BIOSTATISTICAL ANALYSIS OF *ENIGMOCARPON* FRUITS

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ABSTRACT

150 specimens of *Enigmocarpon* fruit have been studied for size, thickness of wall, thickness of axis, length and breadth of seeds, to ascertain whether there is a single or more species of *Enigmocarpon* or whether there are varieties of the same species, *Enigmocarpon parijai* Sahni. The data was subjected to biostatistical analysis.

INTRODUCTION

ON several visits to Mohgaonkalan, Chhindwara District, India I could collect about 125 specimens of *Enigmocarpon parijai* Sahni exposed in different planes. About 25 specimens were left at my disposal for further study by Dr (Mrs) Chitaley. These specimens were collected by her from the same locality. All these 150 petrified specimens were without any doubt of *Enigmocarpon* fruit. They showed the same characters as given by Sahni in his paper (1943).

The *Enigmocarpon* fruit is briefly described as a dry ellipsoidal capsule measuring 30 mm in length and 18 mm in breadth. Locules vary from 6-9 in number with axile placentation bearing many seeds in each locule in two rows. Seeds are dicotyledonous, each measuring 1·5-3·0 mm in length and 1-2 mm in breadth with spongy raphe. The fruit wall is differentiated into two regions, the outer made up of thick walled cells and the inner aerenchymatous. Dehiscence of the capsule is loculicidal (Pl. 1, Figs. 1-21).

From the study of these 150 new specimens some interesting facts are observed.

1. Thickness of the wall different in different fruits of the same size.
2. The thickness of the axis different in different fruits of the same size.
3. The size of the seed also different in different fruits of the same size.

For further analysis of the data I have tabled all the reported characters of the fruits.

The tables support my observations. The next step is to ascertain the speciation of the fruit whether there is a single species or more than one species of *Enigmocarpon* or whether there are varieties of the same species *E. parijai*.

To verify this position all these fruits with their prominent characters are subjected to statistical analysis as given below.

METHOD

Following method is applied for the statistical analysis. The important characters of which the measurements are taken into consideration are ... size of the fruit, thickness of the wall of fruit, thickness of the axis of the fruit, the length of the seed and the breadth of the seed.

These five types are the 5 variables ... $X_1 \ldots\ldots X_5$ as under.

X_1 — Size of fruit.
X_2 — Thickness of wall of fruit.
X_3 — Thickness of axis of fruit.
X_4 — Length of seed.
X_5 — Breadth of seed.

Sample means of the variables are denoted by $\bar{X}_1 \ldots \bar{X}_2$. They are computed as

$$\bar{X}_i = \frac{1}{n_i} \sum_{j=i}^{ni} (X_{ij})$$

where
$i = 1, 2, 3, 4$ and 5;
$j =$ the total number of fruits, viz., 31 in t.s. and 27 in l.s. of fruit.

Then the relation between the two variables say X_1 X_2 will be measured by the coefficient of correlation r, as

$$r = \frac{\text{Cov } (X_1 X_2)}{V(X_1) V(X_2)}$$

Since in the present case there are more than two variables the relationships between the variables are to be tested by computing the partial Correlation Coefficient which would give the relationship in between any two variables. Since we are considering Partial Correlation the effect of other variables has been accounted for.

The Correlation Coefficient between the variables X_1 and X_2 when the effect of the

TABLE 1 – OUT OF 150 SPECIMENS ONLY 31 IN T.S. AND 27 IN L.S. ARE TAKEN FOR CONSIDERATION IN THIS TABLE SINCE THEY SHOWED ALL THE NECESSARY CHARACTERS (PHOTOGRAPHS OF ONLY 21 SPECIMENS TAKEN)

		Measurements in T.S. of Fruit					
Sr. No.	Fruit No.	Size in mm X_1	Thickness of Wall in mm X_2	Thickness of Axis in mm X_3	Seed		Number of Locules
					Length in mm X_4	Breadth in mm X_5	
1	4	13×12 156	2·5	2·5	2·0	1·5	8
2	5	12×12 144	2·0	2·5	2·5	1·5	6
3	11	16×8 128	2·0	2·5	2·5	2·0	—
4	14	9×8 72	2·0	2·0	2·5	1·5	—
5	17	12×8 96	2·0	2·0	2·0	1·5	—
6	21	15×14 210	2·0	2·5	2·0	1·5	7
7	24	12×9 108	1·5	2·0	2·5	1·5	—
8	29	14×13 182	2·5	3·0	2·0	1·5	—
9	35	17×12 204	2·5	3·0	2·5	2·0	8
10	37	18×18 324	2·5	2·5	2·0	1·5	8
11	43	15×11 165	3·0	3·0	2·5	2·5	—
12	44	15×10 150	2·0	3·0	2·5	1·5	—
13	52	15×12 180	2·0	2·5	2·5	1·5	7
14	53	12×9 108	2·0	2·0	2·0	1·5	—
15	71	16×10 160	2·0	3·0	2·0	1·5	—
16	75	12×8 96	2·0	2·0	2·5	1·5	7
17	79	13×7 91	1·5	2·5	3·0	1·5	7
18	83	16×10 160	2·0	2·0	2·5	1·5	—
19	86	15×15 226	3·0	3·0	2·9	1·5	—
20	93	13×16 208	2·5	2·5	2·5	1·5	—
21	96	16×16 256	3·0	3·0	2·0	1·5	9
22	97	17×17 289	2·5	3·0	2·5	1·5	8
23	101	12×12 144	2·5	2·5	2·0	1·5	8
24	102	10×10 100	2·5	2·5	2·0	1·5	8
25	104	13×13 169	2·0	2·5	2·5	1·5	7
26	115	10×5 50	1·5	1·5	2·0	1·5	—
27	119	15×12 180	2·5	2·0	2·5	2·0	—
28	121	9×9 81	2·0	2·0	2·0	1·5	—
29	127	9×8 72	1·5	2·5	2·0	1·5	—
30	133	14×7 98	2·0	2·0	2·5	1·5	—
31	140	10×10 100	2·0	2·0	2·0	1·5	—
Total		4706	67·5	75·5	70·5	48·0	

other remaining variables X_3, X_4, and X_5 being removed, is computed as below.

$$r_{12\cdot345} = \frac{r_{12\cdot34} - r_{15\cdot34} - r_{35\cdot34}}{\sqrt{(1-r^2_{15\cdot34})(1-r^2_{25\cdot34})}}$$

After computing all the values of Partial Correlation Coefficient it is felt necessary to test the significance of this correlation coefficient by applying the 't' test. The value of 't' is computed as below

$$\frac{r^2_{1\cdot2345}}{1-r^2_{1^2\cdot345}}\, n-k = t^2(n-k)$$

Where $n = 31$ or 27 and $k = 5$ (number of variables).

The values of r and r^2 are computed from the data. Then these values are compared with the table values (Crammer, 1958) at 5% level of significance. If the computed value of r is more than the standard value the Correlation Coefficient is significant, if not, it is insignificant.

Calculations worked out from Table 1 raising the value to r^2 (*see* p. 234).

For the above collected data, the sample mean of the variables are

$\bar{X}_1 = 151{\cdot}8$ $\bar{X}_2 = 2{\cdot}17$ $\bar{X}_3 = 2{\cdot}43$
$\bar{X}_4 = 2{\cdot}22$ and $\bar{X}_5 = 1{\cdot}55$

Then the variance of X_5 viz. $V(X_1)$ is as—
$V(X_1) = 4128{\cdot}17$, $V(X_2) = 0{\cdot}2023$,
$V(X_3) = 0{\cdot}1999$, $V(X_4) = 0{\cdot}0971$ and
$V(X_5) = 0{\cdot}0169$

Then the Correlation Coefficients (r) are —
$r_{12} = 0{\cdot}646$, $r_{13} = 0{\cdot}276$, $r_{14} = 0{\cdot}041$,

TABLE 2

MEASUREMENTS IN L.S. OF FRUIT

Sr. No.	Fruit No.	Size in mm X_1		Thickness of Wall in mm X_2	Thickness of Axis in mm X_3	Seed		Number of Locules
						Length in mm X_4	Breadth in mm X_5	
1	9	10×10	100	2·0	3·0	2·0	1·0	—
2	16	12×8	96	2·0	2·0	2·0	1·5	—
3	18	17×15	255	2·0	2·0	2·0	1·5	—
4	19	19×17	323	3·5	3·5	2·5	1·5	—
5	23	15×10	150	1·5	3·0	2·5	1·5	—
6	28	12×10	120	2·0	3·0	1·5	1·5	—
7	34	12×8	96	2·0	2·0	2·0	1·5	—
8	47	12×11	132	2·0	2·0	2·0	1·5	—
9	58	12×11	132	2·0	2·0	2·0	1·5	—
10	63	10×8	80	2·0	2·0	2·0	1·5	—
11	65	7×6	42	2·0	2·0	2·5	1·5	—
12	68	15×9	135	1·5	2·0	2·5	1·5	—
13	70	15×8	120	1·5	2·0	2·5	1·5	—
14	73	12×8	96	1·5	2·5	3·0	1·5	—
15	76	13×9	117	2·0	2·0	2·5	1·5	—
16	81	13×9	117	2·0	2·0	2·5	1·5	—
17	84	12×12	144	3·0	2·0	2·5	1·5	—
18	87	17×11	187	2·0	2·0	2·5	1·0	—
19	90	12×10	120	2·0	2·0	2·0	1·5	—
20	98	15×12	180	2·5	3·0	2·5	1·5	—
21	100	18×16	288	3·0	2·5	2·5	1·5	—
22	111	10×8	80	2·0	2·5	2·0	1·5	—
23	118	15×10	150	2·5	2·5	2·5	1·5	—
24	124	15×11	165	2·5	3·0	2·5	1·5	—
25	131	14×10	140	2·0	3·0	2·5	1·5	—
26	136	12×8	96	1·5	2·0	2·0	1·5	—
27	139	20×15	300	2·5	3·0	2·5	1·5	—
Total			3961	57·0	64·5	60·0	39·5	—

$r_{15} = 0{\cdot}081$, $r_{23} = 0{\cdot}065$, $r_{24} = 0{\cdot}010$,
$r_{25} = 0{\cdot}021$, $r_{34} = 0{\cdot}173$, $r_{35} = 128$ and
$r_{45} = 0{\cdot}128$

After computerising the Partial Correlation Coefficient of the third order the '*t*' test of significance has been applied.

$r^2_{12\cdot345} = 0{\cdot}5098^*$ $r^2_{13\cdot245} = 0{\cdot}2683^*$
$r^2_{14\cdot235} = 0{\cdot}0055$ $r^2_{15\cdot234} = 0{\cdot}484$
$r^2_{23\cdot145} = 0{\cdot}4369^*$ $r^2_{24\cdot135} = 0{\cdot}0231$
$r^2_{25\cdot134} = 0{\cdot}2642^*$ $r^2_{34\cdot125} = 0{\cdot}0376$
$r^2_{35\cdot124} = 0{\cdot}0096$ $r^2_{45\cdot123} = 0{\cdot}00997$
(*significant values)

INFERENCE

From the above statistical calculations the following inferences are drawn:

There is a definite linear relation

1. Between size of fruit and thickness of wall.
2. Between size of fruit and thickness of axis.
3. Between thickness of wall and thickness of axis.
4. Between thickness of wall and thickness of seed.

Calculations worked out from Table 2 (*see* p. 235).

Above data have been 'processed, as table 1, to get the Partial Correlation Coefficient of the third order which later on subjected to '*t*' test to find out significant coefficient (*).

$r^2_{12\cdot345} = 0{\cdot}3576^*$, $r^2_{13\cdot245} = 0{\cdot}1197$,
$r^2_{14\cdot235} = 0{\cdot}2530^*$,
$r^2_{15\cdot234} = 0{\cdot}1170$, $r^2_{23\cdot115} = 0{\cdot}4470$,
$r^2_{24\cdot135} = 0{\cdot}3339^*$,
$r^2_{25\cdot134} = 0{\cdot}3016^*$, $r^2_{34\cdot125} = 0{\cdot}1376$,
$r^2_{35\cdot124} = 0{\cdot}0231$ & $r^2_{45\cdot123} = 0{\cdot}1798^*$

CALCULATIONS WORKED OUT FROM TABLE 1 RAISING THE VALUE TO r^2

Sr. No.	Fruit No.	Size of wall in mm X_1^2	Thickness of wall in mm X_2^2	Thickness of axis in mm X_3^2	Seed		No. of Locules
					Length in mm X_4^2	Breadth in mm X_5^2	
1	4	24336	6·25	6·25	4·00	2·25	—
2	5	20736	4·00	6·25	6·25	2·25	—
3	11	16384	4·00	6·25	6·25	4·00	—
4	14	5184	4·00	4·00	6·25	2·25	—
5	17	9216	4·00	4·00	4·00	2·25	—
6	21	44100	4·00	6·25	4·00	2·25	—
7	24	11664	2·25	4·00	6·25	2·25	—
8	29	33124	6·25	9·00	4·00	2·25	—
9	35	41616	6·25	9·00	6·25	4·00	—
10	37	104976	6·25	6·25	4·00	2·25	—
11	43	27225	9·00	9·00	4·00	2·25	—
12	44	22500	4·00	9·00	6·25	2·25	—
13	52	32400	4·00	6·25	6·25	2·25	—
14	53	11664	4·00	4·00	4·00	2·25	—
15	71	25600	4·00	9·00	4·00	2·25	—
16	75	9216	4·00	4·00	6·25	2·25	—
17	79	8281	2·25	6·25	9·00	2·25	—
18	83	25600	4·00	4·00	6·25	2·25	—
19	86	50625	9·00	9·00	6·25	2·25	—
20	93	43264	6·25	6·25	6·25	2·25	—
21	96	65536	9·00	9·00	4·00	2·25	—
22	97	83521	6·25	6·25	4·00	2·25	—
23	101	20736	6·25	6·25	4·00	2·25	—
24	102	10000	6·25	6·25	6·25	2·25	—
25	104	28561	4·00	6·25	6·25	2·25	—
26	115	2500	2·25	2·25	4·00	2·25	—
27	119	32400	6·25	4·00	6·25	4·00	—
28	121	6561	4·00	4·00	4·00	2·25	—
29	127	5184	2·25	6·25	4·00	2·25	—
30	133	9604	4·00	4·00	6·25	2·25	—
31	140	10000	4·00	4·00	4·00	2·25	—
Total		842314	152·25	189·25	162·75	75·00	—

INFERENCE

From the above statistical tests the following inferences are drawn:

There exists linear relations between size of fruit and thickness of wall, size of fruit and length of seed, thickness of wall and thickness of axis, thickness of wall and length of seed, thickness of wall and breadth of seed, length of seed and breadth of seed

All the above tests confirm the correlation between the size of the fruit and that of wall, seed and axis.

In order to test the variety difference the intended sample was divided into two groups. The first group having the fruit wall up to 2 mm thick and the second group more than 2 mm in thickness. The same is done in case of axis thickness of the fruit.

It was then felt to find out whether these two groups have the real variety difference. For this following test is applied.

The mean size of the first group being denoted by $\bar{X}_1$ and $\bar{X}_2$.

$$s = \frac{\Sigma_i(X_{1i}-\bar{X}_1)^2+\Sigma_i(X_{2i}-\bar{X}_2)^2}{n_1+n_2-2}$$

Where n_1 is 16 and n_2 is 37.

Then

$$y = \sqrt{\frac{n_1 n_2(\bar{X}_1-\bar{X}_2)}{n_1+n_2}}$$

$$t = \frac{y}{s}$$

The values of the Statistic 't' is computed from the data and is compared with the standard table values (Crammer, 1958) at 5% level of significance.

CALCULATIONS WORKED OUT FROM TABLE 2

Sr. No.	Fruit No.	Size in mm X_1^2	Thickness of wall in mm X_2^2	Thickness of axis in mm X_3^2	Seed		No. of Locules
					Length in mm X_4^2	Breadth in mm X_5^2	
1	9	10000	4·00	9·00	4·00	1·00	—
2	16	9216	4·00	4·00	4·00	2·25	—
3	18	65025	4·00	4·00	4·00	2·25	—
4	19	104329	12·25	12·25	6·25	6·25	—
5	23	22500	2·25	9·00	6·25	2·25	—
6	28	14400	4·00	9·00	2·25	2·25	—
7	34	9216	4·00	4·00	4·00	2·25	—
8	47	17424	4·00	4·00	4·00	2·25	—
9	58	17424	4·00	4·00	4·00	2·25	—
10	63	6400	4·00	4·00	4·00	2·25	—
11	65	1764	4·00	4·00	6·25	2·25	—
12	68	18235	2·25	4·00	6·25	2·25	—
13	70	14400	2·25	4·00	6·25	2·25	—
14	73	9216	2·25	6·25	9·00	2·25	—
15	76	13689	4·00	4·00	6·25	2·25	—
16	81	13689	4·00	4·00	6·25	2·25	—
17	84	20736	9·00	4·00	6·25	2·25	—
18	87	34969	4·00	4·00	6·25	1·00	—
19	90	14400	4·00	4·00	4·00	2·25	—
20	98	32400	6·25	9·00	6·25	2·25	—
21	100	82944	9·00	6·25	6·25	2·25	—
22	111	6400	4·00	6·25	4·00	2·25	—
23	118	22500	6·25	6·25	6·25	2·25	—
24	124	27225	6·25	9·00	6·25	2·25	—
25	131	19600	4·00	9·00	6·25	2·25	—
26	136	9216	2·25	4·00	4·00	2·25	—
27	139	90000	6·25	9·00	6·25	2·25	—
Total		707307	126·50	160·25	145·00	58·25	—

WALL THICKNESS OF FRUIT

Fruit wall up to 2 mm thick

Sr. No.	Fruit No.	Size of fruit in mm 1		1-126 difference X^2	X_2^2
1	23	15×10	150	24	576
2	28	12×10	120	−6	36
3	73	12×8	96	30	900
4	18	17×15	255	129	16641
5	87	17×12	204	78	6080
6	13	16×15	240	114	12996
7	91	14×10	140	14	196
8	76	13×9	117	−9	81
9	81	13×9	117	−9	81
10	47	12×11	132	6	36
11	90	12×10	120	−6	36
12	110	12×10	120	−6	36
13	16	12×8	96	−30	900
14	9	10×10	100	−26	675
15	94	10×8	80	−46	2116
16	111	10×8	80	−46	2116
17	12	9×6	54	−72	5184
18	79	13×7	91	−35	1225
19	1	10×10	100	−26	676
20	115	10×5	50	−76	5776
21	32	9×8	72	−54	2916
22	37	18×16	288	162	26244
23	83	16×12	192	066	4356
24	71	16×10	160	34	1156
25	11	16×8	128	2	4
26	21	15×14	210	84	7056
27	120	15×12	180	54	2916
28	30	15×10	150	24	576
29	5	12×12	144	18	324
30	4	12×10	120	−6	36
31	52	12×9	108	−18	324
32	75	12×8	96	−30	900
33	17	12×8	96	−30	900
34	89	11×11	121	−5	25
35	121	9×9	81	−25	625
36	15	7×6	42	42	7056
37	91	7×6	42	−84	7056
	Total	4662			111998·00
		Mean 126·00			

Fruit wall more than 2 mm thick

Sr. No.	Fruit No.	Size of fruit in mm		−199·44 difference X_1	X_1^2
1	29	17×12	204	4·56	
2	98	15×12	180	−9·44	
3	124	15×11	165	−34·44	
4	19	19×17	323	123·56	
5	100	18×16	288	88·56	
6	86	15×12	180	−9·44	
7	84	12×12	144	−55·44	
8	35	17×12	204	4·56	
9	78	17×12	204	4·56	
10	96	16×16	256	56·56	
11	44	16×11	176	−23·44	
12	110	15×12	180	−9·44	
13	66	14×11	154	−45·44	
14	101	12×12	144	−55·44	
15	102	10×10	100	−99·44	
16	97	17×17	289	89·56	
Total		3191		54495·53	
		Mean 199·44			

Since in this case the observed value of 't' is greater than the table value of 't', the supposition that there is no difference in the two types of varieties is rejected.

AXIS THICKNESS OF FRUIT

Up to 2 mm thick

Sr. No.	Fruit No.	Size of fruit in mm		X_2	X_2^2
1	91	7×6	42	−82	6724
2	18	17×15	255	131	17161
3	13	16×15	240	116	13456
4	76	13×9	108	−16	256
5	81	13×9	108	−16	256
7	90	12×10	120	−4	16
8	110	12×10	120	−4	16
9	34	12×8	96	−28	784
10	16	12×8	96	−28	784
11	29	17×12	204	80	6400
12	86	15×12	180	56	3136
13	84	12×12	144	20	400
14	115	10×5	50	−74	5476
15	91	7×6	42	−82	6724
16	32	9×8	72	−52	2704
17	37	18×16	288	164	26896
18	83	16×12	192	68	4624
19	30	15×10	150	26	676
20	53	12×9	108	−16	256
21	75	12×8	96	−28	764
22	17	12×8	96	−28	764
23	89	11×11	121	−3	9
24	121	9×9	81	−43	1849
25	14	9×8	72	−32	2704
26	15	7×6	42	−82	6724
Total			3225		118030
		Mean	124·00		

More than 2 mm thick

Sr. No.	Fruit No.	Size of fruit in mm		X_1	X_1^2
1	37	12×8	96	−67	4489
2	111	10×8	80	−83	6889
3	118	15×10	150	−13	169
4	100	18×16	288	125	15625
5	23	15×10	150	−13	169
6	28	12×10	120	−43	1849
7	87	12×12	144	−19	361
8	9	10×10	100	−63	3969
9	19	19×17	323	240	57600
10	98	15×12	180	17	289
11	124	15×11	165	2	4
12	79	13×7	91	−72	5184
13	21	16×15	240	77	5929
14	11	16×8	128	−35	1225
15	4	12×10	120	−43	1849
16	119	15×7	105	−58	3364
17	71	16×10	160	−3	9
18	5	12×12	144	−19	361
19	35	17×12	204	41	1681
20	44	16×11	176	13	169
21	107	12×12	144	−19	361
22	97	17×17	289	126	15876
Total			3587		127421·00
		Mean	163·04		

AXIS THICKNESS OF FRUIT

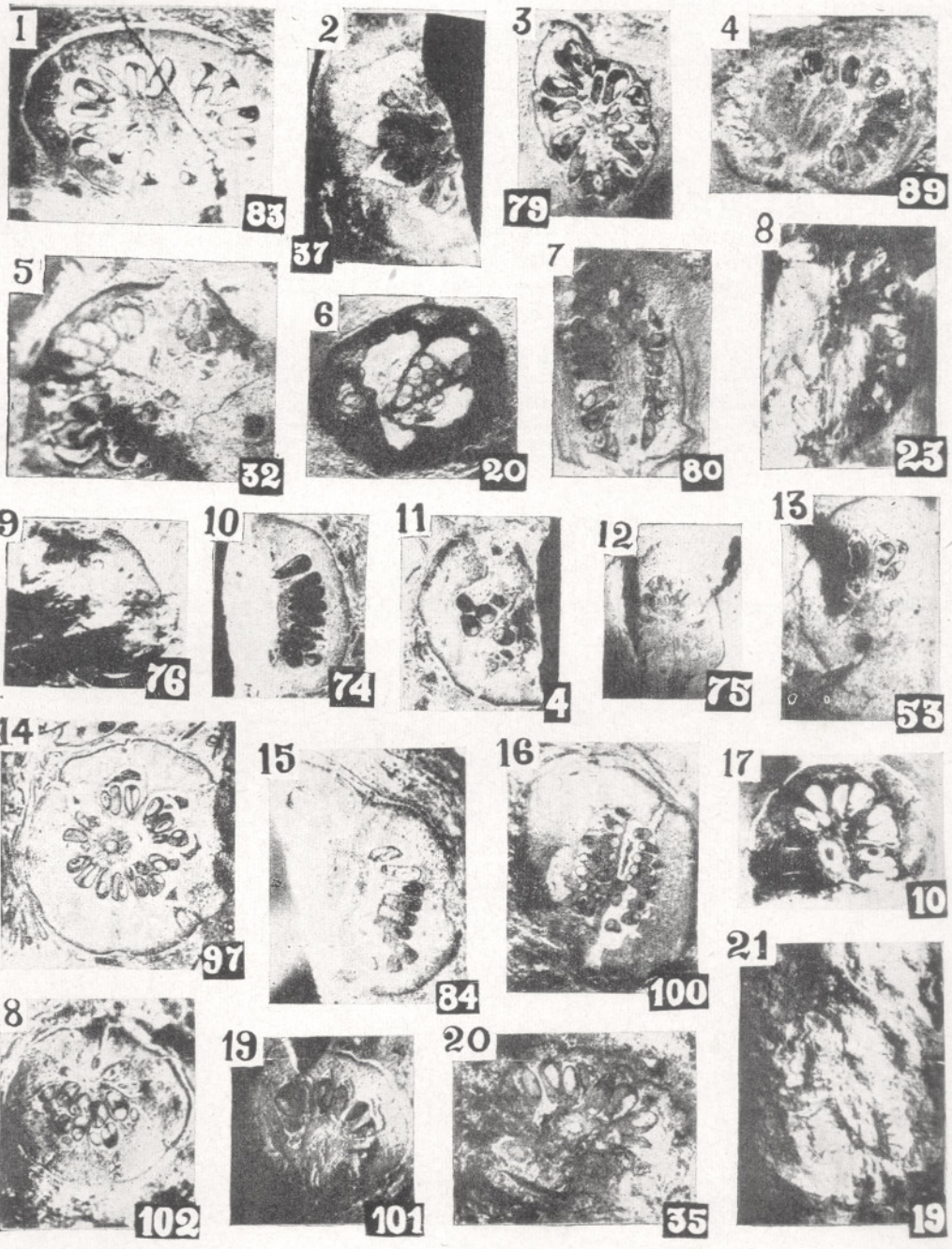
Here, the value of 't' is found smaller than the tabulated value 1·83, and hence the supposition that there is no significant difference in the two types of varieties cannot be rejected.

CONCLUSIONS

There exists correlation between the size of fruit and thickness of wall, thickness of wall and thickness of axis, and thickness of axis and length and breadth of seeds.

These correlations are positive and hence we expect, with the increase in size of fruit proportionate increase in the thickness of wall, thickness of seed and thickness of axis of the fruit. However, there are fruits in which thickness of wall of the fruit is more and the size of the fruit is small and the thickness of wall is less and the size of the fruit is large. The same is found true in the case of the axis of the fruit and fruit size.

Thus on the basis of the above facts these fruit samples were grouped into two: (1) thickness of fruit wall up to 2·0 mm and (2) thickness of fruit wall more than 2·0 mm. The same is done in the case of the axis.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From the statistical applications it has been observed that this grouping of fruits into two, stands true in the case of the fruit wall thickness and not of the axis thickness.

Hence, all these fruits are grouped into two varieties, A and B, on the basis of the wall thickness of the fruit.

Variety A will have the fruit wall less than 2 mm for 12×10 mm size of the fruit. *Variety* A will have the fruit wall more than 2 mm for the same size, 12×10 mm of the fruit. These varieties are named as follows:

Variety A, *Enigmocarpon parijai mohgaoense*

Variety B, *Enigmocarpon parijai intertrappea*

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REFERENCES

CRAMMER, H. (1958). Mathematical methods of Statistics. *Princeton Uni. Press.*

SAHNI, B. (1943). Indian Silicified Plants-II, *Enigmocarpon parijai*, a silicified fruit from the Deccan with a review of the fossil history of the Lythraceae. *Proc. Indian Acad. Sci.* **178**(3): 59-96.

EXPLANATION OF PLATES

ENIGMOCARPON PARIJAI

1-21. Photos of 21 specimens × 2. Numbers in black ink plate figure numbers and number in white ink fruit specimen numbers.

1-13. Fruit wall thickness 1·5-2 mm.

14-21. Fruit wall thickness above 2 mm.