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DEFNE YAPRAĞI

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DEFNE YAPRAĞI
LAURUS NOBILIS LEAF
Lauri folium

TANIM
Laurus nobilis L. (Lauraceae) olgun dallarındaki bütün ya da kısmen kırılmış, kurutulmuş yaprakları.

İçerik: Kuru bitkisel drogda en az 18 mL/kg uçucu yağ, uçucu yağda en az %48 *1,8-sineol* ($C_{10}H_{14}O$; b*MA:* 150.2)

ÖZELLİKLER
Ezildiğinde,1,8-sineol'ün keskin aromatik kokusuna sahiptir ve hafif acımsı tattadır.

TANIMA
A. Yapraklar; 3-10 (-11) x 2-4 (-5) cm, dar dikdörtgenimsi, mızraksı ya da geniş yumurtamsı, bazen uçlarda sivrilmiş ve dalgalı kenarlı, derimsi görünüşlüdür.

B. Mikroskobik İnceleme (*2.8.23*). Toz grimsi-yeşil renklidir. Mikroskopta *kloral hidrat çözeltisi R* kullanılarak incelenir. Yaprak alt, üst yüzeysel ve enine kesitlerinde aşağıdaki ayırıcı özellikler görülür (Şekil 1): Yaprak üst yüzeyde ondüleli epidermis [40X büyütme], (A); Yaprak alt yüzeyde amarillis tip stoma [40X], (B); Uçucu yağ depo hücresi [25X], (C); Palizat parankiması [25X], (D); Sünger parankiması [25X], (E); İletim demeti [25X], (F).

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Laurus nobilis L. Essential Oil-Loaded PLGA as a Nanoformulation Candidate for Cancer Treatment

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Abstract: The aim of this study was to obtain essential oil (LNEO) from the *Laurus nobilis* L. plant, and to prepare LNEO-loaded poly lactic-co-glycolic acid (PLGA) nanoparticles (NPs) as an approach in cancer treatment. The components of the obtained LNEO were analyzed using GC-MS. The LNEO-NPs were synthesized by the single-emulsion method. The LNEO-NPs were characterized using UV-Vis spectrometry, Dynamic Light Scattering (DLS), Scanning Electron Microscopy (SEM), and a DNA binding assay, which was performed via the UV-Vis titration method. According to the results, the LNEO-NPs had a 211.4 ± 4.031 nm average particle size, 0.068 ± 0.016 PdI, and −7.87 ± 1.15 mV zeta potential. The encapsulation efficiency and loading capacity were calculated as 59.25% and 25.65%, respectively, and the in vitro drug release study showed an LNEO release of 93.97 ± 3.78% over the 72 h period. Moreover, the LNEO was intercalatively bound to CT-DNA. In addition, the mechanism of action of LNEO on a dual PI3K/mTOR inhibitor was predicted, and its antiproliferative activity and mechanism were determined using molecular docking analysis. It was concluded that LNEO-loaded PLGA NPs may be used for cancer treatment as a novel phytotherapeutic agent-based controlled-release system.

Keywords: laurel essential oil; PLGA; controlled release system; nanoparticle; DNA binding

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1. Introduction

According to the World Health Organization (WHO), cancer is the second leading cause of death worldwide, accounting for around 10 million deaths annually. Globally, one in six deaths are associated with cancer. It is estimated that cancer-related deaths will increase by 70% in 2027 [1]. Cancer-causing infections, such as hepatitis and human papilloma virus (HPV), are responsible for approximately 30% of cancer cases in low- and middle-income countries [2]. More than 90% of high-income countries have comprehensive treatment, while less than 15% of low-income countries have this opportunity [3].

Traditional cancer treatment includes different interventions such as chemotherapy, surgery and radiation therapy; however, these treatment modalities also damage the adjacent healthy cells [4]. New anti-proliferative drugs are used for cancer treatment, but they come with severe adverse effects, toxicity and have high costs. Therefore, cost-effective and biocompatible therapeutic applications are needed [5]. New natural products will play an important role in this period. Many of the antitumor agents currently used in clinical practice are of natural origin. Among the great diversity of phytochemicals,

PBS	phosphate-buffered saline
SD	standard deviation
SEM	scanning electron microscopy
CT-DNA	calf thymus DNA
PI3K/mTOR	phosphatidylinositol 3-kinase/mammalian rapamycin target
ADME	absorption, distribution, metabolism, excretion

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