

Optimizing conditions of mycelial inoculum immobilized in Ca-alginate beads: a case study in ectomycorrhizal fungus *Astraeus odoratus*

World Journal of Microbiology & Biotechnology

Authors

Yanisa Punsung

Pawara Pachit

Teeratas Kijpornyongpan

Chanita Paliyavuth

Karn Imwattana

Jittra Piapukiew^{1, 2, *}

Affiliations

¹ Biological Sciences Program, Faculty of Science, Chulalongkorn University, Pathum Wan, Bangkok 10330, Thailand

² Center of Excellence in Biocatalyst and Sustainable Biotechnology, Faculty of Science, Chulalongkorn University, Pathum Wan, Bangkok, 10330, Thailand

*Corresponding author

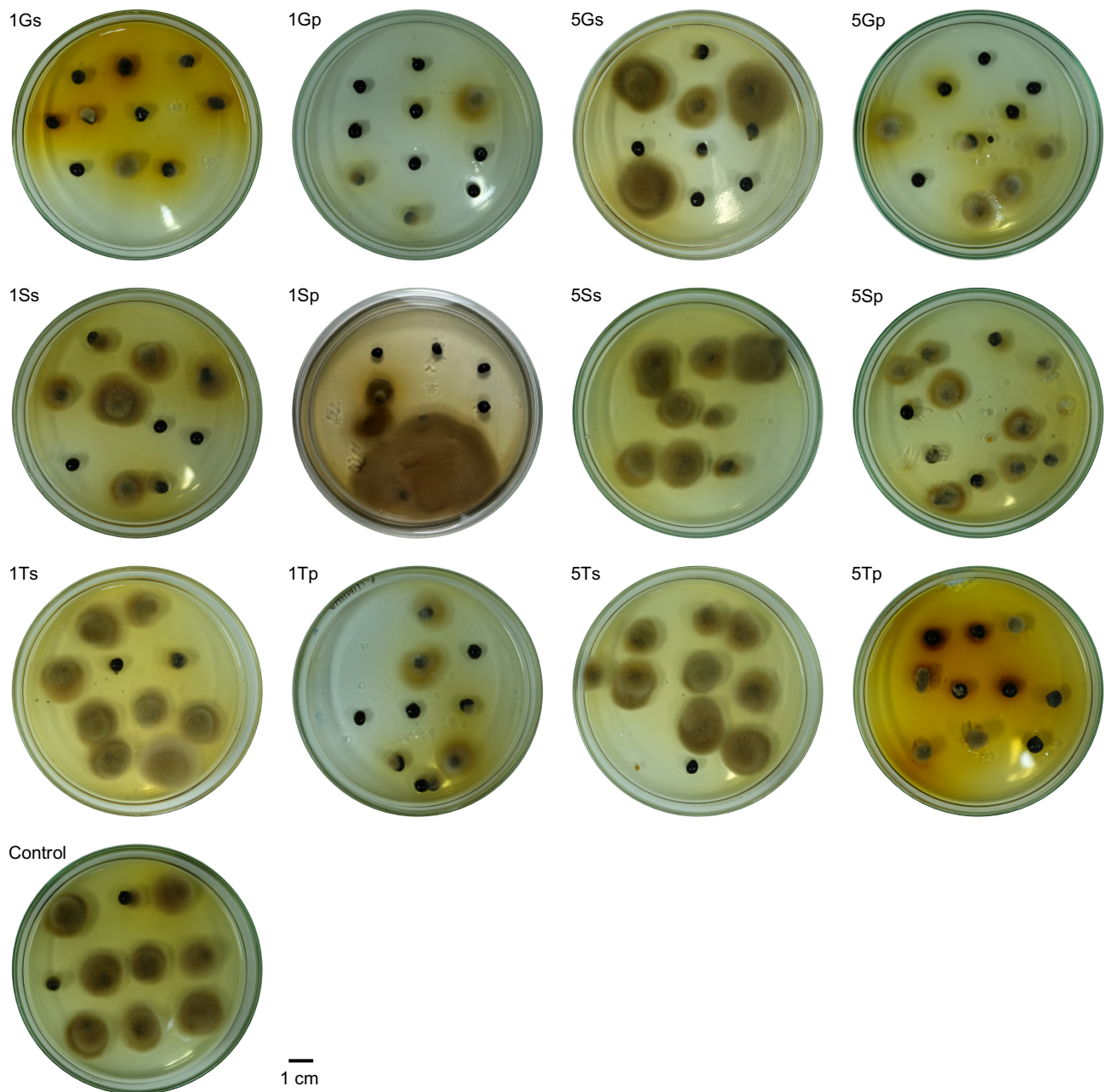
Corresponding author

Jittra Piapukiew

Department of Botany, Faculty of Science, Chulalongkorn University, Pathum Wan, Bangkok 10330, Thailand

Telephone: +66 (0) 2218 5492

E-mail: jittra.k@chula.ac.th



Online Resource 1 Features of alginate bead and mycelium germination of *Astraeus odoratus* in different sugar: glucose (G), sucrose (S), trehalose (T), with different concentrations: 1% (1), 5% (5), and added protectant additives: 5% sorbitol (s), 5% polyethyleneglycol (p). Incubation was carried out in PDA agar plate for 20 days at room temperature.

Online Resource 2 The viability of alginate bead stored in different solutions for 60 days at 4 °C and 25 °C. All values are mean $\pm$ SE. (different letters indicate differ significantly at $P < 0.05$). Abbreviations: 10% glycerol (10G), 5% glycerol (5G), 10% DMSO (10D), 5% DMSO (5D)

Treatment		Distilled water	CaCl ₂	10G	10D	5G	5D
1Ss 4 °C	Day 0	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a
	Day 15	0	13.00 $\pm$ 2.60 b	0	0	0	0
	Day 30	0	8.00 $\pm$ 2.00 bc	0	0	0	0
	Day 45	0	5.00 $\pm$ 2.24 bc	0	0	0	0
	Day 60	0	2.00 $\pm$ 2.00 c	0	0	0	0
5Ss 4 °C	Day 0	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a
	Day 15	58.00 $\pm$ 3.59 b	57.00 $\pm$ 3.96 b	0	0	60.00 $\pm$ 3.33 b	0
	Day 30	26.00 $\pm$ 2.67 c	30.00 $\pm$ 3.94 c	0	0	11.00 $\pm$ 3.14 c	0
	Day 45	20.00 $\pm$ 3.33 cd	22.00 $\pm$ 2.90 cd	0	0	0	0
	Day 60	10.00 $\pm$ 2.98 d	12.00 $\pm$ 3.89 d	0	0	0	0
1Ss 25 °C	Day 0	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a	99.00 $\pm$ 1.00 a
	Day 15	99.00 $\pm$ 1.00 a	96.00 $\pm$ 2.67 a	90.00 $\pm$ 2.98 b	68.00 $\pm$ 2.91 b	100.00 $\pm$ 0 a	85.00 $\pm$ 2.24 b
	Day 30	98.00 $\pm$ 1.33 a	74.00 $\pm$ 2.67 b	35.00 $\pm$ 3.42 b	17.00 $\pm$ 3.67 c	100.00 $\pm$ 0 a	72.00 $\pm$ 2.49 c
	Day 45	98.00 $\pm$ 1.33 a	35.00 $\pm$ 3.07 c	15.00 $\pm$ 3.42 c	0	99.00 $\pm$ 1.00 a	0
	Day 60	70.00 $\pm$ 2.58 b	27.00 $\pm$ 2.60 c	0	0	64.00 $\pm$ 3.06 b	0
5Ss 25 °C	Day 0	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a	100.00 $\pm$ 0 a
	Day 15	100.00 $\pm$ 0 a	94.00 $\pm$ 2.67 a	97.00 $\pm$ 1.53 a	52.00 $\pm$ 2.91 b	100.00 $\pm$ 0 a	85.00 $\pm$ 3.73 b
	Day 30	100.00 $\pm$ 0 a	70.00 $\pm$ 2.98 b	62.00 $\pm$ 3.59 b	50.00 $\pm$ 3.65 b	100.00 $\pm$ 0 a	72.00 $\pm$ 2.49 b
	Day 45	96.00 $\pm$ 2.67 a	74.00 $\pm$ 3.06 b	35.00 $\pm$ 3.07 c	0	98.00 $\pm$ 1.33	0
	Day 60	86.00 $\pm$ 3.06 b	50.00 $\pm$ 2.98 c	15.00 $\pm$ 3.73 d	0	85.00 $\pm$ 3.07 b	0