

## ABSTRACT

The high number of deaths due to cervical cancer occurs due to late detection since the symptoms are only visible in stage 3. Early detection of cervical cancer such as pap smear has weaknesses in terms of convenience and socio-cultural. This research seeks to find other methods by relying on the behavioral patterns of *Caenorhabditis sp.* nematodes with their ability to sense the stimulation of volatile organic compound (VOC) chemical structures by the olfactory system. Researchers tried to observe morphology and movement patterns based on microscopic observations, chemotaxis index, and validity tests for early detection of cervical cancer. Experimental methods and quantitative approaches using nematode growth medium (NGM) agar plates tested on urine were conducted as proof. In this study, we used 14 urine samples assisted by an expert, Dr. Subandi, and several medical co-ass students at Universitas Brawijaya Hospital, Universitas Muhammadiyah Malang Hospital, and Gambiran Hospital. This study also obtained an ethical clearance issued by the Poltekkes Kemenkes, Malang. *Caenorhabditis sp.* was isolated and cultured on NGM media and then observed for morphological and molecular characteristics to confirm the cultured species. Once confirmed, the movement pattern of *Caenorhabditis sp.* was observed through plate testing divided into 4 quadrants, namely Q1+Q4 (buffer) and Q2+Q3 (normal/cancer treatment urine). The number of nematodes leading to each treatment group was compared to calculate the chemotaxis index for statistical analysis. Validation tests were also conducted using a 2x2 table to calculate sensitivity, specificity, positive accuracy, and error rate. The results showed *Caenorhabditis sp.* was proven to be used for early detection of cervical cancer through validity data in terms of sensitivity, specificity, and positive accuracy by 86%, and an error rate of 14%. It can be concluded that *Caenorhabditis sp.* has the potential for early detection of cervical cancer through urine.

Keywords: *Caenorhabditis sp.*, chemotaxis index, early detection of cervical cancer, nematode growth medium (NGM), volatile organic compound (VOC)