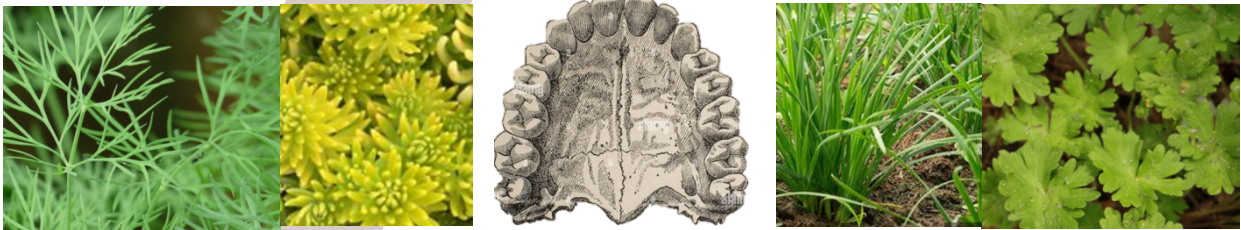


## The gateway to health garden: *your mouth and your body*

Location: Allotment gardens, ALT677 next to 'how to' stage

A blend of art, nature and oral science was the background to the design of this garden. The mouth, its impact on every part of an individual's life is often forgotten when considering overall health. This design aims to bring the mouth to the forefront.

Aside from the gut, the mouth has the most variety bacteria, archaea, fungi, and viruses. At least 700 different microbes have been found. (Di Stefano et al, 2022) . Most of these are considered as “**good bacteria**” working together to keep humans healthy (**symbiosis**) helping us to digest food, lower blood pressure and even help in the natural oral defence process protecting against disease causing organisms.



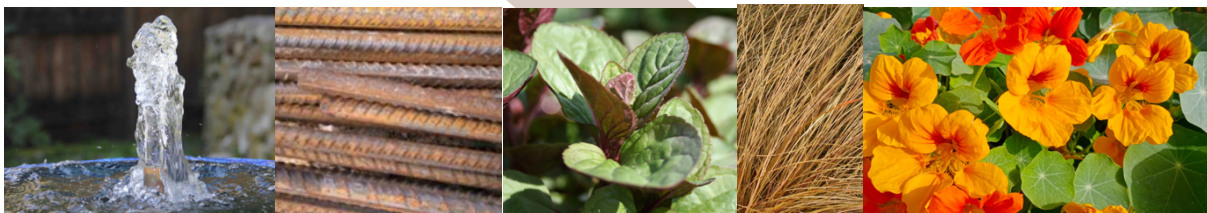
### Gardening, the microbiome and oral health

- Exposure to microbes in the soil during gardening affects immunity, inflammation and mental health through the skin microbiome. The gut microbiome is currently being widely discussed as it is integral to health. One of the primary mechanisms of improving bodily microflora is the mouth, the gateway to health.
- Plants (such as **Menthol** and **Eugenol**) contain essential oils which kill decay causing bacteria.
- Other plants that have shown similar but with less potent potential are *Achillea*, *Baccharis dracunculifolia*, *Croton cajucara*, *Cryptomeria japonica*, *Coriandrum sativum*, *Eugenia caryophyllata*, *Lippia sidoides*, *Ocimum americanum*, and *Rosmarinus officinalis*

The garden will be based on a **naturalistic woodland theme**, to represent the complex relationship between bacteria, fungi and viruses and the microbioma as a whole.

There will be a large sculpture of the upper jaw, and tongue surrounded by **saliva 'pools'** and home grown (in Hampton wick) plants.

Saliva is incredibly important in maintaining oral and dental health, containing enzymes, minerals and has a lubricating effect. Saliva removes food, protects the teeth and gums and is critical in the normal functioning of the mouth. Saliva also supports and 'moves' friendly bacteria around the mouth.



## Oral health and food

- Tooth decay causing bacteria have only entered the mouth since humans started farming (carbohydrates). Especially high amounts of streptococcus mutants have been identified since the invention of industrially processed flour and sugar.
- Bacteria have been identified (DNA sequenced) in hard plaque (calculus) ancient skulls, throughout history and compared to modern plaque/calculus samples.
- The pre-agricultural ( 10,000 years ago )diet consisted mainly of unprocessed wild fruits and vegetables, tubers, nuts and wild animals (Associated with good bacteria) The transition from hunter-gatherer to agrarian lifestyles introduced cereals, pulses, dairy products and meat into the human diet, associated with bacteria causing infected gums and decaying teeth
- The multiple health benefits of leafy greens are partly because spinach, lettuce and beetroots are brimming with nitrate, which can be reduced to nitric oxide by nitrate-reducing bacteria inside the mouth. Nitric oxide is known to lower blood pressure and improve exercise performance.

## Key features

The free flowing **natural plants and grasses** in muted earthy tones contrast with the charred wood and steel rebar parts of the design.

The seating area underlaid with gravel represents enamel, one of the hardest substances in the body. The enamel provides a unique surface which contains its own bacterial biofilm (microbiome).



Within the design there will be teeth, these teeth represent the 31,165 episodes of tooth extractions per year due to dental decay.

Dentistry has been in the news due to significant issues with dental access, the garden challenges spectators to place their oral health at the centre of their wellbeing and see dental professionals as partners in maintaining this delicate internal ecosystem. Poor oral health not only causes pain and distress, it affects eating, sleeping, recovery, infection, self esteem, wellbeing and mental health.

The design also includes an area of contemplation, surrounded by mints which spill over the edge of the bed to encourage touch and reminiscence of oral products through a distinctive mint aroma.

Drawing on Kathryn's art and design background and Yasmin's dental background the garden blends the artistic, visual aspect with biology.

The open 'mouth' is like a shout or a call for action, there are many people in the UK suffering from the effects of poor oral health, which is especially seen in vulnerable groups. Despite the seriousness of the message, the garden will inspire joy and fun, the bright lively colours, the grandness of the scale and saliva features provide a light hearted perspective on the topic.



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