

2013 International Conference on Agricultural and Natural Resources Engineering

## Screening of emerging pollutants in the mangrove of Segara Anakan Nature Reserve, Indonesia

Agung Dhamar Syakti<sup>a,\*</sup>, Moussa Mahdi Ahmed<sup>b</sup>, Nuning Vita Hidayati<sup>a</sup>, Endang Hilmi<sup>a</sup>, Isdy Sulystyo<sup>a</sup>, Anne Piram<sup>b</sup>, Pierre Doumenq<sup>b</sup>

<sup>a</sup>*Fisheries and Marine Sciences Department-Jenderal Soedirman University, Kampus Perikanan Unsoed Karangwangkal, Jl dr. Suparno, Purwokerto, 53123, Indonesia.*

<sup>b</sup>*Aix Marseille Université, CNRS, LCE, FRE 3416, équipe MPO. Europôle de l'Arbois-Bâtiment Villemain BP80-13545 Aix-en-Provence Cedex 4, France*

---

### Abstract

107 compounds have been qualitatively identified in the water of the Segara Anakan Nature Reserve, Indonesia, using liquid chromatography - mass spectrometry (LC-MS), and specially, using time-of-flight (TOF) mass analyzer. Ten stations represented both anthropogenic (oil refinery site) types and natural (riverine, lagoon, marine) were considered. Dimecrotic acid, hymechromone, valeryl salicylate, and phthalic acid mono-2-ethylhexyl ester were discovered at all station indicating apportionment from certain administered medications and from using ubiquitous plastic.

© 2013 The Authors. Published by Elsevier B.V. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).  
Selection and peer review under responsibility of Information Engineering Research Institute

**Keywords:** Environmental chemistry; River basin; Emerging organic compounds; Agricultural and industrial effluents; Mangrove

---

### 1. Introduction

Segara Anakan Nature Reserve (SANR) is a unique wetland in Java, Indonesia which is made up of a

---

\* Corresponding author. Tel.: +62-81173827; fax:+62-281-638793.  
E-mail address: [agungsyakti@chemist.com](mailto:agungsyakti@chemist.com)

mangrove-fringed lagoon in Cilacap coastal area. In recent decades, such ecological resources have been degraded by anthropogenic activities and uncontrolled discharge of environmental pollutants.<sup>[1,2]</sup> This study focus on the “new and recently recognized” environmental pollutants, called emerging contaminants (ECs). ECs are known because of their potential adverse impact on environmental health even human health. ECs include lots of chemicals such as personal and pharmaceutical products, such as disrupting endocrine chemicals (estrogens and steroid hormones), industrial chemicals, biological metabolites, perfluoroalkylated surfactants, and nanoparticles.<sup>[3,4]</sup> In SANR, ECs can enter the environment directly *via* non-point source discharge such as fisheries, and agricultural activities ,domestic waste, and partly *via* point-source discharge of industrial effluents. In view of the current situation, preventive measures must be taken for the ecosystem protection. Therefore, it is important for us to establish pollution baseline levels as a reference for future studies. liquid chromatography - mass spectrometry using quadrupole time-of-flight mass analyzer (LC-QTOF -MS) is used in this study to preliminary screen the ECs since it can provide molecular mass measurements in high precision (<5 ppm) which is, comparing with available databases of accurate masses, the identification of an unknown compounds from its empirical formula is possible.<sup>[5]</sup> The novelty of the study lies in the investigation of the screened non-target emerging contaminants in the aquatic environment in SARN, which has been carried out for the first time in the studied area, as well as in Indonesia.

## 2. Materials and methods

### 2.1 Sampling

Sampling was conducted in Lagoon and estuary of Segara Anakan which is located on the south coast of Java in Indonesia. The sites (Fig. 1) included 10 stations with different representative land cover and land uses such as marine stations (MR1 and MR2), riverine stations (Citanduey, R1; Cibereum, R2), lagoon stations (SA1-SA3), and three stations impacted by different human activities respectively, i.e., agriculture, urbanization and industry (A1-A3). Surface water samples were collected using a bottle sampler and directly filtered up to 0.45 µm with membrane filters provided by Millipore (Molsheim, France) and reserve at 4 °C.

Download English Version:

<https://daneshyari.com/en/article/554112>

Download Persian Version:

<https://daneshyari.com/article/554112>

[Daneshyari.com](https://daneshyari.com)