Contribution ID : **72** Type : **Oral**

# 6-Benzylaminopurine modulates photosynthetic performance and cytokinin homeostasis in Lemna minor under salt stress

*martedì 29 settembre 2026 10:15 (15)*

Salinity primarily reduces plant productivity by disrupting the photosynthetic apparatus, and cytokinins are considered to be context-dependent regulators of its tolerance (1-3). This study aimed to determine if and how 6-benzylaminopurine (1 µM 6-BA) protects the photosynthetic apparatus of *Lemna minor* under salt stress (50, 100, 150 mM NaCl) and to analyze how it modulates accompanying metabolic responses. Chlorophyll *a* fluorescence and oxygen exchange were measured to assess plant responses. Simultaneously, we profiled hormone and cytokinin levels and quantified phenolics, antioxidant capacity, pigments, proline, malondialdehyde (MDA), starch, and antioxidant enzymes. The interaction between 6-BA and NaCl was the most significant source of variation in the fluorescence response (PERMANOVA $R^2 = 16.5\%$, $p < 0.001$). 6-BA had a modest cost at low salinity, but it stabilized PSII at high salinity (reversing between 100 and 150 mM), while the PSI acceptor side declined regardless. A similar pattern was observed in cytokinin homeostasis, where 6-BA decreased the endogenous cytokinin pool by half (0.52-fold) and increased it by more than twofold at 150 mM (2.24-fold), with a reversal occurring between 50 and 100 mM. Salinity decreased levels of jasmonates, auxin, phenolics, antioxidant capacity, and pigments but increased levels of ABA, proline, MDA, and starch as expected. 6-BA decreased ABA and MDA at all salinity levels and induced a maximal antioxidant response at 100 mM that was lost at 150 mM NaCl. The results suggest that 6-BA improves salt tolerance of *L. minor* by coordinating stress-level-dependent adjustments of photosynthesis, respiration, hormonal and antioxidant metabolism.

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## Scientific Session

Cell Biology, Physiology, Metabolisms

## Keywords

PSII biophysics, phytohormones, antioxidant defense

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**Session Classification :** Cell Biology, Physiology & Metabolisms I