













- d.  $a = 0.301 = 0.608$
- e.  $a = 0.608/0.301$
- f.  $a = 2.019$

Using the value of 'a' the expected values of 'y' has been determined in the following table:

TABLE IX OBSERVED VALUES AND EXPECTED VALUES OF Y

Number of papers	Number of authors (y) (observed value)	Number of authors (y) (with the value of authors i.e. $a=2.019$ )
1	2079	2079
2	513	512.95
3	205	226.22
4	92	126.53
5	59	80.65
6	29	55.81
7	28	40.88
8	13	31.22
9	13	24.61
10	7	19.9
11	8	16.41
12	4	13.77
13	4	11.71
14	2	10.08
15	3	8.77
16	1	7.7
17	1	6.81
18	3	6.07
19	2	5.44
20	1	4.9
23	1	3.7
28	1	2.48
30	1	2.16
37	1	1.41

*a. Goodness-of-Fit Tests*

There are several statistics available for goodness of fit tests. Among those tests, we used the t-test as goodness-of-fit tool.

To find out the suitability of Lotka's law in the observed author productivity distribution, compare the calculated value obtained 2.012 with the critical value of t as shown in the table X. For a two-tailed test with 46 degree of freedom we can read the critical value at the 0.05 level is 2.013. On comparing, the calculated value of t-test is smaller than the

critical value. Thus, the Lotka's law does fit in the observed given author productivity distribution of the first authors.

TABLE X SUITABILITY OF LOTKA'S LAW USING T- STATISTICAL TEST

Descriptive statistics	Variable 1	Variable 2
Mean	127.95833	137.4658
Variance	184720.04	183186.2
Observations	24	24
Pooled Variance	183953.14	
Hypothesized Mean Difference	0	
df	46	
t Stat	-0.07679	
P(T<=t) one-tail	0.4695619	
t Critical one-tail	1.6786604	
P(T<=t) two-tail	0.9391238	
t Critical two-tail	2.0128956	

**VII. FINDINGS AND CONCLUSIONS**

The major findings of this study are summarized as follows:

1. The maximum number of these contribution is 177 (45%) in the Calcutta University during the period of study.
2. The period from 2000 to 2012 is the most productive period. The highest numbers of 140 (35%) theses are submitted during this period. Average number of theses submission per year is 7.43.
3. The relative growth rate and doubling time for theses under study work out to 0.631 and 0.966 respectively during this period.
4. The most active supervisor with 31 (7.86%) research works to his credit is S. C. Mukhopadhyay from the Calcutta University.
5. Three hundred nine in numbers (78.68%) male researchers and the female researchers are eighty four (21.32%) only who submitted theses during the period of study.
6. The grand average number of citations per theses is 146 citations.
7. The highest number of citations recorded is from journals with 5568 (62%) citations.
8. The Lotka's law does fit in the observed given author productivity distribution of the first authors.

It is evident from the present study that research scholars carried out an extensive study on almost every sub-discipline of Earth Science during the period under study. It is also noticed that research scholars consulted vast range of related literature during their research work as evident from citations analysis. The rank list of journals is very useful in the acquisition of journals in the library and could also help in evaluating the importance of journals. It is assumed that an improved collection for earth science literature and their

accessibility will better support the research needs of future PhD scholars in the field of Earth Sciences.

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