Life in marine driftwood: The case of driftwood specialist talitrids

December 20 2017

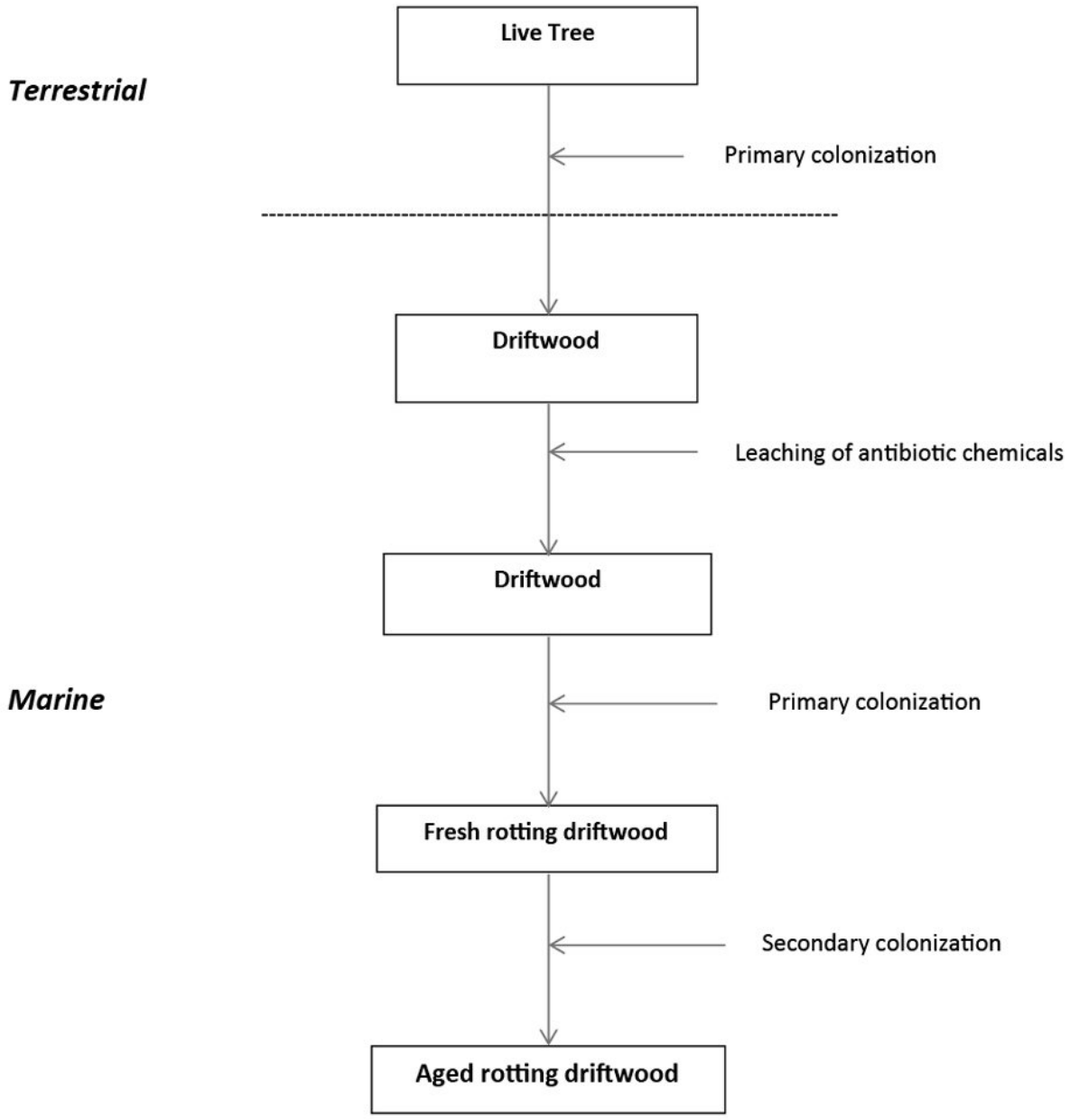
Photograph of a driftwood depository at Hartley Cove, Bay of Fundy, Canada, in May 2016. Credit: David Wildish

Driftwood in the sea - either floating or stranded on beaches - is a common feature particularly in temperate regions. Large quantities of driftwood, termed driftwood depositories, may collect at the mouth of small streams associated with marshes and have been present for some 120 millennia - since the origin of flowering plants.

Once marine driftwood begins to decay, it undergoes a specific succession. Firstly, it is colonized by salt tolerant, wood degrading fungi and bacteria, along with a few invertebrates able to digest wood by producing native wood degrading enzymes. The latter include gribbles (isopods) and chelurid amphipods.

Driftwood hoppers (talitrids), as well as isopods, chilopods, insect larvae, some ants and termites, comprize the secondary colonizers. They are all characterized by their inability to utilize driftwood directly. Instead, they rely on symbiotic microflora for digestive purposes.

Within all talitrids, the driftwood hoppers count as few as seven species, most likely because they are extremely difficult to locate and, therefore, discover and describe. Apart from living in tiny burrows, they measure between 13 and
Having reviewed the driftwood specialized talitrids, Dr. David Wildish of the St. Andrews Biological Station, Canada, concludes that all seven known species demonstrate dwarfism based on slow metabolism and growth. Their sexual development begins earlier compared to faster growing related species. All of them are also characterized with reduced eye size and absence of dorsal pigment patterns.



Flow chart of the succession involved with driftwood in the sea. Credit: David Wildish

In his review article published in the open access journal *Zoosystematics and Evolution*, the scientist confirms that dwarfism in driftwood hoppers

has evolved due to poor diet, in turn resulting in slowed metabolism and growth. A further adaptive challenge is the empty gribble burrow size occupied by talitrids (burrow diameter between 0.6 to 5 mm) with the smaller ones being more widespread. Larger talitrids can only complete their life cycle in the larger burrows.

"The size gradient in gribble burrow diameter provides a satisfactory explanation for serial dwarfism within the driftwood talitrids and is why each species becomes successively smaller," explains the researcher.

Responsibility for first establishing the driftwood talitrid ecological grouping was made during graduate studies by David Wildish, London University, U.K., and Laura Pavesi, University of Rome, Italy. The two criteria for inclusion of a talitrid in the driftwood grouping was: behavioral fidelity to the occupied driftwood and that the food source was solely rotting driftwood (see references).

The larger talitrid family are small/medium in body length (driftwood specialists. A few freshwater and many terrestrial species are also known.

More information: David J. Wildish, Evolutionary ecology of driftwood talitrids: a review, *Zoosystematics and Evolution* (2017). DOI: 10.3897/zse.93.12582

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