



ASSESSMENT OF SOIL QUALITY AND MICROPLASTIC CONTAMINATION IN PADDY FIELDS OF NA MUEN SRI AND KHOK SABA SUBDISTRICTS, NAYONG DISTRICT, TRANG PROVINCE, THAILAND

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Introduction

Paddy fields are essential for food security in Thailand, and soil quality plays a key role in rice growth and productivity. Major soil nutrients (N, P, and K), soil pH, and moisture are important indicators of soil fertility and crop performance.

Recently, microplastic contamination has emerged as a concern in agricultural soils, as microplastics may affect soil properties and biological processes.



Introduction

However, information on microplastic contamination in paddy soils in Thailand is still limited. This study therefore aims to assess soil quality together with microplastic contamination in paddy fields to provide baseline data for sustainable soil management.



Research Question

What are the levels of soil quality in terms of major nutrients, soil pH, soil moisture, and microplastic contamination in paddy soils of Na Muen Sri and Khok Saba subdistricts



Research Hypothesis

of microplastic contamination. Paddy soils of Na Muen Sri and Khok Saba subdistricts differ in soil quality and the level



Methodology

Study of Soil Properties in the Study Area



The study was conducted in paddy fields of Khok Saba and Na Muen Sri subdistricts, with two study areas selected in each subdistrict. Soil-water extracts were prepared by mixing soil with distilled water and allowing the mixture to settle. Major soil nutrients (nitrogen, phosphorus, and potassium) were analyzed using colorimetric test kits. Soil pH, moisture, and light intensity were measured using a needle-type soil meter inserted into the soil at a depth of 10 cm.

Methodology



Study of Microplastic Detection in Soil in the Study Area

Microplastic analysis was conducted following Pattanasirinon and Suriyaphan (2021). Soil samples were collected with three replicates per site, oven-dried, and sieved. Microplastics were separated using a NaCl solution, organic matter was digested with H_2O_2 , and the samples were filtered through GF/C filters. Microplastics were identified and counted under a stereo microscope.

Results

Soil quality varied among the four study sites. Nitrogen and phosphorus were mostly detected at trace levels, while potassium ranged from low to high, with the highest level found in Khok Saba 2. Soil pH ranged from 6 to 8, indicating neutral to slightly alkaline conditions, and soil moisture and light intensity differed among sites.



Table 1 Result of soil properties in the study area

Area	Nitrogen (N)	Phosphorus (P)	Potassium (K)	pH	Soil moisture	Soil light intensity
Khok Saba 1	trace	trace	medium	8	1	200
Khok Saba 2	trace	low	high	7	8	2000
Na Muen Sri 1	low	trace	Low	7	9	2000
Na Muen Sri 2	trace	trace	Medium	6	3	1000

Results

Microplastic particles were detected in paddy soils of both subdistricts. Khok Saba 1 showed the highest number of suspected microplastics (9 particles), followed by Khok Saba 2 (5 particles). No microplastics were detected in Na Muen Sri 1, whereas 4 particles were found in Na Muen Sri 2, indicating spatial variation in microplastic contamination across the study areas.



Table 2 Results of microplastic detection in soil in the study area

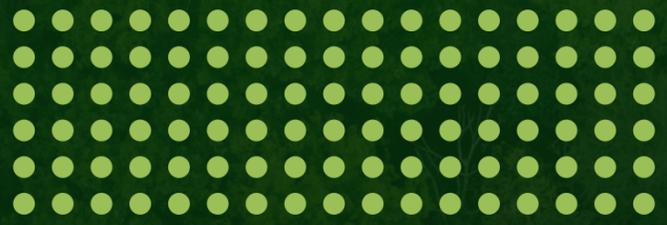
Area	Amount (pieces)	Example Images
Khok Saba 1	9	
Khok Saba 2	3	
Na Muen Sri 1	0	-

Na Muen Sri 2	4	
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Summary and Discussion

Paddy soils in Khok Saba and Na Muen Sri differed in chemical and physical properties, with generally low nitrogen and phosphorus, variable potassium, and soil pH ranging from 6 to 8. Microplastics were unevenly detected across sites, with higher occurrence in Khok Saba, indicating spatially variable contamination and the need for continued monitoring.





THANK YOU!

