Article ID No. 2804 DOI No. https://doi.org/10.5281/zenodo.21214706

Ornithological Research in India Evolved in Recent Years: A Bibliometric Inquiry

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Abstract:

The present study discusses the bibliometric analysis of Indian ornithology and avian research during one of the phases of academic research between 2016 and 2025. The research used OpenAlex as the main data resource and involved 6,653 English language articles related to Indian institutions and conducted through Bibilometrix (R-Biblioshiny) and MS Excel. The study focuses on publication trends, authors and collaborations, main institutions, sources of publishing, and thematic trends of ornithology research in India. It is found that there is an upward trend for ornithological publications, especially since 2020, a high level of research collaboration, and the role of ICAR institutions and agricultural universities. As for thematic trends, a dominance of biologic and ecology trends and an increasing interdisciplinary approach, including cooperation with veterinary medicine, genetics, computer science, and engineering.

Keywords: *Ornithology; Avian Studies; Bibliometrics; OpenAlex; India*

1. Introduction:

In India, ornithology has shifted from being an early descriptive discipline to an evolving scientific field that is closely intertwined with several other sciences, including ecology, conservation biology, veterinary science, and new techniques involving computation. With over 1,375 species of birds in India, one of the mega diverse nations in the world, there are still many deficiencies in research concerning documentation at the species level, long-term observation, and ecological investigations within regions (Mahanta, Tripathi & Pradhan, 2025)[1]. There have been increasing trends in scholarship in recent years focusing on various anthropogenic issues including climate change, habitat alteration, and urbanization (Deomurari, Jathar & Jathar, 2023)[2]. In addition to thematic development, Indian ornithology has witnessed a methodological change, aided by digital databases, open access tools, and citizen science projects (Thrikkadeeri & Viswanathan, 2024)[3]. The use of bibliometric approaches provides a scientific way of measuring the intellectual

[1] Mahanta, G., Tripathy, B., & Pradhan, S. (2025). Avian diversity and habitat preferences in scrubland ecosystems of the Eastern Ghats of southern Odisha, India. Land, 14(3), 511. https://doi.org/10.3390/land14030511

[2] Deomurari, A., Jathar, G., & Jathar, P. (2023). Projected shifts in bird distribution in India under climate change. Diversity, 15(3), 404. https://doi.org/10.3390/d15030404

[3] Thrikkadeeri, K. and Viswanathan, A. (2024). Despite short-lived changes, COVID-19 pandemic had minimal large-scale impact on citizen science participation in India. Ornithological Applications, 126(4). https://doi.org/10.1093/ornithapp/duae024

development through analyzing the number of publications, collaborations, institutional performance, and thematic development. The term bibliometrics was first introduced by Pritchard (1969)[4], who defined it as the use of mathematical and statistical techniques on writing communications.

Despite the increasing number of ornithological publications in India, the application of bibliometrics to create a map of the discipline in a national context is still insufficient. In an attempt to fill this vacuum, the current paper uses bibliometrics and scientometrics to develop a map of contemporary Indian ornithological research.

2. Previous Studies:

The scholarly debate regarding ornithology in India has focused on its evolutionary development into the information age, which is characterized by easy access to databases and high demands for readily available primary sources (Shyamal, 2007)[5]. The early analysis by Ali (1971)[6] presented an important historical perspective on ornithology in India, emphasizing the evolution from observations to science-based research. Studies on bibliometrics within ornithological publications have been limited. In a study conducted by Vellaichamy and Jeyshankar (2020)[7], it was found that there was domination by authors from Europe as well as collaborative research publication trends in the Journal of Ornithology. In addition, Quader, Goswami & Sankaran (2025)[8] listed down 101 research questions prioritized in India.

Apart from ornithology, other bibliometric studies in environmental sciences and LIS highlight the usefulness of quantitative mapping methods in assessing research productivity, collaborations, and theme changes (Khanna, Singh & Kaur, 2018)[9]. The work of Derviş (2019)[10] and Harsanto (2021)[11] confirms that Bibliometrix is suitable for analyzing the scientific

[4] Pritchard, A. (1969). Statistical bibliography or bibliometrics? Journal of Documentation, 25(4), 348-349.
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landscape, whereas the study conducted by Alperin et al. (2024)[12] confirms that OpenAlex can be used as an effective replacement for proprietary databases in bibliometric analysis at the national level.

Aslam et al. (2021)[13] carried out an assessment of research productivity and scholarly communication about digital and online resources in academic libraries published from 1981 to 2020. Within the context of environmental science, Bathri Narayanan (2016)[14] undertook a scient metric study that involved analyzing the publications about pollution control in India within the Scopus database. The importance of applying bibliometric approach in assessment of research in Library and Information Science in the twenty-first century was highlighted by Mondal (2021)[15]. Similarly, Siddique et al. (2020)[16] assessed the research performance of Library and Information Science discipline in Pakistan for the years 1957 to 2018. Therefore, it is evident that there is a lack of bibliometric research that can be effectively applied to the field of Indian ornithology; and precisely for this reason, this study has become necessary.

3. Objectives:

Objectives of the Study Include:

(i) Analyzing the trend in growth in the field of ornithology and bird-related research articles in India from 2016-2025;
(ii) Identifying the topmost authors and institutions in this field;
(iii) Studying the sources and means of scholarly communication in the field;
(iv) Analyzing the themes in the field of ornithology and bird-related studies in India.

4. Methodology:

In this study, a systematic approach was followed to analyze the research landscape on ornithological and avian research in India. The data for analysis were collected through the OpenAlex database as of 28 December 2025, using the following bibliometric keywords: “ornithology” OR “birds” OR “avian”. In the first run, the number of records generated was

[12] Alperin, J. P., Muñoz Nieves, C., Schimanski, L. A., Fischman, G. E., Niles, M. T., & McKiernan, E. C. (2024). An analysis of the suitability of OpenAlex for bibliometric analyses. https://doi.org/10.48550/arXiv.2404.17663

[13] Aslam, S., Ahmad, S. and Zafar, A. (2021). Research on digital and online resources of academic libraries from 1981 to 2020: A bibliometric analysis. Library Philosophy and Practice (e-journal), 1-17.

[14] Bathri Narayanan, L. (2016). Pollution control research output in India from Scopus database: A scientometric analysis. International Journal of Information Movement, 1(4), 22-28.

[15] Mondal, H. (2021). Bibliometrics approach on library and information science in the 21st century. In Handbook of metric studies for library and information science scholars (1st ed., pp. 10-22).

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590,000 globally. After filtering only those records with some Indian affiliation, the record number dropped to 10,900. Application of the time filter (between 2016 and 2025) reduced the number of records to 7,314 records. Application of the language filter (English) further reduced the number of records to 7,166 records. Finally, applying filters for types of documents such as articles, book chapters, reviews, books, and reports decreased the total records to 6,653 records.

All references were collected and organized in Mendeley Reference Manager for efficient organization, removal of duplicate articles, and correct citation. The data analysis stage comprised bibliometric analysis, involving publication outputs, authors' patterns, source titles, and organizations publishing the research. The bibliometric analysis stage used the Bibliometrix package (via the Bibilioshiny interface) and Microsoft Excel software tools.

5. Data Collections and Analysis:

Table 1: Descriptive Statistics of Indian Ornithology and Avian Research

Description	Value	Description	Value	Document Types	Frequency
Timespan	2016-2025	Keywords Plus (ID)	7936	article	5733
Sources (Journals, Books, etc)	2085	Author's Keywords (DE)	7820	book	12
Documents	6653	Authors	19463	book-chapter	595
Annual Growth Rate %	0.58	Authors of single-authored docs	577	report	2
Document Average Age	4.11	Single-authored docs	659	review	311
Average citations per doc	8.036	Co-Authors per Doc	4.33		
References	164839	International co-authorships %	18.02		

The Indian ornithology and bird research during the period between 2016 and 2025 involves 6,653 scientific papers found in 2,085 publications, showing a consistent but moderate annual growth of 0.58%. The mean document age of 4.11 reflects the relative contemporaneity of research studies conducted in the area, with the average number of citations per document being 8.036. The considerable number of references per paper, namely 164,839, attests to the active involvement in the previous literature of scientific value. Diverse themes can be identified from the use of 7,936 Keywords Plus and 7,820 author-keywords, which reflect the wide conceptual framework of research studies in the area. Collaboration is also indicated by the high

number of authors involved in the process, namely 19,463 researchers, where only a few papers are single-author papers. The average number of collaborators per paper is 4.33, with the international collaboration index reaching 18.02%. Regarding the type of documents published in ornithology, journal articles dominate the list of document types followed by book chapters, review articles, with book papers and report papers being very rare (see Table 1).

5.1. Growth Trends in Indian Ornithology Research:

Figure 1 represents the trend in yearly publication of ornithology and avian science in India between the years 2016 to 2025. It can be seen that there has been a rise in publication of research in these areas from 2016 (394 papers) to 2018 (552 papers), after which there has been a fall in the number of publications in 2019. Thereafter, there is a rapid growth phase from 2020, corresponding to increasing interest in academic research in areas of biodiversity, ecology, and conservation, resulting in a peak in the year 2023 with 1,009 publications. This indicates rising interest and an increase in collaboration-based research during the post-2020 era. It must be noted that there is a sharp fall in publications in 2024 and 2025, probably due to lag effect in publications or indexing of papers published in recent years.

Year	Articles
2016	394
2017	527
2018	552
2019	519
2020	758
2021	800
2022	943
2023	1009
2024	736
2025	415

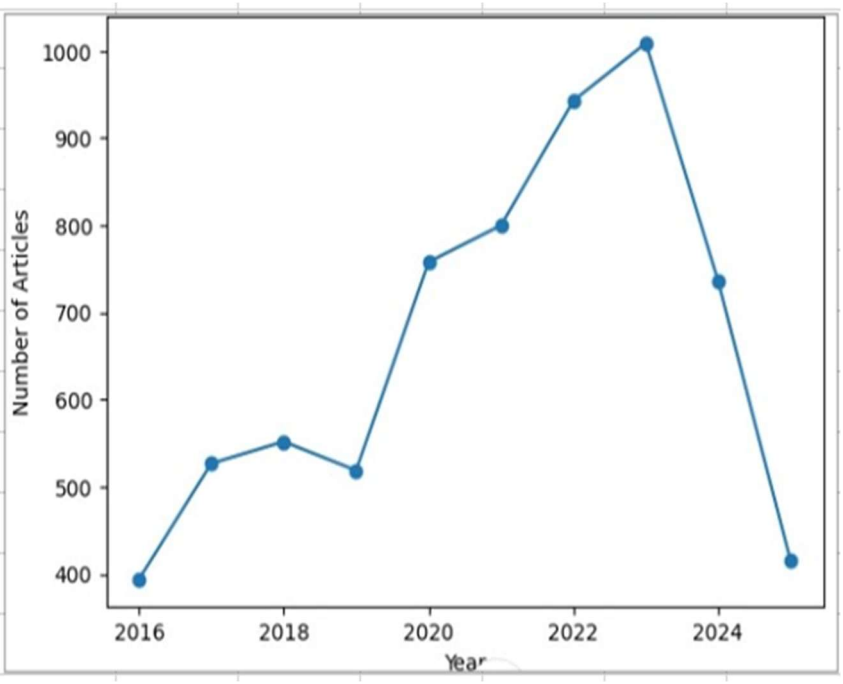

Fig-1: Growth Trends in Indian Ornithology Research

5.2. Leading Authors and Institutions in Avian Studies:

Table 2: Top Contributing Authors and their Institutional Affiliations in Ornithology and Avian Research

Rank	Author	Affiliation	Articles	Fractionalized Articles
1	Vinod Kumar	University of Delhi	63	17.68
2	Yashpal Singh Malik	Guru Angad Dev Veterinary and Animal Sciences University	60	11.07
3	Kuldeep Dhama	ICAR-Indian Veterinary Research Institute	57	7.66
4	Manoj Kumar	ICAR-National Institute of High Security Animal Diseases	43	9.26
5	Indranil Samanta	West Bengal University of Animal & Fishery Sciences	36	9.60
6	Sangeeta Rani	University of Lucknow	36	7.74
7	S. V. Rama Rao	Sri Ramadhootha Poultry Research Farm Pvt. Ltd.	35	7.94
8	Sachin Kumar	Indian Institute of Technology Guwahati	34	9.84
9	Shalie Malik	University of Lucknow	34	7.39
10	Avishek Biswas	ICAR-Central Avian Research Institute	31	4.93

This table (Table 2) presents the most productive authors who have made significant contributions to the field of ornithology and avian research in India between 2016-2025, both in terms of individual production and institutional representation. Vinod Kumar of the University of Delhi stands out as the key contributor with 63 publications. It is followed by the high productivity of authors Yashpal Singh Malik and Kuldeep Dhama associated with veterinary and agricultural research institutes. Their affiliation with such institutions reflects the prominent contribution of applied and disease-based avian research in India. Besides, the inclusion of several authors from ICAR institutions and State Universities reflects the important contribution of public institutions in the research output on ornithology in India. In addition to this, the fractionalization of article number helps in understanding the difference in collaboration between various authors, implying the extensive networking of some authors compared to others who publish through limited teams of researchers.

5.3. Regional Distribution of Leading Institutions

Table 3: Leading Institutional Affiliations in Indian Ornithology and Avian Research.

Rank	Affiliation	State	Articles
1	ICAR-Indian Veterinary Research Institute	Uttar Pradesh	403
2	ICAR-Central Avian Research Institute	Uttar Pradesh	363
3	West Bengal University of Animal and Fishery Sciences	West Bengal	320
4	Assam Agricultural University	Assam	313
5	Tamil Nadu Veterinary and Animal Sciences University	Tamil Nadu	300
6	University of Delhi	Delhi	281
7	Indian Veterinary Research Institute	Uttar Pradesh	261
8	ICAR-Directorate of Poultry Research	Telangana	257
9	Guru Angad Dev Veterinary and Animal Sciences University	Punjab	249
10	Wildlife Institute of India	Uttarakhand	242

A state-wise breakdown of prominent institutional affiliations in Indian ornithology and avian research throws light on the regional focus and dispersion of the field in India (Table 3). An obvious clustering of high-output institutions can be seen in the state of Uttar Pradesh, home to several premier ICAR-affiliated institutes, thus demonstrating the significance of the state in conducting veterinary, poultry and avian disease-centered research. West Bengal and Assam emerge as important players in eastern India, as a result of consistent academic interest in animals, fisheries and biodiversity research. Tamil Nadu and Punjab have their own contributions in this area owing to the existence of specialized universities in the region; the contribution from central universities, such as the University of Delhi, along with the Wildlife Institute of India in Uttarakhand is also significant.

5.4. Source-wise Publication Outlets

Table 4: Top Sources Publishing Indian Ornithology and Avian Research.

Rank	Source	Articles
1	Unidentified	548
2	International Journal of Current Microbiology and Applied Sciences	275
3	The Indian Journal of Animal Sciences	186
4	Zenodo (CERN European Organization for Nuclear Research)	164
5	Journal of Threatened Taxa	141
6	Indian Journal of Animal Research	137
7	Scientific Reports	66
8	Elsevier eBooks	62
9	SSRN Electronic Journal	43
10	Journal of Animal Research	42
11	The Indian Journal of Veterinary Sciences and Biotechnology	37

Table 4 above illustrates the main publication outlets that are influencing Indian ornithology and birds studies. Animal and veterinary journals play the central role in scientific research, as the discipline is both applied and biological. The availability of open access repositories such as Zenodo and SSRN points to an increasing trend toward open dissemination. Scientific Reports and the Journal of Threatened Taxa are examples of foreign publication outlets used in the field.

5.5. Thematic Orientation and Interdisciplinary Trends

Table 5: Top Subject Terms and Their Frequency in Indian Ornithology and Avian Research.

Rank	Term	Frequency
1	Biology	4,906
2	Ecology	2,532
3	Medicine	2,109
4	Geography	1,766
5	Computer Science	1,511
6	Genetics	951
7	Animal Science	874
8	Engineering	843
9	Gene	843
10	Veterinary Medicine	813

This table 5 shows some of the major topics of research in the field of ornithology in India. These include biology and ecology, which are still central disciplines. Medicine and veterinary sciences have a relatively high frequency, which indicates that there is an applied emphasis within the subject. Geography suggests geographical studies, while computer science and engineering reflect more on the interdisciplinary aspect of this field using technology. The inclusion of genetics and genes also show that there is much importance attached to genetics within the field.

6. Discussion:

The results demonstrate the emergence of an increasingly vibrant ornithological research community in India, with a marked increase in publications following 2020. The increasing number of publications is linked to increasing concerns about biodiversity conservation, climate change, and zoonotic diseases at the global and national level. Multi-author papers and relatively moderate levels of international collaboration point to a developing research community characterized by increasing cooperation among researchers.

A comparison of institutional data shows the key importance of ICAR institutes and agricultural universities in India as contributors to the development of ornithology through applied

veterinary and poultry-related studies. At the same time, it must be noted that the existence of conservation-focused organizations and their scientific publications demonstrate an increasing trend towards ecologically and biodiversity-oriented research.

7. Scope of the Study:

The coverage for this analysis will be restricted to studies written in English language and available in the OpenAlex database between 2016 and 2025. Even though the coverage in terms of open metadata by OpenAlex is broad and wide-ranging, certain differences in sources' standardization and delay in indexing can be expected to have an effect on more recently published articles.

8. Conclusion:

The bibliometric study presents a systematic map of ornithology and bird research in India at a relatively recent stage of its academic evolution. It is shown that there is stable growth, a tendency towards collaboration, clustering of institutions in agronomically and ecologically important areas, as well as a growing interdisciplinary nature of the field. Through the identification of major authors, topical directions, and publishing platforms, this study presents a systematic tool for use by researchers, policy-makers, and information specialists. Possible future research could expand on this study using citation network mapping and altimetric, among other methods.

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