Assessment of the capacity of Halicarcinus planatus larva to reach the South Shetland Islands through passive dispersal.

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In the last 50 years, the anthropogenic activity and atmospheric temperature in the West Antarctic Peninsula have increased constantly, and consequently have facilitated the establishment of exotic species. Different populations of alien plant and insect species have been already recorded in the terrestrial Antarctic (*e.g. Poa annua*, *Juncus bufonius* and *Eretmoptera murphyi*). In contrast, no alien marine species have been reported until now in Antarctic seawater, with the exception of a single ovigerous female of *Halicarcinus planatus* found in the shallow waters of Deception Island in 2010 and reported in the scientific literature in 2015. *Halicarcinus planatus* is a small brachyuran crab living in shallow habitats, distributed in the southern South-America and in Sub-Antarctic islands (*i.e. Prince Edward and Marion Islands, Crozet and Kerguelen Islands, Falkland Islands and New Zealand*). In the Sub-Antarctic islands, *H. planatus* is usually the unique crab species present in the shallow ecosystems. This species is able to live in cold Sub-Antarctic water mainly because of its capacity to down-regulate Magnesium concentration ($[Mg^{2+}]$) in the hemolymph below seawater concentration. Because of these physiological characteristics, together with a high potential of dispersal through a 45 to 60 days larva, *H. planatus* has been historically considered as a potential invasor of Antarctic shallow ecosystems.

Here, the ability of *H. planatus* larvae to be transported by water current from Sub-Antarctic to Antarctic is evaluated through the Lagrangian particles approach and model-estimated ocean circulation. Model parameters were defined by the species characteristics (*i.e. behavior, habitat preference and reproductive strategy*) and ecophysiology lab experiments. The survival rates of *H. planatus* were measured for extreme temperatures (between -1.8 and 5°C for adults and at 1, 2 and 5°C for larvae) and for salinity between 4 and 32 PSU (for only adults). Results showed that *H. planatus* could survive at temperature above 1°C and salinity above 18 PSU. So that, larvae could reach Antarctic waters during summer, when temperatures are above 0°C.

A possible larvae transport is from Diego Ramirez Island; it's the last island from South America that in addition is located very near of polar front and where *H. planatus* can be found.

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Poster preference