

How Can We utilize Nature's Gifts to Solve the Oral Health Problems We are Facing Today?

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Editorial

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Editorial

In his 'Nobel lecture', Prof Sathoshi Omura said that he had long been convinced that nature has splendid gifts to solve all our health problems. This eminent scientist who has grown up in a rural village witnessing how his family depended entirely on nature for all their necessities. Later on harvested many a gift from nature for the betterment of the society. His best finding is the Nobel Prize winning 'ivermectin' from a bacterium in Japanese soil to treat several devastating diseases in tropical countries [1]. His inspirational words motivate us to believe in nature to solve oral health problems we are facing today.

Regarding this issue, the first question we must ask is 'Can we utilize nature's gifts to solve these oral health problems?' It is a timely question to ask since oral health is being seriously challenged today, despite current advances in contemporary dental practices in leaps and bounds. The magnitude of this challenge can be understood when we explore the global statistics on oral diseases. For instance, dental caries has been identified as the single most common disease and chronic periodontitis, is identified as the sixth most common disease across the world. In addition, the worst of all oral diseases, the oral cancer is identified as the 6th most common cancer in the world [2]. Considering the negative impact of these diseases on the community, the WHO and the World Dental Federation (FDI) have jointly highlighted the importance of greater efforts and alternative approaches to prevent oral diseases [3]. This is a great opportunity to introduce multi-compound

multi-target nature's gifts as alternatives to single compound-single target conventional medicines used to prevent multifactorial diseases such as dental caries, periodontitis and oral cancer. In fact, several lines of evidence indicate the feasibility of using nature's gifts in preventive dentistry [4].

Next question we must ask is "How are we going to identify the best gifts from nature for this purpose?" The answer is very simple. The world renounced American poet Perl S. Buck once said that "if you want to understand today, you have to search yesterday". A group of Chinese scientists who have taken this advice and screened traditional medicinal formulas extracted using traditional protocols have not only succeeded in developing artemisinin from *Artemisia annua*, which has saved the lives of millions of people from the devastating disease, malaria, but also have won the Nobel Prize in 2015 [5]. If we, the scientists from the field of dentistry are humble enough to turn back and explore what our ancestors have used to maintain their oral hygiene, we can find ample evidence on "time tested gifts from nature" to be used in preventive dentistry. They come in different forms- herbal mouth washes, herbal twig tooth brushes, tooth pastes and oral gels unique to different ethnic groups. For example, evidence for the use of chewing stick, the predecessor of the contemporary tooth brush is available from many countries in Asia, Africa, and Middle East regions. Any plant stick that was used as a chewing stick has been called "miswak" in Arabic culture, "datun"

in Indian culture and “dahati” in Buddhist culture. Similar examples can be found for mouth washes, oral gels and tooth pastes also [6].

Once we identify the potential candidates from nature to be used in preventive dentistry, what is the next step? We must analyze them systematically for their quality, safety and efficacy. In order to achieve this goal, the potential candidates selected from initial screening must undergo rigorous in vitro testing. It is essential to test them not only for their anticariogenic, antiperiodontopathic and anti cancer effects but also for their cytotoxic and genotoxic effects using suitable state of the art tools of six omics (genomics, epigenomics, transcriptomics, proteomics, metabolomics and immunomics). If the tested candidates meet the required standards of safety and efficacy, we must obtain their chemical fingerprints for assurance of their chemical quality. Finally, the researchers must be encouraged to conduct a randomized double blind placebo clinical trial—the gold standard in vivo study. Even if a toxic compound is detected amidst multitude of therapeutic compounds in a nature’s gift, thanks to the advances in modern technology, we can remove it using “the target constituent removal combined with bioactivity assay strategy” [7]. This is an added advantage for natural drug discovery. While moving steadily on the correct track, it is imperative to establish common databases to share our knowledge with fellow scientists and also to reduce the wastage of resources on duplicating the same study. In this golden era blessed with omics and bioinformatics, let us strive together to achieve a world free of dental caries, periodontitis and oral cancer through effective utilization of ‘natures gifts’.

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