Title: Microplastics in Suandok wastewater treatment plant: distribution and removal efficiencies

Author(s) :

1. Jiratchaya Miller — **Student ID :** 650515004
2. — **Student ID :**
3. — **Student ID :**

Major : Environmental Science

Advisor(s) :

1. Assistant Professor Dr. Pumis Thuptimdang
2.
3.

Type of presentation* ***(choose 1)*** **:**

- ☐ **Oral Presentation** (เฉพาะ ตัวแทนนศ.ที่สาขาเลือกให้นำเสนอแบบบรรยาย)
- ☑ **Poster** (กรณี นำเสนอผลงานปัญหาพิเศษ/การค้นคว้าอิสระ)
- ☐ **Cooperative Education** (กรณี นำเสนอผลงานสหกิจศึกษา)

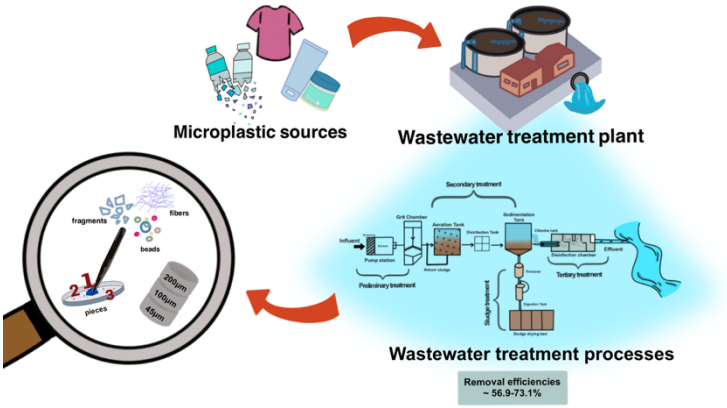
ABSTRACT

Microplastics (MPs) are emerging pollutants of concern in water due to their potential to cause physical damage to humans and other organisms. Plastic uses by humans can lead to MPs contamination in wastewater, where they might not be effectively removed in a wastewater treatment plant (WWTP), leading to the discharge of MPs into the environment. This research investigated the distribution and removal efficiency of MPs across different stages at Suandok wastewater treatment plant, Chiang Mai University. Water samples were collected throughout all treatment units, while sludge samples were collected from sedimentation-related units and sludge drying beds. Water samples were processed using sieves, and sludge samples were oven-dried prior to analysis. All samples were digested using Fenton's reagents, subjected to density separation, oven-dried, and then examined under a digital microscope. MPs were classified by size and shape, and removal efficiencies were calculated for preliminary, secondary, and tertiary treatment stages. The results showed that MPs removal was inefficient and inconsistent in the preliminary treatment units. In contrast, MPs concentrations increased in the aeration tank, likely due to redistribution and adsorption of MPs onto activated sludge biomass. A significant decrease was observed after the sedimentation, indicating that microplastic removal was most effective during biomass settling. Fibers were the dominant microplastic shape in both water and sludge samples, while smaller microplastics were

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*

more likely to remain in the final effluent. Overall MPs removal efficiencies ranged between 56.9% and 73.1%, indicating that conventional wastewater treatment mainly reduces MPs by transferring them from wastewater to sludge rather than eliminating them. This study provides baseline information on MPs behavior in a WWTP and supports future monitoring and management strategies.



Keywords: microplastics; microplastic removal; sludge; wastewater treatment plant

*Type of presentation must be matched with an option you choosing on student upload system.

**The abstract can be more than one page and must be approved by project advisor before upload.

Title name guide.

ADVISOR title name / แปลไทย	
Professor Dr.	ศาสตราจารย์ ดร.
Professor	ศาสตราจารย์
Associate Professor Dr.	รองศาสตราจารย์ ดร.
Associate Professor	รองศาสตราจารย์
Assistant Professor Dr.	ผู้ช่วยศาสตราจารย์ ดร.
Assistant Professor	ผู้ช่วยศาสตราจารย์
Dr.	ดร.
Lecturer	อาจารย์
Mrs.	นาง
Ms.	นางสาว
Mr.	นาย

Major name guide.

SCIENCE MAJOR name / แปล	
Biology	ชีววิทยา
Microbiology	จุลชีววิทยา
Zoology	สัตววิทยา
Biochemistry and Biochemical Technology *or* Biochemistry and Biochemical Innovation	ชีวเคมีและชีวเคมีเทคโนโลยี *หรือ* ชีวเคมีและชีวเคมีนวัตกรรม
Chemistry	เคมี
Industrial Chemistry	เคมีอุตสาหกรรม
Materials Science	วัสดุศาสตร์
Physics	ฟิสิกส์
Computer Science	วิทยาการคอมพิวเตอร์
Data Science	วิทยาการข้อมูล
Mathematics	คณิตศาสตร์
Statistics	สถิติ
Gemology	อัญมณีวิทยา
Geology	ธรณีวิทยา
Environmental Science	วิทยาศาสตร์สิ่งแวดล้อม

**Type of presentation must be matched with an option you choosing on student upload system.*

***The abstract can be more than one page and must be approved by project advisor before upload.*