

## Abstract

**Background:** Since the beginning of life, humankind depended on nature as a major source of food and medicine, people knew the importance of plants and the massive benefits they contain and to this day researchers are astonished by the amount of scientific data that obtained from plants. Therefore, the current study aims to estimate anticancer, antimicrobial, antioxidant, metabolic enzymes inhibitory, and coagulation cascade activities of *Rubus sanctus* roots four solvents fractions.

**Methods:** Antibacterial activity was conducted using microdilution assay against wide range of microbial strains, while prothrombin time (PT), activated partial thromboplastin time (aPTT), and thrombin time (TT) tests were established utilizing standard hematological methods. Moreover, Assessment of the DNA cell cycle of breast cancer was conducted using propidium iodide (PI) and apoptosis activity was estimated by staining with Annexin-V using flow cytometry. In addition, metabolic enzymes inhibitory enzymes and antioxidant potentials were determined using *in vitro* bioassays

**Results:** Micro-dilution antimicrobial assay results showed that the methanol, acetone and hexane solvents fractions have antibacterial and antifungal activities against all the screened strains. While the aqueous (RS) plant fraction has only antifungal activity against *C. albicans* and did not show any antibacterial effect. Moreover, the coagulation tests revealed a significant anticoagulant activity of all plant fractions. All fractions prolonged the clotting tests (PT, aPTT and TT) in a dose-dependent manner. However, the methanol fraction showed the highest activity in all tests.