

(ID 136)

Developing a Natural Toothbrush to Reduce the Non-Biodegradable Wastes in the Environment

Senanayake, S.I.N.*, Ishara, M.D.P., Wimalasiri, Y.S.G.

Faculty of Indigenous Medicine, University of Colombo, Colombo 03, Sri Lanka

**imashisenanayake99@gmail.com*

Abstract

The World Health Organization estimates that 3.5 billion people worldwide suffer from one or more oral disorders. As a solution, brushing teeth is being done by people to lessen the occurrence of oral illnesses. The American Dental Association suggests that everyone should replace their toothbrushes once every three or four months and 3.5 billion toothbrushes are sold worldwide each year. Discarded toothbrushes can take up to years to decompose as they have been made from polypropylene, polyethylene and nylon. Dental twigs which were prepared from various medicinal plants have been used to brush teeth in ancient times. It was replaced by the non-biodegradable plastic toothbrushes in the modern era that has become an impact to the environment. The objectives of this study were to develop a natural toothbrush in order to decrease the amount of non-biodegradable wastes in the environment and to improve the environmental sustainability. The literature has been gathered from the various Pharmacology texts, journals and authentic websites to find out pharmacodynamics properties of plants which are used to prepare dental twigs in Ayurveda. Results were analysed and a natural toothbrush was prepared. Considering the bristles, husk of *Areca catechu* has been chosen as it provides anti-microbial action against oral pathogens like *streptococcus mitis*, *streptococcus salivarius* and husk is a disposed product commercially without reusing. Arecanut is mentioned in Ayurveda as *mukhavishyadyakara dravya* (cleansing the oral cavity). The fibres extracted from the arecanut husk are used for soft, natural bristles of the toothbrush. For the handle of the toothbrush, the wood of *Cinnamomum zeylanicum* is used as it is discarded after taking the barks. Therefore, this unused cinnamon wood, which has medicinal value and widely used for oral diseases, was used as the handle. The final product was convenient to grip and user-friendly. As this toothbrush is made from natural plant materials, it is biodegradable and promotes reusing the most discarded natural by-products. Thus, it is possible to reduce the impact to the environment due to plastic toothbrushes and help to preserve the environmental sustainability.

Keywords: Toothbrush, Biodegradable, Natural, Sustainability