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SILKROP: a research project to develop a new biostimulant from silk processing wastewater

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Natural silk for the textile industry is obtained from silkworm cocoons that are mainly formed by fibroin surrounded by sericin, a globular protein, called "silk glue". Raw silk fibers are subjected to chemical and heat treatments, by which fibroin is purified, and sericin is traditionally discarded in the wastewater. Sericin is a protein with interesting characteristics, such as biocompatibility and biodegradability, moisturizing capability, antimicrobial, antioxidant and UV-protective properties [1,2,3]. These features make sericin an excellent candidate for producing a new biostimulant. Preliminary data showed the biostimulant activity of sericin-enriched formulations on seed germination and plant resilience during drought stress. SILKROP is an international research project aimed at studying the wastewaters from silk manufacturing to evaluate beneficial biological activities on crops. The project includes different research activities, such as the definition of the chemical composition and stability of silk processing wastewater, the evaluation of sericin ability to mitigate nutritional deficiencies and drought stress on model plants, and the application of sericin formulations for the cultivation of high-value crops, such as fresh-cut leafy vegetables and grapevine. A dedicated and ongoing assessment of the environmental and economic impact supports all the activities. Currently, SILKROP enjoys the participation of several stakeholders belonging to the silk processing industry and textile sector, viticulture, fertilizers and biostimulants producers. Overall, SILKROP represents an effort to gain new scientific knowledge and to improve industrial and agricultural sustainability.

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