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Authorship Pattern And Degree Of Collaboration In Marine Pollution Research Output

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Abstract

This scientometric analysis aims to investigate the authorship patterns and degree of collaboration in marine pollution research output. By analyzing a comprehensive dataset of relevant articles obtained from a research database, this study examines the authorship distribution, authorship order, and collaboration dynamics within the field of marine pollution.

The analysis begins by collecting a dataset of marine pollution research articles using appropriate search terms. The authors' information, including their affiliations, is extracted for further analysis. The authorship distribution is explored by determining the average number of authors per article, identifying single-authored and multi-authored papers, and analyzing the distribution pattern.

Furthermore, the authorship order is investigated to identify trends such as the prevalence of first authors, last authors, and corresponding authors in marine pollution research output. This analysis provides insights into the roles and contributions of different authors within the field.

The collaboration dynamics are examined by constructing a collaboration network based on co-authorship relationships. By linking authors who have collaborated on papers, clusters or communities of researchers can be identified. The degree of collaboration is quantified using collaboration indices, such as the Collaboration Coefficient, which measures the average number of authors per paper.

Additionally, institutional collaboration is explored to determine the extent of collaboration among different institutions, organizations, or countries. This analysis sheds light on the collaborative networks and relationships within the marine pollution research community.

Visualizations, such as network diagrams, co-authorship maps, and collaboration matrices, are employed to effectively represent the authorship patterns and collaboration relationships discovered in the analysis.

The findings of this scientometric analysis provide valuable insights into the authorship patterns and degree of collaboration in marine pollution research output. The interpretation and discussion of these findings contribute to a better understanding of the research dynamics and collaborative trends in this field. Moreover, the results can inform researchers, institutions, and policymakers about the collaborative landscape in marine pollution research and facilitate future collaborations and interdisciplinary efforts to address this critical environmental issue.

Introduction:

Marine pollution is a pressing global environmental issue that poses significant threats to the health of marine ecosystems and the well-being of human populations. Understanding the state of research in this field, including authorship patterns and collaboration dynamics, is essential for evaluating the progress, identifying research gaps, and fostering effective interdisciplinary collaborations.

Scientometric analysis provides a systematic and quantitative approach to studying scientific literature, enabling researchers to analyze publication patterns, authorship trends, and collaborative networks. By applying scientometric methods to marine pollution research output, valuable insights can be gained regarding the authorship patterns and degree of collaboration within the field.

Authorship patterns play a crucial role in understanding the research landscape. Examining the distribution of authors per publication provides insights into the level of collaboration and the extent of teamwork within the field. It can reveal whether marine pollution research is predominantly conducted by individual researchers or if multi-authored papers are more prevalent. Additionally, analyzing the order of authors within publications can shed light on the roles and contributions of different authors, such as first authors who may be early-career researchers, last authors who often represent senior researchers or principal investigators, and corresponding authors who handle the correspondence and communication aspects.

Collaboration is a fundamental aspect of scientific research and plays a vital role in addressing complex environmental challenges like marine pollution. By analyzing collaboration dynamics, such as co-authorship networks, researchers can identify clusters or communities of authors who frequently collaborate. Understanding the patterns of collaboration can provide insights into the interdisciplinarity of marine pollution research and the relationships among researchers from different institutions, organizations, or countries. Furthermore, tracking changes in collaboration patterns over time can reveal evolving research trends and the impact of initiatives aimed at promoting collaboration and knowledge exchange in this field.

By conducting a scientometric analysis on marine pollution research output, we can gain a comprehensive understanding of the authorship patterns and degree of collaboration. This knowledge can facilitate evidence-based decision-making, foster interdisciplinary collaborations, and guide future research directions. The following sections will outline the methods and findings of the scientometric analysis, shedding light on the authorship patterns and collaboration dynamics within the field of marine pollution research.

Methodology:

The methodology section outlines the steps taken to conduct the scientometric analysis of authorship patterns and the degree of collaboration in marine pollution research output. The following steps were followed:

Data Collection: A comprehensive dataset of relevant research articles on marine pollution was obtained from a reputable research database such as Web of Science. The dataset was retrieved using appropriate search terms related to marine pollution, such as "marine pollution," "ocean pollution," "coastal pollution," etc.

Data Extraction: From the collected dataset, relevant information was extracted for analysis. This included details such as article titles, authors' names, affiliations, publication year, and other bibliographic data.

Authorship Analysis:

a. Authorship Distribution: The number of authors per article was determined, and the distribution pattern was analyzed. Parameters such as the average number of authors per article, the percentage of single-authored papers, and the percentage of multi-authored papers were calculated.

b. Authorship Order: The order of authors within each article was examined to identify trends. This involved determining the frequency of first authors, last authors, and corresponding authors.

c. Authorship Network: A collaboration network was constructed based on co-authorship relationships. Authors who had collaborated on one or more papers were linked, forming a network. Network analysis techniques, such as social network analysis, were employed to identify clusters or communities of collaborating authors.

Collaboration Analysis:

a. Collaboration Indices: Collaboration indices were calculated to measure the degree of collaboration. These could include the Collaboration Coefficient, which represents the average number of authors per article, or other relevant indices.

b. Collaboration Dynamics: Changes in collaboration patterns over time were analyzed to identify trends. This involved examining the growth of collaborative research and the emergence of new collaborative networks or partnerships.

c. Institutional Collaboration: The affiliations of authors were analyzed to determine the extent of collaboration among different institutions, organizations, or countries. This provided insights into the collaborative relationships within the marine pollution research community.

Visualization: Visual representations, such as network diagrams, co-authorship maps, and collaboration matrices, were generated to visualize the authorship patterns and collaboration relationships identified in the analysis. These visualizations aided in understanding the complex patterns and facilitating interpretation.

Interpretation and Discussion: The findings of the scientometric analysis were interpreted and discussed in the context of marine pollution research. The implications of the authorship patterns and collaboration dynamics were explored, considering factors such as disciplinary trends, interdisciplinary collaborations, and the influence of funding or policy initiatives on collaboration patterns.

It is important to note that the specific methods and techniques employed may vary depending on the research database, software tools, and expertise of the researchers conducting the scientometric analysis. The methodology described above provides a general framework for analyzing authorship patterns and collaboration in marine pollution research output.

AUTHOR DISTRIBUTION

Most productive and author who got high citation for their publications on Marin Pollution were listed below table. Highest contribution Bellas J contributed 24 records with 1125 Global Citation. Followed by walker TR (Tony R Walker) affiliated with Dalhousie University 24 records with 1315 Global Citation. Beiras R affiliated with University of Vigo contributed 17 records with 836 Global Citation. Total authors 9347.

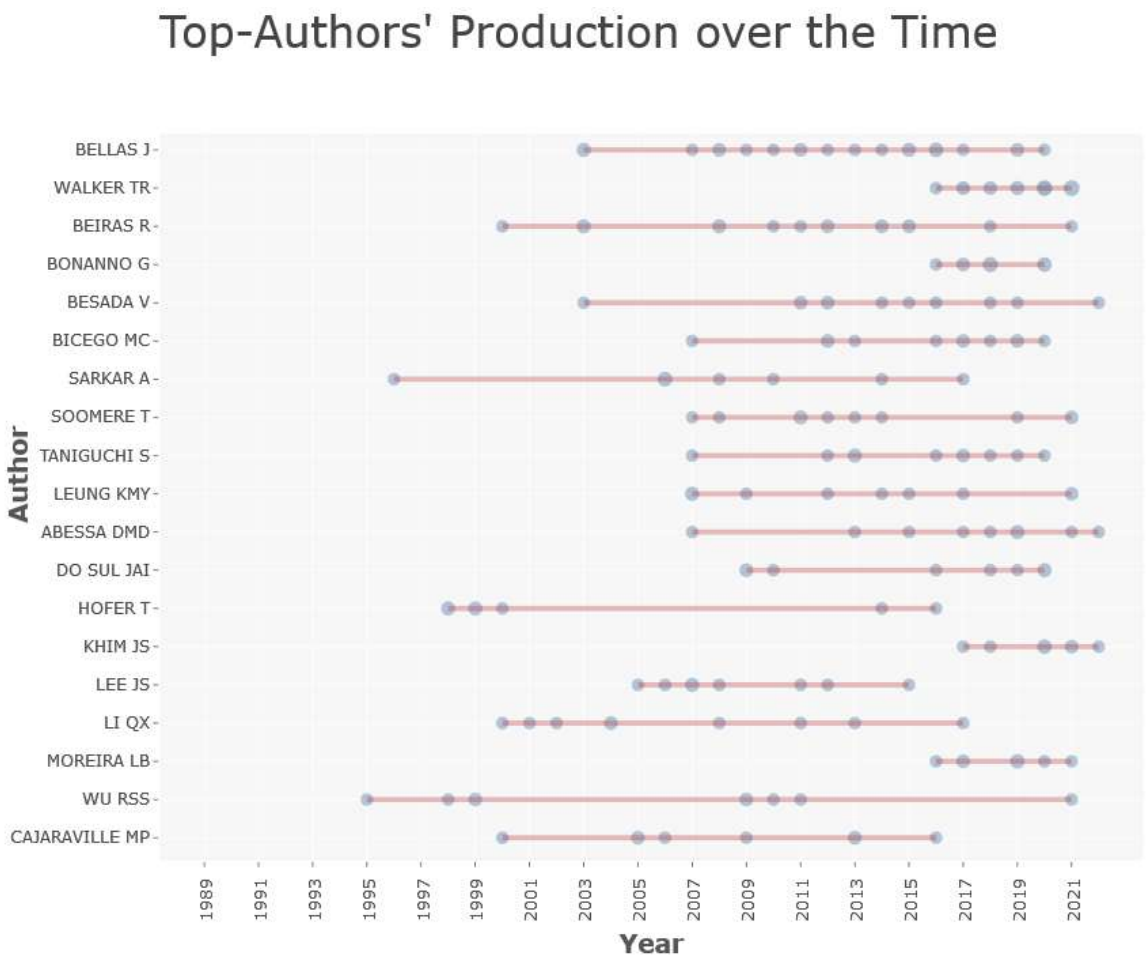

Figure: 1 Author Wise Distribution

Table:1 Author Distribution with Record Wise

S.No	Author	ACPP	Records	Percent	TLCS	TGCS
1	Bellas J	46.87	24	0.9	125	1125
2	Walker TR	54.79	24	0.9	164	1315
3	Beiras R	49.17	17	0.6	115	836
4	Bonanno G	22.23	13	0.5	36	289
5	Besada V	54.81	11	0.4	79	603
6	Bicego MC	21.27	11	0.4	13	234
7	Sarkar A	40.00	11	0.4	57	440
8	Soomere T	13.36	11	0.4	19	147
9	Taniguchi S	21.90	11	0.4	11	241

10	Leung KMY	44.00	10	0.4	10	440
11	Abessa DMD	14.66	9	0.3	9	132
12	do Sul JAI	45.77	9	0.3	32	412
13	Hofer T	17.00	9	0.3	13	153
14	Khim JS	16.22	9	0.3	5	146
15	Lee JS	75.11	9	0.3	28	676
16	Li QX	27.66	9	0.3	9	249
17	Moreira LB	8.44	9	0.3	6	76
18	Wu RSS	22.88	9	0.3	8	206
19	Cajaraville MP	128.00	8	0.3	66	1024
20	Galgani F	67.12	8	0.3	28	537
21	Gutierrez AJ	6.00	8	0.3	1	48
22	Lee J	16.25	8	0.3	2	130
23	Li Y	11.87	8	0.3	2	95
24	Marigomez I	4.00	8	0.3	26	320
25	Orlando-Bonaca M	24.00	8	0.3	20	192

Table:2 Author Distribution with TGCS Wise

S.No	**Author**	**ACPP**	**Records**	**TLCS**	**TGCS**
1	Law KL	436.50	4	58	1746
2	Moret-Ferguson S	460.33	3	32	1381
3	Proskurowski G	460.33	3	32	1381
4	Walker TR	54.79	24	164	1315
5	Reddy CM	416.33	3	33	1249
6	Bellas J	46.87	24	125	1125
7	Thompson RC	214.20	5	48	1071
8	Peacock EE	535.00	2	32	1070
9	Hafner J	515.50	2	55	1031

10	Cajaraville MP	128.00	8	66	1024
11	Porte C	254.50	4	56	1018
12	Beiras R	49.17	17	115	836
13	Napper IE	277.00	3	41	831
14	Lusher AL	382.00	2	17	764
15	O'Connor I	382.00	2	17	764
16	Officer R	382.00	2	17	764
17	Viarengo A	377.00	2	42	754
18	Maximenko NA	692.00	1	32	692
19	Lee JS	75.11	9	28	676
20	Bebianno MJ	326.50	2	41	653
21	Blasco J	652.00	1	41	652
22	Sarasquete C	652.00	1	41	652
23	Fendall LS	628.00	1	50	628
24	Sewell MA	628.00	1	50	628
25	Besada V	54.81	11	79	603

Highest cited were listed below table **Law KL** affiliated with Sea Education Association, USA received highest citation of 1746 contributed 4 records with ACR 436.50**. Moret-Ferguson S** affiliated with Sea Education Association, USA got second highest citation of 1381 with contribution of 3 records average of single paper received 460.33 Citation. **Proskurowski G** affiliated with Plasticseurope (Association) obtain the same 1381 Citation with 3 records which Proskurowski G collaborated with Moret-Ferguson S. Maximenko NA affiliated with University of Hawaii Manoa had highest Average Citation per Record.

Author's Collaboration

It is observed from the Table 3, about 85% of papers were contributed by multi authors. Out of 2732 papers, the highest number of papers was published by three authors and it accounts for 444 with 16.25% followed by four authored articles account for 434 with 15.89%. 15.04% of articles were published by single authors. 14.6 % of articles were published by double authors. 12.3% of articles were published by five authors. 25.92% of articles were published by more than five authors.

Table:3 Author's Collaboration

S.No	Authors	Records	Percentage
1	Single Author	411	15.04
2	Double Author	399	14.6
3	Three Authors	444	16.25
4	Four Authors	434	15.89
5	Five Authors	336	12.3
6	Six Authors	245	8.96
7	Seven Authors	154	5.63
8	Eight Authors	84	3.11
9	Nine Authors	77	2.81
10	Ten and more than Ten Authors	148	5.41
Total		**2732**	**100**

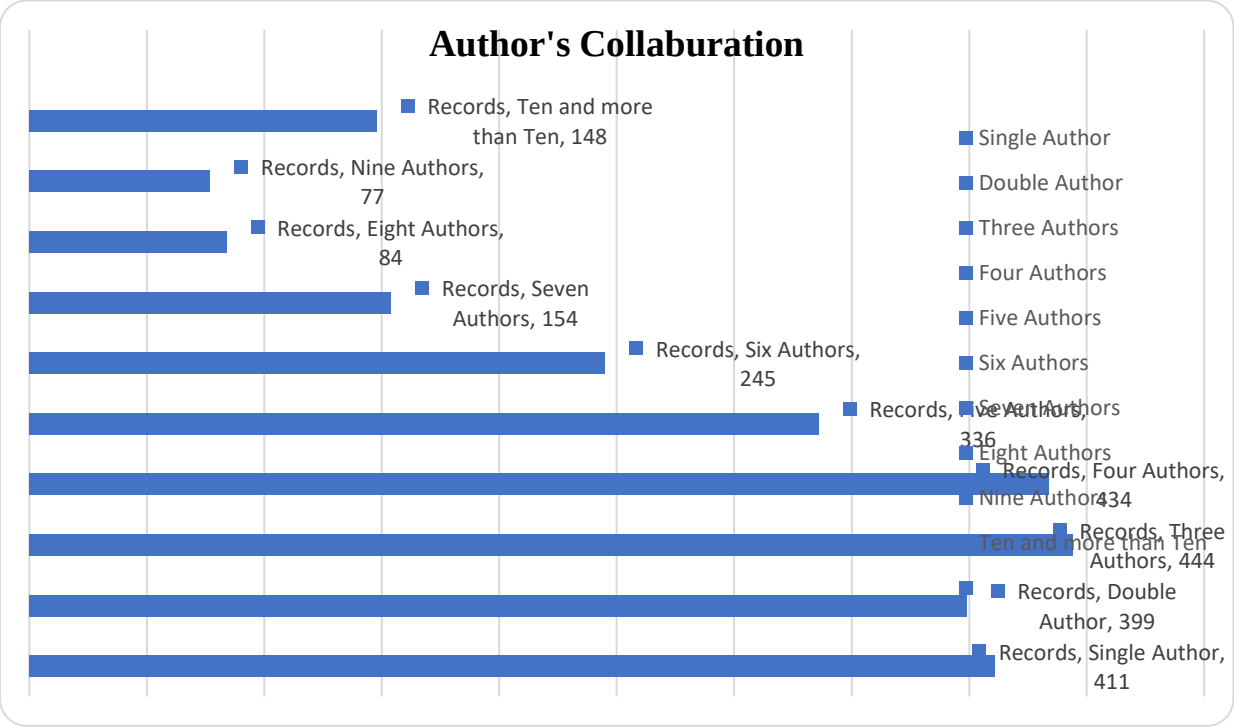

Figure: 2 Author's Collaboration

Highly Cited Paper Wise

The analysis based on the global citation scores of the individual has been organized in the below table 18 revealed that, the top 10 research articles scored more than 350 citations. The most frequently cited one was Law KL, Moret-Ferguson S, Maximenko NA, Proskurowski G, Peacock EE, et al. Plastic Accumulation In The North Atlantic Subtropical Gyre, published in SCIENCE. 2010 SEP with 692 citations followed by Cajaraville MP, Bebianno MJ, Blasco J, Porte C,

Sarasquete C, et al. The Use Of Biomarkers To Assess The Impact Of Pollution In Coastal Environments Of The Iberian Peninsula: A Practical Approach, published in SCIENCE OF THE TOTAL ENVIRONMENT 2000 MAR with 652 citations and Fendall LS, Sewell MA, Contributing To Marine Pollution By Washing Your Face: Microplastics In Facial Cleansers, published in MARINE POLLUTION BULLETIN 2009 AUG with 628 Citations.

Table:16 Highly Cited Papers

S.No	Title	Author	Source	Year	Citation
1	Plastic Accumulation In The North Atlantic Subtropical Gyre	Law KL, Moret-Ferguson S, et al.	Science	2010	692
2	The Use Of Biomarkers To Assess The Impact Of Pollution In Coastal Environments Of The Iberian Peninsula: A Practical Approach	Cajaraville MP, Bebianno MJ, et al.	Science of the total environment	2000	652
3	Contributing To Marine Pollution By Washing Your Face: Microplastics In Facial Cleansers	Fendall LS, Sewell MA	Marine pollution bulletin	2009	628
4	Trace Metal Contamination In Estuarine And Coastal Environments In China	Pan K, Wang WX	Science of the total environment	2012	524
5	Microplastic Particles In Sediments Of Lagoon Of Venice, Italy: First Observations On Occurrence, Spatial Patterns And Identification	Vianello A, Boldrin A, et al.	Estuarine coastal and shelf science	2013	508
6	Release Of Synthetic Microplastic Plastic Fibres From Domestic Washing Machines: Effects Of Fabric Type And Washing Conditions	Napper IE, Thompson RC	Marine pollution bulletin	2016	489
7	Microplastics In Arctic Polar Waters: The First Reported Values Of	Lusher AL, Tirelli V, et al.	Scientific reports	2015	472

	Particles In Surface And Sub-Surface Samples				
8	International Policies To Reduce Plastic Marine Pollution From Single-Use Plastics (Plastic Bags And Microbeads): A Review	Xanthos D, Walker TR	Marine pollution bulletin	2017	401
9	The Size, Mass, And Composition Of Plastic Debris In The Western North Atlantic Ocean	Moret-Ferguson S, Law KL, et al.	Marine pollution bulletin	2010	378
10	Plastics In The Marine Environment	Law KL	Annual review of marine science	2017	365

Conclusion

In conclusion, the scientometric analysis of authorship patterns and the degree of collaboration in marine pollution research output provides a comprehensive understanding of the research landscape. The findings emphasize the collaborative nature of marine pollution research, the interdisciplinary collaborations, and the collective efforts to address environmental challenges. This analysis serves as a valuable resource for researchers, institutions, and policymakers, facilitating future collaborations, informing research priorities, and contributing to effective strategies for mitigating marine pollution and preserving marine ecosystems.The study discusses the types of collaboration and describes the measures of collaboration. In author collaboration, two authors dominated on other authorship collaboration pattern. The conclusion of this article is three authors were found to have produced more than the productivity of remaining authors. Other word, multiple author publications, while compared to single and joint authorship strength was found to be more. In this analaysis shows that Lotka's law not applicable with regard to author productivity in proliferation of research in Meditation research output as the research papers equally distributed by a large number of authors.

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