

Relevance of colour polymorphism in the invasive Golden Star tunicate when exposed to thermal stress and ocean acidification



PRESENTER:
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BACKGROUND:

- The Golden Star tunicate (*Botryllus schlosseri*) has invade BC waters, where it impacts fishing, aquaculture, and native species¹
- It occurs in multiple colours², but what these colours mean for survival is unclear
- We tested how Golden Star tunicates of different colours responded to ocean acidification and an extreme heat event

METHODS:

- Two sets of tiles submerged at Reed Point Marina, Port Moody, BC
- Allowed tunicate colonies to develop for 10 weeks on the tiles, photographing them every 2 weeks
- First set hung in 2013 by Norah Brown and colleagues³
 - Half the tiles in acidified seawater, half in normal seawater
- Second set hung in 2021
 - Heat dome spanned the 6th week of our experiment
- Analysed the percent cover of each tunicate colour over time

RESULTS:

- Purple and orange Golden Star tunicates grew on the tiles in both years
- Neither ocean acidification nor the heat dome affected tunicate growth
- The orange and purple colour morphs were similarly unaffected

DISCUSSION:

- Golden Star tunicates of both colours grew under harsh conditions associated with climate change
- Similarly harsh conditions have been shown to negatively affect native species⁴
- Climate change continues to alter conditions along the BC coast, which may facilitate the invasion of this tunicate as it could outcompete native species
- As climate change intensifies, this invader will continue to spread

Both colours of the invasive Golden Star tunicate unaffected by climate change.

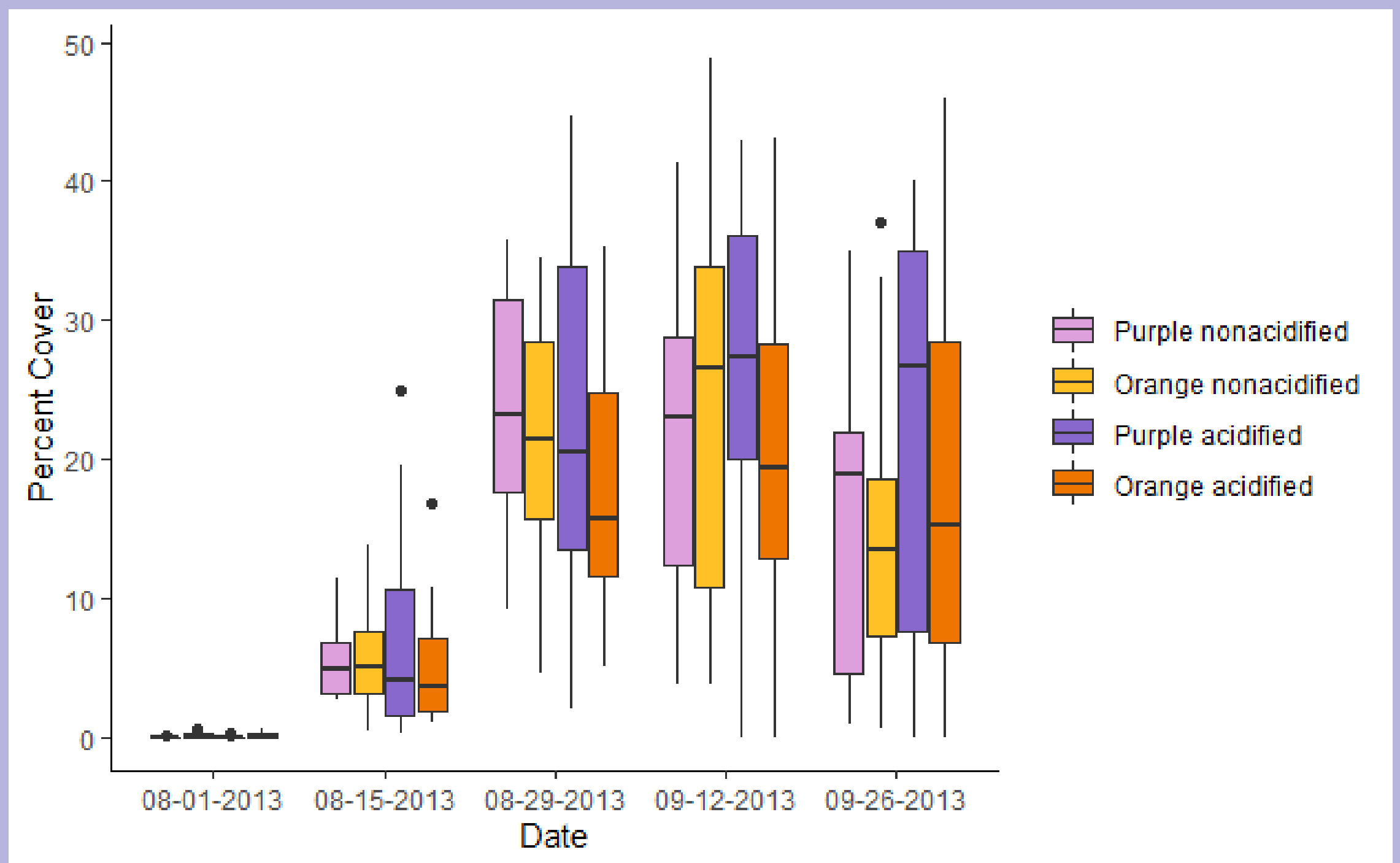


Fig 1. Change in percent cover of tunicate colonies on the settlement tiles over time, in acidified and nonacidified conditions.

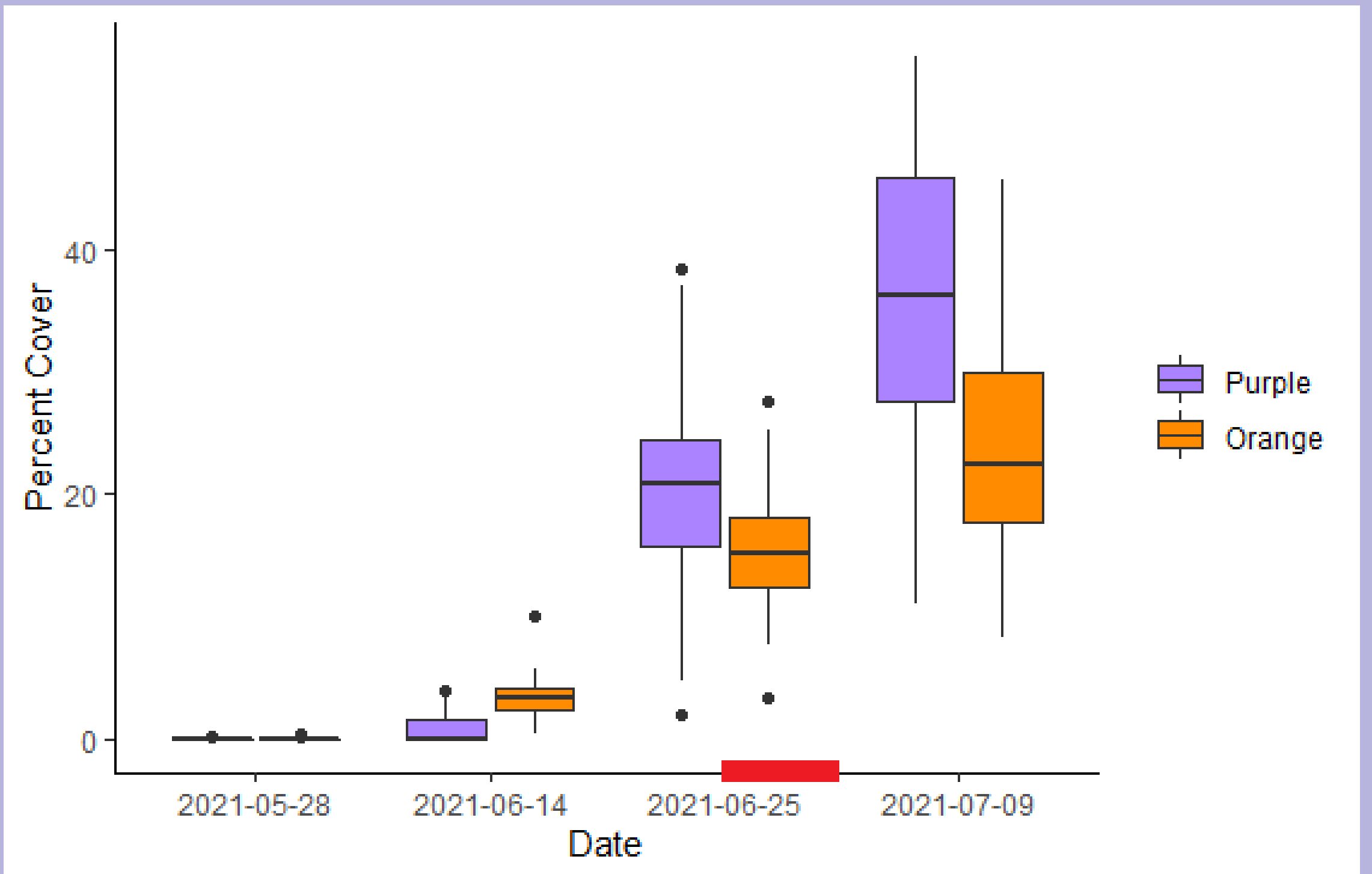


Fig 2. Change in percent cover of tunicate colonies on the settlement tiles over time. The red bar indicates the duration of the heat wave.

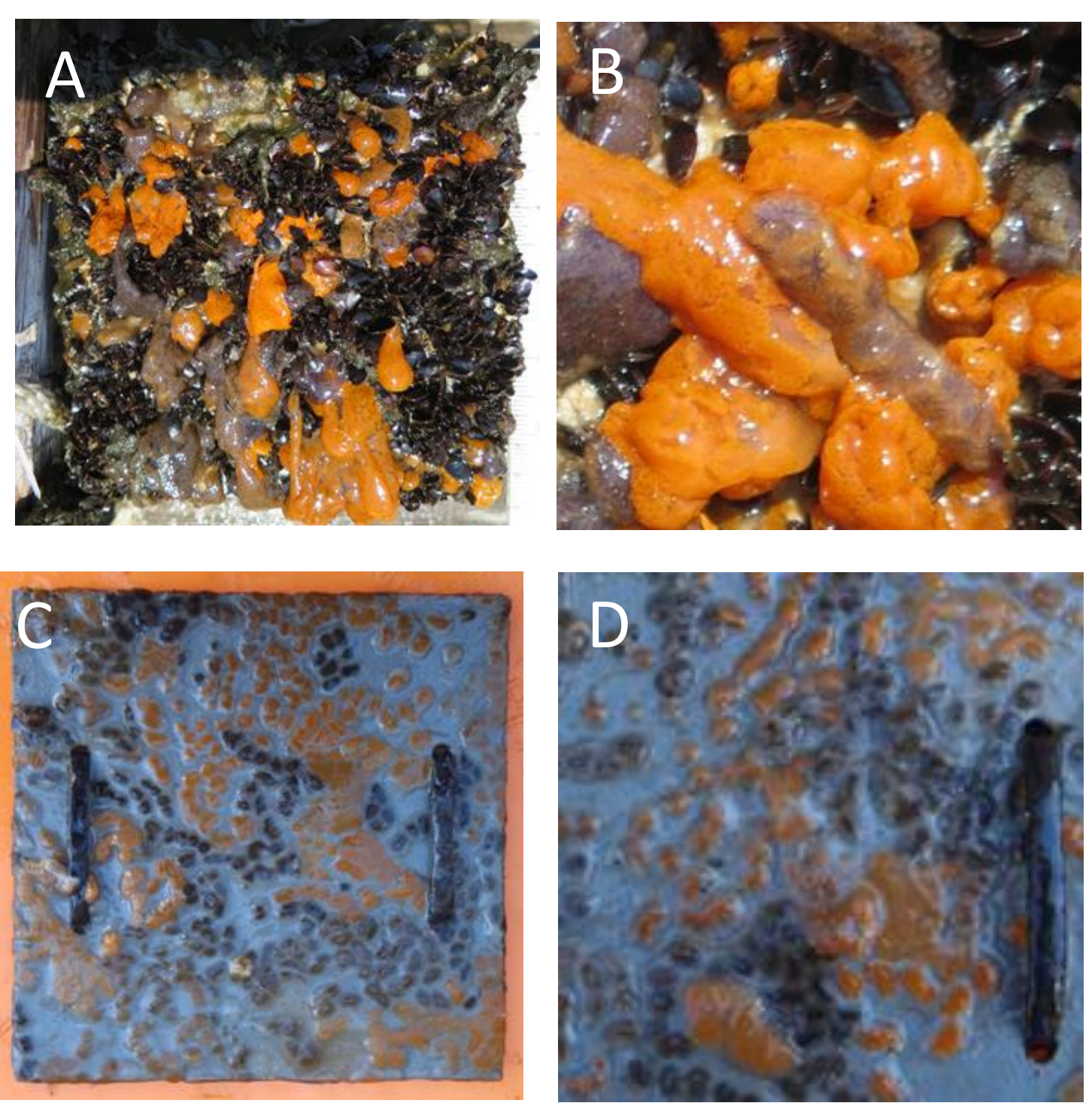


Fig 3. A: 2021 settlement tile after 8 weeks of growth. B: Close up of a 2021 settlement tile at 8 weeks showing the orange and purple colonies, and a chimaera (fusion of two different coloured colonies). C: 2013 settlement tile at 8 weeks. D: Close up of a 2013 settlement tile at 8 weeks.

References:

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2. Rinkevich, B., Porat, R., & Goren, M. (1998). Ecological and life history characteristics of *Botryllus schlosseri* (Tunicata) populations inhabiting undersurface shallow-water stones. *Marine Ecology*, 19(2), 129–145. <https://doi.org/10.1111/j.1439-0485.1998.tb00458.x>
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