

LAND-USE SYSTEMS IMPACT ON THE DIVERSITY AND ABUNDANCE OF *Pheretima* Group (CLITELLATA: MEGASCOLECIDAE)

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SUMMARY

RIZKI AMALIAH. Land-use systems impact on the diversity and abundance of *Pheretima* Group (Clitellata: Megascolecidae). Supervised by TRI ATMOWIDI and ANDY DARMAWAN.

Earthworms are widely distributed in Indonesia, especially in Sulawesi which has high biodiversity and endemism. The soil's physical and chemical properties greatly influence the presence of earthworms. However, land conversion from natural habitats can potentially reduce the diversity of earthworm species. Until now, there has been no report on diversity of earthworms in Sulawesi. This study aims to provide baseline data on the diversity of earthworm and their relationship with soil properties in several habitats in the enclave Lindu, Sulawesi.

This study was conducted in five habitats in the enclave Lindu, including primary forest, secondary forest, grassland, cacao plantation, and rural area. Samples were collected using digging and hand-sorting method and preserved in 4% formaldehyde for identification. Soil samples were collected using compositing method and analyzed in the laboratory. Species diversity was displayed through rarefaction and extrapolation curves, while the effect of soil properties on earthworm abundance was analyzed using Canonical Correspondence Analysis (CCA).

The results showed that there were 269 individuals of earthworms belonging to 16 species from three genera, with four of them being endemic species. The distribution varied greatly between habitats, with primary forest having the highest species richness and diversity, while rural area recorded the lowest value. This variation indicates an influence of the soil properties on the abundance and distribution of earthworms.

These finding reinforce that converting natural land to anthropogenic land reduces the diversity of earthworms, presumably due to changes in environmental conditions. Nevertheless, this study successfully identified several morphospecies that can become new species, indicating that Sulawesi still has excellent potential for discovering new taxa.

Keywords: Distribution, diversity, habitat, lake Lindu, land conversion.

RINGKASAN

RIZKI AMALIAH. Dampak sistem penggunaan lahan terhadap keanekaragaman dan kelimpahan kelompok *Pheretima* (Clitellata: Megascolecidae). Dibimbing oleh TRI ATMOWIDI dan ANDY DARMAWAN.

Cacing tanah tersebar luas di Indonesia, khususnya di Sulawesi yang memiliki keanekaragaman hayati dan endemisitas yang tinggi. Keberadaan cacing tanah sangat dipengaruhi oleh sifat fisik dan kimia tanah. Namun, alih fungsi lahan dari habitat alami berpotensi menurunkan keanekaragaman spesies cacing tanah. Hingga saat ini, belum ada laporan mengenai keanekaragaman cacing tanah dan pengaruhnya terhadap sifat tanah di Sulawesi. Penelitian ini bertujuan untuk menyediakan data dasar mengenai keanekaragaman cacing tanah dan hubungannya dengan sifat tanah di beberapa habitat di enclave Lindu, Sulawesi.

Penelitian ini dilakukan pada lima habitat di enclave Lindu, meliputi hutan primer, hutan sekunder, padang rumput, kebun kakao dan kawasan pemukiman. Sampel dikoleksi menggunakan metode penggalian dan sortasi manual dan diawetkan dalam formalin 4% untuk identifikasi. Sampel tanah dikoleksi menggunakan metode kompositing dan dianalisis di laboratorium. Keanekaragaman spesies ditampilkan melalui kurva rarefaksi dan ekstrapolasi, sedangkan pengaruh sifat tanah terhadap kelimpahan cacing tanah dianalisis menggunakan *Canonical Correspondence Analysis* (CCA).

Hasil penelitian menunjukkan bahwa terdapat 269 individu cacing tanah yang tergolong ke dalam 16 spesies dari tiga genus, dengan empat diantaranya merupakan spesies endemik. Distribusinya sangat bervariasi antarhabitat, dimana hutan primer memiliki kekayaan spesies dan keanekaragaman tertinggi, sedangkan kawasan pemukiman mencatat nilai terendah. Variasi ini mengindikasikan bahwa adanya pengaruh sifat tanah terhadap kelimpahan dan distribusi cacing tanah.

Temuan ini memperkuat bahwa konversi lahan alami menjadi lahan antropogenik mengurangi keanekaragaman cacing tanah, diduga akibat perubahan kondisi lingkungan. Meskipun demikian, penelitian ini berhasil mengidentifikasi beberapa morfospesies yang berpotensi menjadi spesies baru, menunjukkan bahwa Sulawesi masih menyimpan potensi besar untuk penemuan taksa baru.

Kata kunci: Alih fungsi lahan, danau Lindu, distribusi, habitat, keanekaragaman.



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**LAND-USE SYSTEMS IMPACT ON
THE DIVERSITY AND ABUNDANCE OF *Pheretima* Group
(CLITELLATA: MEGASCOLECIDAE)**

RIZKI AMALIAH

Thesis
as a requirement for obtaining a Magister's degree
in Study Program of Animal Biosciences

**STUDY PROGRAM OF ANIMAL BIOSCIENCES
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
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FOREWORD

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