Shipwrecks and Global 'Worming'

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Abstract

Marine borers, particularly the shipworms, as destroyers of timber, par excellence, are well known from very ancient times. They attacked the wooden hulls of ships with such intensity that the weakened bottom planks broke up even due to a mild impact caused by hitting a rock or any floating objects inducing shipwrecks. Even the survival of sunken ships as wrecks depends on the mercy of wood-destroying organisms, which may turn these 'port-holes' to history into meaningless junks. The silent saboteurs, involved in several early shipwrecks, are the molluscan and crustacean borers, aided by bacteria and fungi.

The paper presents an account of the marine wood-borers, together with a historical review of literature on their depredation on wooden ships, and on protective methods adopted from antiquity to modern times. The seriousness with which early mariners faced the problem of bio-deterioration and the fear the wood-borers created in their minds have been brought to light with, in some cases, excerpts from their journals and books. The anxiety and concern for protecting the ships from the ravages of wood-borers and for their own safety, as evidenced from their accounts, are discussed. Classification of various groups of marine wood-borers with notes on characters of systematic value and a complete list of species so far recorded in literature have been included under Appendix I and II. Methods employed to prevent damage to the boats included deep-charring, coating with pitch, coal-tar, whale oil and mustard oil with lime; scupper nailing ('filling'); sheathing with animal skin, hair, tarred paper, wooden boards (untreated or soaked in coal tar, Ferrous sulphate, Copper sulphate or Lead monoxide); sheathing with metals (Lead or Copper sheets); plastic, neoprene coated ply-woods; and painting with Copper oxide, Pentachlorophenol or phenylarsenious oxide. None of these imparts complete protection. Recent archaeological investigations carried out in British waters, especially on 'Mary Rose', are also summarised. It is suggested that, though borers are instrumental in inducing ship-wrecks thereby enriching the materials for archaeological studies, excavations at known ship-wreck sites should be augmented to unearth valuable historical data, before they are lost to satisfy the insatiable appetite of these pests.

Chapter 1. Introduction

Since antiquity, wood has been a material available almost anywhere and easily accessible to humans for a variety of different activities, from primary ones, such as hunting and cooking to secondary ones, such as exploration, sailing and trade. Timber, being the only constructional material available in the form in which it can be readily put to use, is naturally the first material employed by mankind for their varied activities, particularly for exploration of food resources in the sea, international trade and also for waging wars and piracy. Consequently, wooden craft, boats and ships have played a fundamental role in human ventures. However, the wooden hulls of these craft are prone to rapid infestation by certain types of marine organisms, such as wood-borers (shipworms, pholadids, gribbles and pill-bugs) and micro-organisms (bacteria and fungi), which attack the organic components of wood, acting as the 'primary active biological decomposers' (Brown, Bump and Muncher, 1988; Santhakumaran 1988). Thus, mankind had to confront the problem of marine bio-deterioration of timber, perhaps, from the very first day he set out into the sea on a wooden log or on a primitive craft. Of the above, the wood-boring molluscs of the *Teredinidae* family, commonly known as shipworms, are capable of rapid, high level degradation of wooden objects and their destructive potential to wood, especially to archaeological wood, is often underestimated, as the results of an attack can sometimes be deceptive, leaving wood looking externally sound, though internally timbers may be thoroughly honeycombed with tunnels (Santhakumaran 1988). (Figure 1)

Figure 1: Borer-infested archaeological wood fragment, showing external sound appearance (left) against the internal honey-combed structure (right).

Known to them as 'shipworms' or 'broma', all the ancient navigators had invariably a taste of the ruthless destruction caused by these borers to the hulls of their boats. The mariners were well aware of this hidden danger lurking in the underwater portions of their boats, and from their writings it was evident that they shuddered at the very thought of these organisms. Recorded history of early navigation has unfolded instances of several unhappy encounters between the navigators and marine wood-borers. Endowed with unlimited appetite ingesting any type of timber with apparent enthusiasm, prodigious fecundity resulting in heavy intensity of attack, fast rate of growth enabling the destruction of timber with remarkable rapidity, and highly specialized adaptations for boring into wood and leading a sedentary life, marine wood-borers are, from time immemorial, destroyers of timber par excellence and man's formidable enemy in the sea as agents of ancient ship-wrecks.

In the present paper, a historical review of literature on depredation of marine borers on wooden ships and on protective methods used from antiquity to modern times is presented together with an account of the organisms responsible for the damage. The role played by the marine wood-borers in causing ancient ship-wrecks, the fear these organisms created in the minds of early sailors and the seriousness with which they faced the problem of bio-deterioration have been brought to light, with, in some cases, excerpts from their Journals and books. Recent findings on archaeological wooden materials in British waters are also summarised.