



Article

Monitoring Consumption of Common Illicit Drugs in Kuala Lumpur, Malaysia, by Wastewater-Cased Epidemiology

Peng Du ^{1,2} , Xin Liu ³, Guangcai Zhong ³, Zilei Zhou ², Margaret William Thomes ⁴, Choon Weng Lee ^{4,5}, Chui Wei Bong ^{4,5}, Xuan Zhang ¹, Fanghua Hao ¹, Xiqing Li ^{2,*}, Gan Zhang ^{3,*} and Phong K. Thai ⁶

¹ Beijing Key Laboratory of Urban Hydrological Cycle and Sponge City Technology, College of Water Sciences, Beijing Normal University, Beijing 100875, China; dup@bnu.edu.cn (P.D.); xuan@bnu.edu.cn (X.Z.); fanghua@bnu.edu.cn (F.H.)

² Laboratory of Earth Surface Processes, College of Urban and Environmental Sciences, Peking University, Beijing 100871, China; zhoulilei@pku.edu.cn

³ State Key Laboratory of Organic Geochemistry, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China; liuxin@gig.ac.cn (X.L.); gczhong@gig.ac.cn (G.Z.)

⁴ Institute of Biological Sciences, University of Malaya, Kuala Lumpur 50603, Malaysia; margaretwt@um.edu.my (M.W.T.); lee@um.edu.my (C.W.L.); cwbong@um.edu.my (C.W.B.)

⁵ Institute of Ocean and Earth Sciences (IOES), University of Malaya, Kuala Lumpur 50603, Malaysia

⁶ Queensland Alliance for Environmental Health Sciences (QAEHS), The University of Queensland, Brisbane 4102, Queensland, Australia; p.thai@uq.edu.au

* Correspondence: xli@urban.pku.edu.cn (X.L.); zhanggan@gig.ac.cn (G.Z.)

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Abstract: Southeast Asian countries including Malaysia play a major role in global drug trade and abuse. Use of amphetamine-type stimulants has increased in the past decade in Malaysia. This study aimed to apply wastewater-based epidemiology for the first time in Kuala Lumpur, Malaysia, to estimate the consumption of common illicit drugs in urban population. Influent wastewater samples were collected from two wastewater treatment plants in Kuala Lumpur in the summer of 2017. Concentrations of twenty-four drug biomarkers were analyzed for estimating drug consumption. Fourteen drug residues were detected with concentrations of up to 1640 ng/L. Among the monitored illicit drugs, 3,4-methylenedioxy-methamphetamine (MDMA) or ecstasy had the highest estimated per capita consumptions. Consumption and dose of amphetamine-type stimulants (methamphetamine and MDMA) were both an order of magnitude higher than those of opioids (heroin and codeine, methadone and tramadol). Amphetamine-type stimulants were the most prevalent drugs, replacing opioids in the drug market. The prevalence trend measured by wastewater-based epidemiology data reflected the shift to amphetamine-type stimulants as reported by the Association of Southeast Asian Nations Narcotics Cooperation Center. Most of the undetected drug residues were new psychoactive substances (NPSs), suggesting a low prevalence of NPSs in the drug market.

Keywords: substance abuse; MDMA; methamphetamine; ketamine; wastewater analysis; Southeast Asia

1. Introduction

According to the United Nations Office on Drug and Crime, both the range of drugs and drug markets are consistently expanding and diversifying more than ever before [1]. Production of opium and manufacturing of cocaine are at the highest levels ever recorded, and markets for cocaine and