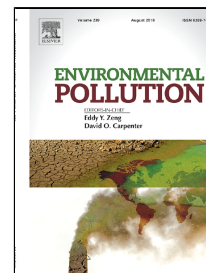


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Can nano-SiO₂ reduce the phytotoxicity of acetaminophen? – a physiological, biochemical and molecular approach

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1 **Can nano-SiO₂ reduce the phytotoxicity of acetaminophen? – a**
2 **physiological, biochemical and molecular approach**

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13
14 ***Combining physiological, biochemical and molecular methodologies, this work is the first to***
15 ***explore the potential of Si (a beneficial element for plant growth under abiotic stress)***
16 ***nanomaterial in alleviating pharmaceutical-induced stress.***

17 **ABSTRACT**

18 This study aimed at evaluating the interactive effects of acetaminophen (AC;400 mg kg⁻¹) and
19 silicon dioxide nanomaterial (nano-SiO₂;3 mg kg⁻¹) on soil-grown barley. After 14 days of
20 growth, plant growth, evaluated in terms of fresh and dry weight, was greatly inhibited by AC,
21 independently of being or not co-treated with nano-SiO₂. Plants growing under high levels of AC
22 did not show any increase in malondialdehyde (MDA) nor thiols contents, though levels of
23 superoxide anion (O₂⁻) and hydrogen peroxide (H₂O₂) were increased in leaves and roots,
24 respectively. When plants were co-treated with nano-SiO₂, reactive oxygen species (ROS) content
25 remained unchanged, but lipid peroxidation (LP) was diminished and the thiol redox network was

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