Termites

Termites, commonly known as 'white ants', are not ants but members of a group called the Isoptera and are one of the world's most successful group of insects. There are many species, some of which build huge mounds containing millions of individuals. A few species are very serious and destructive pests of structural timber in museums and historic buildings.

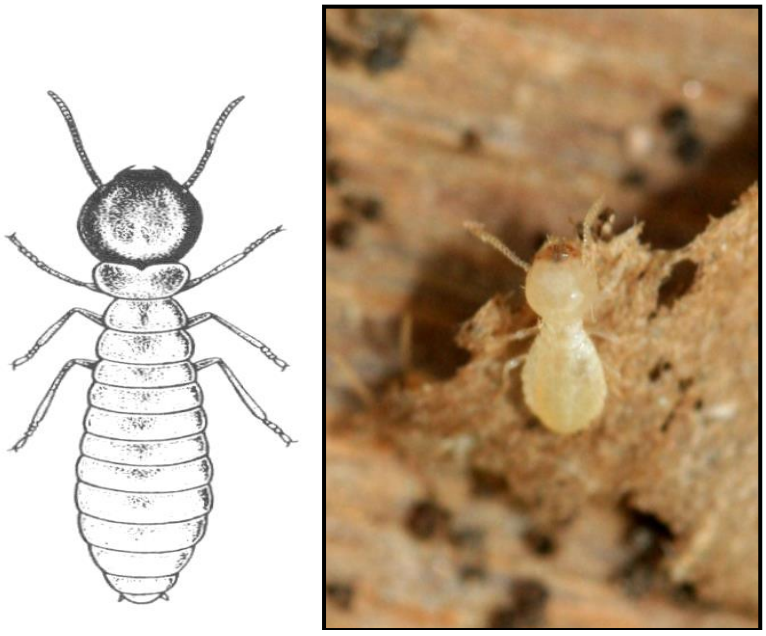
Termite infestation of wood in the buildings can also spread to display and storage furniture and so collections can be seriously damaged. The most severe problems are encountered in countries with warm temperate and tropical climates. Termites are not a problem in cool temperate countries and are absent from Canada, the northern part of the former Soviet Union and northern Asia. They have started to spread into northern Europe and there has been one isolated outbreak of *Reticulotermes* in the UK in Devon.

Types of Termites

There are many different species of termites and they are divided into three types with distinctly different life styles, drywood, dampwood and subterranean. Subterranean termites cause the greatest damage to buildings, whereas drywood termites usually cause the greatest damage to artifacts. Dampwood termites rarely cause problems in museums and stores.

Termites, like ants, live in colonies which may have millions of individuals with a complex social structure. There are different types or 'castes' in this structure which includes workers, soldiers,

kings and queens, plus the developing eggs, larvae and nymphs. The reproductive cycle of many termites involves the production of large numbers of winged reproductives called alates which swarm from the colony and then lose their wings before establishing new colonies.



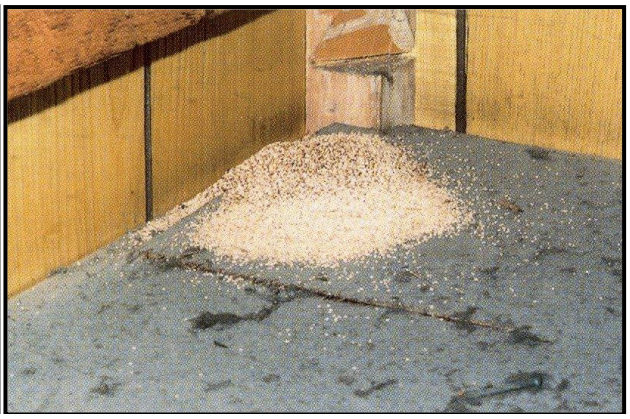
Termite worker (3-10mm long depending on species)

Drywood termites

Drywood termite damage

Drywood termites, including the common species *Cryptotermes* and *Kalotermes* need high temperatures to survive and cause serious problems in tropical and semi-tropical countries. They bore galleries in timber in many directions and tunnels, frequently across the grain of the wood. Channels are connected by narrow passages which are clean and smooth. Damage is often characterised by waves at the sides of excavated tunnels. Faecal pellets or 'frass' are scattered in the passages and they are often stored in chambers which are sealed off. Drywood termites can be

identified by their pellets which are the shape of poppy seeds. Some species may bore small round holes in the surface of the wood and eject piles of frass through these 'toilet holes'.



Timber and wooden objects may be extensively damaged before infestation is noticed because a thin layer of undamaged wood may be left on the outside. The nests and colonies are constructed entirely within timber and they do not forage widely from infested material. Drywood termites will also attack and destroy other material made of cellulose, including paper and books.

Subterranean termites

Subterranean termites need to live in contact with soil and some species build the classic 'termite cities' with colonies in huge mounds or spires of soil. Colonies of some species, including *Reticulitermes, Coptotermes* and *Macrotermes,* will spread from the natural environment of soil and trees to the woodwork of buildings.

Many species require fungi in their diet which is produced on decaying wood within the nest. They need to maintain high levels of moisture in the colony for the development of fungi to prevent the desiccation of the nymphs and workers. This leads to the characteristic tube-building habitat of subterranean termites.

Termite mud tube on wood support structure

These tubes, which may be some metres in length, are constructed of soil and faecal material which protect the termites as they pass between nests in soil to the food sources of wood or other

cellulosic material. They will line their galleries with a mud layer which conceals holes and covers wood which they are excavating. This habit, together with the presence of connecting tubes, provide the main clues to distinguish colonies of subterranean termites from those of drywood termites which have relatively clean galleries. A further diagnostic feature of damage is that subterranean termite galleries are restricted to softwood and do not cross growth rings.

As their name implies, subterranean termites are found near or below ground level and seldom spread above the lower floors, this means that basement areas are particularly at risk. In addition to damage to museum objects, the enormous amount of timber which can be consumed by subterranean termites can be sufficiently severe to cause structural collapse of buildings.

Infestations can also spread into wood objects, paper and books and damage can be very severe because the infestation may be hidden inside the objects.

Subterranean termite damage to archives

Prevention and Control

New buildings should be constructed in such a way that termite problems are minimised and building guidelines are available in many countries. The eradication of termites from older museums and their subsequent exclusion is extremely difficult and it usually necessary to employ a pest control contractor who specialises in termite problems.

Further reading

Termites in buildings. R Edwards and A E Mill, The Rentokil Library, 1986

Wood Destroying Insects. J W Creffield, CSIRO Australia, 1991

Termites in UK Buildings. BRE Digest 443/1, 1999

Termites – Animals of mass destruction. M Harasymiw, 2014