Bibliometric Analysis Of Scientific Articles Published In The Field Of Veterinary Medicine And Related Areas On Equus Asinus Between 1998 And 2024

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ABSTRACT

Objective. To evaluate the overall scientific output highlighting the relevance of Equus asinus, based on the literature available in the Scopus database during the period 1998-2024.

Materials and methods A retrospective cross-sectional descriptive study was conducted, applying a bibliometric analysis of articles published in journals in the field of veterinary medicine and related areas, published worldwide, which were found in the Scopus database. The bibliometric analysis focused on patterns of knowledge production and accumulation, using quantitative software tools to analyse large sets of bibliographic data.

Results. From 1998 to 2017, scientific output related to the subject of study averaged a maximum of five articles per year, indicating that the scientific community had little interest in studying or evaluating topics related to Equus asinus. In the period from 2018 to 2022, there was an upturn in publications relevant to Equus asinus in the field of veterinary medicine and related areas, with up to 10 articles identified. The co-citation network made it possible to identify that the studies focused on areas such as domestication, distribution, genetic, behavior, parasitology, and genetic diversity, among others.

Conclusions. The scientific literature on global scientific production highlighting the relevance of Equus asinus, based on the available literature, showed a main trend toward research in the areas of genetic analysis and behavior, parasitology, phylogenetics, genetic diversity, among others. The majority of the literature was published by the United States, Brazil, Italy, Portugal, and Spain.

Keywords: Donkey, Veterinary medicine, bibliometrics, development, productivity, Equus. Animal husbandry (Sources: DeCS, MeSH)

INTRODUCTION

Over time, the donkey (Equus asinus) has been much more than just a beast of burden. Its presence in rural areas around the world has been crucial for activities such as agriculture, the transport of goods and even as a means of transporting people in these areas. Recent research highlights qualities ranging from its docile temperament, its ability to adapt to hostile environments and its resistance to disease, making it an indispensable resource for populations with economic and infrastructure limitations (López-Yáñez et al., 2025; Hernández-Herrera et al., 2022).

Figure 1. Equus asinus-Sincelejo –Sucre- Colombia

In the vast majority of Latin American countries, these animals play an active role in the daily lives of rural communities, performing specific tasks such as carrying water and firewood, facilitating access to schools in remote areas, and playing a key role in agricultural work. Interestingly, in contexts of extreme poverty, their function can range from simple pack animals to a source of traction that can be perfectly employed in

agricultural activities (López-Yáñez et al., 2025). Brazil is another clear example, where donkeys are pillars of livestock farming and the rural economy in different areas of the country (Pimentel et al., 2023). However, despite their importance, it has been reported that donkey populations face alarming risks.

In Colombia, their numbers are declining rapidly due to the massive export of skins for the manufacture of ejiao (a traditional Asian medicine) and problems of inbreeding that reduce their genetic diversity (Ministry of the Environment-Colombia, 2023). In Brazil, the situation is similar, where the abandonment of specimens and the illegal trade in skins have contributed to issues such as malnutrition and abuse of this species, neglecting their welfare (Farias et al., 2025). On the other hand, studies on equine health reveal recurring and relevant problems, such as gastrointestinal parasite infestations (Strongylus sp), which affect almost 97% of donkeys in Colombia (Pinilla León et al., 2025), reflecting deficiencies in deworming practices. Other common conditions include diseases such as chronic gastritis (more common in donkeys than in horses) and skin diseases such as dermatophytosis or sarcoids (Medina et al., 2024). In addition, tick-borne pathogens such as Ehrlichia equi are responsible for generating considerable inflammatory responses (Cocco et al., 2023).

This work is a tool for analyzing the scientific community in the field of veterinary science and related areas. The information provided will enable the orientation or proposal of lines of research, the substantiation of decision-making related to the topics of study, and the definition of guidelines or strategies. Through bibliometric analysis, it is possible to retrospectively examine a specific area of knowledge and evaluate the potential of present and future research, as well as characterize the development of scientific disciplines and their lines of research. In this regard, there are no studies that examine the evolution of scientific production in the field of veterinary and related sciences that contain information on Equus asinus; only a few related articles are found in the literature. Therefore, the objective of this article was to evaluate the global scientific production that highlights the relevance of Equus asinus, based on the literature available in the Scopus database during the period 1998-2024.

METHODOLOGY

A retrospective cross-sectional descriptive study was conducted, applying a bibliometric analysis of articles published in journals in the field of veterinary medicine and related areas, published worldwide, which were found in the Scopus database between 1998 and 2024. The bibliometric analysis focused on patterns of knowledge production and accumulation, using quantitative software tools to analyze large sets of bibliographic data.

To define the quality and quantity of scientific articles in academic journals during the period analyzed, the public platform SCImago Journal & Country Rank (https://www.scimagojr.com) was used, developed by the SCImago group based on information contained in the Scopus database. The impact and prestige indicator (SCImago Journal Rank), the quartile in which each journal is found, and its respective H-index were taken into account.

To focus and delimit the research topic, key terms related to the subject studied were used, which allowed the results to be narrowed down. Table 1 describes the search chain and the total number of related studies. The results found (study metadata) were analyzed using the statistical software R, employing the commands bibliometrix::biblioshiny(). The approach developed allowed the bibliographic information from the dataset to be compiled, facilitating the analysis of research trends and patterns present in the selected studies.

Table 1. Inclusion and exclusion criteria	
Criterio	Election
Database	Scopus
Search term	Equids, Equus, Animalia, Equus asinus, Equidaes, Donkey, Horse, Animal, Equus africanus asinus
Excluded documents	Errata

Ethical considerations.
Given that the study is based on the analysis of publicly available scientific publications, approval from an ethics committee was not required. The integrity of all data in its original form was respected, and the

procedure can be reproduced and documented.

RESULT AND DISCUSSION

Bibliometric analysis in the age of digitalization is a relevant tool for evaluating academic productivity from different perspectives. It allows us to understand the relevance of a specific academic topic by author, institution and country, and also consolidates important information on the impact of scientific research in a specific area of knowledge. Its practical usefulness lies in presenting results in indicators that allow the performance of specific sectors of science to be quantified (Tomás et al., 2018).

The initial search for scientific articles highlighting the relevance of Equus asinus revealed a complex network of co-occurrence, as shown in Figure 2.
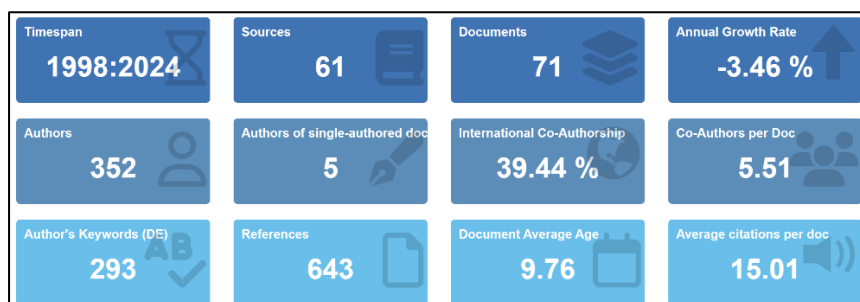

Figure 2. Thematic search network.

The bibliometric review of scientific developments highlighting the relevance of Equus asinus, based on the literature available in the Scopus database during the period 1998–2024, can be seen in Figure 3, which shows that in the period 1998 to 2017, scientific output related to the subject of study was a maximum of five articles per year, indicating that the scientific community did not have much interest in studying or evaluating topics related to Equus asinus.

In the period between 2018 and 2022, there was an upturn in publications relevant to Equus asinus in the field of veterinary medicine and related areas, with up to 10 articles being identified. These significant changes in scientific output may be related to specific events or discoveries that have impacted the direction and focus of the field in question during those years. Likewise, the consistency in the number of publications over the years indicates a slight interest, suggesting that the area of study has maintained its relevance over time, attracting the attention of the academic community.
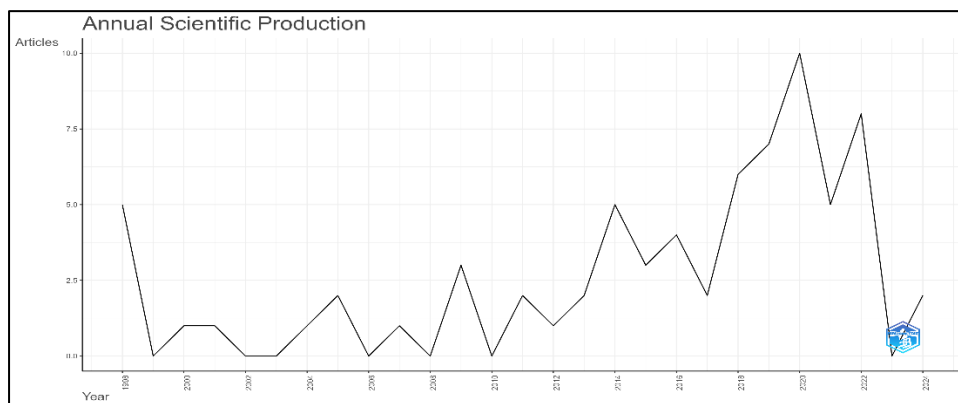

Figure 3: Trend in scientific developments highlighting the relevance of Equus asinus, based on literature available in the Scopus database during the period 1998–2024.

The analysis by country (Figure 4) reveals that the United States leads scientific production in this field, followed by Brazil, Italy, Portugal, and Spain. It is also noteworthy that there are few studies from Africa and many Latin American countries, highlighting a regional gap in knowledge production.
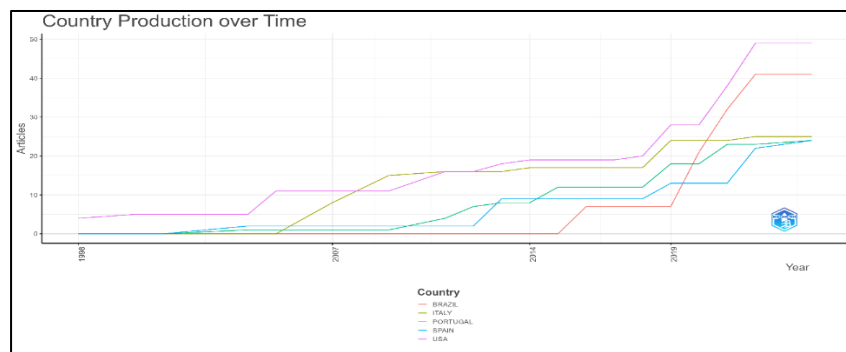
Figure 3. Country performance in relevant scientific research on Equus asinus, based on the literature available in the Scopus database during the period 1998-2024.

Among the most productive and cited authors (Figure 5) is Albano Beja-Pereira, professor at Joseph Fourier University in Grenoble (France), who visited 52 countries, collecting DNA samples from domestic donkeys and wild asses and their relatives in Africa and Asia. His scientific work has focused on the genetic diversity and domestication of Equus asinus, which is a global reference. Similarly, bibliometric impact analysis, based on citations and H-index, confirms that these authors' studies have served as a key reference in the consolidation of the field. However, there is a high dispersion of authors, indicating that a consolidated and stable community has not yet been formed.
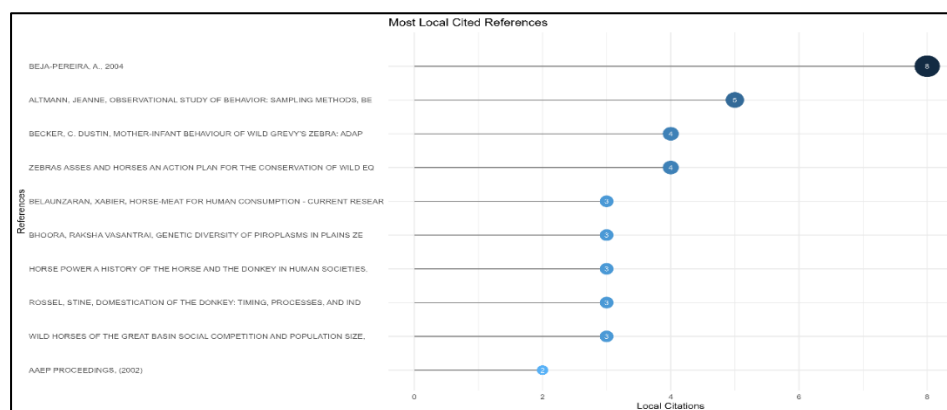

Figure 5. Bibliometric impact of the most influential authors in the field of study (Equus asinus).

The co-citation network allowed us to identify several clusters (Figure 6). The main cluster groups together work focused on the domestication, distribution, genetic analysis and behaviour of Equus asinus, while the second cluster brings together studies on basic topics in veterinary medicine in the areas of parasitology, phylogenetics and genetic diversity, among others. This cluster segmentation highlights the interdisciplinary nature of the field and the diversity of existing approaches.
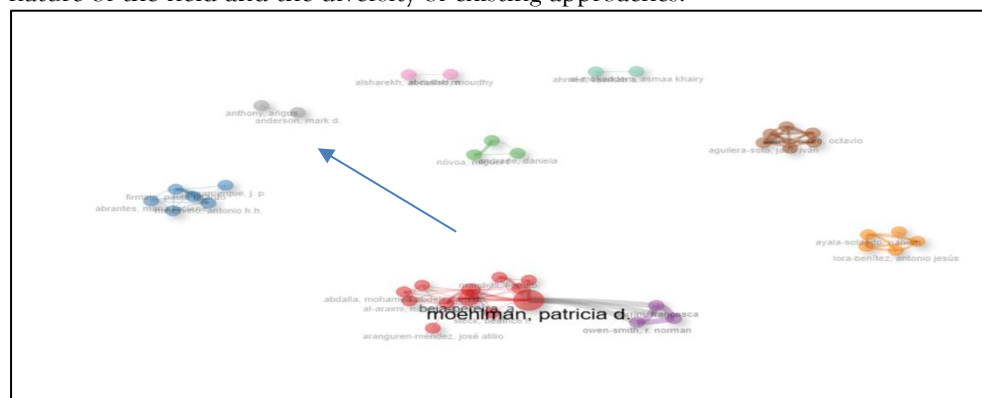

Figure 6. Co-citation network with identification of relevant thematic clusters in the analyzed literature (1998–2024)

Qualitative analysis of the most prominent documents in each cluster (Figure 7) revealed that the research published in the first group focuses on topics such as: the donkey as a wild animal, ecological behaviour, and wild donkeys, among others. The second group covers topics in the areas of genetics, parasitology, and comparisons between donkeys and horses. The third group highlights research in the thematic areas of: the donkey as an African mammal species, among others. The fourth and final cluster is enriched with topics that consolidate the species Equus asinus as an animal with potential for studies in areas of interest such as conservation, intoxication, foot and tissue studies.

The results obtained in this study allow us to observe the academic behaviour of topics related to Equus asinus. The observation of a compact and structurally defined core allowed us to conceptually identify the scientific topic under investigation. The link found between the clusters that related the relevance of topics related to the Equus asinus species implied, first of all, recognizing that there is still interest in studying this species (Equus asinus), despite the fact that scientists are mainly interested in the Equus caballus species (De Almeida et al., 2024).
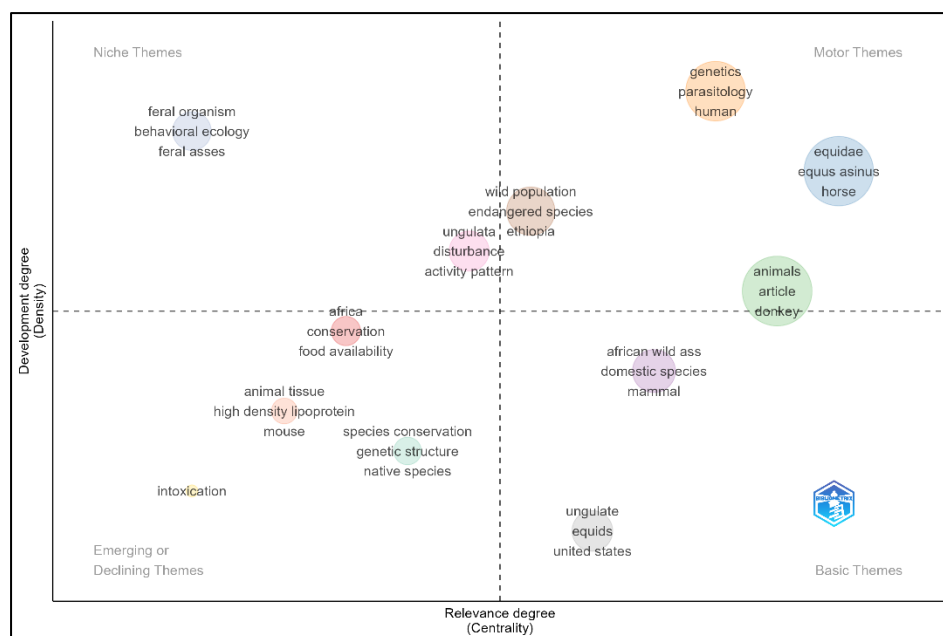

Figure 7. Thematic map of conceptual clusters identified in the analyzed literature (1998–2004).

In terms of geographical distribution, the leadership of countries such as the United States, Brazil, Italy, Portugal, and Spain reveals a pattern where research ecosystems and promotion policies in areas that interact with the Equus asinus species have facilitated a more structured research response, in contrast to other countries around the world.

The study and analysis of keywords and co-citation networks detected a division in research approaches, reinforcing the idea that the field of research on the Equus asinus species is still in the process of theoretical consolidation.

It should be noted that the Equus asinus species has been steadily increasing worldwide since 1961, continuing its trend until 2018 (global increase in the donkey population of approximately 1% per annum). This information is important for understanding the global, regional, and national factors driving changes in equid populations and potential threats to their welfare (Norris et al., 2021).

CONCLUSION
The scientific literature on global scientific production highlighting the relevance of Equus asinus, based on the literature available in the Scopus database during the period 1998–2024, showed that the main trends were research in the areas of genetic analysis and behaviour, parasitology, phylogenetic, genetic diversity, among others, showing a high degree of segmentation of research in these topics, which highlights

the interdisciplinary nature of the field and the diversity of existing approaches. The largest amount of literature was published by the United States, Brazil, Italy, Portugal, and Spain.

Author contributions

Mr. Camilo Severiche wrote the main manuscript, Mr. Alexander Pérez reviewed the manuscript and Donicer E. Montes prepared the figures and helped in the analysis of the topic and style correction.

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