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Unlocking the Potential of Biochar in Drought Stress Tolerance Mechanisms: A Global Bibliometric Analysis

Abhishek Singh*, Sakshi Singh, Armine Chakhmakhchyan,
Ani Hayrapetyan, Nare Darbinyan, Karen Ghazaryan

Applied Ecology and Environmental Research Laboratory (AEER- Lab), Research Institute of Biology, Yerevan State University, 1 Alex Manoogian str., Yerevan, 0025, Armenia

ABSTRACT

This bibliometric review investigates global research trends and scientific productivity in the field of "biochar and drought stress" over a 17-year duration (2009-2025), including 489 records retrieved from 160 journals, books, and proceedings from web of science (WOS) database. This research field shows an annual steady growth rate of 21.14% on an average document age of 3.21 years with 27.83 citations per publication reflecting continuous academic attention and impact. The overall research output comprises 2361 contributing authors, high co-authorship rate of 6.76 authors per document, and 51.12% of studies being international, indicating the global importance and multidisciplinary context of the subject. The collection comprises a broad variety of different document types, with original research articles (410) composing the majority, as well as reviews (56) and other types of contributions. Keyword maps show a conceptual universe of 1,380 authors' keywords and 1,054 Keywords Plus, and themes include soil health, water retention, plant productivity, and resilience to climate. 24,761 references also demonstrate the depth of the scholarly public interest in employing biochar as a sustainable tool to mitigate drought stress under agroecosystems.

Keywords: biochar, bibliometric analysis, drought, sustainable tool, agroecosystems

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*Corresponding Author:

Abhishek Singh Applied Ecology and Environmental Research Laboratory (AEER- Lab), Research Institute of Biology, Yerevan State University, 1 Alex Manoogian str., Yerevan, 0025, Armenia.
Email: sinxabishik@ysu.am