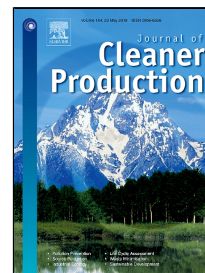


Accepted Manuscript

New role of hydrocyclone in ballast water treatment

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PII: S0959-6526(18)30980-6
DOI: 10.1016/j.jclepro.2018.03.299
Reference: JCLP 12557
To appear in: *Journal of Cleaner Production*
Received Date: 03 July 2017
Revised Date: 28 March 2018
Accepted Date: 29 March 2018

Please cite this article as: Marijana Pećarević, Josip Mikuš, Ivana Prusina, Hrvoje Juretić, Ana Bratoš Cetinić, Marina Brailo, New role of hydrocyclone in ballast water treatment, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.03.299

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1 6929 words

2 **New role of hydrocyclone in ballast water treatment**

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12

13 **Abstract**

14

15 Laboratory experiments were carried out to determine the effects of an integrated ballast water
16 treatment system on the viability of test species of phytoplankton (*Tetraselmis suecica*) and
17 zooplankton (*Artemia salina* cysts and nauplii). The effects of two components of the treatment
18 system were tested: cyclonic separation in the hydrocyclone (HC) and radiation in the ultraviolet (UV)
19 reactor. The approach employed in this study used the HC not only for reduction of the suspended
20 solid content but also for inactivation of living organisms in ballast water. The application of UV
21 radiation following treatment in the HC contributed to a reduction in the number of living organisms
22 in the ballast water. Better separation efficiency was obtained in the experiments with higher inlet
23 pressure and in which organisms with greater mass and density were used. This study demonstrated
24 the successful use of a HC for inactivation of some planktonic organisms. That provides an alternative
25 to the traditional purpose of a HC, namely separation or reduction of suspended matter and organisms
26 in ballast water. These results suggest that optimizing the HC system can potentially improve ballast
27 water treatment capacity.

28

29 Keywords: ballast water, non-indigenous species, plankton, treatment, hydrocyclone, ultraviolet
30 radiation

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34 **1. Introduction**

35

36 Ballast water was recognized as a global vector for aquatic invasions long ago (Carlton, 1985; Carlton
37 & Geller, 1993). Introduction of non-indigenous species is perceived not only as a threat to global

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