



Anticancer Potential Of Corchorus Olitorius L Leaves Aqueous Extract In Osteosarcoma

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Abstract

INTRODUCTION

Osteosarcoma is the most common histological form of primary bone sarcoma. It is most prevalent in teenagers and young adults. Osteosarcoma is the eighth-most common form of childhood cancer, comprising 2.4% of all malignancies in pediatric patients, and about 20% of all primary bone cancers. The treatment of osteosarcoma involves surgery, and chemotherapy followed by radiotherapy. The anticancer potential of Corchorus olitorius L leaves can be used as an adjunct therapy in osteosarcoma. Tumor cell growth and proliferation is regulated by MMPs and TIMPs. Matrix metalloproteinases (MMP-9) have been related to important roles in tumor invasion. Tissue inhibitor of matrix metalloproteinase 1 (TIMP1) inhibits the activity of metalloproteinases

AIM

To analyze the anticancer potential of Corchorus olitorius L leaves aqueous extract in osteosarcoma.

OBJECTIVE

To study the effects of corchorus olitorius L leaves on the MMP 9 and TIMP 1 mRNA expression in the osteosarcoma cell line.

MATERIALS AND METHODS

Corchorus olitorius L leaves are collected and involved in the extraction process. The extraction process includes collection of leaves, grinding, extraction using soxhelt apparatus, concentrating using Rotary evaporator.

After the process of extraction, osteosarcoma cells are cultured in the suitable medium, PH, temperature and ratio should be 95 to the carbon dioxide ratio of five.

Then the osteosarcoma cells are involved in treatment.

There are two treatments for osteosarcoma cells which are culture MTT assay and gene expression analysis. In gene expression analysis RNA isolation is done by harvesting the cells using RNA kit which contain Trizol reagent, chloroform, isopropanol and RNA pellet. After that it is converted to complementary DNA using real-time PCR which denotes the anti-cancer activity

RESULT

In the present study, Corchorus olitorius L leaves extract decreased MMP9 mRNA expression along with proliferation of osteosarcoma

Corchorus olitorius has contain flavanons such as quercetin and ascorbic acid. Many reports available on quercetin-induced anticancer activity in several

<i>CC License</i> <i>CC-BY-NC-SA 4.0</i>	cancers CONCLUSION In conclusion, the present study demonstrates for the first time corchorus olitorius decreased MMP 9 and TIMP 1 mRNA expression in osteosarcoma Keywords: <i>Osteosarcoma, anticancer, Corchorus olitorius L leaves, MMP9, mRNA.</i>
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INTRODUCTION

An Osteogenic sarcoma (OGS) or Osteosarcoma (OS) is a cancer originating from the cells that form the bone. OS is an aggressive malignant neoplasm predominantly affecting the long bones. It is mesenchymal in origin and hence called a sarcoma. It spreads very aggressively differentiating and producing a malignant osteoid [1]. Osteosarcoma is a tumor originating from bone-forming cells. Almost eighty percent of individuals affected are children and teens, (10 – 20 years of age). Osteosarcoma ranks third among the most common adolescent carcinomas. The prevalence of OS is slightly higher in males than in females [2]. The classic symptoms of osteosarcoma are localized pain and swelling. The movement of the joints may be limited. There are chances of metastases mostly in the lungs. The long bones are mostly affected. The three most common sites are - the distal femur, the proximal tibia, and the proximal humerus. The knees are also affected to an extent. The symptoms of osteosarcoma might include bone aches aggravated at night or during physical activities, the presence of swelling or growth at the place of the bone affected, difficulty in the use of the affected limb and probably pathological fractures. The origin of osteosarcoma is not fully understood. Some individuals who bear genetic disorders like Li-Fraumeni syndrome and hereditary retinoblastoma, along with individuals who've undergone radiation therapy in the past, and those whose mutated genes are passed down from their parents run a higher risk for the development of this type of cancer [3, 4].

The course of osteosarcoma can be affected by various factors including the stage of the cancer, site and size of the tumor, rate at which it can be treated and if it has metastasized to other parts of the body and could respond to therapy. The prognosis has improved with more developed chemotherapy and surgical treatment but it still might be hard to cope with these aggressive cancer cells if they have metastasized somewhere else in the body and can be detected with the help of X-ray, CT Scan and PET scan [5].

The treatment consideration for Osteosarcoma is surgery [6] where resection of the tumor is done. Following the surgery, chemotherapy [7] is advocated to increase the likelihood of surviving without recurrence [8]. Radiotherapy is not effective in osteosarcoma [9, 10].

The prognosis of treatment of osteosarcoma is poor and the recurrence rate is very high [11]. Despite numerous studies, research is ongoing for new perspectives on adjuvant therapy with limited complications little progress has been made so far [12]. Chronic inflammation is significantly connected with cancer, namely with the progress and development of osteosarcoma. Immunotherapy has been tried as an alternative therapy [13].

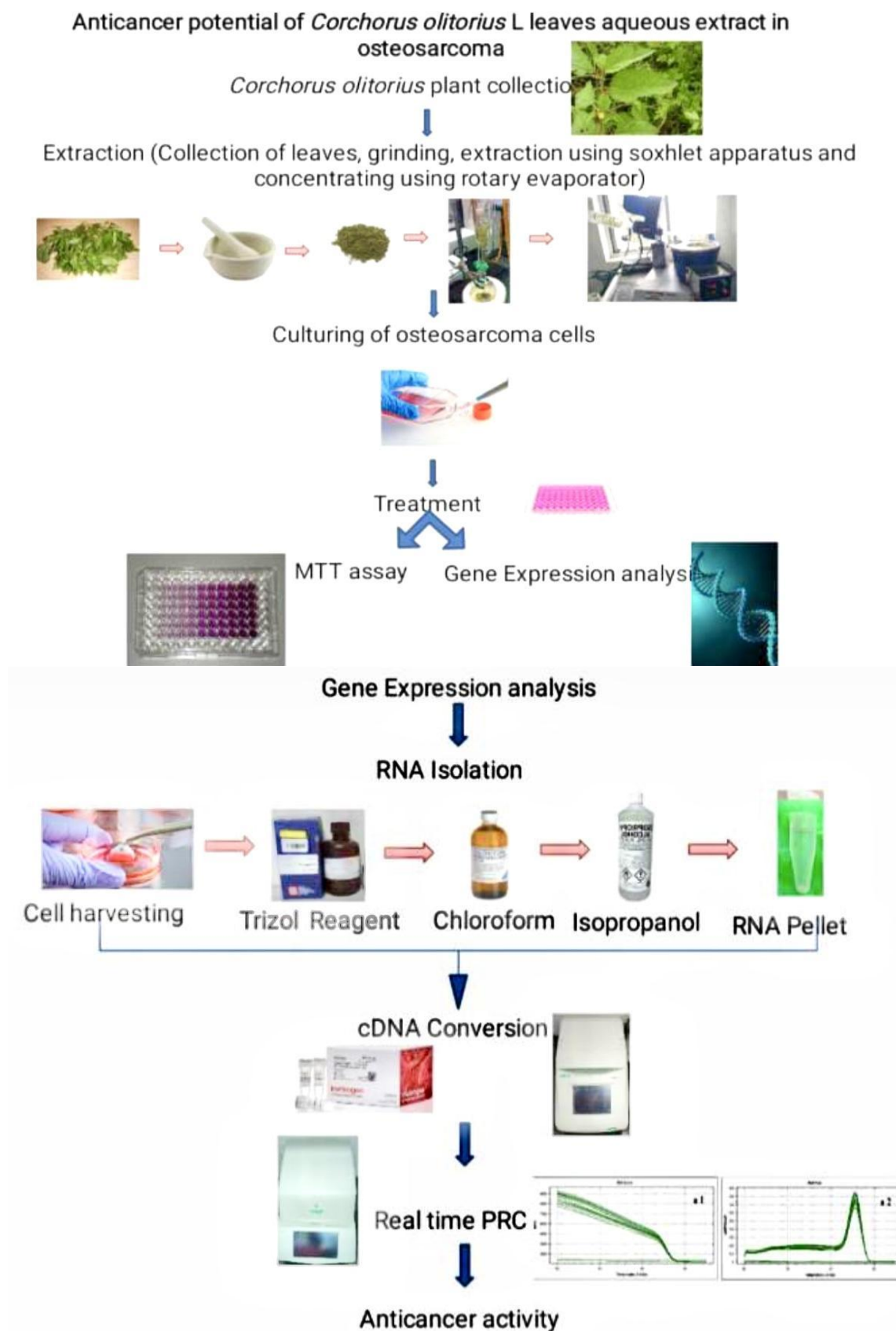
Plant extract of Corchorus olitorius has been found to have anti-inflammatory activities that will possibly play an important role in cancer cell suppression during the inflammation period.

Corchorus olitorius L. also known as jute mallow or molokhia, has been subjected to research as a possible therapeutic modality to treat cancer. It is cultivated widely, used in traditional medicine, and is rich in antioxidants namely carotenoids, and flavonoids In vitro studies of the extract exhibit genotoxic effects[14]. It is a rich source of vitamins and minerals. The extract of Corchorus olitorius Leaves displays antimicrobial, antioxidant, and anti-inflammatory potential. The immunostimulant and antitumor effects are the scope of interest where natural elements may be beneficial and could be used as a cure for bone cancer [15].

Compounds rich in phytols are safer and inexpensive. Corchorus olitorius Leaves are a rich source of phytols that exhibit cytotoxic anti-cancer effects in numerous in vitro studies [16].

A wide range of phytochemicals like glycosides, phenols, flavonoids and sterols are identified in the leaves of Corchorus olitorius L. The anti-cancer, anti-tumor and anti-inflammatory properties of Corchorus olitorius leaves are attributed to these phytochemicals [17].

MATERIALS AND METHODS



Corchorus olitorius L leaves are collected and involved in the extraction process. The extraction process includes the collection of leaves, grinding, extraction using a soxhlet apparatus, and concentrating using a Rotary evaporator.

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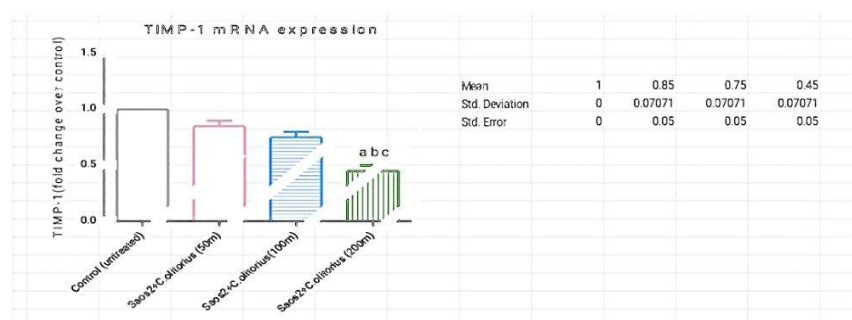
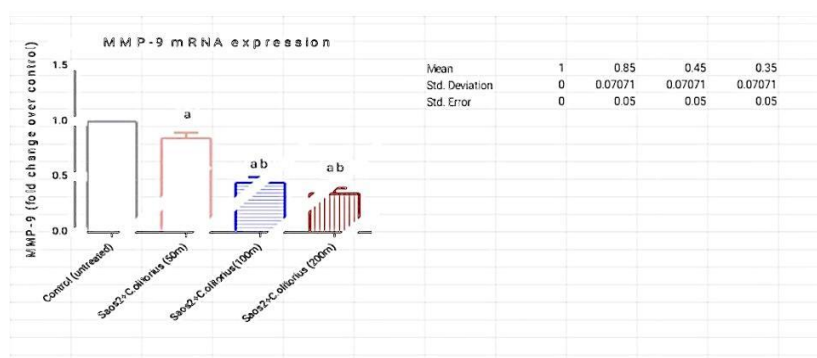
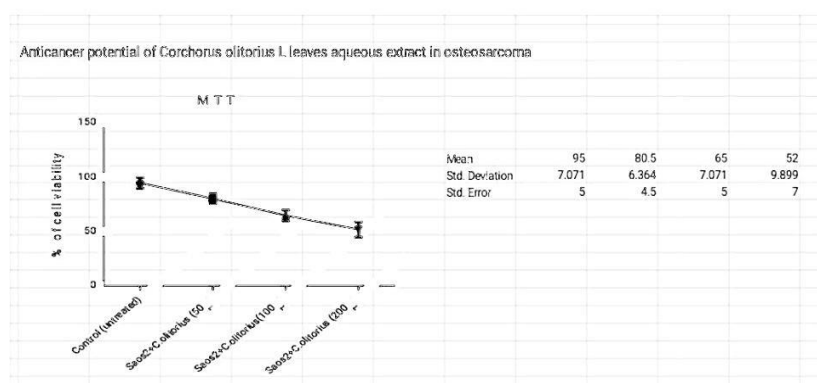
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RESULT

The MTT test for the analyses of the anti-cancer potential of *Corchorus olitorius* L leaves aqueous extract in osteosarcoma cells shows a mean value of 95, a standard deviation of 7.071 and a standard error of five.

The graph is plotted between the percentage of cell viability and control of untreated, Low, moderate and high cells



DISCUSSION

In the present study, *Corchorus olitorius* L leaves extract decreased MMP9 mRNA expression along with the proliferation of osteosarcoma. *Corchorus olitorius* has contain flavanons such as quercetin and ascorbic acid. The anti-tumor potential of *Corchorus olitorius* was studied by Taiwo et al. The cytotoxic effect of *Corchorus olitorius* against the HeLa cells was significant at a concentration of at $\geq 800\mu\text{M}$. Its effects were compared with curcumin which had proven anti-cancer activity. The docking is suggestive to be significant [18].

The cytotoxic and genotoxic effects of leaf extracts of *C. olitorius* on the multiple myeloma-derived ARH-77 cells were compared with the seed extracts of *Corchorus olitorius*. The MTT assay was used to assess the cytotoxic effects. The results proved that the leaf extracts had cytotoxic effects and it increased with the increase in the concentration of the extract [19].

In the in vitro study ascorbic acid on an osteosarcoma cell line or shown to be dependent on higher concentration and cell death osteosarcoma treatment typically involves surgery and chemotherapy radiation therapy might be an option in certain situations

The anti-cancer potential of *Corchorus olitorius* D. leaves aqueous extract in osteosarcoma is promising, and it deserves more perception. Leaves of jute mallow, *Corchorus olitorius*, notably are rich in bioactive compounds including flavonoids, phenolics, and carotenoids like quercetin, and ascorbic acid which have been proven to exhibit good bios such as antioxidant, anti-inflammatory, and anti-cancer activities [20]. These compounds are predicted to suffocate cancer cells with the growth and to induce programmed cell death (apoptosis) in several types of cancer. Many reports available on quercetin-induced anticancer activity in several cancers

In the in vitro study ascorbic acid on an osteosarcoma cell line or shown to be dependent on higher concentration and cell death osteosarcoma treatment typically involves surgery and chemotherapy radiation therapy might be an option in certain situations

CONCLUSION

In conclusion, the present study shows *Corchorus olitorius* decreased MMP 9 and TIMP 1 mRNA expression in osteosarcoma.

Finding solutions to some problems, including extracting *C. olitorius* active ingredients, is crucial to fully utilizing the therapeutic ability of this plant extract in the treatment of osteosarcoma. The testing approach involves strategic well-designed clinical trials for assessing the safety and effectiveness of a drug candidate in human subjects, determination of the suitable dosage and formulation, and unraveling the specific actions of the anticancer drug mechanism.

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