



# Black John - the Bogus Pirate



## War in a Water Drop!

By John Joyce

Avast there, Mateys!  
Find out about the unlikely battleground of a single drop of seawater.

While a single drop of seawater may seem an unlikely battleground, it can be home to many tiny animals and plants . . . each fighting in a war for survival!

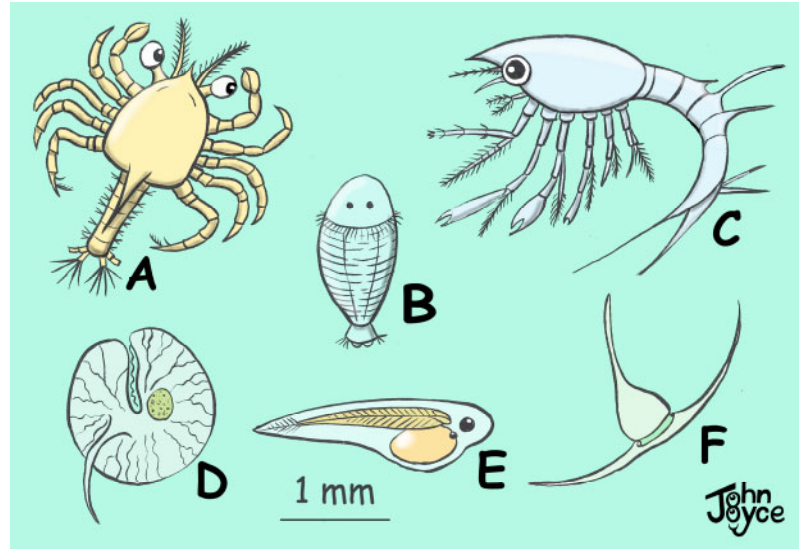
As we saw in the Winter 2020 edition of *Nature's Web*, microscopic, single-celled plants called 'phytoplankton' thrive and 'bloom' in huge numbers when the sea temperature, available light and dissolved nutrients on which they feed are all at comfortably high levels. And feeding on these microscopic plants – and each other – are a host of tiny animals known as 'zooplankton'.

The largest group of zooplankton are simple, single-celled animals called 'protozoa' – or 'first animals' (D and F). But the term 'zooplankton' is also used to describe everything from fish eggs and larvae (E) and the larvae of crabs (A), scampi (C) and the larvae of the bottom-dwelling tube worms such as *Pectinaria koreni* (B).

Copepods – tiny relatives of lobsters and shrimps – are the most numerous members of the zooplankton and, in fact, the most abundant multicellular animals on Earth, outnumbering insects by three orders of magnitude. Because of their enormous numbers and their importance as a food source to larger animals, zooplankton play a key role in marine ecosystems. They also perform a vital function in helping to remove carbon from the atmosphere by eating the microscopic marine plants which absorb that gas from the atmosphere, just as land plants do. This 'fixes' the carbon from the phytoplankton within the zooplankton's animal bodies, which eventually die and fall to the sea floor – preventing the carbon from re-entering the atmosphere.

What concerns marine biologists, is the fact that higher seawater temperatures are causing some species of shrimp and starfish to breed earlier. This means that their larvae – which are part of the zooplankton - are not available as a food source when the young of other, larger marine animals including important commercial fish species, appear later in the year. This has led to the call for international cooperation to monitor changes in zooplankton distribution over time and to study the effects of pollution, overfishing and climate change on ocean life. Some leading marine scientists have even warned that the wide variety of life in the Ocean may shrink to fewer and fewer species if warming continues, so that it becomes dominated by microbes, bacteria and jellyfish.

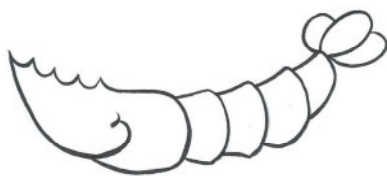
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**A = Edible Crab larvae**  
(*Cancer pagurus*);  
**B = Tube Worm larvae**  
(*Pectinaria koreni*);  
**C = Scampi larvae**  
(*Nephrops norvegicus*);

**D = Luminous plankton**  
(*Noctiluca scintillans*);  
**E = Newly hatched cod**  
(*Gadus morhua*);  
**F = Dinoflagellate plankton**  
(*Ceratium arcticum*).

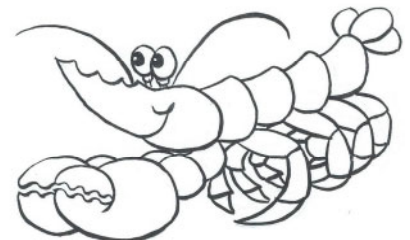
## HOW TO DRAW A LOBSTER



DRAW THE HEAD AND BODY



ADD EYES, ANTENNAE AND CLAWS



FINISH OFF WITH THE LEGS

Follow Black John the Bogus Pirate and his crew on Facebook at <https://www.facebook.com/BlackJohntheBogusPirate/>

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