Research, Society and Development, v. 14, n. 12, e188141250472, 2025
(CC BY 4.0) | ISSN 2525-3409 | DOI: http://dx.doi.org/10.33448/rsd-v14i12.50472

Dynamics of scientific production on Acrididae (Orthoptera) in Brazil: A bibliometric analysis of authors, themes, and impact

Dinâmica da produção científica sobre Acrididae (Orthoptera) no Brasil: Uma análise bibliométrica de autores, temas e impacto

Dinámica de la producción científica sobre Acrididae (Orthoptera) en Brasil: Un análisis bibliométrico de autores, temas e impacto

Received: 12/23/2025 | Revised: 12/27/2025 | Accepted: 12/27/2025 | Published: 12/28/2025

Walmyr Alberto Costa Santos Junior
ORCID: https://orcid.org/0000-0002-3340-1658
Museu Paraense Emilio Goeldi, Brazil
E-mail: walmyrjr@gmail.com
Nathalia Lucia Colares Freitas
ORCID: https://orcid.org/0009-0003-4853-567X
Universidade Federal do Pará, Brazil
E-mail: nathaaliafreitas@gmail.com
Jean Alberto Gomes Santos
ORCID: https://orcid.org/0009-0007-2062-8961
Universidade Cruzeiro do Sul, Brazil
E-mail: jean.agsantos@gmail.com

Abstract
This study presents a bibliometric analysis of scientific production on grasshoppers of the Acrididae family in Brazil, aiming to identify patterns of publication, academic impact, collaboration networks, and thematic structure. Data were collected from the Web of Science and Scopus databases, covering the period from 1979 to 2025. The analysis was conducted using R software, with the Bibliometrix and Biblioshiny packages. Results indicate an irregular scientific output, with occasional peaks and no consistent growth trend. The average impact per document is moderate, and the most productive authors show a relevant h-index, notably ADIS J., ZEFA E., and LECOQ M. National collaboration is predominant, while internationalization remains limited. Thematic maps reveal a predominance of basic taxonomic and ecological studies, with emerging niches in molecular genetics and aquatic ecology. The keyword co-occurrence network highlights thematic fragmentation in the field, with two major clusters: one focused on taxonomy and biogeography, and another on the ecology of wet environments. The conceptual structure map and dendrogram reinforce this division, pointing to the need for greater interdisciplinary integration. It is concluded that research on Acrididae in Brazil has solid foundations but requires thematic renewal, methodological diversification, and expansion of international collaborations.
Keywords: Acrididae; Bibliometrics; Scientific production.

Resumo
Este estudo apresenta uma análise bibliométrica da produção científica sobre gafanhotos da família Acrididae no Brasil, com o objetivo de identificar padrões de publicação, impacto acadêmico, redes de colaboração e estrutura temática. Os dados foram coletados das bases Web of Science e Scopus, abrangendo o período de 1979 a 2025. A análise foi realizada utilizando o software R, com os pacotes Bibliometrix e Biblioshiny. Os resultados indicam uma produção científica irregular, com picos ocasionais e sem tendência consistente de crescimento. O impacto médio por documento é moderado, e os autores mais produtivos apresentam um índice h relevante, destacando-se ADIS J., ZEFA E. e LECOQ M. A colaboração nacional é predominante, enquanto a internacionalização permanece limitada. Os mapas temáticos revelam predominância de estudos básicos taxonômicos e ecológicos, com nichos emergentes em genética molecular e ecologia aquática. A rede de coocorrência de palavras-chave evidencia fragmentação temática na área, com dois grandes agrupamentos: um focado em taxonomia e biogeografia, e outro na ecologia de ambientes úmidos. O mapa de estrutura conceitual e o dendrograma reforçam essa divisão, apontando para a necessidade de maior integração interdisciplinar. Conclui-se que a pesquisa sobre Acrididae no Brasil possui bases sólidas, mas requer renovação temática, diversificação metodológica e expansão das colaborações internacionais.
Palavras-chave: Acrididae; Bibliometria; Produção científica.

Resumen
Este estudio presenta un análisis bibliométrico de la producción científica sobre saltamontes de la familia Acrididae en Brasil, con el objetivo de identificar patrones de publicación, impacto académico, redes de colaboración y estructura temática. Los datos fueron recopilados de las bases Web of Science y Scopus, cubriendo el período de 1979 a 2025. El análisis se realizó utilizando el software R, con los paquetes Bibliometrix y Biblioshiny. Los resultados indican una producción científica irregular, con picos ocasionales y sin una tendencia de crecimiento consistente. El impacto promedio por documento es moderado, y los autores más productivos muestran un índice h relevante, destacándose ADIS J., ZEFA E. y LECOQ M. La colaboración nacional es predominante, mientras que la internacionalización sigue siendo limitada. Los mapas temáticos revelan una predominancia de estudios básicos taxonómicos y ecológicos, con nichos emergentes en genética molecular y ecología acuática. La red de coocurrencia de palabras clave evidencia una fragmentación temática en el campo, con dos grandes agrupamientos: uno centrado en taxonomía y biogeografía, y otro en la ecología de ambientes húmedos. El mapa de estructura conceptual y el dendrograma refuerzan esta división, señalando la necesidad de una mayor integración interdisciplinaria. Se concluye que la investigación sobre Acrididae en Brasil tiene bases sólidas, pero requiere renovación temática, diversificación metodológica y expansión de las colaboraciones internacionales.
Palabras clave: Acrididae; Bibliometría; Producción científica.

1. Introduction

The order Orthoptera constitutes one of the most diverse groups within Polyneoptera, currently comprising more than 29,000 described species (Cigliano et al., 2022). It is a cosmopolitan taxon, widely distributed in tropical and subtropical regions, with occurrences also in areas of high altitude and latitude. Its populations tend to present high density, which makes orthopterans relevant components of terrestrial fauna, both in ecological and economic terms (Bidau, 2014; Santos Junior et al., 2021; Souza-Dias, 2024).

In the Neotropical region—considered one of the most biodiverse on the planet—more than 6,497 species of Orthoptera had been recorded by 2022, representing just over 20% of the known global diversity (Cigliano et al., 2022; Castro-Souza et al., 2025). However, this number is underestimated due to the scarcity of systematic studies and the lack of specialists dedicated to the order in the region. While countries such as Argentina, Brazil, and Uruguay have a tradition in orthopterological research, vast continental areas remain practically unexplored, such as Bolivia, Guyana, Suriname, and Venezuela (Carbonell, Cigliano, & Lange, 2006).

In Brazil, a total of 1,952 species had been recorded by 2022, distributed across 565 genera and 18 families, corresponding to about 30% of the known Neotropical diversity (Cigliano et al., 2022). The Brazilian fauna of Caelifera is relatively well documented, with 924 species recorded. For Ensifera, 1,028 species are known—a slightly higher number, but still insufficient to reflect the true diversity of the suborder. Historically, several foreign orthopterists carried out expeditions in the national territory and contributed significantly to the knowledge of grasshopper (Caelifera) fauna.

This study presents a bibliometric analysis of scientific production on grasshoppers of the Acrididae family in Brazil, aiming to identify patterns of publication, academic impact, collaboration networks, and thematic structure and existing gaps in the literature. By systematizing and visualizing these data, the study intends to contribute to strengthening orthopterological research in Brazil, highlighting priority areas for investigation and the need for training specialists in the taxonomy and ecology of Acrididae.

2. Methodology

2.1 Data collection

This study is characterized as a bibliometric research (Ferreira & Vidigal, 2025) of a quantitative and exploratory nature (Pereira et al., 2018), employing simple descriptive statistics with data classes and absolute frequency in quantity (Shitsuka et al., 2014), the use of time series (Nascimento et al., 2015), and statistical analysis (Costa Neto & Bekman, 2009),

in a study focused on analyzing the scientific production on the Acrididae family. Bibliographic data were obtained through searches in the Scopus (Elsevier) and Web of Science databases, recognized for their comprehensiveness and reliability in indexing scientific literature.

The search was conducted in August 2025, using the following descriptors in the title, abstract, and keyword fields: “Acrididae AND Brasil.”

Documents included were scientific articles, reviews, book chapters, and conference communications, published up to the year 2025, in any language. Duplicate records or those that mentioned the group only marginally were excluded. Records were exported in .bib format, with the “full record” field activated, ensuring the retrieval of detailed metadata (title, authors, keywords, institutional affiliation, source, references, etc.).

2.2 Data processing and treatment

The analysis was conducted in R software (R Core Team, 2025), using the bibliometrix package (Aria & Cuccurullo, 2017). Files were converted into bibliometric analysis format through the function convert2df(), with parameters dbsource = "scopus" and format = "csv" or bib, depending on the database used.

Data underwent cleaning procedures, such as standardization of author names, normalization of keywords, and removal of duplicates. Multivariate analyses were performed based on relative frequency, term co-occurrence, and conceptual clustering.

2.3 Bibliometric analyses

The general analysis was performed using the function biblioAnalysis(), which provides descriptive statistics such as: Annual production of documents; Most productive authors; Most relevant sources; Most frequent keywords; Average citations per document; Authors’ h-index; Institutional and international collaborations.

3. Results and Discussion

The bibliometric analysis conducted on the scientific production involving grasshoppers of the family Acrididae in Brazil covers a period of 46 years, between 1979 and 2025. During this interval, 73 documents were identified, published across 36 different sources, reflecting a relatively modest scientific output distributed over time

3.1 Temporal evolution of scientific production

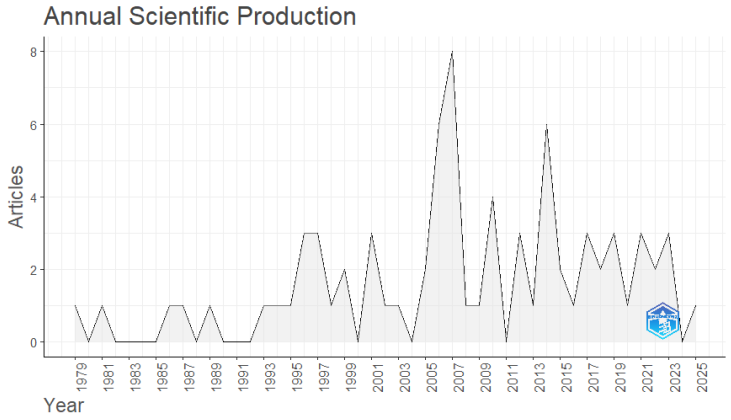
Scientific production on this group in Brazil shows a trajectory marked by significant fluctuations over time. The annual publication graph (Figure 1) reveals that output was modest and sporadic, with at most one article per year. From the second half of the 1990s onward, there is a gradual increase in publication frequency, with notable peaks in 2005 and 2014, each recording five publications. The year 2007 stands out as the period with the highest number of articles published in a single year (seven documents), representing an isolated peak of productivity.

This constant oscillation indicates that research on Acrididae did not follow a continuous growth pattern, but rather a dynamic influenced by factors such as research funding and institutional restructuring. Despite these variations, a moderate growth trend can be observed across the decades, especially when compared to the near absence of production in the early years analyzed. In more recent years (2020–2025), a modest resurgence is evident, possibly driven by current environmental and agricultural concerns.

The absence of a clear growth trend, reinforced by the annual growth rate of 0%, suggests that the field remains

scientifically stable but still underexplored. This opens space for new approaches, particularly in areas such as functional diversity, ecological bioindicators, and the role of Acrididae in environmental restoration.

Figure 1. Annual scientific production on Acrididae in Brazil (1979–2025).



Source: Research data (2025).

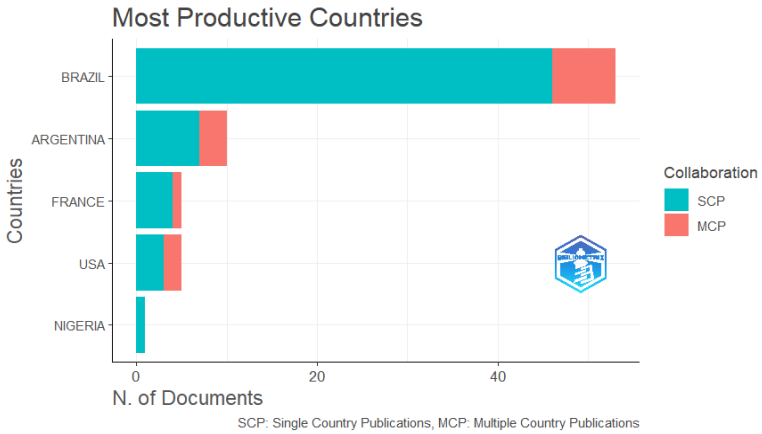
Complementarily, the analysis also allowed the observation of the geographical distribution of scientific production on Acrididae, as presented in Figure 2. Brazil stands out prominently, with more than 30 published documents, consolidating its leadership in research on this insect family. This prominence reflects not only the richness of local biodiversity but also the consistent work of specialized research groups.

Most Brazilian publications are classified as SCP (Single Country Publications), indicating the predominance of studies conducted exclusively by national institutions. However, there is also a relevant presence of MCP (Multiple Country Publications), evidencing a growing international collaboration by Brazilian researchers.

Other countries, such as Argentina, Benin, France, and Germany, showed more modest production, generally linked to internationally co-authored publications (MCP). This suggests the existence of collaborative networks with Brazilian or other foreign researchers, contributing to the global circulation of knowledge.

Although global production is still concentrated in a few countries, the data reveal a growing collaborative effort, especially in nations with a lower volume of publications. International collaboration plays a strategic role in expanding the impact and diversity of research, as well as contributing to the strengthening of science on a global scale.

Figure 2. Most productive countries in publications on Acrididae.



Source: Research data (2025).

3.2 Average citations per year

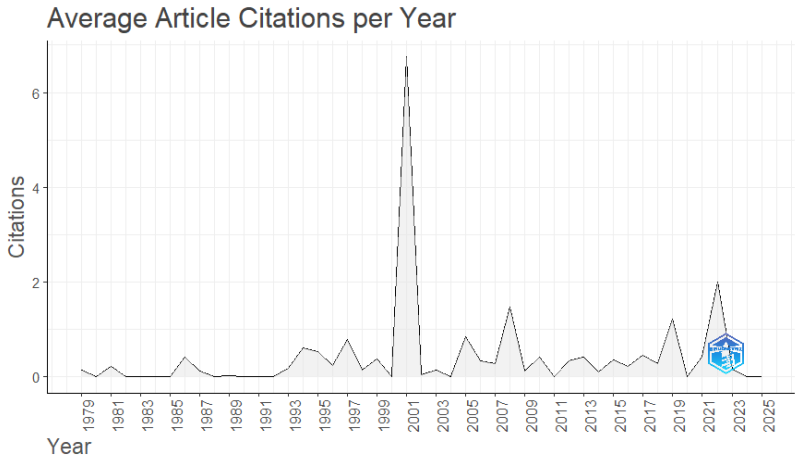
The analysis of the average number of citations per year reveals a significant variation in the impact of articles on Acrididae over time. It shows that, although scientific production has been irregular, certain periods attracted greater attention from the academic community, reflected in citation peaks (Figure 3).

The early 2000s stand out, particularly around the year 2000, when the average number of citations exceeded six per article, indicating that the works published during this period were widely referenced. This peak may be related to the publication of landmark studies or the intensification of applied research, such as agricultural pest control, which gained relevance at that time.

In subsequent years, fluctuations in the average number of citations can be observed, with periods of lower impact interspersed with small increases. This oscillation may reflect both the episodic nature of research on Acrididae - often motivated by specific outbreaks—and the lack of thematic continuity in certain lines of investigation.

The continued citation of older articles contributes to the relatively high average age of documents (17.1 years), suggesting that part of the literature remains relevant, but also indicating the need for scientific renewal, with new studies that engage with contemporary approaches such as functional diversity, ecological bioindicators, and restoration ecology.

Figure 3. Annual citations on Acrididae in Brazil (1979–2025).



Source: Research data (2025).

This pattern is expected in scientometric studies, since more recent articles have not yet had sufficient time to accumulate significant citations. In addition, the impact of the COVID-19 pandemic, which began in 2020, may have influenced both the production and citation of studies during this period.

This pattern may reflect a need for thematic renewal, greater articulation among researchers, and the adoption of new methodological approaches capable of rekindling the scientific community's interest in this group of insects.

3.3 Most relevant sources in Acrididae research

The analysis of the most relevant sources reveals that scientific production on Acrididae in Brazil is concentrated in a relatively small set of specialized journals. The absolute highlight is the journal Zootaxa, which gathers 12 documents, representing a significant portion of the literature on the group. This predominance suggests that Zootaxa serves as a central platform for taxonomic and systematic publications related to acridid grasshoppers.

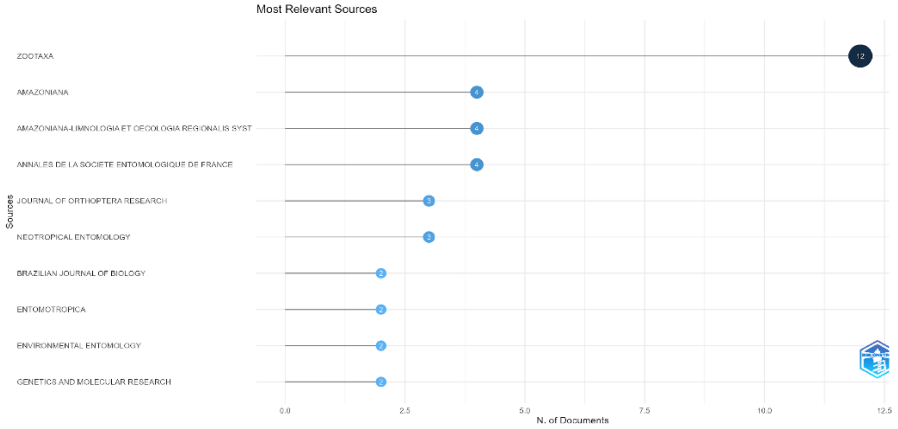
Other journals with a balanced presence include Amazoniana, Annales de la Société Entomologique de France,

Journal of Orthoptera Research, Neotropical Entomology, and Amazoniana–Limnologia et Geologia Regionalis Syst, each with three documents. These sources indicate a diversity of approaches, ranging from regional studies in the Amazon to broader entomological investigations.

In addition, journals such as Brazilian Journal of Biology, Entomotropica, Environmental Entomology, and Genetics and Molecular Research appear with two documents each (Figure 4), reflecting specific contributions in areas such as ecology, genetics, and pest control.

This distribution shows that, although specialized journals concentrate most of the production, there is also thematic dispersion that allows publication in multidisciplinary journals. This can be strategically explored by researchers seeking to broaden the reach of their studies, especially when integrating ecological, functional, or applied aspects of Acrididae biology.

Figure 4. Most frequently used sources on the topic in Brazil.



Source: Research data (2025).

3.4 Most relevant authors

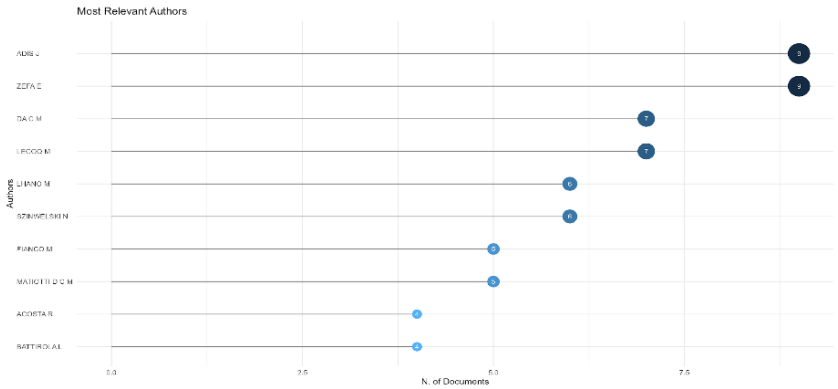
The analysis of the most productive authors reveals the main researchers who have significantly contributed to advancing knowledge on Acrididae in Brazil. The authors Adis, J. and Zefa, E. stand out with nine documents each, being the most prolific within the dataset analyzed. The size and intensity of the bubbles in the graph reinforce their centrality in scientific production, indicating that their works likely influenced several lines of research.

Other authors with relevant output include Mattiotti, Lecco, Lhano, Szinwelski, Fianco, and Battirola, with the number of documents ranging between two and five (Figure 5). This distribution shows that, although there are leaders in the field, there is also a diverse network of researchers contributing with specific or regional studies.

The presence of multiple authors with significant production suggests that the field is collaborative and distributed, with potential for the formation of more integrated research networks. Identifying these names is strategic for future collaborations, systematic reviews, or even for understanding the dominant thematic clusters, such as taxonomy, applied ecology, or pest control.

This pattern of concentrated productivity among a few authors is recurrent in bibliometric studies, as pointed out by Vanti (2002), and may indicate the existence of consolidated research nuclei dedicated to the theme. Such a configuration reinforces the importance of fostering interinstitutional collaborations, broadening the diversity of approaches, and strengthening the dissemination of scientific knowledge.

Figure 5. Most relevant authors in Acrididae research in Brazil.



Source: Research data (2025).

3.5 Author's production over time

The visualization of authors' scientific production over time makes it possible to identify patterns of activity, continuity, and impact in research on Acrididae in Brazil. The graph shows that some authors, such as Abis, J. and Zefa, E., maintained consistent output over several years, with emphasis on periods between the late 1990s and the mid-2010s (Figure 6).

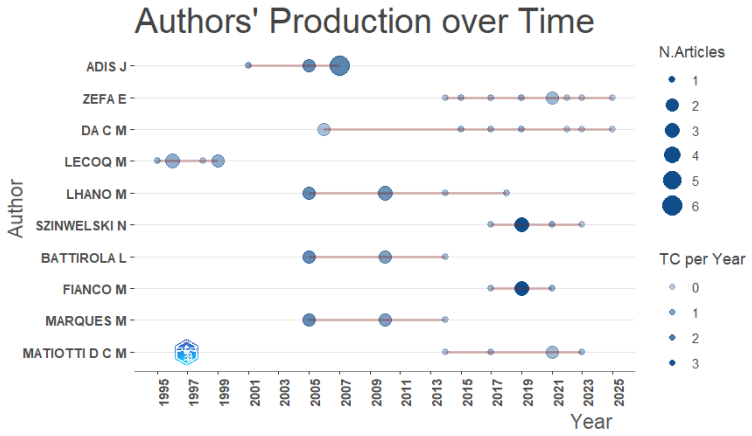
Each line represents the publication trajectory of an author, and the points indicate the years in which production occurred. The size of the points reflects the number of documents published in a given year, while the color indicates the average impact per article (T/C per year), allowing the evaluation not only of quantity but also of the quality and influence of the publications.

Some authors present concentrated peaks, suggesting involvement in specific projects or activity during moments of greater scientific demand, such as agricultural outbreaks or biological control initiatives. Others maintain distributed production, which may indicate a continuous and consolidated line of research.

This analysis is useful for identifying key researchers, understanding the thematic evolution of the field, and guiding future collaborations. Moreover, it allows the recognition of temporal gaps, such as periods with little production, which can be explored by new studies with updated approaches, such as functional diversity or restoration ecology.

In summary, Figure 6 reveals a network of authors marked by isolated contributions, with few nuclei of systematic production over time. The absence of consolidated poles of high productivity and impact suggests fragmentation of the field, which may compromise its international visibility. This scenario reinforces the need for collaborative strategies and institutional strengthening, aiming at greater consistency and relevance in scientific production on Acrididae in Brazil.

Figure 6. Author's production over time.



Source: Research data (2025).

3.6 Local impact of authors

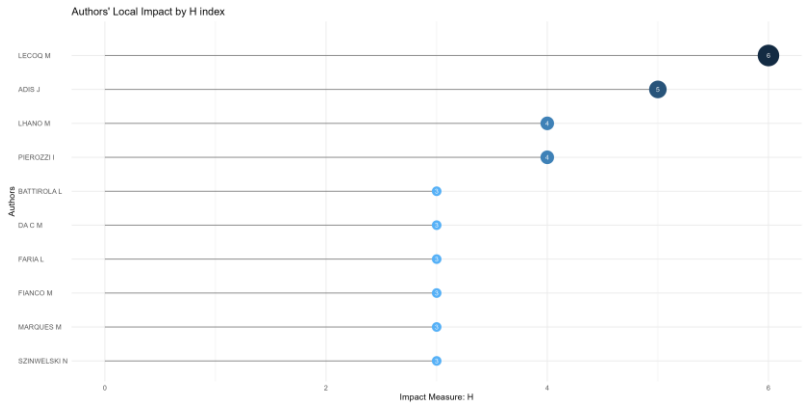
The local impact graph by h-index (Figure 7) reveals the authors with the greatest academic influence in research on Acrididae in Brazil, considering both productivity and citation frequency. It is worth noting that the h-index is a metric that combines the number of publications and the number of citations, and is widely used to evaluate a researcher's impact (Thomas, Assad & Moreira).

Within the analyzed set, the author Lecco, M. presents the highest h-index, with 6, followed by Adis, J. with 5, and Liano, M. and Pierdzi with 4 each. These values indicate that these authors not only published frequently but also had their works widely cited, reinforcing their relevance in the field.

Other authors such as Battirola, Faral, Fango, Marques, and Szynvelski appear with an h-index of 3, showing moderate but consistent impact. The size of the bubbles in the graph visually reinforces this hierarchy of influence.

This analysis is useful for identifying key researchers, understanding the longevity and relevance of published studies, and guiding future collaborations or systematic reviews. Moreover, it complements the productivity analysis, allowing distinction between authors who publish extensively and those whose works truly shape the field.

Figure 7. Local impact of authors based on the h-index.



Source: Research data (2025).

These results reflect a historical shortage of specialists dedicated to the group. This gap has led to the limited training of specialized human resources in the country, making the discovery of genera and species not yet described relatively

common, especially in under-sampled areas (Lecoq & Magalhaes, 2006; Leponce et al., 2010; Bidau, 2014).

3.7 Thematic map of keywords: Relevance and development

The thematic map (figure8) presented classifies the main topics of research on acrididae based on two axes: centrality (degree of relevance to the scientific field) and density (degree of internal development of the theme). This approach makes it possible to identify four quadrants, each representing a distinct thematic category:

Motor Themes (High centrality and high density)

Located in the upper right quadrant, topics such as “acrididae,” “grasshopper,” and “orthoptera” are considered research drivers. They are widely connected with other topics and well developed methodologically. They represent the consolidated core of the literature, sustaining the conceptual and taxonomic foundation of the field.

Basic Themes (High centrality, low density)

In the lower right quadrant appear terms such as “taxonomy,” “morphology,” “state,” and “desert locust.” These are fundamental and widely used themes, but they still lack technical or methodological depth. These topics are essential to the structure of research but offer potential for expansion and sophistication.

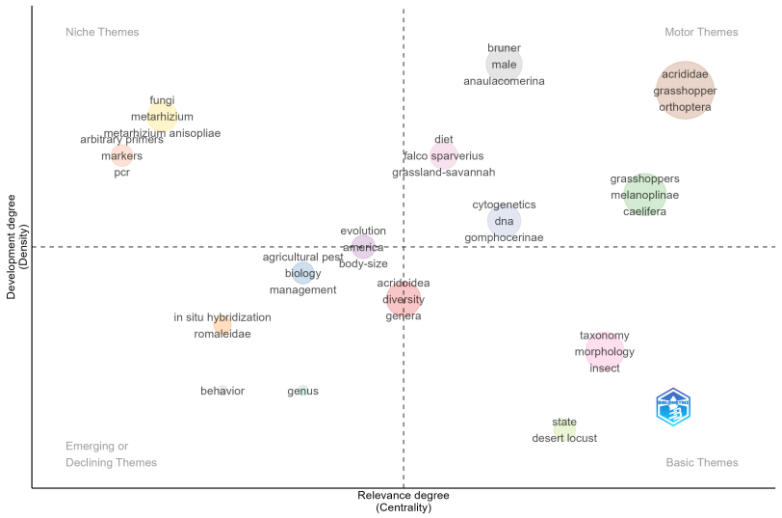
Niche Themes (High density, low centrality)

In the upper left quadrant are words such as “fungi,” “metarhizium,” “primers,” and “PCR.” These themes are highly specialized and well developed internally, but with little connection to the rest of the literature. They represent technical niches, generally linked to specific applications such as biological control or molecular genetics.

Emerging or Declining Themes (Low centrality and low density)

In the lower left quadrant are terms such as “behavior,” “genius,” and “in situ hybridization.” These topics may be either emerging or declining, depending on the context. They represent areas with little articulation and development, but which may indicate opportunities for innovation or critical reviews.

Figure 8. Thematic map of keywords.



Source: Research data (2025).

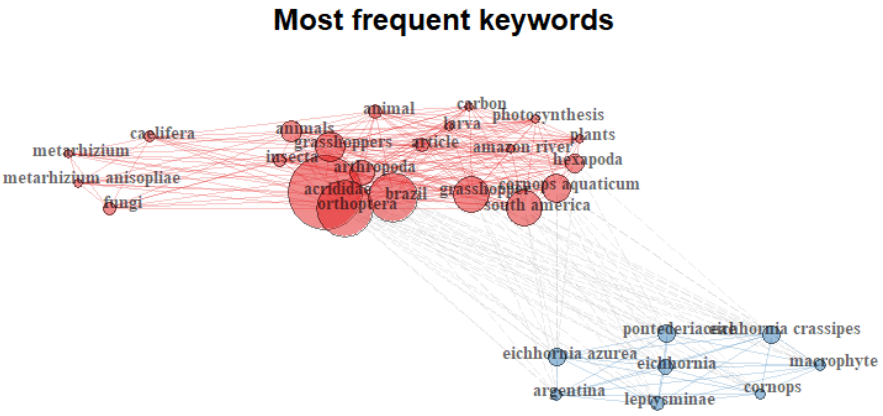
The keyword co-occurrence network highlights the semantic structure of scientific production on Acrididae, revealing how the main concepts cluster and interact within the literature. The nodes represent keywords, and their size indicates frequency of use, while the connections (edges) show which terms most frequently appear together.

The visualization reveals two distinct thematic clusters, suggesting conceptual fragmentation: The red cluster, located on the left, groups terms such as “orthoptera,” “acrididae,” “grasshopper,” “insect,” “animal,” and “south america.” This core represents the taxonomic and ecological basis of the research, focusing on biological classification, geographic distribution, and general aspects of Acrididae biology. The blue cluster, on the right, brings together terms such as “pontederiaceae,” “eichhornia crassipes,” “eichhornia azurea,” “macrophyte,” and “argentina.” This group is associated with applied ecological studies, particularly in aquatic environments and interactions between grasshoppers and host or invasive plants.

The separation between clusters indicates that there are thematic subareas with limited connections, which may reflect excessive specialization or a lack of dialogue between research lines. This fragmentation restricts the development of integrative approaches, such as the use of Acrididae as bioindicators in aquatic ecosystems or studies on cross-ecological impacts between fauna and flora. Moreover, the presence of geographic terms such as “south america” and “argentina” reinforces the regional scope of the research, while also pointing to potential for international collaboration, especially in comparative studies among South American countries.

This co-occurrence network is strategic for identifying conceptual gaps, guiding new interdisciplinary investigations, and strengthening the thematic coherence of scientific production on Acrididae in Brazil.

Figure 9. Co-occurrence network of the most frequent keywords in articles on Acrididae in Brazil. The nodes represent keywords, and their size indicates frequency. The colors identify distinct thematic clusters: biology/physiology (blue) and taxonomy/geography (red).



Source: Research data (2025).

3.8 Structural analysis of concepts and thematic clusters

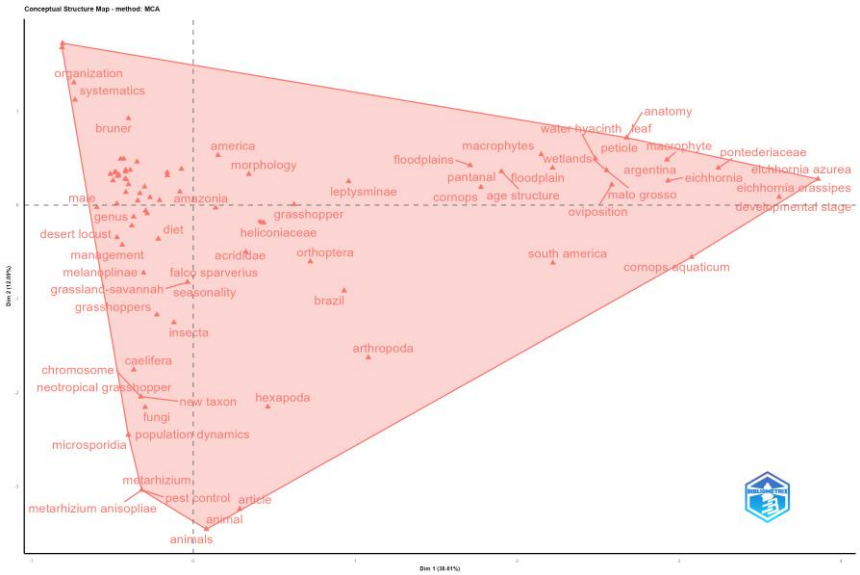
Complementing the hierarchical analysis, the conceptual structure map (WCA) positions the main terms of the literature in a two-dimensional space, based on principal components that explain thematic variance. The axes represent latent dimensions that organize the concepts according to their frequency and co-occurrence.

The terms are distributed into visual clusters, and a red polygon highlights a dominant conceptual cluster, which includes words such as “america,” “organization,” “floodplains,” “chromosome,” “fungi,” “animals,” and “water-hyacinth.”

This grouping suggests an intersection between ecological, genetic, and geographic themes, indicating that a significant portion of scientific production is focused on the interaction between organisms and environments, with emphasis on morphological and genetic aspects, as shown in Figure 10.

The dispersion of other terms outside the polygon indicates the existence of peripheral or emerging concepts that have not yet consolidated as thematic nuclei. This configuration reinforces the need for greater articulation among subthemes and points to opportunities for interdisciplinary integration, particularly between ecology, genetics, and conservation.

Figure 10. Thematic map of keywords.



Source: Research data (2025).

4. Final Considerations

The bibliometric analysis of scientific production on Acrididae in Brazil revealed a stable yet still underexplored research field, with significant potential for thematic and methodological expansion. The annual production of documents proved irregular, with occasional peaks and a null growth rate, indicating the absence of a consolidated trend of increase in scientific publication.

Despite the low temporal consistency, the articles show moderate impact, with an average of 12.6 citations per document and the presence of authors with a relevant h-index, such as Lecco, M. and Adis, J. Scientific collaboration is predominant, with an average of 3.85 co-authors per article, although international participation remains limited (17.81%).

The most frequent keywords and thematic maps indicate that the central topics of research revolve around taxonomy, morphology, and basic ecology, while themes such as molecular genetics, bioindicators, and behavior appear as specialized or emerging niches. The conceptual structure map reinforces this thematic dispersion, highlighting the need for greater integration among subareas.

Hierarchical groupings reveal the existence of well-defined conceptual clusters but also point to fragmentation that can be overcome through interdisciplinary approaches. The analysis of authors over time shows that production is concentrated in a few researchers, with either occasional or continuous contributions, which underscores the importance of fostering new collaborative networks.

In light of these results, it is concluded that research on Acrididae in Brazil has solid foundations but lacks thematic renewal, methodological diversification, and stronger institutional articulation. In this scenario, it is estimated that diversity in Brazil is at least twice as high as currently known. Therefore, we emphasize the urgent need for the training and activity of specialists in virtually all families present in Brazilian territory.

The use of bibliometrics in studies of Acrididae grasshoppers represents a strategic tool for understanding the evolution of scientific knowledge about this group of insects. Through quantitative analysis of publications, citations, and collaboration networks, it is possible to identify research trends, thematic gaps, and the main centers of knowledge production. This approach not only strengthens the systematization of available information but also guides future investigations, enabling researchers to prioritize emerging topics and consolidate underexplored areas.

Moreover, bibliometrics contributes to interdisciplinary integration by revealing connections among ecology, taxonomy, physiology, and pest management, broadening the understanding of the role of Acrididae in ecosystems and agriculture. Thus, the systematic application of bibliometrics becomes essential to optimize resources, foster international collaborations, and ensure that scientific advances are directed toward current environmental and socioeconomic demands.

Acknowledgments

We thank the institutions to which we belong and from which we receive support in carrying out our studies: Museu Paraense Emílio Goeldi – MPEG, Universidade Federal do Pará - UFPA, and Universidade Cruzeiro do Sul - UNICSUL. This study received financial support from the Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES) and the National Council for Scientific and Technological Development (CNPq).

References

Adis, J., & Lecoq, M. (2005). Orthoptera da Amazônia: aspectos ecológicos e taxonômicos. Acta Amazonica, 35(1), 45–52.

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959–975.
Battirola, L. D., Loreto, V., & Acosta, R. C. (2012). Levantamento faunístico de Acrididae em áreas de várzea. Boletim do Museu Paraense Emílio Goeldi, 12(4), 89–97.

Bekman, O. R. & Costa Neto, P. L. O. (2009). Análise estatística da decisão. Editora Edgard Blücher.

Bidau, C. J. (2014). Padrões na biodiversidade de Orthoptera. I. Adaptações em contextos ecológicos e evolutivos. Journal of Insect Biodiversity, 2(20), 1–39. https://doi.org/10.12976/jib/2014.2.20

Carbonell, C. S., Cigliano, M. M., & Lange, C. E. (2006). Espécies de acridomorfos (Orthoptera) da Argentina e Uruguai. Recuperado de https://biodar.unlp.edu.ar/acridomorph/en/info/20191.html

Castro-Souza, R.A., Stropp, J., Iniesta, L.F.M., Ladle, R.J., Szinwelski, N., Tessarolo, G., Diniz-Filho, J.A., Sobral-Souza, T., Hortal, J. (2025) Mapping the status of global taxonomic knowledge of Orthoptera (Arthropoda, Insecta). Frontiers of Biogeography 18: e145455. https://doi.org/10.21425/fob.18.145455

Cigliano, M. M., Braun, H., Eades, D. C., & Otte, D. (2025). Orthoptera Species File (Versão 5.0). Recuperado de http://Orthoptera.SpeciesFile.org

Ferreira, A. & Vidigal, I. (2025). Mapeando a ciência com a bibliometria. Editor: Eduardo F. Santos. ISBN-10: 6501479673. ISBN-13: 978-6501479675.

Lecoq, M., & Magalhães, B. P. (2006). Gafanhotos no Brasil. In B. P. Magalhães & M. Lecoq (Eds.), Bioinseticida e gafanhotos-praga (pp. 23–37). Brasília: Embrapa Recursos Genéticos e Biotecnologia.

Lecoq, M., & Chopard, L. (2008). Grasshopper outbreaks and agricultural impact in South America. Journal of Orthoptera Research, 17(1), 33–41.

Leponce, M., Meyer, C., Häuser, C. L., Bouchet, P., Delabie, J., Weigt, L., & Basset, Y. (2010). Desafios e soluções para o planejamento e implementação de inventários bióticos em larga escala. In Manual de técnicas e protocolos de registro de campo para Inventários e Monitoramento da Biodiversidade de Todos os Táxons (pp. 18–48). Meise: ABC Taxa.

Magalhães, B. P., & Marques, M. I. (2016). Morfologia e fisiologia de acridídeos em ambientes de cerrado. EntomoBrasilis, 9(2), 101–109. https://doi.org/10.12741/ebrasilis.v9i2.123

Matiotti, M. K., Zefa, E., & Lhano, M. G. (2014). Estudos sobre Acrididae no Brasil: diversidade e distribuição. Revista Brasileira de Entomologia, 58(3), 215–223.

Matiotti Da Costa, M. K., Martins, L. P., Zefa, E., Redü, D. R., Morselli, J. P., & De Mello, F. A. G. (2015). Lista de verificação de gafanhotos (Orthoptera: Acridoidea) da Reserva Florestal Adolpho Ducke, Estado do Amazonas, Brasil, e novos registros para o país. Journal of Orthoptera Research, 24(2), 59–65. https://doi.org/10.1665/034.024.0204

Nascimento, E. G. S. et al. (2015). Um algoritmo baseado em técnicas de agrupamento para detecção de anomalias em séries temporais. In: Estudos e Práticas de Aprendizagem de Matemática e Finanças com Apoio de Modelagem (pp.155-186). Editora Ciência Moderna.

Pereira, A. S. et al. (2018). Metodologia da pesquisa científica. (Ebook gratuito). Santa Maria. Editora da UFSM.

R Core Team. (2025). R: A language and environment for statistical computing. Vienna: R Foundation for Statistical Computing. Recuperado de https://www.R-project.org/

Santos Junior, W. A. C., Martins, C. F., & Souto, R. N. P. (2021). Diversity and similarity Gomphocerinae (Orthoptera: Acrididae) communities in the Brazilian Amazon. Research, Society and Development, 10, e54710817763. https://doi.org/10.33448/rsd-v10i8.17763

Scopus. (2025). Base de dados bibliográfica. Elsevier. Recuperado de https://www.scopus.com

Shitsuka, R. et al. (2014). Matemática fundamental para tecnologia. (2ª ed.). Editora Érica.

Souza-Dias, P. G. B., Sperber, C. F., Costa, M. K. M., Mendes, D. M. M., Campos, L. D., Olivier, R. S., Silva, D. S. M., Fianco, M., Szinwelski, N., Bolfarini, M. P., Domenico, F. C., Chamorro-Rengifo, J., & Jesus, F. M. (2024). Orthoptera Olivier, 1789. In J. A. Rafael, G. A. R. Melo, C. J. B. de Carvalho, S. Casari, & R. Constantino (Eds.), Insetos do Brasil: Diversidade e Taxonomia (2ª ed., pp. 254–290). Manaus: Instituto Nacional de Pesquisas da Amazônia.

Thomaz, P. G., Assad, R. S., & Moreira, L. F. P. (2011). Uso do fator de impacto e do índice H para avaliar pesquisadores e publicações. Arquivos Brasileiros de Cardiologia, 96(2), 90–93. https://doi.org/10.1590/S0066-782X2011000200001

Trumper, E. V., Cease, A. J., Cigliano, M. M., Copa Bazán, F., Lange, C. E., Medina, H. E., Overson, R. P., Therville, C., Pocco, M. E., Piou, C., & outros. (2022). A review of the biology, ecology, and management of the South American locust, Schistocerca cancellata (Serville, 1838), and future prospects. Agronomy, 12(1), 135. https://doi.org/10.3390/agronomy12010135

Vanti, N. A. (2002). A informação científica na Internet e o papel das bibliotecas universitárias. Ciência da Informação, 31(2), 28–38. Recuperado de http://revista.ibict.br/ciinf/article/view/106