Low-Cost Experiments in STEM Education

SCIENCE ON STAGE TURKU 2024

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Study of New Biowrappers to Reduce Plastics in Our Recesses

REAL MAESTRANZA DE CABALLERÍA DE RONDA

Introduction: Research to create a most stable recipe for a completely biodegradable bioplastic from the waste generated by the peels of some fruits that are not reused, such as lemon peels.

Investigation Development: The creation of bioplastics has stability problems due to mold and worms. The goal is to delay the degradation of the product to make it useful in more cases. The success of this research has been to improve an original recipe by at least tripling its initial durability, in the worst case, making it much more interesting for industrial use.

Biodegradability tests: Water,dry land,wet land, fresh air

Original Bioplastic recipe

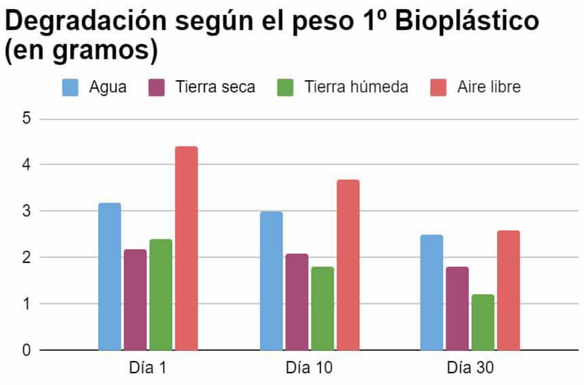
	Water	Dry land	Wet land	Fresh air
Day 1	weight: 3,2g 👍	weight: 2,2g 👍	weight: 2,4g 👍	weight:4 ,4g 👍
Day 10	weight: 3,0g harder texture and white	weight: 2,1g moldy, soft	weight: 1,8g dark, soft color	weight:3 ,7g moldy, soft
Day 30	weight: 2,5g hard, yellowish and thick when absorbing water	weight: 1,8g greenish color	weight: 1,2g white and wormy	weight:2, 6g with mold and white specks

Success Bioplastic recipe

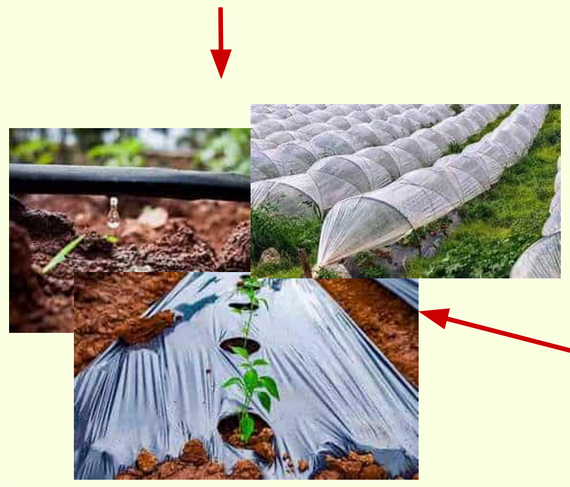
	Water	Dry land	Wet land	Fresh air
Day 1	weight: 5,0g 👍	weight: 5,0g 👍	weight: 5,0g 👍	weight: 5,0g 👍
Day 10	weight: 3,8g soft, moldable	weight: 4,3g dark color for the earth	weight: 3,6g soft, dark color	weight: 4,9g estado: same appearance, more moldable
Day 30 …	weight: 3,1g similar to previous	weight: 3,9g similar to previous	weight: 2,2g similar to previous	weight: 4,7g more elastic and moldable

OBJECTIVES

Degradation according to weight (gr)

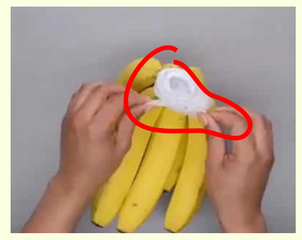


POSSIBLE APPLICATIONS



Agriculture

Plastic bags



- Wrappers to preserve fruit

Conclusions: It is possible to create bioplastics from lemon peels, with qualities very similar to current plastic, and with a enhanced durability that allow many applications, for everyday and industrial use.