Institute of Plant Physiology and Genetics,
Bulgarian Academy of Sciences

METABOLIC CHANGES IN *IN VITRO* PROPAGATED *STEVIA REBAUDIANA* IN RESPONSE TO CREATINE-LYSINATE COMPLEX, ADDED TO MS MEDIUM

Mariana Sichanova[1]*, Maria Geneva[1], Kamelia Miladinova-Georgieva[1], Eli Zayova[1], Daniela Tsekova[2]
[1]Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, Sofia, Bulgaria; [2]Department of Organic Chemistry, University of Chemical Technology and Metallurgy, Bulgaria
e-mail: m.sichanova@abv.bg

BACKGROUND: *Stevia rebaudiana* B. is an herbaceous perennial plant of Asteraceae family and is known as sweet leaf, honey leaf, and candy leaf. Stevia leaves contain many biologically active substances, which have beneficial effects on human health. The antioxidant activity of *in vitro* cultivated *S. rebaudiana* is influenced by growth regulators and amino acids added to the nutrient media.

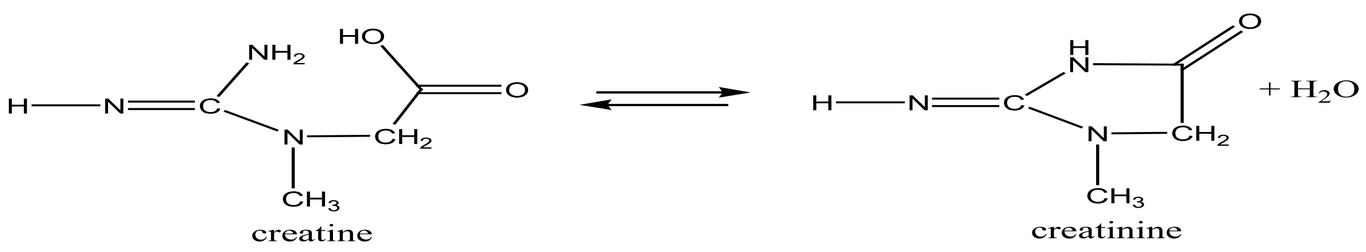

Figure 1. Creatine and creatinine in aqueous solutions exist in equilibrium depending on pH.

Creatine-lysinate is a relatively new, synergistic form of creatine, developed to improve its solubility and absorption by the plant organism.

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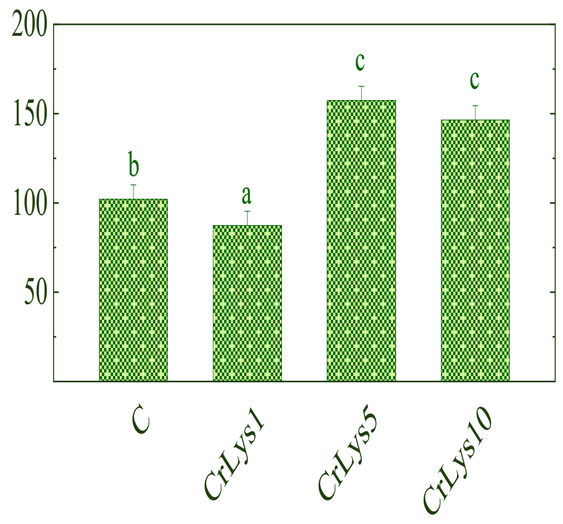
Key structural features:

- ✓ Increased stability: The lysine component helps stabilize the creatine molecule.
- ✓ High solubility: Due to its amino acid nature, creatine-lysinate dissolves significantly better in water than the monohydrate.
- ✓ Better bioavailability: This form is designed to ensure that creatine reaches plant tissues more efficiently.



Content of metabolites with antioxidant potential (FRAP) in *Stevia rebaudiana* plants propagated *in vitro*

Variants	Microshoots			Roots	
	Number explant $^{-1}$	Height cm	FW g	Length cm	FW g
Control	1.65±0.083^{a}	8.95±0.448^{a}	0.164±0.008^{a}	1.34±0.067^{a}	0.04±0.002^{a}
CrLys1	1.80±0.09^{a}	9.13±0.458^{a}	0.166±0.008^{a}	1.48±0.074^{a}	0.05±0.003^{b}
CrLys5	2.40±0.12^{c}	10.04±0.502^{b}	0.185±0.009^{ab}	1.76±0.088^{b}	0.06±0.003^{c}
CrLys10	2.00±0.1^{b}	8.37±0.419^{a}	0.172±0.01^{d}	1.99±0.1^{c}	0.07±0.004^{d}
LSD	0.187	0.861	0.036	0.156	0.005

OBJECTIVE: This study aimed to evaluate the influence of creatine-lysinate complex at different concentrations (1, 5 and 10 mg L-1) on growth characteristics and the content of secondary metabolites with antioxidant potential in *S. rebaudiana* seedlings.

MATERIALS AND METHODS: Shoot explants (1.5–2 cm) were cultured on MS medium including vitamins supplemented with 3.0% sucrose and 7.0 g L1 agar. The main biometric indicators of 30-day-old microplants were determined. A number of spectrophotometric methods for measuring non-enzymatic antioxidant activity were used to quantify the main complexes of biologically active substances in *Stevia rebaudiana* Bert.

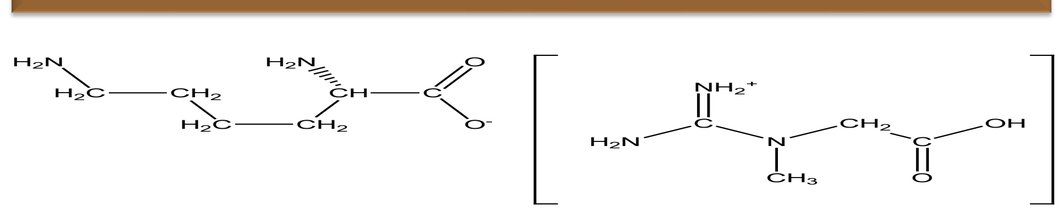
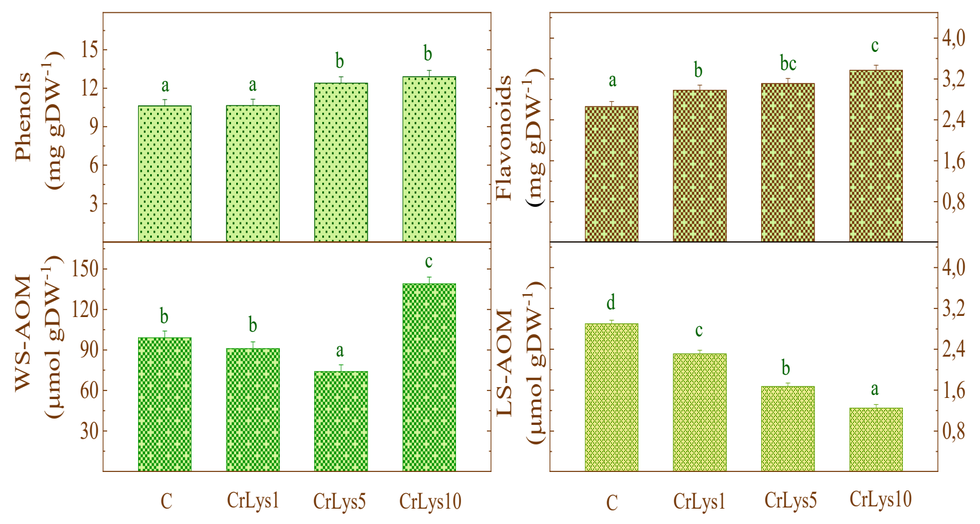


Figure 2. Molecular structure of creatine-lysinate



Content of metabolites with antioxidant capacity in *Stevia rebaudiana* plants propagated *in vitro* on MS medium and MS medium supplemented with different concentrations (1, 5, 10 mg L-1) of creatine-lysinate.

CONCLUSION: In this study, the application of creatine-lysinat complex in MS medium provoke the metabolism of *S. rebaudiana* and led to better performance in biometric parameters and to higher content of most metabolites with antioxidant potential.

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