

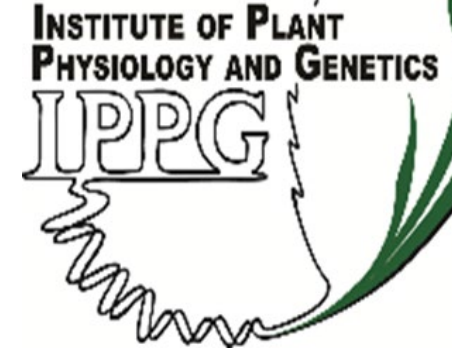
# ROLE OF ORGANIC NANOFIBERS ON ENZYME ANTIOXIDANT DEFENCE SYSTEM IN *STEVIA REBAUDIANA* PLANTLETS

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**Introduction:** Plants are exposed to stress conditions (low gas exchange, high humidity, low light, etc.) during in vitro propagation via direct organogenesis. Many research studies have shown that vitamins and amino acids may help plants mitigate the adverse effects of biotic and abiotic stressors. In this work, we chose organic peptidomimetics as an auxin indole-3-acetic acid (IAA) delivery system to study the effect of nanofibres on in vitro propagation of *Stevia rebaudiana* Bert. and its enzyme antioxidant activity. For the purpose of the study, as a carrier of IAA, we used an organic compound that includes two valine fragments and nicotinic acid linked together and doubled through a diamino hexane spacer, possessing the capability to produce nanofibrillar networks both in organic solutions and in the absence of solvent.

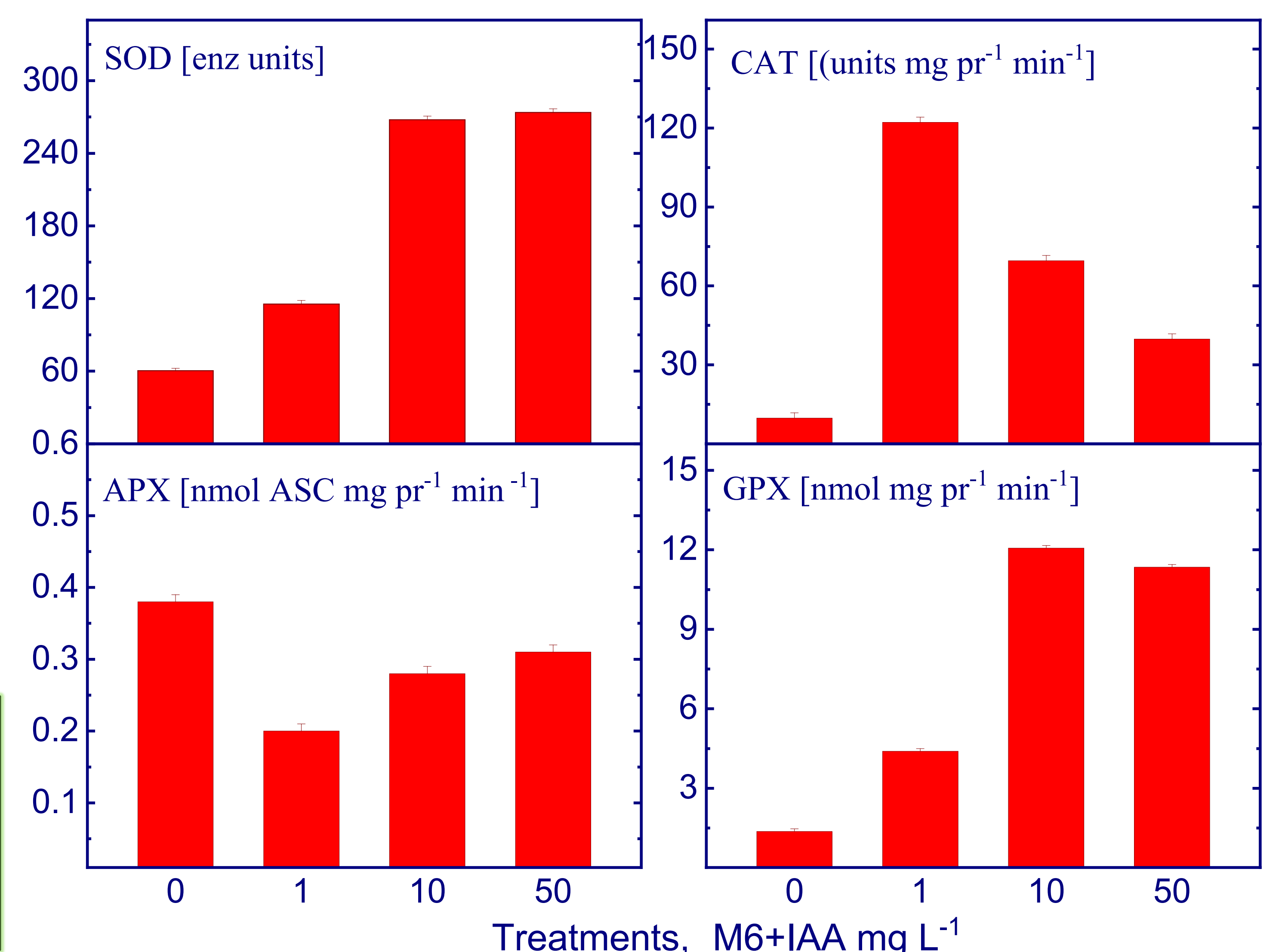
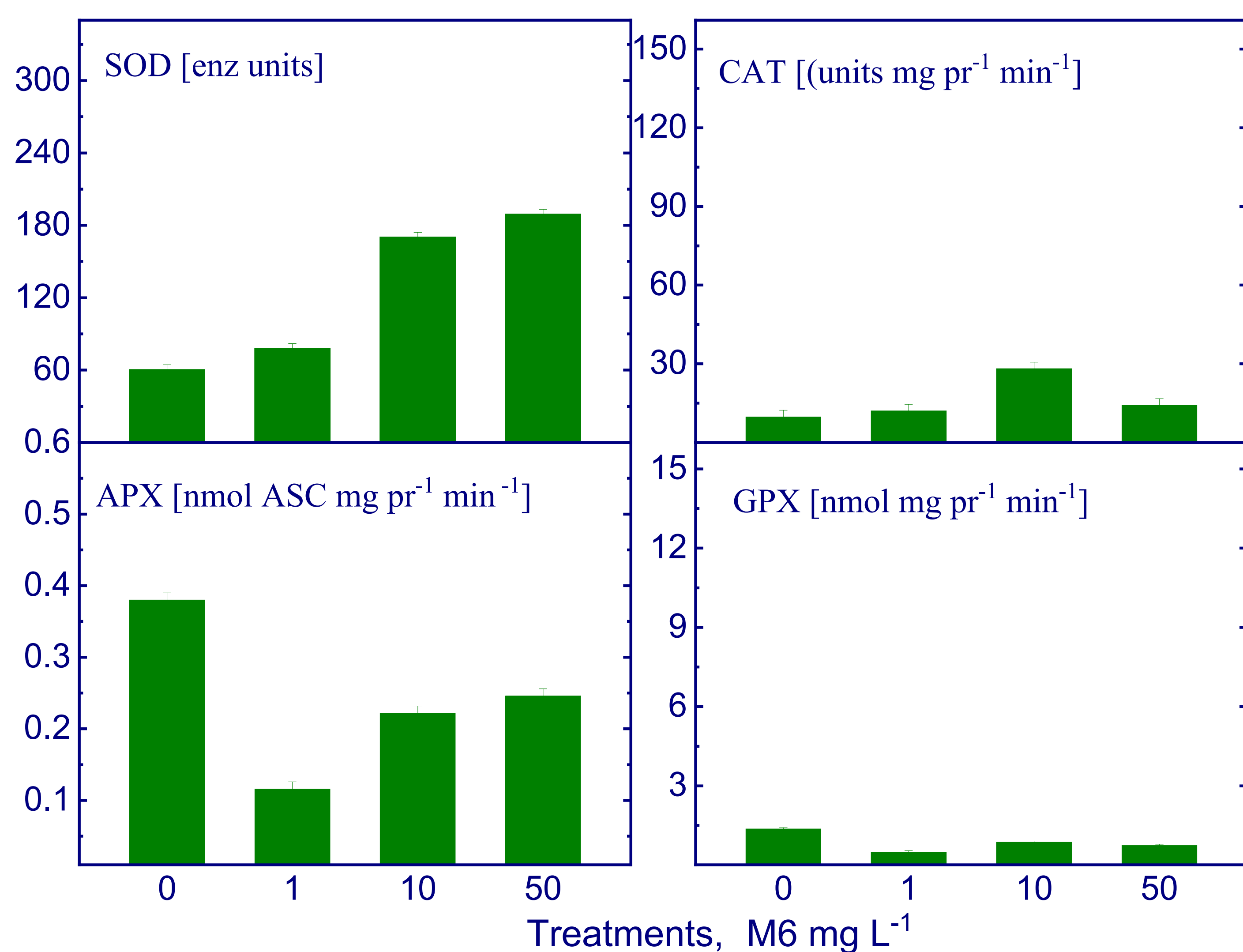
	Shoot FW	Shoot height	Shoot numbers	Nod numbers	MR	Rooting %
C	0,122	4.53	1.02	2.31	2.35	0.03
1 mg L <sup>-1</sup> M6	0.229	7.621	1.75	4.26	7.46	65
10 mg L <sup>-1</sup> M6	0.249	9.538	1.95	4.76	9.28	85
50 mg L <sup>-1</sup> M6	0.213	7.192	1.65	4.800	7.92	75
1 mg L <sup>-1</sup> M6+IAA	0.185	5.413	1.70	3.875	6.59	100
10 mg L <sup>-1</sup> M6+IAA	0.191	5.706	1.75	4.125	7.22	100
50 mg L <sup>-1</sup> M6+IAA	0.176	4.713	1.55	4.058	6.29	85

## Material and Methods

The effect of M6 and M6+IAA applied in MS nutrient media at different concentrations (0, 1, 10, and 50 mg L<sup>-1</sup>) on the growth and the antioxidant power of *in vitro* micropropagated *S. rebaudiana* plantlets were tested



**Results** The organic nanofiber alone (M6) or as an IAA carrier (M6+IAA) added to the MS medium during direct organogenesis, positively affected growth parameters (fresh and dry biomass accumulation, shoot height, shoot number per explant, root formation, number of nodes per shoot and micropropagation rate) of *S. rebaudiana*. The results showed that M6 enhanced plantlet growth parameters at a higher level than M6-IAA, but the rooting was higher at M6-IAA treatment.



The antioxidant enzyme activity bioassay test demonstrated enhanced SOD and CAT activity caused by M6 treatment, while M6+IAA treatment led to SOD, CAT and GPX activity increasing compare to the control plantlets.

**Conclusion** The amino acid valine, the nicotinic acid and the auxin IAA together influence the growth and antioxidant activity. These results showed that the studied organic nanofiber M6 could serve as an IAA carrier with a lower environmental impact, comparable effect, and effective plantlet growth.