

Pharmacology and Ethnopharmacology

May 02-04, 2016 Chicago, USA

Innovative Strategies for Accelerating New Bone Formation in the Rapid Maxillary Expansion by Natural Products

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Maxillary expansion, which is used to correct transverse discrepancies between the maxilla and mandible, occurs through a combination of skeletal and dental expansion. Skeletal expansion involves separating the maxilla at the midpalatal suture. Sutural expansion is accomplished by stretching the collagenous fibres, which is then accompanied by new bone formation. After expansion, the suture undergoes remodelling by way of bone formation. However, although long-term retention is used to prevent relapse, there is generally a reduction of the width of the expanded maxillary arch. Clinically, bone begins to repair itself within weeks following expansion and lasts for months. Bone remodeling is dynamically equilibrated by bone-forming osteoblasts and bone-resorbing osteoclasts for several months up to 1 year. Free radicals function as intermediates in osteoclast activation, which is vital for bone resorption. Some studies showed that antioxidants affect bone metabolism, via an increase of osteoblastic activity. Recently, some studies have demonstrated that traditional medicines have beneficial therapeutic effects on accelerating new bone formation.

The current review focuses on pharmacological, clinical, and animal studies with chemically profiled extracts of some selected traditional medicinal plants (*Salvia officinalis*, *S. miltiorrhizae*, *Ginkgo biloba*, *Hypericum perforatum*, *Nigella sativa* etc.) in accelerating new bone formation, conducted by research groups in Turkey and abroad.

Biography

Emre Kayalar has completed his PhD from Istanbul University, Dentistry Faculty, Department of Orthodontics in 2014. He began postdoctoral studies and studying for second masters degree in Anadolu University, Faculty of Pharmacy, Department of Pharmaceutical Botany. He is working especially on the traditional medicines for new bone formation in the rapid maxillary expansion topic. He has published more than 5 papers in national or international journals. He participated in many national and international congresses with some presentations.

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