Biswanath Dutta
(Editor)

Proceedings of International Conference on

Bridging the Gap: Trends in Library and Information Science

"Connecting Practice, Education, and Innovation"

LIB-BRIDGE 2026

LIB-BRIDGE

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Scientometric Portrait of Bharat Ratna Prof. C.N. R. Rao: A study

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Abstract. The present study deals with Scientometrics analysis of 143 research publications by Prof. CNR Rao for the period of ten years i.e. 2015 to 2024. The study focuses on publication pattern over the years, authorship pattern, citation analysis, h-index and Altmetrics of Prof. CNR Rao obtained by official webpage of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR). The study reveals that there is decrease in single authored articles i.e. 4.89% vs Multi authored articles 95.11%. Prof. CNR Rao has published highest number of articles in year 2015 with 20.27% and least number of articles in the year 2021 with 1.39%.

Keywords: Scientometrics, CNR Rao, Authorship pattern, Collaborations, Altmetrics, h-index.

1 Introduction

Scientometric portrait of scientists helps in identification of individual contribution to the field of the study. It also helps to identify the growth of research publications by year-wise, Country-wise and pattern of collaboration with other authors. A prominent scientist Prof. CNR Rao who is contributing to the field of Solid State Chemistry, Atomic Layer Deposition & Pulsed Laser Deposition, Two Dimensional Materials & Catalysis event at age of 91 years who has received Bharat Ratna has to be celebrated in every aspect of scientific research. His contribution to the field of Chemistry has inspired & will be inspiring many millions of Scientists, Researchers, students and even layman's in their day to day Life.

2 About C.N.R. Rao

C.N.R. Rao was born on 30 June 1934, Bangalore, India, received the M.Sc. degree from Banaras in 1953, Ph.D. from Purdue in 1958, D.Sc. from Mysore University in 1960. He is Honorary President and Linus Pauling Research Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research.

He is also an Honorary Professor at the Indian Institute of Science. His main research interests are in solid state and materials chemistry. He is an author of over 1774 research papers and 54 books. He has received honoris causa doctorate degrees from 84 universities including Purdue, Prof. C.N.R. Rao was awarded the Bharat Ratna in 2014 for his significant contributions to chemistry and materials science, becoming the third scientist to receive India's highest civilian honour, Among the various medals, honours and awards received by him, mention may be made of the Marlow Medal of the Faraday Society (1967), Bhatnagar Prize (1968), Padma Shri (1974), Royal Society of Chemistry (London) Medal (1981), Padma Vibhushan (1985), Honorary Fellowship of the Royal Society of Chemistry, London (1989), Blackett Lectureship of the Royal Society (1991), Einstein Gold Medal of UNESCO (1996), Linnett Professorship of the University of Cambridge (1998), Centenary Medal of the Royal Society of Chemistry (2000), Hughes Medal of the Royal Society for original discovery in physical sciences (2000), Karnataka Ratna (2001), the Order of Scientific Merit (Grand-Cross) from the President of Brazil (2002) and the Somiya Award of the International Union of Materials Research (2004).

3 Objectives and Methodology of the Study

Bharat Ratna Prof. C.N.R. Rao's publications has been taken from official website of Jawaharlal Nehru Centre for Advanced Scientific Research for the Scientometric analysis which excludes reviews, book chapters, editorials

etc. concentrating only on research articles. Lots of Scientometric studies of Prof. C N R Rao have been carried out in the past i.e. 1956 to 1975 by Gadad & Ravi (2018), 1957-2013 by Ahirwal & Pathak (2015), from 2010-2017 by Gadad, Ravi, Savannuru (2019), Mulla et.al (2010) studies bibliometric analysis of Prof. C N R Rao literature from 1989 to 2008 to study research output, there is gap in earlier studies which can be observed in these articles, even our study is restricted for the period of ten years i.e. 2015-2024. The data from updated website has been taken till December -15th 2025.

The total numbers of research articles are 143 papers including 2 papers published in 2025. The data available from Jawaharlal Nehru Centre for Advanced Scientific research covers all the articles of Prof. C N R Rao along with Altmetric data and citations received by article i.e. year-wise. The past studies don't investigate these criteria of Altmetrics, updated citations, hence our study covers extensive articles from 1957 to 2025 for h-index, citations, google scholar data and Altmetrics.

The objectives of the Study are:

- To study year wise publications of Bharat Ratna Prof. C.N.R. Rao
- To analyse growth pattern of research publications
- To understand authorship pattern and degree of collaboration in publications
- To study citation and h-index of Bharat Ratna Prof. C.N.R. Rao
- To study Altmetrics of Bharat Ratna Prof. C.N.R. Rao publications.

4 Data Analysis and Interpretation

Table 1. Publication wise

Sl. No.	Publications	Total In Numbers	Percentage
1.	Research articles	1500	83.79
2.	Book chapter	82	4.58
3.	Conference proceedings	37	2.06
4.	Reviews	62	3.46
5.	Editorial	40	2.23
6.	Books	31	1.73
7.	Letters	17	0.94
8.	Notes	15	0.83
9.	Short survey	6	0.33
	Total	**1790**	**100**

Table -1 shows publication wise distribution of articles published by Prof. CNR Rao during the period of 1957 to 2025 i.e. 1790 and more than 1500(83.79) research articles,82 (4.58) book chapters followed by conference proceedings with 37(2.06) articles. Reviews are 62(3.46) followed by editorial articles with 40(2.23), 31(1.73) books, followed by letters with 17(0.94), notes with 15(0.83) and lastly short surveys with 6(0.33) which supports that his major part of communications are research articles and less are short surveys.

Table 2. Year-Wise Publications

Sl. No.	Years	No. of. Articles	Percentage
1.	2015	29	20.27
2.	2016	23	16.08
3.	2017	17	11.88
4.	2018	19	13.28
5.	2019	16	11.18
6.	2020	14	9.79
7.	2021	2	1.39
8.	2022	8	5.59
9.	2023	8	5.59
10.	2024	5	3.49
11.	2025	2	1.39
	Total	**143**	**100**

Table-2 shows year-wise publications of Prof. C N R Rao during the period of 2015-2025. Highest number of articles were published during 2015 with 20.27% articles and lowest number of articles were published during 2021 with 1.39%.

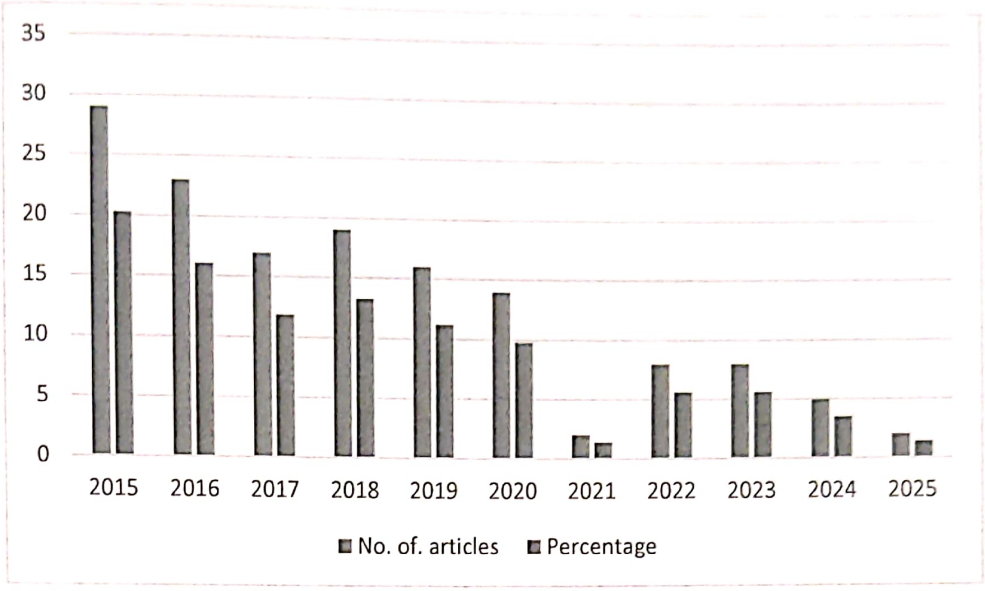


Fig.1. Year-wise publication of Prof. C N R Rao

Table 3. Citations & Cross reference Citations

Sl. No.	Years	Citations	Percentage	Cross Reference Citations	Percentage
1	2015	1607	32.99	1527	32.24
2	2016	1027	19.07	999	21.09
3	2017	929	19.07	941	19.86
4	2018	411	8.43	404	8.53
5	2019	486	9.97	450	9.50
6	2020	184	3.77	188	3.96
7	2021	34	0.69	34	0.71
8	2022	91	1.86	92	1.94
9	2023	77	1.58	76	1.60
10	2024	24	0.49	25	0.52
11	2025	0	0	0	0
	Total	**4870**	**100**	**4736**	**100**

Table-3 shows citations & cross reference citations received for articles by Prof. C N R Rao published during 2015 -2025. Highest number of articles i.e. 29 and highest number of citations i.e. 1607 are received in 2015, over the years there is decrease in number of citations. Least number of citations are received in 2024 & 2025.

Figure 2. Citation Analysis

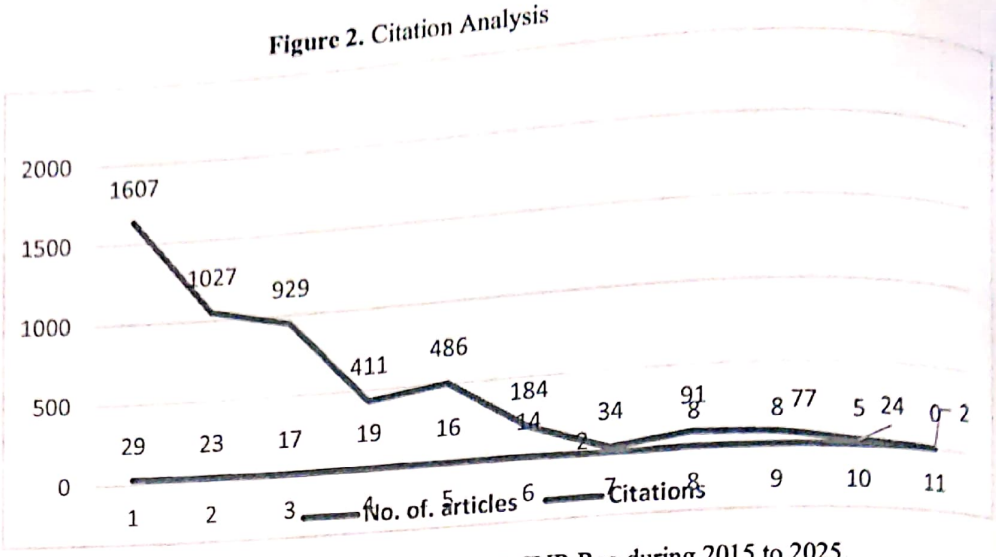


Fig.2. Citation analysis of articles published by Prof. CNR Rao during 2015 to 2025.

Table 4. Authorship Pattern

Year	1 Author	2 Authors	3 Authors	4 Authors	5 Authors	6 Authors	More Than 6 Authors	Total
2015	1	2	7	7	5	6	1	29
2016	1	2	3	6	5	5	1	23
2017	0	1	3	5	1	3	4	17
2018	1	1	1	4	4	4	4	19
2019	2	1	0	1	2	8	2	16
2020	2	1	1	6	1	2	1	14
2021	0	0	0	1	0	1	0	2
2022	0	2	1	3	1	1	0	8
2023	0	1	0	2	3	2	0	8
2024	0	0	1	2	1	1	0	5
2025	0	1	1	0	0	0	0	2
Total	7	12	18	37	23	33	13	143
Pert%	**4.89**	**8.39**	**12.58**	**25.87**	**16.08**	**23.07**	**9.09**	**100**

Table-4 shows authorship patterns of publications by Prof. C N R Rao during 2015 to 2025. Single authored articles are 4.89% and Multiple authored articles 95.11%. Among multi-authored articles 4-authored articles are highest with 25.87% and lowest are 2-authored articles with 8.39%.

Table 4. Degree of Collaboration

Sl. No.	Year	Single	Multi-authored	Degree of Collaboration
1	2015	1	28	0.96
2	2016	1	22	0.75
3	2017	0	17	0.58
4	2018	1	18	0.62
5	2019	2	14	0.48
6	2020	2	12	0.41
7	2021	0	2	0.06
8	2022	0	8	0.27

9	2023	0	8	0.27
10	2024	0	5	0.17
11	2025	0	2	0.06
	Total	7	136	0.95
	Percentage	**4.89**	**95.11**	

Table -5 depicts degree of collaboration in research articles published by Prof. C N R Rao during 2015 to 2025. The degree of collaboration is 0.95 for research articles published by Prof. C N R Rao. The degree of collaboration is calculated using the formula proposed by Subramanyam (1983) and has been computed as under:

$C=Nm/Nm+Ns$

C: Degree of Collaboration (value typically between 0 and 1)

Nm: Number of multiple-authored papers

Ns: Number of single-authored papers

Table 6. Citations

Sl. No	Type	Total In Numbers
1	Citations	106815
2	Cross –reference citations	96344
3	H - index	151

Table-6 shows citations data obtained from the vidwan webpage which depicts that for 1707 articles, 106815 citations were received from 1957 to 2025. 96344 cross reference citations were received which in total gives H-index of 151 for Prof. C N R Rao.

Table 7. Altmetrics

Sl. No	Type	Total in Numbers
1	Google scholar	283
2	Facebook	176
3	X(Twitter)	984
4	G+	193
5	Cross reference	69666

Table-7 depicts Altmetrics data of Prof. CNR Rao, which shows in google scholar Prof. CNR Rao has 283 citations or occurrences. 176 Facebook, 984 twitter and G+ with 193 but Cross reference is 69666 which is highest among Altmetrics data obtained from Vidwan web page.

Table 8. Google Scholar

Sl. No	Type	Total in Numbers	Total in Numbers (IN 2020)
1	Citations	124080	27090
2	h-index	165	77
3	I10–index	1214	60

Table-8 shows google scholar data of Prof. CNR Rao, 124080 citations were received in total and 27090 citations were received till 2020. The H-index of Prof. CNR Rao is 165 and 77 in the year 2020. I10 –index is 1214 and 60 in the year 2020.

5 Findings

i. Prof. CNR Rao has published 143 research articles during 2015 to 2025 and more than 1790 publications from 1957 to 2025.

ii. Highest number of articles were published during 2015 with 29(20.27%) and less number of articles i.e. 2(1.39%) in 2021.

iii. A Total of 4807 citations are received during 2015 to 2025 and the highest number of citations i.e. 1607 are received in 2015 and 24 citations are received during 2024.
iv. Single authored articles are 7(4.89%) and multi-authored articles are 136(95.11%).
v. The Degree of collaboration is 0.95 which proves highest number of articles are produced by collaboration.
vi. Altmetrics and google scholar data shows that Prof. C N R Rao has an h-index of 151 with more than 106815 citations.

6 Conclusion

Prof. C N R Rao has published more than 1790 articles over the period of 1957 to 2025 and still he is publishing extensively at the age of 91years. Many Scientometrics studies have been carried early with time constraint, even our study is limited to ten years of publications, an extensive study can be carried out which includes all of his publications till date. His most preferred channel of communication is research articles i.e. more than 1500 and less preferred mode of communications is short surveys. Over the years it can be observed that single authored articles are decreasing and multi-authored articles are increasing and citations of articles are more compared to Altmetrics data, this might be because his communications are more in scientific journals and social media access to these are very much restricted. Prof. C N R Rao's legacy continues to grow over time and his contributions have to be celebrated in every way.

Declaration of AI and AI-Assisted Technologies used in Manuscript Writing: Not Applicable

References

1. Ahirwal, Ashish Kumar & Pathak, Sandeep Kumar (2015). Scientometric portrait of Bharat Ratna Professor C N R Rao: A Study. IJESR, 3(11), 54-80.
2. Eleventh COLLNET Meeting, October 19 – 22, 2010, University of Mysore.
3. Gadad Raju & Ravi B. (2018). Publication productivity of Bharat Ratna Prof. C N R Rao during 1956-1975: A Scientometric Portrait. IJLS, 8(2), pp282-287.
4. Gadad Raju, Ravi, B. & Savanur, Kiran (2019). Highly cited paper of Bharat Ratna Prof, C N R Rao: Scientometric attempt. Asian Journal of Information Science & Technology. 9(1). pp91-94.
5. Gadad, Raju. & Ravi, B. (2016). Nobel Laureate TC Sudof: A Scientometric Portrait. Journal of Research in Librarianship, 3(6), pp. 11-18.
6. Gadad, Raju. & Ravi, B. (2017). Nobel Laureate Prof. M.B. Moser: A Scientometric Portrait. ISST Journal of Advances in Librarianship, 8(2), pp. 18-26.
7. Jawaharlal Nehru Centre for Advanced Scientific Research | IRINS. (2025). Irins.org. https://jncasr.irins.org//
8. K.R. Mulla & et. ella (2010) A STUDY ON BIOBIBLIOMETICS ANALYSIS OF PROF. C. N. R. RAO 'S RESEARCH PUBLICATIONS in Sixth International Conference on Webometrics, Informatics and Scientometrics &
9. Kalyane, V.L. & Sen B.K. (1996) Scientometric portrait of Nobel laureate Pierre-Gilles de Gennes. Malaysian Journal of Lib.Infor.Sci. 1(2), pp.13-26.
10. Kulkarni, Manoj (1997) Bibliometric Portrait of Scientist working on yoga. IASLIC Bulletin, 42(4), pp.185-88.
11. Nagarjuna, P., & Javali, S. I. (2015). Highly Cited Paper from Indian Institute of Science, Bengaluru, India during 2001-14: A Scientometrics Analysis Case Study. In 10th International CALIBER-2015. HP University and IIAS, Shimla, Himachal Pradesh, India March 12-14,
12. Sangam, S L. et al. (2006). Scientometric portrait of Prof. Peter John Wyllie. Scientometrics, 66(1), 43-53