value show non-significant result.
Among the prostate cancer patients the percentage frequency of arches (18.03%) is higher than the loops (13.11%), while in control group reverse trend has been seen. In control group the frequency of loops (18.03%) is higher than the arches (13.93%). The other patterns do not show much variation in frequencies between cancer patients and control group. The Chi-square value show non-significant result.

**Inter digital Area II**

In case of male mouth cancer patients (5.00%) the percentage frequency of loops is slightly lower than the control group (7.50%) and the percentage frequency of open fields is slightly higher among the cancer patients (95.00%) than the control group (92.50%). The Chi-square value show non-significant result.

A reverse trend has been observed in case of female mouth cancer patients where the percentage frequency of loops is higher among the patients (10.00%) than the control groups (6.00%) and the percentage frequency of open field is lower among the cancer patients (90.00%) than the control group (94.00%). The Chi-square value show non-significant result.

In case of breast cancer patients the percentage frequency of loops is greatly varies between cancer patients (7.29%) and control group (15.62%). Similarly, the percentage frequency of open fields also exhibit differences between cancer patients (92.70%) and control group (84.37%). The Chi-square value show non-significant result.
Among the prostate cancer patients and the control group the percentage frequency of loops is almost same (Cancer patients-17.21%; Control group - 18.85%). Similarly, the percentage frequency of open fields is (82.78%) also same in cancer patients and 81.14 percent in control group. The Chi-square value show non-significant result.

**Inter digital Area III**

In case of male mouth cancer patients (15.00%) the percentage frequency of loops is slightly higher than the control group (12.50%) and the percentage frequency of open fields is slightly lower among the cancer patients (85.00%) than the control group (87.50%). The Chi-square value show non-significant result.

A reverse trend has been observed in case of female mouth cancer patients and control group, where the percentage frequency of loops is lower in cancer patients (12.00%) than the control group (16.00%) and the percentage frequency of open fields is higher in cancer patients (88.00%) than the control group (84.00). The Chi-square value show non-significant result.

In case of breast cancer patients the percentage frequency of loops is higher (20.83%) than control group (15.62%) and the percentage frequency of open fields is lower among cancer patients (79.16%) than control group (84.37%). The Chi-square value show non-significant result.
A similar trend is maintained by the prostate cancer patients. The percentage frequency of loops is higher among cancer patients (26.22%) than the control group (18.03%) and the percentages frequency of open fields is lower in the cancer patients (73.77%) than the control group (81.96%). The Chi-square value show non-significant result.

Inter digital Area IV

Among the male mouth cancer patients (7.50%) the percentage frequency of loops is higher as compared to the control group (5.00%). But the frequency of open fields is lower among the cancer patients (92.50%) than the control group (95.00%). The Chi-square value show non-significant result.

A reverse trend is shown between the female mouth cancer patients and the control group. Among the cancer patients (24.00%) the percentage frequency of loops is lower than the control group (28.00%) and the percentage frequency of open fields is higher in cancer patients (76.00%) than the control group (72.00%). The Chi-square value show non-significant result.

In case of breast cancer patients (11.45%) the percentage frequency of loops is higher as compared to the control group (9.37%) and the percentage frequency of open fields is lower in cancer patients (88.54%) than control group (90.62%). The Chi-square value show non-significant result.
A similar trend has been seen in the prostate cancer patients and the control group. The cancer patients are showing higher percentage frequency of loops (30.32%) as compared to the control group (27.86%). Whereas the percentage frequency of open fields is higher in control group (72.13%) as compared to the cancer patients (69.67%). The Chi-square value show non-significant difference.

Axial triradius

Among male mouth cancer patients the percentage frequency of triradius t is quite higher (66.25%) as compared to the control group (53.75%). The other types of axial triradii do not show much difference in their percentage frequencies between cancer patients and control group. The Chi-square value show non-significant result.

In case of female mouth cancer patients the percentage frequency of triradius t is lower (62.00%) as compared to the control group (64.00%). A striking difference has been observed in the frequencies of triradii tt' and t'' between cancer patients (8.00% and 8.00%) and control group (14.00% and 2.00%). The chi-square value do not show significant difference.

In breast cancer patients the percentage frequency of triradius t is higher (67.70%) as compared to the control group (58.33%), while the situation is reversed in case of percentage frequency of triradius t'. Its percentage frequency is higher in control group (28.12%) than cancer patients (13.54%). The Chi-square value show non-significant result.
In case of prostate cancer patients the percentage frequency of the triradius $t$ is strikingly higher among the control group (70.49 %) as compared to the cancer patients (52.45%). While the percentage frequencies of triradii $t''$ and $tt''$ is higher among patients (13.11% and 5.73%) than control group (5.73% and 1.63%). The Chi-square value show significant result.

**Angle $\angle atd$**

Among the male mouth cancer patients the highest percentage frequency of the $\angle atd$ has been found between the angle range of $41^\circ-45^\circ$ (35.00%) but in case of control group the same has been found between the angle range of $36^\circ-40^\circ$ (31.25%). The other ranges of $\angle atd$ exhibit greater variation in their percentage frequencies between cancer patients and control group. The Chi-square value show non-significant result.

In female mouth cancer patients the percentage frequency of angle range $36^\circ-40^\circ$ of $\angle atd$ (30.00%) is the highest but its value is much lower when compared with the control group (54.00%). The situation is reversed in case of angle range $41^\circ-45^\circ$ and $46^\circ-50^\circ$. In these cases the cancer patients exhibit higher percentage frequency (26.00% and 18.00%) than the control group (16.00% and 6.00 %). The Chi-square value show non-significant result.

Among breast cancer patients the highest percentage frequency of $\angle atd$ has been found between the angle range of $36^\circ-40^\circ$ (30.20%)
but its frequency is much lower when compared with the control group (44.79%). Similar result has been shown by the angle range 46°-50° (Cancer patients-13.54%; Control group -25.00%). A reverse trend is shown by the angle range 41°-45° and 51°-55° between cancer patients (28.12% and 14.58%) and control group (22.91% and 2.08%). The Chi-square value show significant result.

In case of prostate cancer patients the highest percentage frequency of $\angle atd$ has been seen in the angle range of 41°-45° (46.72%) and this is strikingly different when compared with the control group (36.06%). The other angle ranges of $\angle atd$ do not vary much in their percentage frequencies between cancer patients and control group except angle range 56°-60° where cancer patients exhibit much lower frequency (1.63%) as compared to the control group (7.37%). The Chi-square value show non-significant result.

**Inter Triradial Ridge counts**

**a-b ridge counts**

The male mouth cancer patients (36.25%) and the control group (37.50%) both exhibit the highest frequency of a-b ridge count in the range between 26 to 30. The other ranges also show moderate differences between cancer patients and control group. The Chi-square value show non-significant result.

Similar trend has been maintained by the female mouth cancer patients (40.00%) and the control group (44.00%), where ridge counts
range between 26 to 30 also show the highest occurrence of the a-b ridge counts. The Chi-square value show non-significant result.

When the breast cancer patients were compared (39.58%) with the control group (37.50%) it has again been observed that both groups exhibit the highest frequency of a-b ridge counts in the range between 26 to 30. The Chi-square value do not suggest any significant variation.

Among the prostate cancer patients the highest frequency of the a-b ridge counts falls in the range between 31 to 35 (32.78%), while in case of control group it again falls in the range of 31 to 35 (28.68%). The Chi-square value show non-significant result.

**b-c ridge counts**

The male mouth cancer patients (63.75%) and the control group (65.00%) both show the highest frequency of b-c ridge counts in the range below 20. The other ranges of b-c ridge counts significantly vary between cancer patients and control group. The Chi-square value show significant difference.

Similar trend is maintained by the female mouth cancer patients (72.00%) and the control group (68.00%) where the angle range below 20 exhibits the highest frequency of b-c ridge counts. The Chi-square value show significant difference.

Similar situation has been observed between breast cancer patients (67.70 %) and the control group (64.58%). The other ranges
do not show much difference between these two groups. The Chi-square value show non-significant result.

The prostate cancer patients (59.83%) and control group (58.19%) also exhibit the highest occurrence of the b-c ridge counts in the range below 20. The Chi-square value show non-significant difference.

c-d ridge counts

Among the male mouth cancer patients the range between 26 to 30 shows the highest occurrence of the c-d ridge count (40.00%), while the same in control group is shown by the range of 21 to 25 (40.00%). The other ranges also show marked difference between cancer patients and control group. The Chi-square value show significant difference.

The female mouth cancer patients (32.00%) and also the control group (32.00%) both show the highest frequency of c-d ridge counts in the range between 26 to 30. The Chi-square value again exhibit significant difference.

In the case of breast cancer patients the highest frequency of c-d ridge counts has been observed in the range between 26 to 30 (50.00%), while among the control group the same has been observed in the range below 20 (33.33%). The other ranges also exhibit marked differences between these two groups. The Chi-square value show significant result.
The prostate cancer patients (26.22%) and also the control group (26.22%) both exhibit the highest frequency of c-d ridge counts in the range between 31 to 35. The other ranges also do not show marked difference between cancer patients and control group. The Chi-square value show non-significant result.

**a-d ridge counts**

The male mouth cancer patients show the highest frequency of the a-d ridge counts in the range between 51 to 55 (38.75%) while the same in the control group (45.00%) has been observed in the range between 56 to 60. Similarly the other ranges also show marked differences between these two groups. The Chi-square value show significant difference.

The female mouth cancer patients (26.00%) and the control group, (32.00%) both show the highest frequency of the a-d ridge counts in the range between 46 to 50. The Chi-square value show non-significant result.

In the breast cancer patients the highest occurrence of a-d ridge counts has been observed in the range between 56 to 60 (40.62%), while the same has been shown in the range between 61 to 65 in the control group (35.41%). The Chi-square value show significant difference.

The prostate cancer patients (37.70%) and also control group (36.06%), both exhibit the highest frequency of a-d ridge counts in the range between 56 to 60. The other ranges also do not exhibit much
difference between these two groups. The Chi-square value fails to suggest any significant difference.

**Palmar flexion Creases**

Among the male mouth cancer patients (DRBC-81.25%, TRBC-1.25%) and the control group (DRBC-67.50%, TRBC-17.50%) the main type DRBC and TRBC show much differences in their percentage frequencies, while main type SRBC maintained almost similar trend in both groups. Considering the subtypes of SRBC, the subtype S₄ exhibits higher frequency among cancer patients (10.00%) as compared to the control group (7.50%). Considering the subtypes of DRBC, the subtype D₄ shows higher value among the cancer patients (46.25%) than control group (37.50%). A striking difference has been found in the frequency of TRBC, where the cancer patients (1.25%) exhibit much lesser percentage frequency than the control group (17.50%). The Chi-square value show significant difference.

Similar findings have been observed in case of female mouth cancer patients. The percentage frequency of main type DRBC is higher among the cancer patients (84.00%) as compared to the control group (82.00%) and the percentage frequency of main type TRBC is lower in cancer patients (0.00%) than the control group (4.00%). Considering the subtypes of SRBC, the subtype S₄ exhibits higher percentage frequency among cancer patients (10.00%) than the control group (6.00%). Among the subtypes of DRBC, the subtype D₄ shows higher percentage frequency in cancer patients (54.00%) than
control group (44.00%). The subtype $T_1$ is totally absent among the cancer patients while its frequency in control group is 4.00 percent. The Chi-square value exhibit non-significant difference.

Similar trend is maintained between the breast cancer patients (DRBC-79.15%, TRBC-3.12%) and control group (DRBC-67.69%, TRBC-11.45%). Here again the main type DRBC and TRBC show greater differences in their percentage frequencies, while the main type SRBC do not show much difference between these two groups. Considering the subtypes of SRBC, the subtype $S_4$ again exhibits higher percentage frequency in cancer patients (10.41%) as compared to the control group (6.25%). Considering the subtype of DRBC a striking percentage difference has been observed in the frequency of $D_1$ which show much higher value among the cancer patients (25.00%) than the control group (4.16%). The subtype $T_1$ also exhibits greater difference between cancer patients (3.12%) and control group (11.45%). The Chi-square value show non-significant result.

Among the prostate cancer patients (4.09%) and control group, (9.83%) it is the main type TRBC which exhibits higher value among control group (9.83%) than cancer patients (4.09%). The other main types SRBC and DRBC do not show striking difference between these two groups. Considering the subtypes of SRBC, the subtype $S_4$ exhibits higher percentage frequency in control group (11.47%) as compared to the cancer patients (5.73%). The subtype $D_4$ of DRBC shows striking difference in percentage frequency between cancer
patients (42.62%) and control group (27.04%). The subtype T₁ of TRBC shows higher percentage value among control group (9.83%) than cancer patients (4.09%). The Chi-square value show non-significant result.

To know the overall trend of the dermatoglyphic traits between the cancer patients and the control group, the data of all the three types of cancer patients are pooled together and the final results are as follows -

**Principal Main Line Formulae**

The pooled cancer patients (32.47%) and the control group (43.10%) both exhibit the highest percentage frequency of the main line formula 11.9.7.- as compared to the other main line formulae but the frequency of main line formula 11.9.7.- is quite higher among the control group when compared with the pooled patients. The Chi-square value show significant difference.

**Termination of Main Line D**

The highest frequency of the termination of line D at position 11 is in the pooled cancer patients (41.09%) and also in the control group (47.12%). The Chi-square value show non-significant difference.

**Termination of Main Line C**

The pooled cancer patients (50.86%) and control group (54.88%) both exhibit the highest termination of line C at position 9. The Chi-square value show significant difference.
**Termination of Main Line B**

The main line B frequently terminates at position 5 in the pooled cancer patients (56.03%) and also in the control group (48.85%). The Chi-square value show non-significant difference between these two groups.

**Termination of Main Line A**

The pooled cancer patients (57.47%) and also the control group (58.90%) both exhibit the highest percentage of the termination of main line A at position 5. The Chi-square value show non-significant difference.

**Pattern types**

**Hypothener**

In pooled cancer patients the whorls exhibit higher frequency (3.16%) as compared to the control group (1.14%), while the frequency of arches are higher among the control group (16.66%) than the pooled cancer patients (12.35%). The Chi-square value show non-significant difference.

**Thenar**

Among the pooled cancer patients the frequency of whorls (4.59%) and arches (18.67%) are higher than the control group (2.87% and 16.95% respectively) but the frequency of loops is higher among the control group (20.97%) than the pooled cancer patients (17.52%). The Chi-square value show non-significant difference.
Inter digital Area II

The frequency of loops is higher among the control group (13.50%) as compared to the pooled cancer patients (10.63%). The Chi-square value show non-significant result.

Inter digital Area III

The pooled cancer patients exhibit higher frequency of loops (20.11%) as compared to the control group (15.80%). The Chi-square value do not show significant difference.

Inter digital Area IV

The pooled cancer patients (18.96%) and the control group (17.52%) both exhibit almost similar frequency of loops. The Chi-square value show non-significant result.

Axial triradius

The pooled cancer patients (61.20%) and the control group (62.35%) both show almost equal frequency of axial triradius t. The Chi-square value show non-significant difference.

Angle ∠atd

Among the pooled cancer patients the highest frequency of the angle ∠atd is found between angle range of 41°-45° (35.91%), while in the same range among the control group the frequency of ∠atd is 27.29 percent. The Chi-square value show significant difference between the pooled cancer patients and the control group.
Inter Triradial Ridge counts

a-b Ridge counts

In case of a-b ridge count the pooled cancer patients exhibit the highest frequency in the range between 31 to 35 (33.99%), whereas among control group the highest frequency of a-b ridge counts falls in the range between 26 to 30 (31.03%). The Chi-square value show non-significant difference.

b-c Ridge counts

Though among the pooled cancer patients (64.65%) and the control group (62.93%) the highest frequency of b-c ridge counts falls in the range of 0-20, but the frequency of b-c ridge counts in other ranges significantly vary between these two groups. The Chi-square value suggest significant difference.

c-d Ridge counts

Among the pooled cancer patients the highest frequency of c-d ridge counts is found in the range of 26 to 30(36.20%), while the control group exhibit the highest frequency of c-d ridge counts in the range of 21 to 25(24.13%). The other ranges also show significant difference in the frequency of b-c ridge counts between the pooled cancer patient and the control group. The Chi-square value show significant difference.

a-d Ridge counts

The pooled cancer patients (28.73%) and also control group (32.18%) both exhibit the highest frequency of a-d ridge counts in the
range of 56 to 60. The other ranges specially, range between 51 to 56 and 61 to 65 show marked difference between the pooled cancer patients and the control group. The Chi-square value show significant result.

**Palmar flexion Creases**

Among the pooled cancer patients (17.24%) and the control group (16.66%) the frequency of the SRBC type of creases is almost same. But in the case of DRBC and TRBC types of creases inverse relationship has been seen between the pooled cancer patients (DRBC-80.17%, TRBC-2.58%) and the control group (DRBC-72.12%, TRBC-11.20%). The Chi-square value show highly significant result and suggests that in regard to palmar flexion creases the pooled cancer patients and the control group are quite different.

From the above discussion it can be said that among the male mouth cancer patients, principal main line formula, termination of line C, termination of line B, b-c ridge counts, c-d ridge counts, a-d ridge counts and the palmar flexion creases show significant difference with control group.

The female mouth cancer patients show significant difference with the control group in b-c ridge counts and c-d ridge counts.

The breast cancer patients when compared with the control group show significant differences in $\angle$atd angle, b-c ridge counts and a-d ridge counts.
The prostate cancer patients when compared with the control group, significant variations have been observed in main line formula and axial triradius.

Finally, when all the three types of cancer are pooled together after that the pooled cancer patients show significant variation with the control group in the termination of principal main line formula, main line C, main line B, atd angle, b-c ridge counts, c-d ridge counts, a-d ridge counts and palmar flexion creases.

To sum up, it is quite clear that the pattern of relationship based on some dermatoglyphic traits and palmar flexion creases do confirm and distinguish to some extent between the different types of cancer and the control group.