

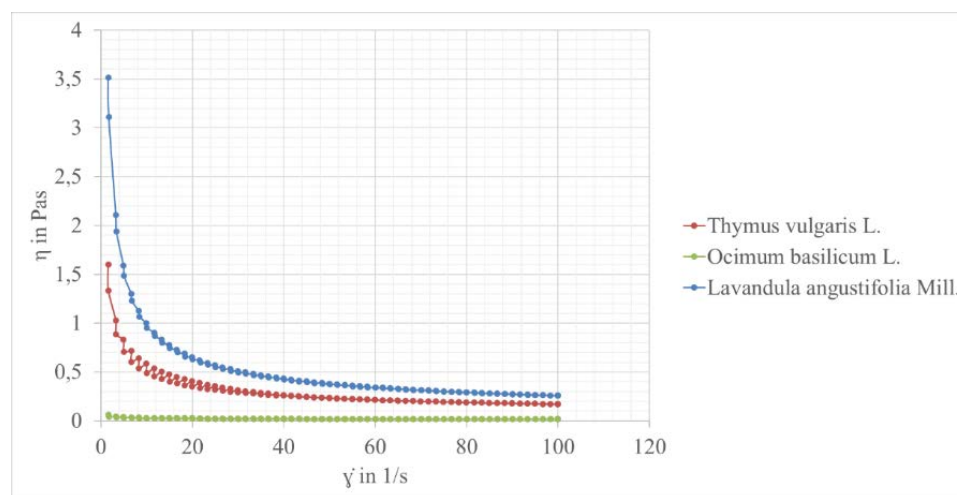
## REOLOŠKE KARAKTERISTIKE ORALNIH GELOVA SA INKORPORIRANIM EKSTRAKTIMA LEKOVITIH BILJAKA

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Pacijentima koji pate od bolesti zuba i desni, farmacija 21. veka pruža sve više mogućnosti lečenja. Iako su ove bolesti posledica upale disbiotičkog porekla, razvoj rezistencije u velikoj meri ograničava efikasnost dostupnih lekova. Alternativno rešenje u ovim situacijama mogu biti i biljni ekstrakti sa antiinflamatornim i antimikrobnim delovanjem. Cilj ovog istraživanja bio je da se ispita kako ekstrakti biljaka mogu uticati na reološke osobine oralnog gela. Izrađeno je tri preparata identičnog sastava sa različitim liofilizovanim vodenim biljnim ekstraktima *Thymus vulgaris* L., *Ocimum basilicum* L. i *Lavanda angustifolia* Mill. Gelovi su izrađeni uz pomoć 0,5% Carbomer-a 940 kao gelirajućeg sredstva i 1% biljnog ekstrakta, homogenizacijom (DLAB Scientific, Kina, 160W AC carbon brush motor) tokom 2 minuta na 30.000 obrtaja. Reološka ispitivanja su izvršena reometrom Haake MARS (Thermo Scientific, Karlsruhe, Nemačka) posredstvom mernog pribora cilindra Z20 DIN na temperaturi  $22 \pm 0,1^\circ\text{C}$ . Ispitivane su krive proticanja primenom histerezisnog postupka. Na osnovu dobijenih rezultata, očitane su vrednosti prividnih viskoziteta pri maksimalnoj brzini smicanja od  $50 \text{ s}^{-1}$  (Grafik 1).



**Grafik 1. Prikaz promene prividnog viskoziteta gelova u zavisnosti od vrste ekstrakta.**

Najniži prividni viskozitet pokazao je gel sa inkorporiranim ekstraktom bosiljka, a najviši gel sa inkorporiranim ekstraktom lavande. Kako je pokazano da izbor biljnih ekstrakata ima uticaj na reološke karakteristike izrađenih preparata, buduća istraživanja treba usmeriti na ispitivanje uzroka prikazanih rezultata, kao i adekvatan odabir biljnih ekstrakata prilikom formulisanja preparata, ne samo na osnovu terapijskih, već i tehnoloških parametara.

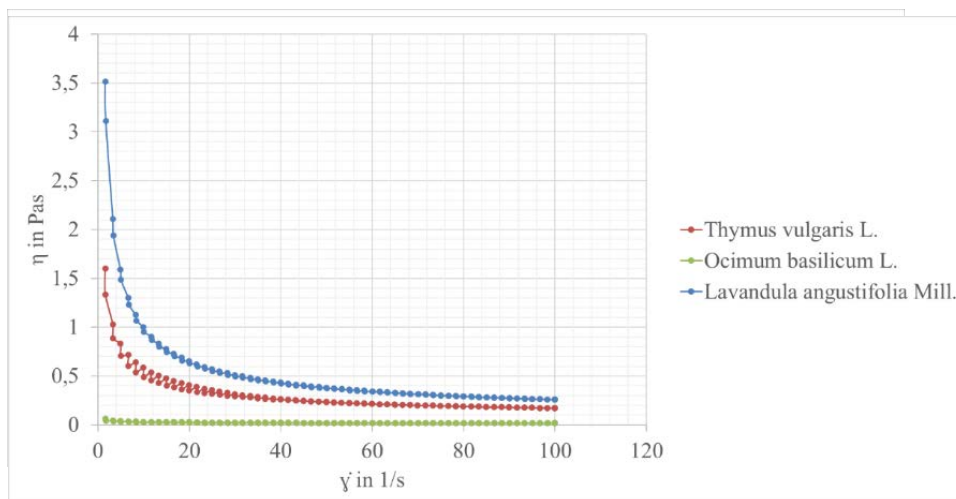
## RHEOLOGICAL CHARACTERISTICS OF ORAL GELS WITH INCORPORATED MEDICINAL PLANT EXTRACTS

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For patients suffering from teeth and gum diseases 21<sup>st</sup>-century pharmacy provides growing array of treatment possibilities. While these diseases result from inflammation of dysbiotic origin, development of resistance restricts the effectiveness of available medicinal substances. An alternative solution could be plant extracts with anti-inflammatory and antimicrobial effects. This research aimed to examine how plant extracts can affect the rheological properties of basic oral gel formulation. Three preparations of identical compositions containing different lyophilized aqueous plant extracts *Thymus vulgaris* L., *Ocimum basilicum* L. and *Lavanda angustifolia* Mill. were formulated. Gels were prepared using 0,5% Carbomer 940 as gelling agent and 1% of plant extract, with homogenization (DLAB Scientific, China; 160W AC carbon brush motor) during 2 minutes at 30.000 spins. Rheological tests were performed using Haake MARS rheometer (Thermo Scientific, Karlsruhe, Germany) using a Z20 DIN cylinder measuring instrument at  $22\pm 0,1^\circ\text{C}$ . Flow curves were examined using the hysteresis procedure. Based on the obtained results, values of apparent viscosities were gathered at the maximum shear rate of  $50\text{s}^{-1}$  (Graph 1).



**Graph 1. Apparent viscosity changes of gels depending on the type of extract.**

The lowest apparent viscosity showed gel with basil extract, while the highest showed gel with lavender extract. Since it has been demonstrated that the choice of plant extract has impact on rheological characteristics of prepared formulations, future research should focus on investigating causes of such results, as well as appropriate selection of plant extracts during formulation, considering not only therapeutic but also technological parameters.