

Evaluation of antitumor potential of *Cinnamomum Tamala* in 3D chitosan scaffold cell culture model

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Preliminary screening of potential anti-tumor test drugs, isolated compounds and crude herbal extracts are widely done using high throughput *in vitro* cytotoxicity assays. Such assays involve testing on 2D-monoculture of cancer cell lines and later assessing cell death or decreased in cellular function using various dyes like sulforhodamine B, MTT etc. It is now well established fact that 2D monoculture of cancer cell lines does not essentially mimics complex tumor microenvironment and cell-cell interactions. Many chemotherapeutic agents face multicellular resistance when administered to solid tumor. Hence it is essential to evaluate efficacy of test drugs in 3D cell culture model. Here in this study we have checked efficacy of crude methanol extract of leaves of *Cinnamomum tamala* (Buch.- Ham.) T. Nees & Eberm. (M.E.-CT) and its petroleum ether fraction on MCF-7 breast cancer cell line grown on 3D chitosan scaffold. Scaffold made up of chitosan, a non toxic and biocompatible polycationic copolymer which provides an extracellular matrix (ECM) analog, allowed cell infiltration and proliferation thus forming 3-dimentional mass of cancer cells loosely mimicking tumor microenvironment. M.E.-CT and its subsequent fractions have been evaluated for their *in vitro* cytotoxic activity against cancer cell lines in our lab. Petroleum ether fraction was found to be most active and potent in 2D cell culture. In 3D cell culture model, petroleum ether fraction had shown cytotoxic effect on MCF-7 cells using MTT assay but at concentration higher than its IC₅₀ in monoculture. The result illustrates that *Cinnamomum tamala* has potential antitumor activity.

Biography

Thanekar D. R has a Master's degree in Science (Biotechnology) from University of Mumbai and currently pursuing Ph.D. from Institute of Chemical Technology, Mumbai, India under guidance of Prof. (Mrs.) A.R. Juvekar, professor in Pharmacology and Physiology. Her current research project involves evaluation of cytotoxic and antitumor activity of herbal extracts using *in vitro*, *ex vivo* and *in vivo* models.

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