

# Comparing Pattern and Ion Composition of Size-fractionated Particulate Matters in Chiang Mai city and Chiang Rai Border area

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## Introduction

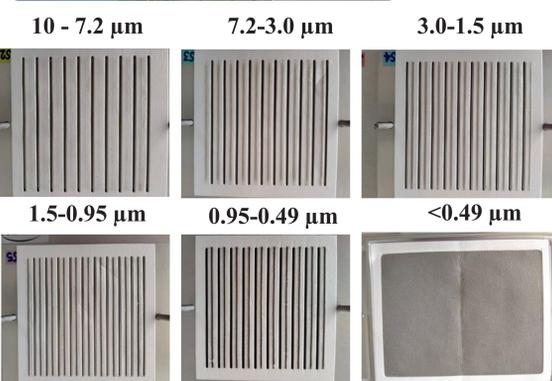
**Particulate Matter (PM)** refers to a mixture of tiny solid particles and liquid droplets suspended in the air. This study examines seasonal variations in PM at two Northern Thailand sites—urban Chiang Mai and the Chiang Rai border. **Fine PM (<2.5 μm)** primarily originates from combustion sources like vehicles and biomass burning, while **coarse PM (2.5–10 μm)** is produced by mechanical processes such as soil and road dust. **Ion Chromatography** was used to measure key ions (Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup>), helping to pinpoint the pollutant sources.

## Methods



### • Samling Sites:

- Chiang Mai meteorological station
- Chiang Rai public health office
- Sampling Duarion:
- Pre-Smoke Haze (Feb 2024)
- Soke Haze (Mar-Apr 2024)
- Post-Smoke Haze (May-June 2024)



### • Samling Method:

- Using High Volume Air Sampler with 5 stage
- Cascade Impactor
- Flow rate 40 CFM, collect for 24 hours



### • PM <0.49 μm Samles Analysis:

- All samples were weigh using Digital Laboratory Scale (MX5 Micro Balance) and Ionic Composition were analysed using Ion Chromatography

## Conclusion

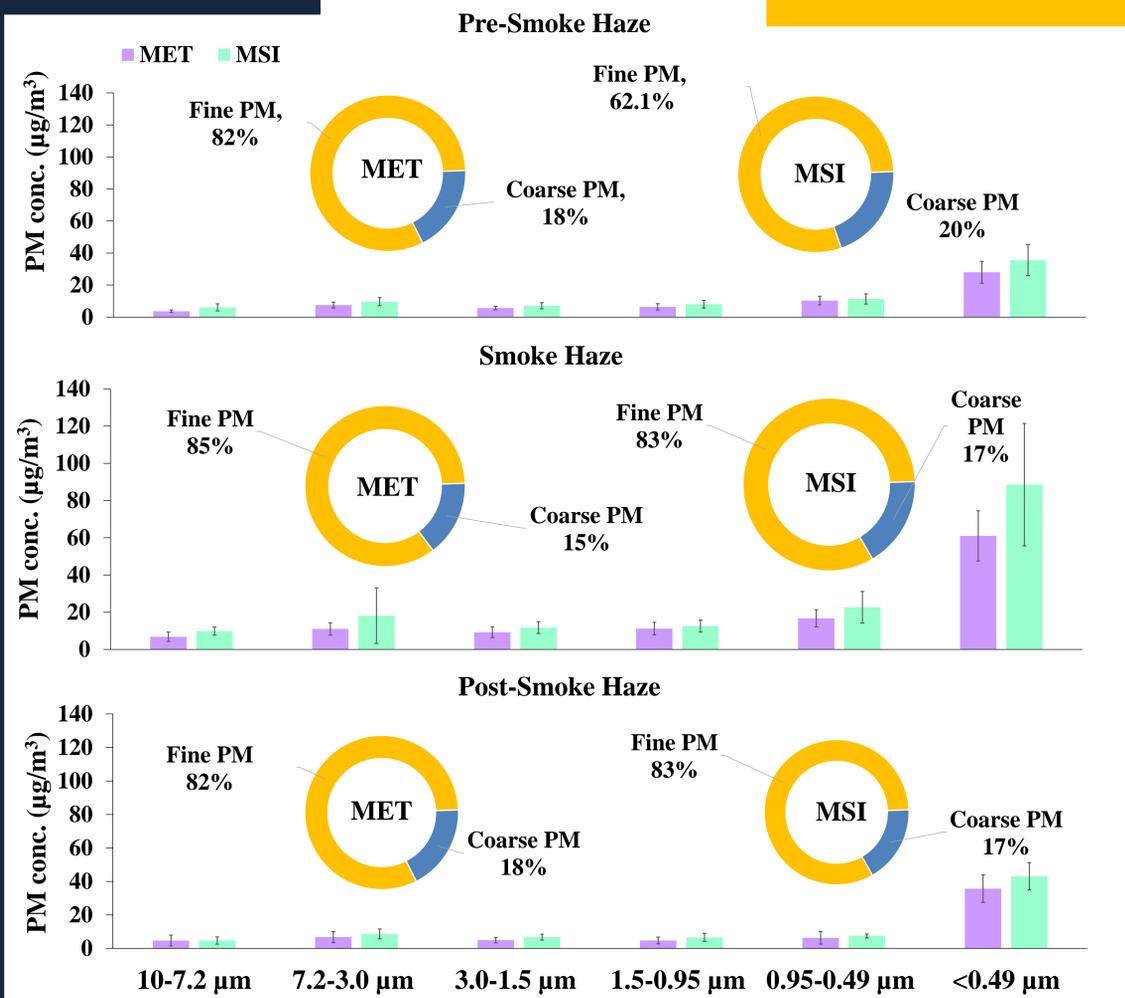
- The average Fine PM (3.0 - <0.49 μm) conc. during Smoke Haze period are **higher than** Coarse PM (10 – 3.0 μm) by approximately **5.5 times in MET** and **4.5 times in MSI**

SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, NH<sub>4</sub><sup>+</sup>, and K<sup>+</sup> were the four dominant ions at both sites, particularly during the smoke haze period. K<sup>+</sup> serves as a tracer for biomass burning, while SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, and NH<sub>4</sub><sup>+</sup> indicate secondary inorganic aerosols and are related to long-range transport.

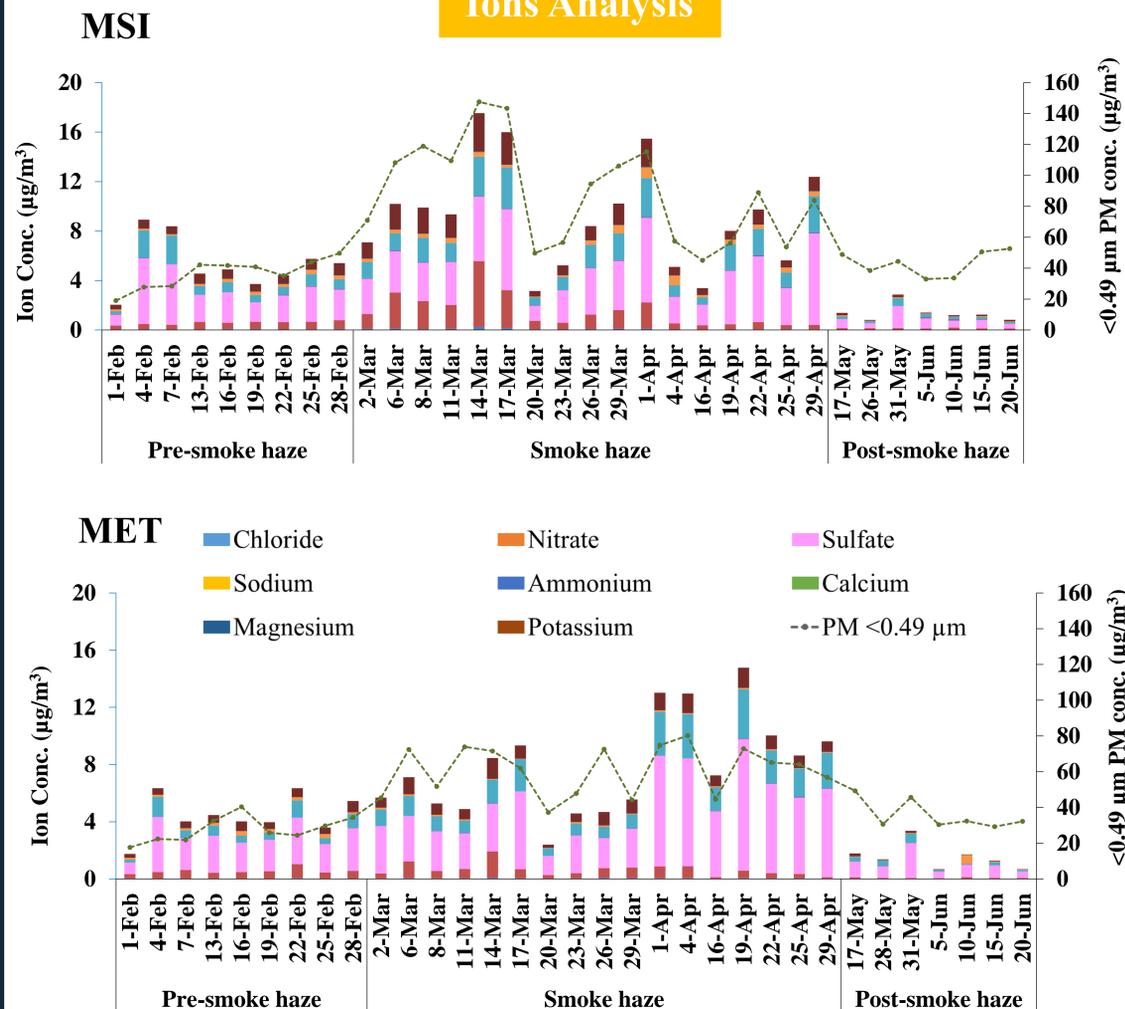
## References

- Inasian, W., Yabueng, N., Wiriya, W., & Chantara, S. (2022). Size-fractionated PM-bound PAHs in urban and rural atmospheres of northern Thailand for respiratory health risk assessment. *Environmental Pollution*, 293, 118488. <https://doi.org/10.1016/j.envpol.2021.118488>

## Results



## Ions Analysis



## ACKNOWLEDGEMENT

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