BIBLIOMETRIC ANALYSIS OF BIODEGRADABLE NATURAL FIBER COMPOSITES: A SUSTAINABLE REVIEW

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ABSTRACT

This paper presents a bibliometric analysis of 1,032 English language journal articles on biodegradable natural fiber composites published between 2015 and 2024 in the Scopus database. Data on document types, sources, citation metrics, and publication trends were organized using citation analysis criteria, with visualization performed through Biblioshiny 2.0 and VOSviewer 1.6.20. The study identifies leading authors, journals, organizations, and countries based on citations, link strength, and publication counts. Frequently occurring terms such as natural fiber, mechanical properties, biocomposite, bioplastic, green composite, and hybrid composite highlight current research priorities, while underexplored topics including luffa, nanocomposite, DSC, ramie, sisal, bone tissue engineering, LCA, and coating reveal significant gaps. Addressing these areas—particularly life cycle assessment, environmental footprint evaluation, and moisture resistant coatings—will strengthen industrial adoption and sustainability performance in line with circular economy goals.

Keywords: *Bibliometric analysis, Biblioshiny, VOSviewer, biodegradable, natural fiber and composite.*

1. INTRODUCTION

Composite materials have evolved from ancient applications to modern high performance structures. Ancient records note reeds, bitumen, and plywood as early composite uses [1–3]. Post World War II, demand for lightweight, high strength materials accelerated the use of fiberglass and carbon fiber in aerospace [4]. With growing environmental concerns, sustainable bio composites from renewable resources gained prominence [5]. Recent studies highlight the mechanical and biodegradable potential of jute and flax fiber reinforced PLA composites [6]. This paper presents a bibliometric analysis using VOSviewer and Biblioshiny to identify research trends, gaps, and citation networks in biodegradable natural fiber composites.

2. MATERIALS AND METHOD

The bibliometric dataset was retrieved from the Scopus database on 10 May 2025. An initial keyword search using biodegradable, natural, fiber, and composites produced 2,686 records. Restricting the publication years to 2015–2024 reduced this to 2,017 documents. Limiting the results to journal articles brought the count down to 1,054, and applying the English-language filter yielded a final dataset of 1,032 articles for analysis.

3. CO-OCCURRENCE ANALYSIS OF KEYWORDS

To capture the main research theme, Author's and Index Keywords were extracted from the Scopus database (2015–2024) using Biblioshiny 2.0 and VOSviewer 1.6.20 [7], restricted to English-language journal articles.

3.1 Author's Keywords and Index Keywords