

Preserving Indigenous Ecological Knowledge Through Digital Humanities: A Lexical Analysis of Flora and Fauna Terminologies in Purananuru

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ABSTRACT

Classical Tamil literature preserves valuable knowledge about language, culture, and the natural environment. Among the Sangam texts, *Purananuru* contains numerous references to flora and fauna that reflect the ecological awareness of ancient Tamil society. This study examines flora and fauna terminologies found in Songs 01–50 of *Purananuru* edited by *Puliyur Kesigan* (1999) with the aim of identifying ecological vocabulary and analysing its continuity and transformation in contemporary Tamil. A qualitative textual analysis approach was employed. The selected poems were systematically examined, and ecological terms were identified using the commentary. The collected data were recorded in a Microsoft Excel database containing the source word, meaning, contemporary equivalent, usage status, and type of linguistic change. The identified terms were analysed to determine patterns of lexical retention, lexical replacement, phonological modification, semantic change, and archaism. The findings reveal that many Sangam-era ecological terms have disappeared from modern Tamil usage or have been replaced by alternative lexical forms, while only a limited number remain in common use. These changes demonstrate the dynamic nature of language evolution and indicate the gradual decline of indigenous ecological vocabulary over time. To address this issue, the study proposes the development of a digital application named *Senhamizh* as a Digital Humanities initiative. The application is designed to serve as a digital repository of flora and fauna terminologies found in *Purananuru*, providing access to original terms, meanings, contextual references, modern equivalents, and linguistic notes. By combining literary research with digital technology, the study contributes to the preservation of Tamil linguistic heritage, indigenous ecological knowledge, and cultural sustainability in the digital era.

Keywords: Digital Humanities, Ecological Knowledge, Flora and Fauna Terminologies, *Purananuru*, Tamil Language Preservation

INTRODUCTION

Language serves as a repository of cultural memory, preserving the knowledge, values, and environmental experiences of a community across generations. Classical Tamil literature, particularly the Sangam corpus, offers valuable insights into the social, political, economic, and ecological life of ancient Tamil society. Among these literary works, *Purananuru* occupies a prominent position as a collection of poems that document the lived experiences, landscapes, flora, fauna, and cultural practices of the Sangam period. The ecological references embedded within these poems reflect the close relationship between humans and nature and provide evidence of indigenous environmental knowledge that has been transmitted through literary traditions.

Flora and fauna terminologies found in *Purananuru* represent an important component of this ecological knowledge. These lexical items not only identify plant and animal species but also reveal information about the environment, livelihoods, agricultural practices, hunting traditions, and cultural symbolism of ancient Tamil communities. However, linguistic change over time has resulted in the modification, replacement, or disappearance of many Sangam-era terms from contemporary Tamil usage. As a result, a significant portion of

the ecological vocabulary preserved in classical texts remains unfamiliar to modern readers, students, and researchers.

The preservation of such vocabulary is particularly important in the contemporary era, where globalization, language modernization, and technological transformation contribute to the gradual loss of traditional linguistic knowledge. Documenting and analysing ancient ecological terminology can contribute to linguistic sustainability, cultural heritage preservation, and a deeper understanding of indigenous knowledge systems. Furthermore, the study of lexical evolution provides insights into phonological, semantic, and sociolinguistic changes that have occurred within the Tamil language over centuries.

Recent developments in Digital Humanities have created new opportunities for preserving and disseminating cultural and linguistic heritage through digital technologies. Digital archives, lexical databases, and mobile applications enable the systematic documentation of historical knowledge while making it accessible to wider audiences. By integrating traditional literary scholarship with digital preservation methods, researchers can ensure that valuable linguistic resources remain available for future generations.

Against this background, the present study examines flora and fauna terminologies found in Songs 01–50 of *Purananuru* edited by *Puliyur Kesigan* (1999). The study identifies and analyses ecological vocabulary within the selected poems and compares these terms with their contemporary Tamil equivalents to investigate lexical continuity, phonological variation, semantic shifts, and language change. In addition, the research proposes a digital platform for archiving and disseminating the identified terminologies, thereby contributing to the preservation of Tamil ecological heritage through a Digital Humanities approach. In addition, the research proposes the ongoing development of a digital application named *Senthamizh* for archiving and disseminating the identified terminologies. The application is being designed as a Digital Humanities platform that will support the preservation of Tamil ecological heritage and improve public accessibility to Sangam ecological knowledge.

LITERATURE REVIEW

Purananuru is one of the most significant works within the Sangam corpus and serves as an important source for understanding the social, political, cultural, and ethical dimensions of ancient Tamil society. Scholars have examined the text from various perspectives, including family structure, social values, humanity, governance, and cultural practices. These studies collectively demonstrate the richness of *Purananuru* as a repository of historical and cultural knowledge.

Jaisankar (2022) investigated the representation of family structures in *Purananuru* and highlighted the importance of familial relationships, parental responsibilities, child-rearing practices, and ethical values in Sangam society. The study revealed that the poems preserve valuable information regarding social organization, women's roles, marriage, family honour, and moral conduct. The author concluded that *Purananuru* serves as an important source for understanding the social foundations of ancient Tamil civilization. The study primarily focused on family life and social values rather than the linguistic and ecological dimensions of the text.

Similarly, Rajalakshmi (2022) examined the concept of humanity in *Purananuru* and demonstrated how the poems reflect virtues such as love, friendship, hospitality, generosity, gratitude, social responsibility, moral conduct, and universal brotherhood. The study argues that *Purananuru* provides valuable insights into the ethical and humanitarian principles of the Sangam age and highlights the cultural sophistication of ancient Tamil society. The author further notes that the text preserves information related to education, governance, social welfare, and community relationships. The study concludes that *Purananuru* functions as a cultural archive that documents the humanistic values and social philosophy of the Tamil people.

Existing scholarship on *Purananuru* has largely concentrated on social history, ethics, political structures, family relationships, and cultural values. These studies have established the literary and historical significance of the text while demonstrating its role in preserving the collective memory of ancient Tamil society. However,

relatively little attention has been paid to the ecological vocabulary embedded within the poems, particularly the flora and fauna terminologies that reflect indigenous environmental knowledge and ecological awareness.

From a linguistic perspective, ecological vocabulary constitutes an important component of cultural heritage because it records the interaction between communities and their natural environment. Terms referring to plants, animals, birds, insects, and aquatic species often carry historical, cultural, and ecological meanings that extend beyond their literal definitions. Over time, many of these lexical items undergo semantic shifts, phonological changes, lexical replacement, or become obsolete in contemporary language use. Consequently, documenting such terminology is essential for understanding language evolution and preserving traditional ecological knowledge.

Recent developments in Digital Humanities have created innovative opportunities for preserving linguistic and cultural heritage through digital archives, lexical databases, and interactive learning platforms. Digital preservation initiatives enable researchers to systematically document historical vocabulary while providing broader public access to cultural resources. The integration of literary analysis with digital technologies has become increasingly important for safeguarding endangered linguistic knowledge and promoting cultural sustainability.

Although previous studies have successfully explored the social, ethical, and cultural aspects of *Purananuru*, there remains a significant research gap regarding the systematic documentation and analysis of flora and fauna terminologies found within the text. Furthermore, limited attention has been given to the application of Digital Humanities methodologies for preserving Sangam ecological vocabulary. Therefore, the present study seeks to address this gap by identifying and analysing flora and fauna terminologies in *Purananuru* Songs 01–50, examining their contemporary usage and linguistic transformation, and proposing a digital platform for the preservation and dissemination of Sangam ecological knowledge.

METHODOLOGY

This study employed a qualitative textual analysis approach to examine flora and fauna terminologies found in *Purananuru*. The primary source of data was *Purananuru* edited by Puliyur Kesigan (1999), with the analysis limited to Songs 01–50. Although the study focuses on Songs 01–50 of *Purananuru*, these poems provide an initial corpus for examining ecological terminology and linguistic change. The findings are not intended to represent the entire *Purananuru* corpus. Future research will extend the analysis to all 400 poems and other Sangam texts, enabling the development of a comprehensive ecological lexical database. The selected poems were carefully examined to identify lexical items related to plants, animals, birds, insects, aquatic species, and other ecological elements. The meanings provided in the commentary and explanatory notes were used to verify the identified terms.

The extracted lexical items were recorded in a Microsoft Excel database containing the source word, category, song number, meaning, contemporary Tamil equivalent, usage status, and type of linguistic change. The identified terms were subsequently compared with contemporary Tamil vocabulary using Tamil dictionaries, lexicons, scholarly commentaries, and present-day language usage to determine whether they have been retained, replaced, modified, or become archaic over time. The analysis focused on patterns of lexical replacement, phonological change, semantic change, and lexical retention in order to examine the evolution of ecological vocabulary from the Sangam period to the present.

To support the preservation and dissemination of the identified terminologies, the study also incorporates a Digital Humanities perspective through the ongoing development of a digital application named *Senhamizh*. The proposed application is designed as a searchable repository containing Sangam ecological vocabulary, meanings, poem references, contemporary equivalents, and linguistic notes. The reliability of the findings was ensured through cross-verification of meanings using the selected text, Tamil lexicons, and relevant scholarly sources. As the study is limited to Songs 01–50 of *Purananuru*, the findings are not intended to represent the entire corpus but rather to provide a foundation for future research and digital preservation initiatives.

FINDINGS AND DISCUSSION

The analysis of *Purananuru* Songs 01–50 resulted in the identification of several flora and fauna terminologies that reflect the ecological knowledge of ancient Tamil society. These lexical items represent various categories, including fish, insects, birds, reptiles, animals, and flowers. The findings indicate that while some terms continue to exist in contemporary Tamil, many have undergone lexical replacement, phonological modification, semantic shifts, or have become archaic. Table 1 presents selected flora and fauna terminologies identified in the corpus.

Table 1 Sample Data

Sangam Term	Meaning	Contemporary Equivalent	Type of Change
கெளிறு	Fish species	Rarely used	Archaic
சுடர்ப்பூ	Bright red flower	Not commonly used	Archaic
மிஞிறு	Bee	தேனீ	Lexical Replacement
கராம்	Crocodile species	முதலை	Lexical Replacement
சிதலை	Ant species	கரையான்	Lexical Replacement
ஈயல்	Winged male ant	ஈசல்	Phonological Change
கானவாரணம்	Jungle fowl	காட்டுக்கோழி	Lexical Replacement
செம்மீன்	Red fish	Limited usage	Partial Retention
மலங்கு	Fish species	Rarely used	Archaic
வீ	Flower	பூ	Lexical Replacement
கதநாய்	Fierce dog	வெறிநாய்	Semantic Replacement

Lexical Replacement and Language Evolution

One of the most significant findings of the study is the prevalence of lexical replacement. Several Sangam-era ecological terms have been replaced by alternative lexical forms in contemporary Tamil. For example, the term *மிஞிறு* has been replaced by *தேனீ*, while *கராம்* is no longer commonly used and has been replaced by *முதலை*. Similarly, *கானவாரணம்* has given way to the more familiar term *காட்டுக்கோழி*.

These changes illustrate the natural process of language evolution, where lexical items are gradually replaced due to shifts in communication patterns, regional usage, social transformation, and linguistic simplification. Although the referents remain unchanged, the original Sangam terminology has largely disappeared from everyday language use.

Phonological Change

The analysis also revealed instances of phonological transformation. The term *ஈயல்*, referring to a winged ant, appears to have evolved into *ஈசல்* in contemporary Tamil. Such changes demonstrate how pronunciation patterns and phonetic simplification contribute to language change over time while preserving the core meaning of the lexical item.

Archaic Ecological Vocabulary

Several terms identified in the corpus are no longer widely recognized among contemporary Tamil speakers. Words such as *கெளிறு*, *மலங்கு*, and *சுடர்ப்பூ* appear to have become archaic. The decline of these terms may be attributed to changing environmental conditions, reduced interaction with specific species, shifts in cultural practices, and the replacement of traditional vocabulary by more generalized expressions.

The disappearance of these lexical items highlights the vulnerability of indigenous ecological knowledge preserved within classical literature. Without systematic documentation, many such terms risk becoming inaccessible to future generations.

Ecological Knowledge in Purananuru

The identified flora and fauna terminologies demonstrate that *Purananuru* is not merely a literary text but also a repository of ecological knowledge. The frequent references to animals, birds, insects, fish, and plants indicate the close relationship between ancient Tamil communities and their natural environment. These terms provide valuable insights into biodiversity, environmental observation, hunting practices, agriculture, and everyday life during the Sangam period.

The findings suggest that ecological awareness formed an integral part of ancient Tamil culture and that literary texts functioned as important vehicles for preserving environmental knowledge.

Social and Environmental Factors Influencing Lexical Decline

The disappearance of many Sangam ecological terms may be linked to several interconnected factors. Urbanization and environmental transformation have reduced direct interaction with certain plant and animal species, resulting in the gradual loss of specialized vocabulary. Educational systems increasingly prioritize standardized modern Tamil, limiting exposure to classical terminology. Furthermore, globalization and the influence of mass media have encouraged the adoption of simplified and widely understood lexical forms, leading to the replacement of traditional ecological terms. These developments demonstrate how language change is closely associated with cultural and environmental change.

Implications for Digital Humanities

The study further highlights the importance of Digital Humanities approaches in preserving linguistic and ecological heritage. The identification and documentation of flora and fauna terminologies provide the foundation for developing a digital lexical archive. Such a platform can systematically store information related to Sangam vocabulary, including meanings, contextual usage, modern equivalents, and linguistic transformations.

The proposed digital archive would not only support academic research but also facilitate public engagement with Tamil cultural heritage. Through searchable databases, educational resources, and future mobile applications, endangered ecological vocabulary can be preserved and made accessible to students, researchers, translators, and language enthusiasts.

Senthamizh Application: Proposed Features

The findings of the present study provide the content foundation for the ongoing development of the Senthamizh application. The proposed application is intended to include several user-oriented features, including a searchable lexical database, flora and fauna categorization, poem-based references, and information on language evolution. Each lexical entry will contain the Sangam term, transliteration, meaning, contemporary equivalent, category, and notes regarding lexical, phonological, or semantic changes. Future versions of the application may incorporate visual representations of flora and fauna species, audio pronunciation of Sangam terms, interactive educational quizzes, multilingual search functions, and searchable digital archives that allow users to explore ecological vocabulary through thematic categories and poem references. Through these features, Senthamizh aims to enhance public engagement with Sangam literature while promoting the preservation of indigenous ecological knowledge in a digital environment.

The development of Senthamizh will follow a phased approach. Phase One involves the creation of a lexical database based on Purananuru Songs 01–50. Phase Two will expand the repository by incorporating the

remaining Purananuru poems and other Sangam texts. The application is intended to be developed as a web-based and mobile-accessible platform to ensure broader accessibility. Sustainability will be supported through periodic updates, collaboration with Tamil scholars and educational institutions, and the integration of new lexical entries contributed through future research projects. This model will enable the repository to evolve continuously as a digital archive of Tamil ecological knowledge.

DISCUSSION

The findings reveal that ecological vocabulary in *Purananuru* reflects both linguistic richness and cultural knowledge. While previous studies on *Purananuru* have emphasized social values, family structures, and humanitarian principles, the present study demonstrates that the text also preserves extensive environmental knowledge through its references to flora and fauna. The observed patterns of lexical replacement, phonological change, and archaism indicate the dynamic nature of language and the gradual transformation of ecological terminology across centuries.

Furthermore, the study emphasizes that the preservation of ancient ecological vocabulary extends beyond linguistic documentation. These terms represent indigenous knowledge systems that connect language, culture, and the environment. By integrating textual analysis with digital preservation strategies, the research contributes to the sustainable safeguarding of Tamil linguistic heritage and promotes the application of Digital Humanities methodologies in Sangam studies.

CONCLUSION AND RECOMMENDATIONS

This study examined the flora and fauna terminologies found in Songs 01–50 of *Purananuru* and explored their relevance to contemporary Tamil language usage. The findings revealed that while some ecological terms continue to exist in modern Tamil, many have undergone lexical replacement, phonological modification, semantic change, or have become archaic over time, highlighting both language evolution and the gradual disappearance of indigenous ecological vocabulary. The study further established that *Purananuru* functions not only as a literary masterpiece but also as a significant repository of environmental knowledge, cultural memory, and linguistic heritage. To preserve this valuable knowledge, the study proposes a Digital Humanities framework that has provided the foundation for the ongoing development of the *Senthamizh* application, which is intended to serve as a searchable digital repository of ecological terminology found in *Purananuru*. Future research should extend the analysis to the entire *Purananuru* corpus and other Sangam texts to facilitate the development of a comprehensive digital ecological lexicon of Classical Tamil. Furthermore, educational institutions, researchers, and cultural organizations should collaborate to create digital repositories, online dictionaries, and mobile applications that preserve and disseminate ancient vocabulary. In an era of rapid globalization and technological advancement, documenting and preserving indigenous and minority languages has become increasingly important, as these languages embody unique cultural knowledge, histories, and worldviews. Therefore, the systematic digitization and preservation of ancient literary works are essential to ensuring that linguistic and cultural heritage remains accessible, relevant, and sustainable for future generations. Beyond linguistic preservation, the proposed digital platform contributes to safeguarding indigenous ecological knowledge embedded within classical Tamil literature. By making this knowledge digitally accessible, the project supports cultural sustainability, educational engagement, and intergenerational knowledge transmission.

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