

EFFECT OF SALINITY OVER TWO STRAINS OF *GAMBIERDISCUS* SPP. SEARCHING FOR CYSTS-FORMING CONDITIONS

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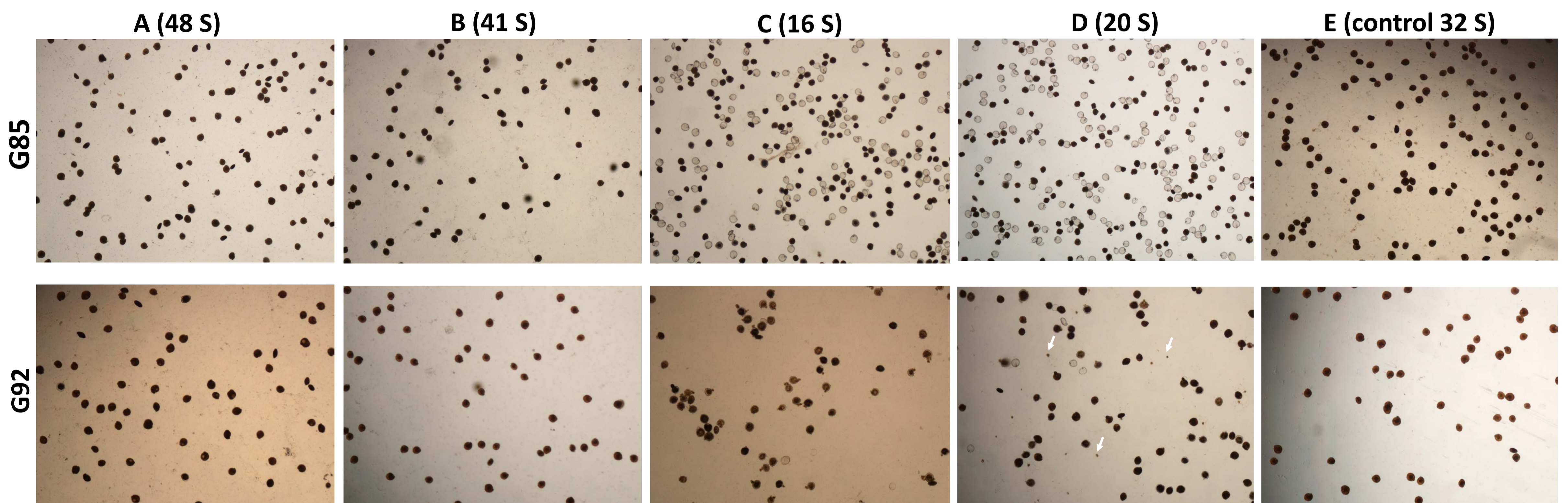
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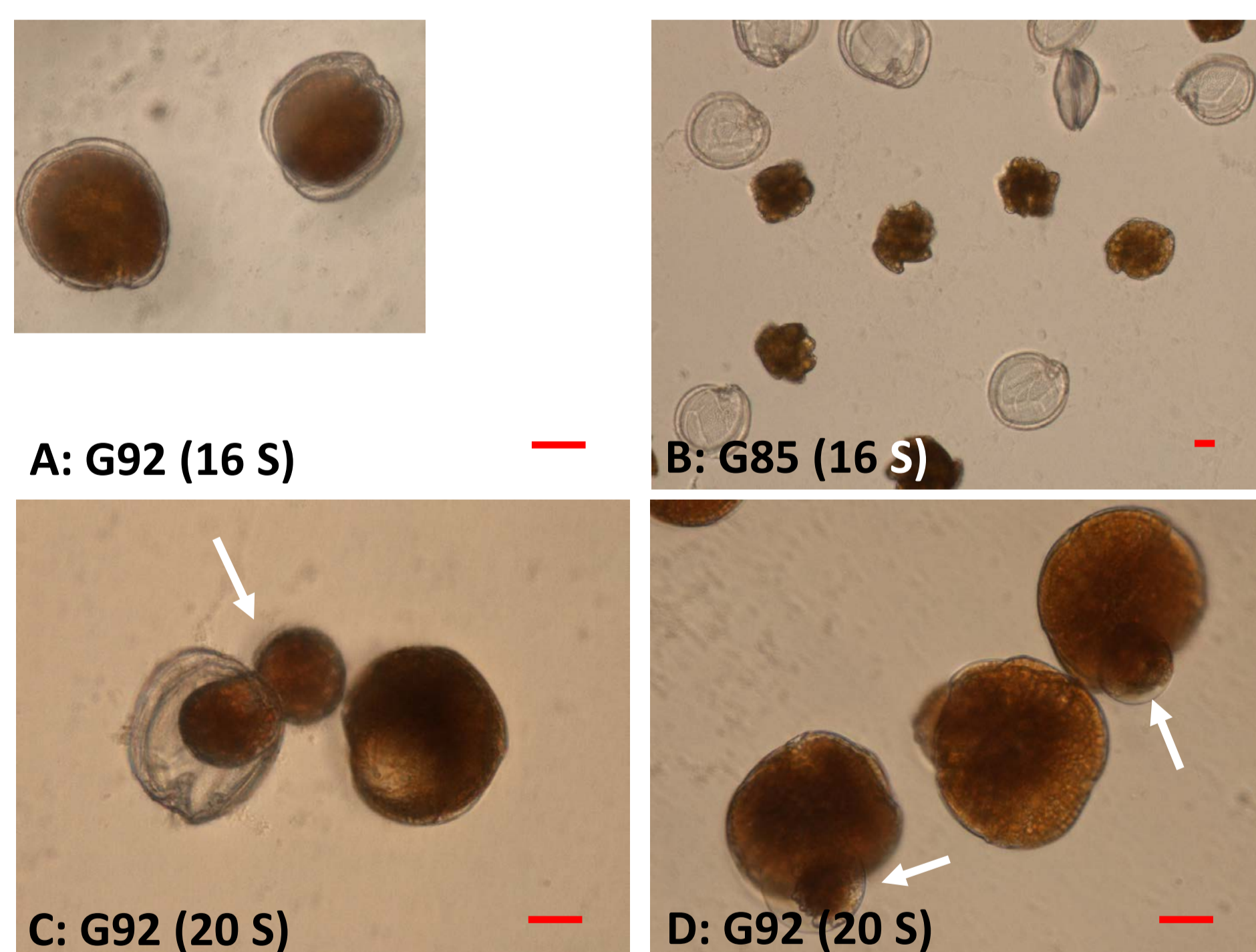
Dinoflagellates belonging to the genus *Gambierdiscus* are the former causative agent of ciguatera fish poisoning (CFP), a human illness induced by the consumption of fish that have accumulated ciguatoxins through their diet. Cysts formation is a part of dinoflagellate life cycle and play an important role in the ecology of the species, since they remain in the sediment layer during unfavorable conditions, such as suboptimal temperature, nutrients and darkness. From the biotechnology point of view, cysts might be considered as an advantage, since for some dinoflagellate species they can produce at least 5 times more toxins than vegetative cells.

The aim of this study was to study the effect of different concentrations of salinity over two strains of *Gambierdiscus* spp. with the purpose of establishing salinity values that might be able to induce cysts under laboratory conditions.

For this purpose, four salinity (S) concentrations were tested (16, 20, 41 and 48) over two strains (G85 and G92) of *Gambierdiscus* spp., originated from Canary Islands. In general, G85 strain was more resistant to unfavorable salinity conditions than G92. The results showed that the two strains were more resistant to higher salinities (41 and 48) than to lower ones (16 and 20), being observed, in the first case, vegetative cells at least until one week after the experiment had started. At lower salinity concentrations (16 and 20), after 24h, ecdysis and cysts were observed for G85, while death, cellular rupture and cysts formation for G92. In all salinities tested, cyst numbers increased and maintained during the all experiment. Future experiments will focus on understanding/confirming whether the induced cysts are able to produce more toxins than vegetative cells.



General microscopic observations (40x magnification) of *Gambierdiscus* cultures after 24h of starting the experiment. G85 respond to low salinity environment with ecdysis process, while G92 cells respond with cyst formation and some cell rupture. At high salinities (48 and 41), at the same period of time, no evident effect was observed over *Gambierdiscus* cells. White arrows might indicate gametes formation.



Some details of different salinity effect over *Gambierdiscus* spp. cultures: Cysts (A), theca and anomalous cell morphology after ecdysis (B), cell undergoing ecdysis (C, arrow), cells with a "gem" (D, arrow). Red scale bar: 20 μ m.

	G85 (Days)										G92 (Days)									
A (48 S)	0	1	2	3	6	7	8	9	10	0	1	2	3	6	7	8	9	10		
Vegetative cells, active																				
Vegetative cells, inactive																				
Cysts																				
Ecdysis																				
B (41 S)	0	1	2	3	6	7	8	9	10	0	1	2	3	6	7	8	9	10		
Vegetative cells, active																				
Vegetative cells, inactive																				
Cysts																				
Ecdysis																				
C (16 S)	0	1	2	3	6	7	8	9	10	0	1	2	3	6	7	8	9	10		
Vegetative cells, active																				
Vegetative cells, inactive																				
Cysts																				
Ecdysis																				
D (20 S)	0	1	2	3	6	7	8	9	10	0	1	2	3	6	7	8	9	10		
Vegetative cells, active																				
Vegetative cells, inactive																				
Cysts																				
Ecdysis																				
E (CONTROL 32 S)	0	1	2	3	6	7	8	9	10	0	1	2	3	6	7	8	9	10		
Vegetative cells, active																				
Vegetative cells, inactive																				
Cysts																				
Ecdysis																				

Microscopic observations of *Gambierdiscus*'s cells (green color means "presence") of the different salinities during a period of 10 days. Other observations (cell rupture, cell death, aberrant cell morphology, etc., are not shown).

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