From Nanoplastic to Microplastic: A bibliometric analysis on the presence of plastic particles in the environment

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Introduction

Plastic production began in 1907 with Bakelite[1]. Currently, plastic research has focused on microplastics and nanoplastics. **Microplastics** (Mps) are pieces of plastic less than 5 mm in diameter while **nanoplastics** (NPs)- pieces of plastic between 1-100 nm in diameter[2,3]. As the fields of MPs and NPs research continue to emerge, bibliometric analysis can be used to identify research trends. **Bibliometric analysis** is a statistical method applied to similar literature that identifies and analyzes publication trends. Here, bibliometric analysis was applied to microplastic and nanoplastic research.

Materials & Methods

Used Web of Science Core Collection

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Performed Search on MPs and NPs

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Refined Categories

Yielded 3,820 results

↓

Analyzed with Vosviewer & Excel

- Following search was used: : TS=((microplastic* OR nanoplastic* or "plastic particle*" OR microbead*OR microfibre* OR microfiber*) AND (marine OR litter OR pollution OR toxic* OR environment* OR health* OR ingestion OR debris OR waste OR sediment*))
- Search was from January 1, 1900 to December 31, 2019.
- Data was further restricted to environmental, human health, education, or public policy categories

Results

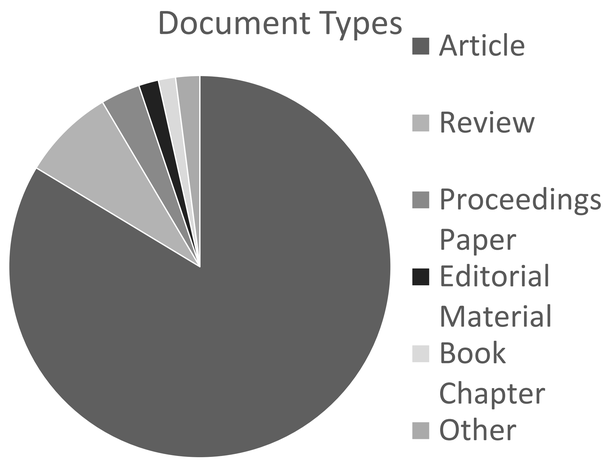

*Figure 1: Types of Documents Represented in the Literature**

Key Finding: Most documents were articles

Table 1: Averages and Top Publishing Entities

Averages	Top Publishing
Authors – 4.06	Countries – USA and China
Pages per document per year – 9.66	Institutions- Chinese Academy of Science and Centre National De :a Recherche Scientifique
Citations per document per year – 49.32	Sources- Marine Pollution Bulletin and Environnemental Pollution

- 93.6% of publications occurred after 2009
- 111 countries, 3,250 institutions, 906 journals/sources

*Images taken from Sorensen, RM, Jovanovic B. (2021). From nanoplastic to microplastic: A bibliometric analysis on the presence of plastic particles in the environment. Marine Pollution Bulletin. 163.

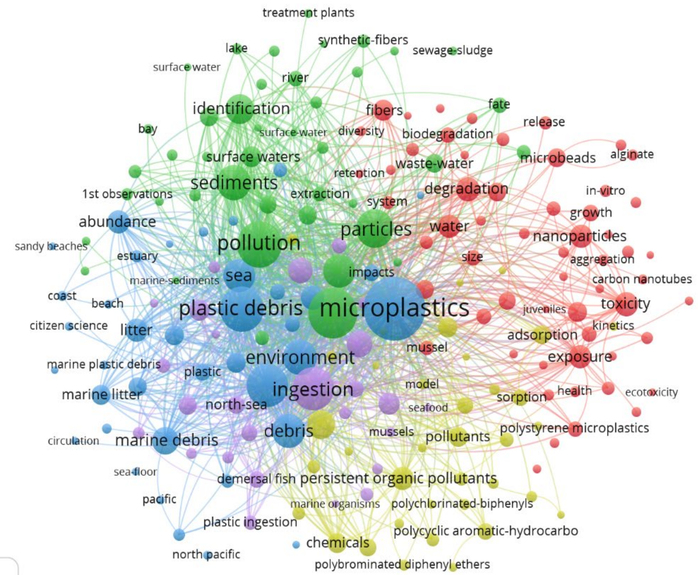

*Figure 2: Top Keywords Present in Publications. Colors refer to different clusters or related topics. The bigger the size of the circle is, the greater frequency of the keyword. The closer the circles are, the more often the two keywords were found in the same publications (Van Eck And Waltman, 2014a).**

- **Figure 2: Top keywords** were microplastics, marine-environment, pollution, plastic debris, accumulation, ingestion, particles, sediments, environment, debris and sea

Conclusion

The field of MPs and NPs research has expanded enough to identify publication trends. These trends can be useful for toxicologists, environmentalists, and regulators.

[1]Baekeland, 1909; [2]Arthur et al. 2009; [3]Jovanović, 2017; [4]Pritchard, 1969

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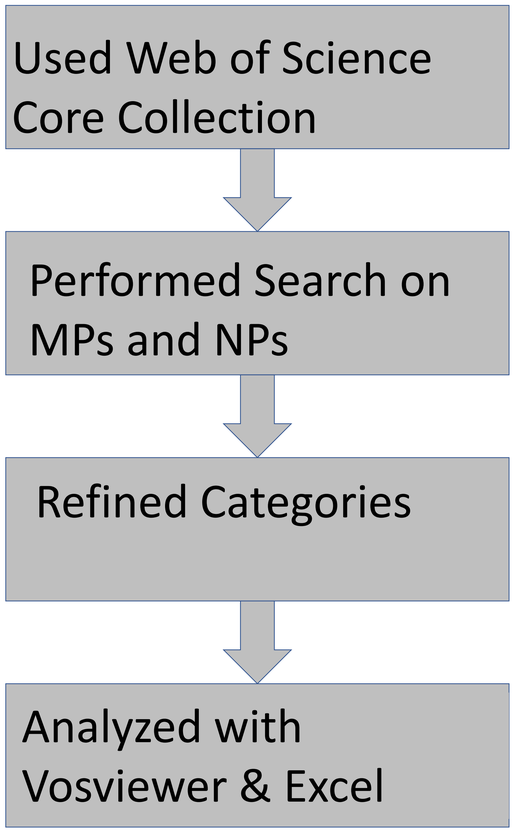

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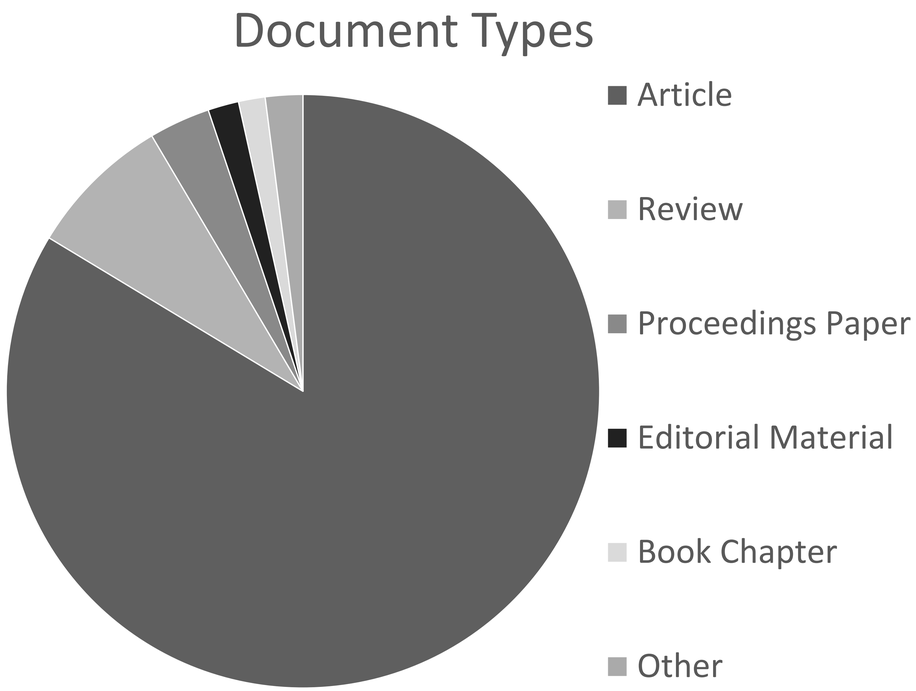

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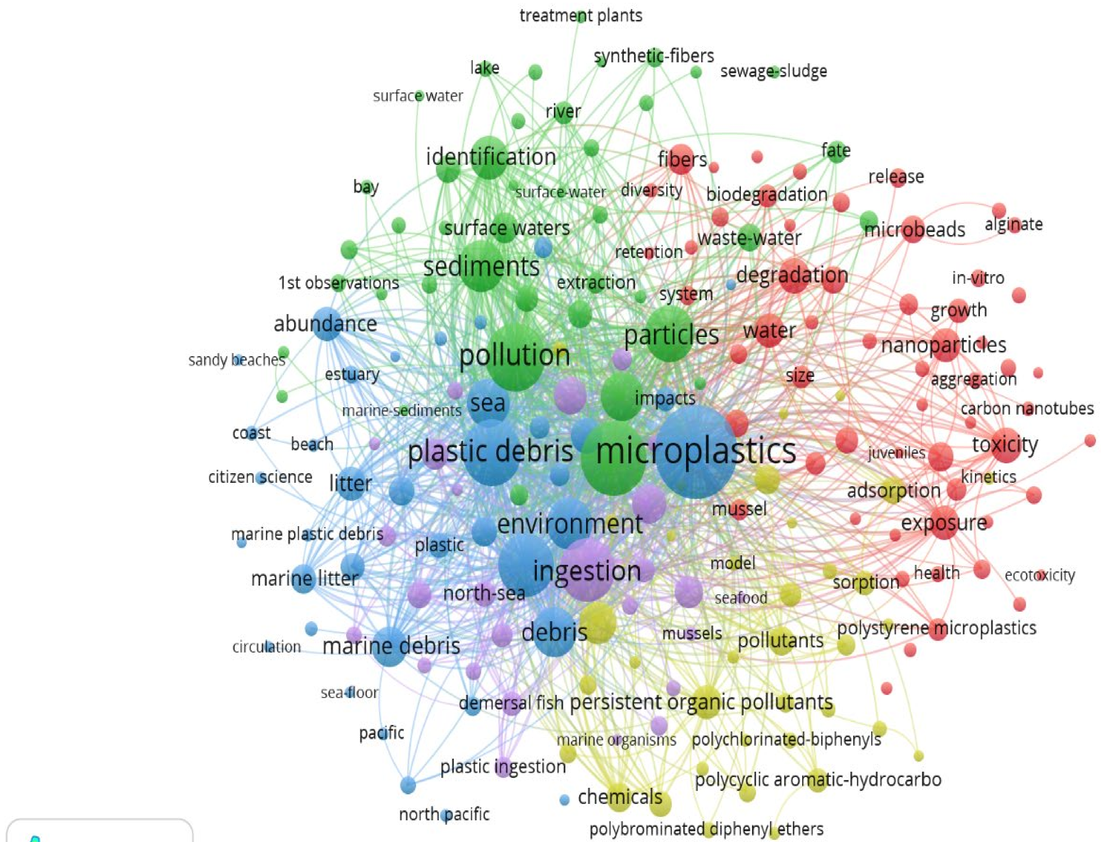

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