water

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Supplementary Materials

Potential toxic effects of Brookite TiO_2/CeO_2 nanocomposites on *Artemia* salina

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Text S1: Vitality rate (24 and 48 h) of *A. salina* nauplii treated with Brookite TiO_2 and CeO_2 NPs

The result for vitality rate (24 and 48h) of *A. salina* nauplii treated with various concentration of Brookite TiO_2-NPs

Treatments	% Vitality to 24h (means ± SD)	% Vitality to 48h (means ± SD)
CTRL	97,92% ± 0,051	97,92% ± 0,032
0,25 mg/L	99% ± 0,025	97,92 ± 0,032
0,50 mg/L	97,92% ± 0,032	96,88 ± 0,052
1,0 mg/L	96% ± 0,053	94,65% ± 0,049
2,0 mg/L	97,92% ± 0,032	97,92% ± 0,032
4,0 mg/L	97,92% ± 0,032	95,69% ± 0,033

The result for vitality rate (24 and 48h) of *A. salina* nauplii treated with various concentration of CeO_2 -NPs

Treatments	% Vitality to 24h (means ± SD)	% Vitality to 48h (means ± SD)
CTRL	100% ± 0,000	98% ± 0,033
0,25 mg/L	100% ± 0,000	96% ± 0,047
0,50 mg/L	95,83% ± 0,032	93,75% ± 0,039
1,0 mg/L	96% ± 0,050	93% ± 0,058
2,0 mg/L	100% ± 0,029	93% ± 0,107
4,0 mg/L	98,04% ± 0,075	88,48% ± 0,033

Text S2: Optical images of *A. salina* nauplii treated with Brookite TiO_2 and CeO_2 NPs

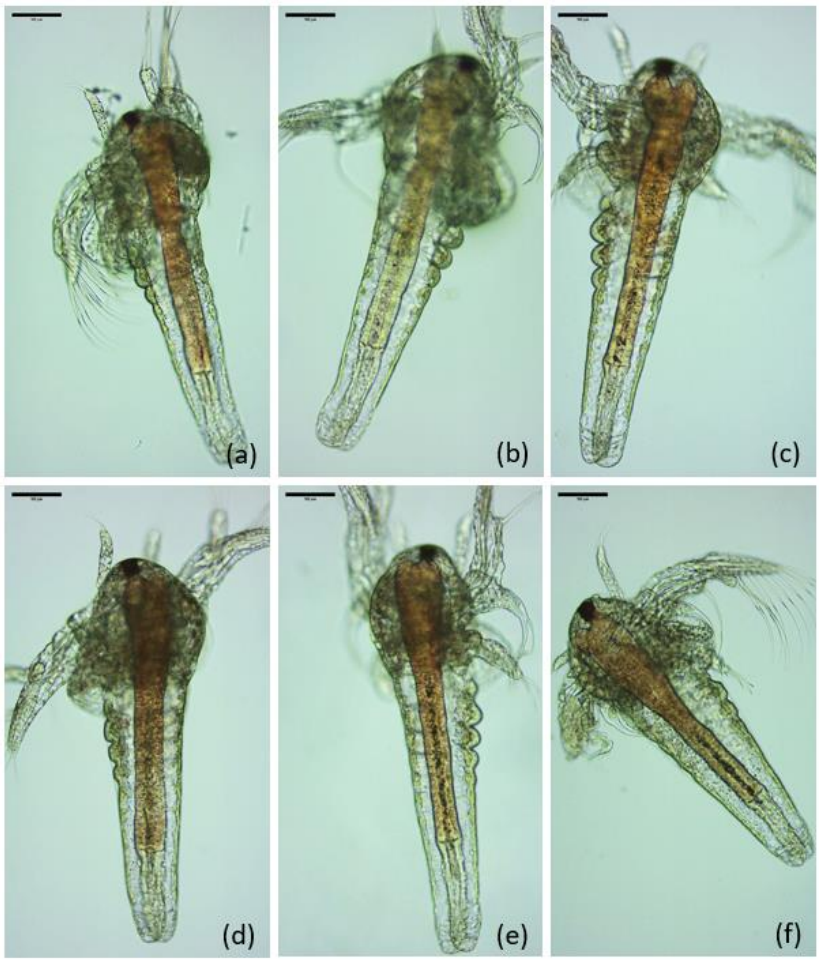


Figure S2. Optical images of *A. salina* nauplii, submitted to difference concentrations of Brookite TiO_2-NPs within 48h of exposure: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 0,25 mg/L of Brookite TiO_2-NPs; (**c**) *A. salina* nauplii exposed to 0,50 mg/L of Brookite TiO_2-NPs; (**d**) *A. salina* nauplii exposed to 1,0 mg/L of Brookite TiO_2-NPs; (**e**) *A. salina* nauplii exposed to 2,0 mg/L of Brookite TiO_2-NPs; (**f**) *A. salina* nauplii exposed to 4,0 mg/L of Brookite TiO_2-NPs. Scale bar 102 μm.

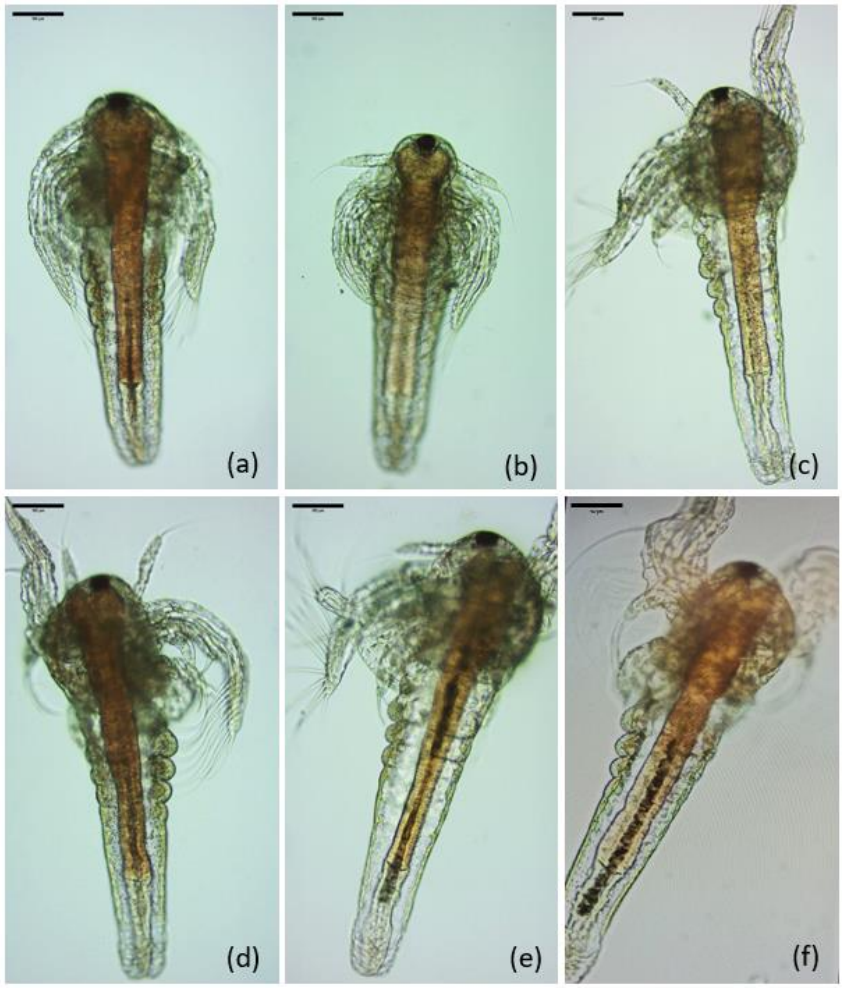


Figure S2. Optical microscopy of *A. salina* nauplii, submitted to difference concentrations of CeO_2-NPs within 48h of exposure: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 0,25 mg/L of CeO_2-NPs; (**c**) *A. salina* nauplii exposed to 0,50 mg/L of CeO_2-NPs; (**d**) *A. salina* nauplii exposed to 1,0 mg/L of CeO_2-NPs; (**e**) *A. salina* nauplii exposed to 2,0 mg/L of CeO_2-NPs; (**f**) *A. salina* nauplii exposed to 4,0 mg/L of CeO_2-NPs. Scale bar 102μm.

Text S3: Reactive oxygen species generation (ROS) on *A. salina* nauplii treated with Brookite TiO_2 and CeO_2 NPs

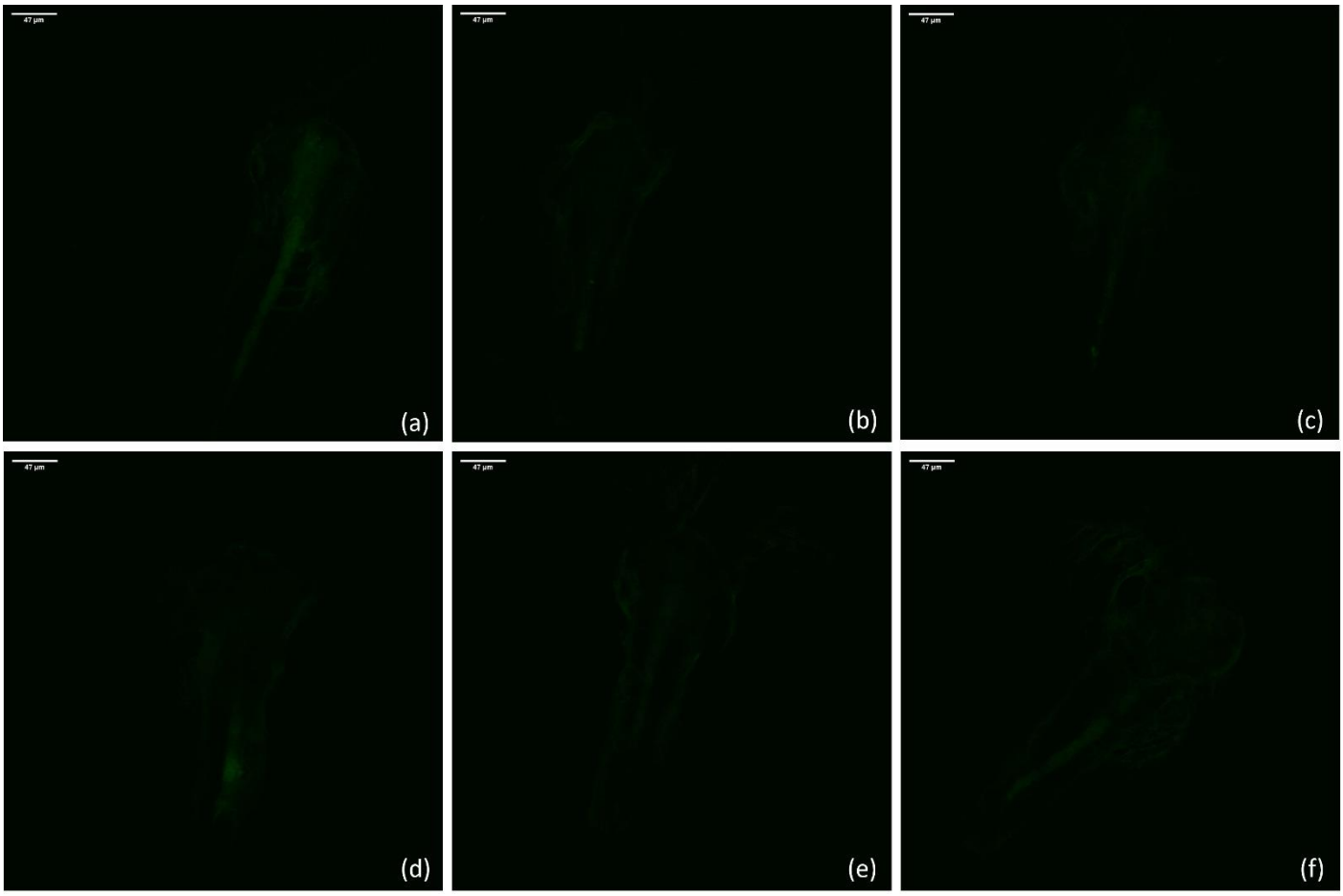


Figure S3. Fluorescence images of *A. salina* exposed to different concentrations of Brookite TiO_2-NPs within 48h of exposure to evaluate ROS generation: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 0,25 mg/L of Brookite TiO_2-NPs; (**c**) *A. salina* nauplii exposed to 0,50 mg/L of Brookite TiO_2-NPs; (**d**) *A. salina* nauplii exposed to 1,0 mg/L of Brookite TiO_2-NPs; (**e**) *A. salina* nauplii exposed to 2,0 mg/L of Brookite TiO_2-NPs; (**d**) *A. salina* nauplii exposed to 4,0 mg/L of Brookite TiO_2-NPs. Scale bar 47 µm.

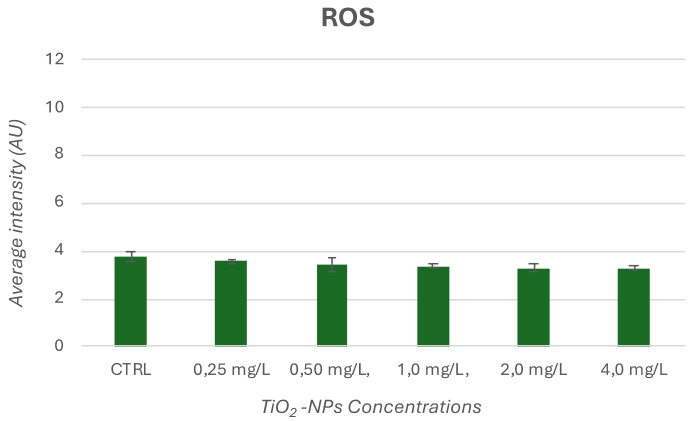


Figure S3. The histogram represents the average fluorescence intensity (AU) of the reactive oxygen species (ROS) at all concentrations of Brookite TiO_2-NPs tested. No statistical significance has been observed, $p>0.05$.

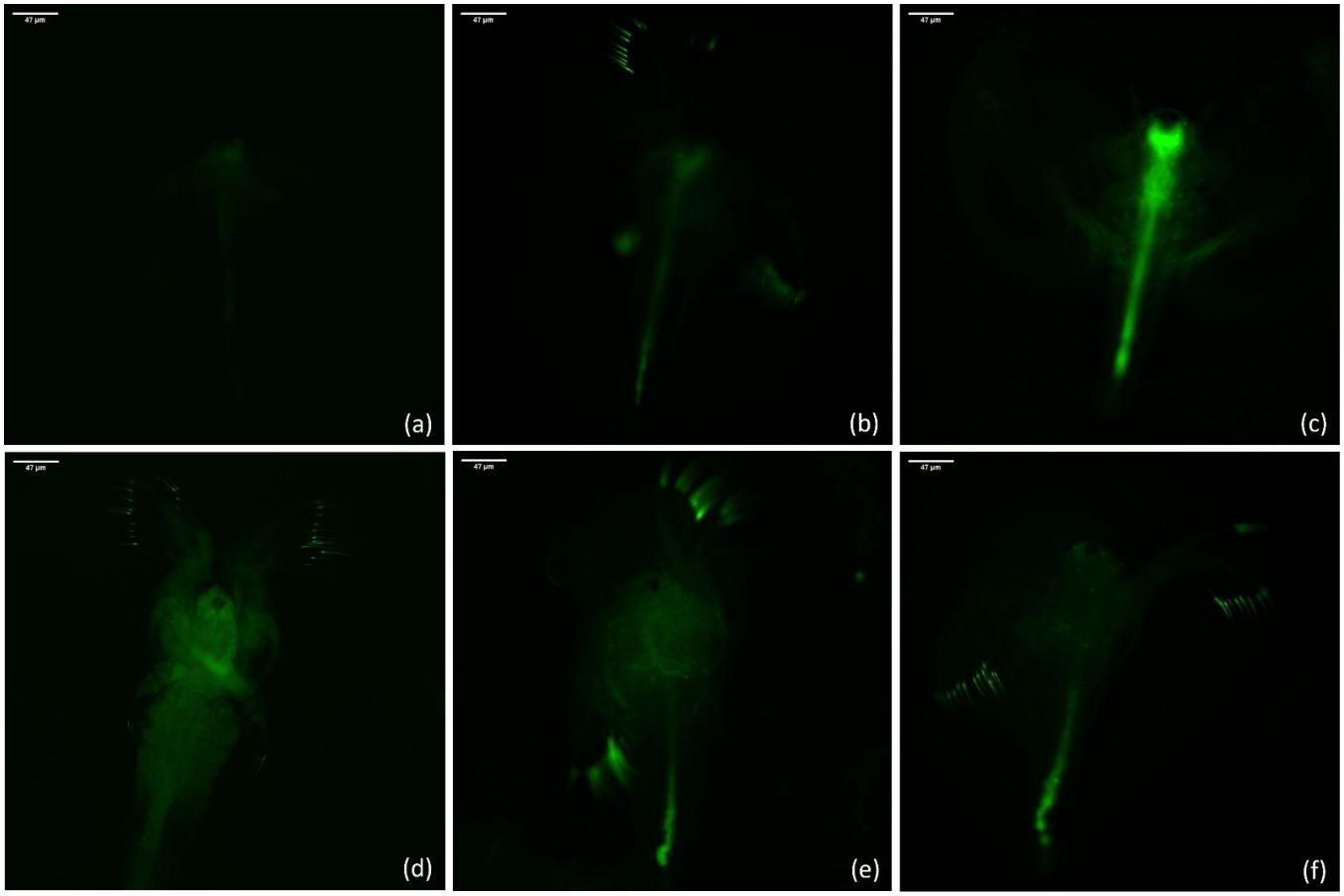


Figure S3. Fluorescence images of *A. salina* exposed to different concentrations of CeO_2-NPs within 48h of exposure to evaluate ROS generation: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 0,25 mg/L of CeO_2-NPs; (**c**) *A. salina* nauplii exposed to 0,50 mg/L of CeO_2 nanocomposite; (**d**) *A. salina* nauplii exposed to 1,0 mg/L of CeO_2 nanocomposite; (**e**) *A. salina* nauplii exposed to 2,0 mg/L of CeO_2 nanocomposite; (**f**) *A. salina* nauplii exposed to 4,0 mg/L of CeO_2 nanocomposite. Scale bar 47 µm.

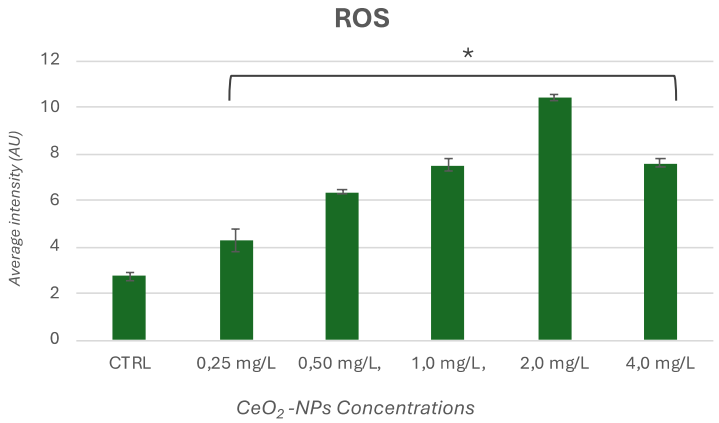
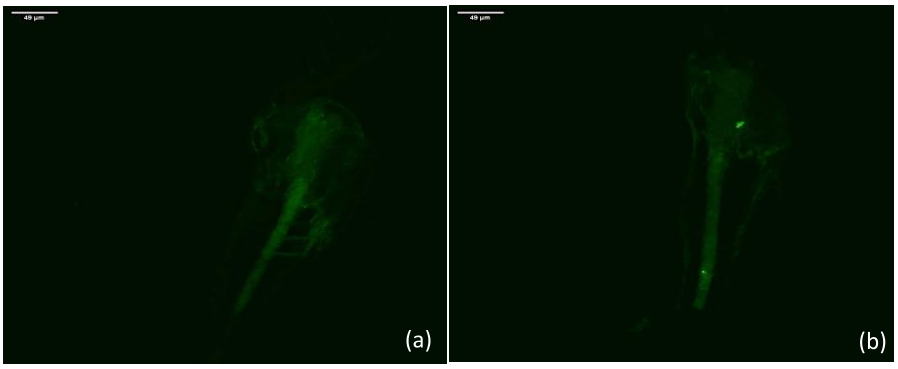


Figure S3. The histogram represents the average fluorescence intensity (AU) of the reactive oxygen species (ROS) at all concentrations of Brookite CeO_2-NPs tested. Statistical significance between exposed groups and control has been observed, A $p<0.05$ (*)

Text S4: Acridine Orange Staining on *A. salina* nauplii treated with Brookite TiO_2 and CeO_2 NPs



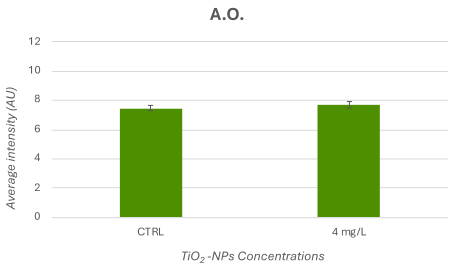


Figure S4. Fluorescence images of *A. salina* exposed to different concentrations of Brookite TiO_2-NPs within 48h of exposure to evaluate apoptotic damage: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 4,0 mg/L of Brookite TiO_2-NPs. The histogram represents the average fluorescence intensity (AU) of the acridina orange (A.O.) for the control group and maximum concentration (4,0 mg/L) of TiO_2-NPs tested. A $p>0.05$.

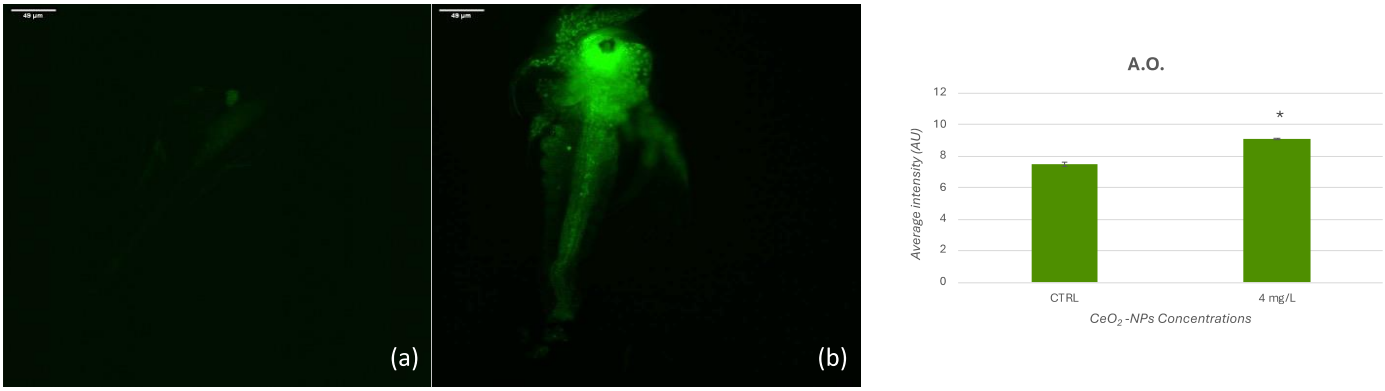


Figure S4. Fluorescence images of *A. salina* exposed to different concentrations of CeO_2-NPs within 48h of exposure to evaluate apoptotic damage: (**a**) *A. salina* in ASPM; (**b**) *A. salina* nauplii exposed to 4,0 mg/L of CeO_2-NPs. The histogram represents the average fluorescence intensity (AU) of the acridina orange (A.O.) for the control group and maximum concentration (4,0 mg/L) of CeO_2-NPs tested. A $p<0.05$ (*).