エポキシ化大豆油を用いた歯用 3D プリンティング材料の開発

（北海道医療大学歯学部　口腔構造・機能発育学系　歯科矯正学分野 [1]）○松木 優子 [1]・（北海道大学　大学院理学研究院 [2]）(北海道大学　高等教育推進機構 [3])　Arteaga Arteaga Fernando [2,3]・澤村　正也 [2]・飯嶋 雅弘 [1]
Development of Dental 3D Printing Materials from Epoxidized Soybean Oil ([1] *Division of Orthodontics and Dentofacial Orthopedics, Department of Oral Growth and Development, School of Dentistry, Health Sciences University of Hokkaido*) ○Yuko Matsuki,[1] ([2] School of Science, Hokkaido University), ([3] Institute for the Advancement of Higher Education, Hokkaido University), Fernando Arteaga Arteaga,[2,3] Masaya Sawamura,[2] Masahiro Iijima.[1]

　In recent years, the use of 3D printers in the dental field has been increasing due to the development of digital technologies such as intraoral scanners and computer-aided design. Most of the resin materials in dental 3D printing are derived from petroleum resources. Accelerating consumption of fossil resources, along with environmental concerns, has raised concerns, and stimulated scientist to search for renewable materials. As the digitalization of dentistry progresses, the consumption of 3D printing materials is expected to increase further, and it is desirable to switch to sustainable materials.

　In this study, we have synthesized a family of light-curing resins based on epoxidized soybean oil and compared their mechanical properties with commercially available 3D printing materials. The epoxidized soybean oil-based resins showed similar properties such as nano-hardness.

Keywords : biomass; photopolymerization; resin; stereolithography; 3D-printing resin

　近年、口腔内スキャナやコンピューター支援設計などのデジタル技術の発展に伴い、歯科領域での 3D プリンター活用が進んでいる。歯科用 3D プリンティングにおける樹脂材料はそのほとんどが石油資源由来の材料となっており、石油消費量の加速や環境問題への懸念から持続可能な材料への転換が望まれている。

　本研究では、エポキシ化大豆油をベースとした光硬化性樹脂を合成し、市販の歯科用 3D プリティング材料との比較を行った。その結果、エポキシ化大豆油ベースの樹脂は市販材料と同等の機械的性質を示した。
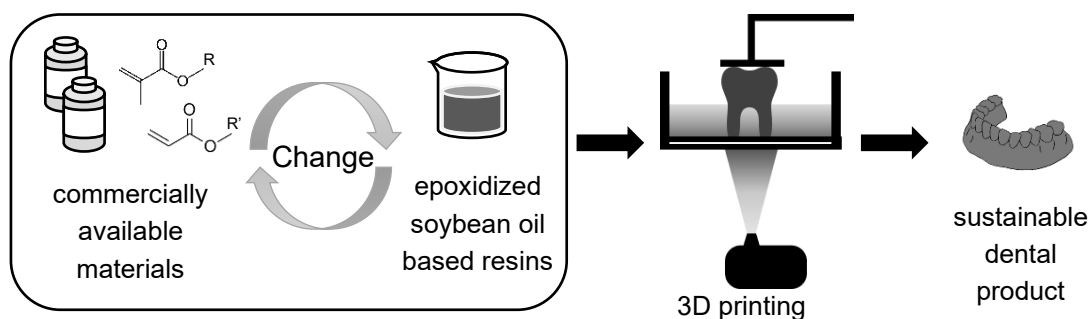
1)Photopolymer resins with biobased methacrylates based on soybean oil for stereolithography. Guit J, Tavares MBL, Hul J, et al. *ACS applied polymer materials.* **2020**;2(2):949-957.