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## TERMITES – BOON or BANE

Singapore’s penchant for introducing and protecting its green heritage poses many challenges. The question often asked is sustainability. A burgeoning population needs to be housed. The plan is to intersperse as many common space for greenery, some well-planned while others odd corners conveniently designated to fulfil the requisite plot ratio. For the properly designated areas the execution objectives can be fulfilled while awkward areas pose different problems.

A successful thriving garden has a rich mix of flora (plants) and with it the fauna (animals). Among the many myriad of creatures that occur includes the termites, commonly called ‘white Ant’, ‘bai ma yi’(mandarin). Or ‘anai-anai’ (Malay). Termites are highly social, living in large permanent communities with castes of workers, soldiers and queen. They are feared for the damage they cause to property, feeding on the cellulose found in wood. Their benefit to the ecosystem is to breakdown of wood. It serves as nature’s agent in recycling or biodegrading wood.



*Microcerotermes* sp. forage within plant stems

Photo courtesy of Foong-Kuan Foo



*Coptotermes* sp. shelter tubes  
Root Beams

Wall of a Church

Photo courtesy of Foong-Kuan Foo

Their quest for wood as their source of food is insatiable making exploratory forays into buildings. A consequence is that they damage electrical insulation and switch-boxes causing power failures. The damage termites cause to built-in furniture, roof beams, wall panelling, timber floors and many timber structures are well documented.

In gardens they generally feed on dead wood, twigs, leaf litter, and various plant material. In instances they have been known to attack Royal Palms, coconut trees, MacArthur Palms, old and diseased trees. Termite trails found on tree barks are not uncommon. Tree boughs weakened by termites attack have been known to break. Of the 2,000 termite species in the world, those that have direct impact in our gardens and buildings are confined to some 12 subterranean termite species in Singapore.



*Macrotermes carbonarius* soldier

Photo courtesy of  
Chow Yang Lee

*Coptotermes gestroi* soldier

Photo courtesy of  
Philip Tan

Whereas in the past, housing estates were built on land formerly used to grow rubber, coconut and fruit trees. While the land may have been cleared, often remnants of the tree stumps and roots remain underground, to be a food source for the termites. Herein, lies the problem upon completion of the houses.

In highly urbanised Singapore, despite massive excavation and grading of the grounds to build basements as many as 4 storeys underground with structures more than 30 storeys high, the termite issues persists.

The deliberate creation of landscapes both below ground level and high up in the upper decks and walls has introduced the same set of conditions for possible termite infestation. Soil mix and plants complete with their root balls are transplanted into these landscape areas. Given time the fauna of the garden will also proliferate. The success of a biodiverse landscape will inevitably result in termite infestation.



Termite infestation – underside of water feature.

Photo courtesy of Jean Teoh

The termite is elusive as they are subterranean, living in tunnels and galleries underground. Evidence of their presence is the mud tubes, sometimes found along the tree barks or structures as they foray in search of food. Some may make mounds of earth.



*Macrotermes carbonarius* foraging

Photo courtesy of Foong-Kuan Foo

The termite species causing most damage in gardens is the *Coptotermes* sp. While the most prominent is *Macrotermes carbonarius* that forage in the open moving in a huge column and are often mistaken for large black ants. Their trails appear mostly in the early morning or late evening or just after rain.

## TERMITE TYPES

Table of Important Subterranean Termite Species in Singapore.

TERMITE SPECIES	CAUSE PROPERTY DAMAGE	BUILD MOUNDS
<i>Coptotermes gastroi</i>	Yes	No
<i>Coptotermes curvignathus</i>	Yes	No
<i>Coptotermes kalshoveni</i>	Yes	No
<i>Macrotermes gilvus</i>	Sometimes	Ground mounds
<i>Macrotermes carbonarius</i>	No	Ground mounds
<i>Microtermes crassus</i>	Sometimes	Arboreal(above ground) nests
<i>Microtermes dubius</i>	Sometimes	Arboreal(above ground) nests
<i>Globitermes sulphureus</i>	Sometimes	Ground mounds
<i>Ancistrotermes pakistanicus</i>	No	No
<i>Schedorhinotermes spp.</i>	Yes	No
<i>Odontotermes spp</i>	Rare	Yes

Table adapted from Chow Yang Lee

From the table above, the species which accounts for the major damage within buildings is *Captotermes gastroi*. As Landscape practitioners, it is important to know that the reservoir of the different termite species reside in the landscape areas. The major part of understanding termite infestations are the detrimental effects caused to the plants in the garden. It is important therefore to be able to identify the species causing damage if any to the plants and also understand the methods available to suppress their spread.

## DETECTION

The most important termite infestation are from the list of subterranean termites listed above. Subterranean means that they live in the ground and are not easy to detect. To detect them one has to seek for evidence of their presence such as termite mounds, arboreal nests, muds trails, weakened timber of trees. If a tree has a weakened diseased look without the symptoms typical diseases of beetle, caterpillar, spider mites and aphids infestation, it is prudent to check the plant or tree is under termite attack.



Arboreal nest of of *Microcerotermes* sp.

Photo courtesy of Philip Tan

## INFESTATION MANAGEMENT

Bear in mind that termites has important beneficial benefits in biodegradation of plant material. As responsible landscape practitioners we have to be mindful that the use of control are environmentally acceptable. The principle method is targeted at colony elimination. The method employed relies on their behaviour of mutual grooming and feeding. This way the introduction of trace amounts if the toxic substance is spread through the colony and to the queen leading to the demise of the colony. The main methods that concern landscape professional are;

- Use of in ground bait stations laced with the trace amount of termiticides have been favoured,
- Drenching of exposed subterranean nest is a more direct control method. This involves exposing the subterranean nest and applying the recommended dose of termiticide.
- Dusting of active termite trails with trace quantities so that the workers moving through the galleries can spread the termiticide through the colony.



In-ground monitoring station termite infestation

Photo courtesy of Philip Tan



Installing monitoring station

Photo courtesy of Alliance Pest Management Pte Ltd



Termite shelter tubes

Photo courtesy of Foong-Kuan Foo

## SUMMARY

To conclude, in our effort to build the most desirable eco-friendly landscaped gardens, Earthscape's approach is to recognise termite infestation in gardens, identify the species of the termite and its risks to the property, before applying the correct management strategies. After all these creatures have been around some 200 million years ago. This resilience to survive the harsh urban gardens should be viewed with respect for the part they play in biodegradation and the aeration of the ground with their subterranean galleries and tunnels. At Earthscape Concepts we are mindful of the importance of maintaining the biological balance and that working hand in hand with pest professionals is the best approach to curb termite risks and preserve our natural heritage.

[ Note: Special thanks to Dr Foo Foong Kuan and Philip Tan from Alliance Pest, Jean Teoh for their photo contributions and to Dr Lee Chow Yang for his valuable advise. For more authoritative information please refer to "TERMITES OF SINGAPORE -a Scientific Guide for Pest Management Professionals in Singapore" (Editor, Dr Lee Chow Yang), a publication of the Singapore Pest Management Association of Singapore.]

# Director's Notes

## New Website & Our Core Attributes

At Earthscape Concepts we have developed core attributes that makes us unique in the Landscape industry. Our services span over the areas of design consultants, landscape installation contractors, audit and maintenance.

The revamp of our website underlines succinctly how these attributes are reinforced in all the services we render. The comprehensiveness of our expertise are distinguished by the integration of each area of expertise, namely:

- **Convenience** – Engaging the customer completely as to meet their favoured design intention while fulfilling other attributes;
- **Eco-friendly** – Ensuring that the standards of nature's intentions are not compromised;
- **Balance** – Enshrined in this concept is the judicious use of the elements of metal, wood, water, fire and earth.

Through Earthscape's work, our website will focus on how each of these attributes are featured. With this approach, Earthscape reaches beyond the specialist skills of consultancy, project management, audit, and maintenance by integrating effectively all of the above attributes to create and perpetuate a truly Earthscape Concepts Brand.

In this edition too, we shall discuss issues relating to the nature's most misunderstood creature, the humble Termite that plays a very crucial role in the biodegradation of plant waste to earth. A boon and bane to urbanisation and a need to employ a practical approach to managing their presence.

As always, it is my great pleasure to treat you to Earthscape Digest's insights to Landscapes.

Lily Chee  
Managing Director



Earthscape Concepts New Website  
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