

# A Study on Antiarthritics activity of Cymbidium Species

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**Abstract** - Inflammation and discomfort in the joints are symptoms of arthritis, a crippling disease that impacts millions of people throughout the globe. The quest for alternative remedies is driven by the fact that conventional medications often have negative effects. Cymbidium species are orchids that have a long history of usage in ethnomedicine, and this research seeks to learn more about their anti-arthritic properties. The major objective of this study is to investigate the possibility of extracts from Cymbidium species as natural treatments for arthritis by assessing their anti-arthritic efficacy in in vitro and in vivo investigations. Researchers used solvents of different polarity to extract bioactive chemicals from different parts of several Cymbidium species' plants, including their leaves, stems, and roots. A preliminary phytochemical screening was performed on the extracts to detect the presence of anti-inflammatory chemicals such as tannins, saponins, flavonoids, and others. The anti-arthritic efficacy was evaluated in vitro via the use of protein denaturation and membrane stabilization tests. Using Freund's complete adjuvant, an arthritis model was established in Wistar rats for the in vivo experiments. Arthritis symptoms were assessed by assessing paw edema, joint diameter, and histological alterations in response to Cymbidium extracts. The extracts from Cymbidium included many bioactive chemicals, as shown by phytochemical investigation. Protein denaturation and red blood cell membrane stability were both markedly inhibited in in vitro tests, suggesting strong anti-inflammatory action. Treatment significantly reduced paw edema and joint swelling in rats as compared to the control group, according to in vivo investigations. The anti-joint properties of Cymbidium extracts were further validated by histopathological analysis. Based on the results of this research, it seems that some species of Cymbidium have bioactive chemicals that work together to alleviate arthritis. Based on these findings, Cymbidium extracts may be useful as an alternative to conventional arthritic treatments. Completely determining their safety and effectiveness in people requires more study including clinical trials.

**Keywords:** Cymbidium species, arthritis, anti-inflammatory, phytochemicals, natural remedies, in vitro, in vivo.

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## INTRODUCTION

Some plants are cultivated for their medicinal or aromatic properties, while others are cultivated for their cosmetic components. The term "unique item" refers to a product that combines several synthetic components, such as those used to create bacteria, plants, or animals. Newman and Cragg (2022) found that the field of identifying things is associated with half of the small pharmacologically inferred essential atoms identified between 2000 and 2010. Seventy percent of the population in developing nations relies on traditional healers and pharmaceutical firms for their healthcare needs, according to the World Health Organization (WHO). Plants also provide medicinal benefits to 5 billion people around the globe (Farnsworth, 2019).

Research into new plant combinations for tumor therapy has been ongoing since the 1950s, made possible by both technological breakthroughs and well-established research facilities (Cragg and Newman 2022). There has been thought given to the health, feasibility, and economic benefits of natural medicine; the present global push to get medications from plants further highlights the plants' continuing significance in conventional medicine. There are two primary motivations for microbiologists to study antimicrobials found in plant extracts. Biodiversity refers to the wide variety of life forms and the species that make up that variation. Another way to put it is to compare it to extracting a little amount of water from the vast ocean; the notion being that the more ordinary the items, the greater the achievement. The bulk of research scenarios,

however, have shown that the organic function of the chemical remains unknown. Alkaloids, glycosides, lignin, steroids, flavonoids, terpenoids, and sugars are some of the beneficial compounds extracted from plants (Adline, 2020).

There is a country where around 120 different plant-based medicines are commonly used. Plant concentrates and dynamic segments have been used in traditional medicine, according to the World Health Organization. Most of the most innovative medicinal drugs on the market today have already been purchased. Natural plant-based compounds such as phenols, flavonoids, carotenoids, alkaloids, tannins, saponins, proteins, and pigments have antibacterial and cell-reinforcing characteristics, much as vitamins A, C, E, and K. There have been a lot of studies, but the precise capability of plant extract is still a mystery (Cathrine, 2021).

Some Palestinians consider the agricultural products they make from their own land to be fundamental to their culture and a path to fulfillment. There are more than 700 plant species on the hill slopes of Palestine, with 2,000 of those species having medicinal use. Optional metabolites, found in abundance in plant extracts, provide an essential physiological role when consumed. They include a wide variety of compounds, including alkaloids, flavonoids, terpenoids, glycosides, tannins, phenols, saponins, sterols, and many more. Because of their relaxing, anti-proliferative, antibacterial, and cancer-preventive organic characteristics, flavonoids and phenols have garnered a lot of attention.

Any house would benefit from having a bromeliad plant. Among the many commercially and medicinally important groups of flowering plant families, the bromeliaceae stand out for their size, diversity, and significance. Approximately 3,172 species belonging to 58 genera are distributed over the whole planet (Luther, 2008). The best, according to most people, are bromeliads. Inflorescences of the stifling animal group of bromeliads, *Tillandsia cyanae* and *Cymbidium devon odessey*, may grow to be as long as a meter and as brilliant as the sun. There is a profuse supply of this plant in the wild due to its aesthetic appeal and its religious and social importance.

The development of new antimicrobial agents has been greatly accelerated by the increasing resistance of pathogenic microorganisms to existing anti-toxins. The first step in developing novel pharmaceuticals is to test plant extracts for antimicrobial and phytochemical properties. The product that has been integrated from different microorganisms or their combined subsidiary is no longer effective due to the emergence of new types of viral illnesses that are resistant to these antimicrobials. This is happening despite the increasing use of antimicrobial specialists and alternative medications derived from plants as the standard drug. It has been observed that plant species are vanishing at a faster pace in the last 20 years. Thanks to the microbiologist's warning, we may suffer phytochemical loss as a result of these structures'

extensive communication. Ethnobotany is an ancient branch of plant and animal research that seeks to understand the many medicinal uses of plants and animals by different cultures. Plant phytochemicals have been used in studies involving the human immunodeficiency virus (HIV).

## METHODOLOGY

### Collection of plant material:

The plant material for *Cymbidium Sarah Jean* and *Cymbidium devon odessey* was gathered from the nursery and garden in May and June.

### Invitro Antiarthritic activity

Experimental setting Researchers began looking into the anti-arthritis effects of the extracts by testing different doses of the two plants. For this evaluation of antiarthritic adequacy, *Cymbidium devon odessey* and *Cymbidium Sarah Jean* were chosen based on the published study. The shade-dried powders of *Cymbidium devon odessey* and *Cymbidium Sarah Jean* were prepared using the soxhlet extraction procedure to get methanolic and hot fluid concentrates. Phytochemical analysis was performed on the methanol and fluid concentrates of *Cymbidium Sarah Jean* and *Cymbidium devon odessey* after their extraction using Soxhlet to determine the active mixtures and the presence of tannins, triterpenoids, steroids, starch, saponins, and flavonoids. The early phytochemical examination of methanolic removes and fluid concentrate shows that the water solvent concentrate and liquor dissolvable concentrate significantly impact the dynamic components. Using these tests, we were able to determine which phytoconstituents were essential to the plant.

Two plants, *Cymbidium devon odessey* and *Cymbidium Sarah Jeanas*, are used in the natural plant extract in a 2:1 ratio with methanolic and fluid plant extracts and powdered rough medicines in these types of conditions.

## RESULTS

Antiarthritic activity of *Cymbidium Sarah Jean*

Methanol Extract of *Cymbidium Sarah Jean*

Concentration -1mg/ml

### Observations:

**Absorbance of Blank = 0.000 Absorbance of test = 0.0378 Absorbance of control = 0.0097 Absorbance of product control = 0.0277**

### Formula:

$$\% \text{ Inhibition} = \frac{(\text{OD of test} - \text{OD of product control})}{\text{OD of control}} \times 100$$

#### Calculations:

$$= \frac{100 (0.0370 - 0.0277)}{0.0097}$$

$$= 95.88\%$$

Antiarthritic activity of *Cymbidium Sarah Jean*

Ethanol Extract of *Cymbidium Sarah Jean*

Concentration -1mg/ml

#### Observations:

Absorbance of Blank = 0.000 Absorbance of test = 0.0370 Absorbance of control = 0.0097 Absorbance of product control = 0.0283

#### Formula:

$$\% \text{ Inhibition} = \frac{(\text{OD of test} - \text{OD of product control}) \times 100}{\text{OD of control}}$$

#### Calculations:

$$= \frac{100 (0.0370 - 0.0283)}{0.0097}$$

$$= 89.69\%$$

Antiarthritic activity of *Cymbidium Sarah Jean C*  
Aqueous Extract of *Cymbidium Sarah Jean*  
Concentration -1mg/ml

#### Observations:

Absorbance of Blank = 0.000 Absorbance of test = 0.0384 Absorbance of control = 0.0129 Absorbance of product control = 0.0333

#### Formula:

$$\% \text{ Inhibition} = \frac{(\text{OD of test} - \text{OD of product control}) \times 100}{\text{OD of control}}$$

#### Calculations:

$$= \frac{100 (0.0384 - 0.0333)}{0.0129}$$

$$= 39.53\%$$

Antiarthritic activity of standard *Diclofenac sodium*

Concentration -1mg/ml

#### Observations:

Absorbance of Blank = 0.000 Absorbance of test = 0.0658 Absorbance of control = 0.0147 Absorbance of product control = 0.0474

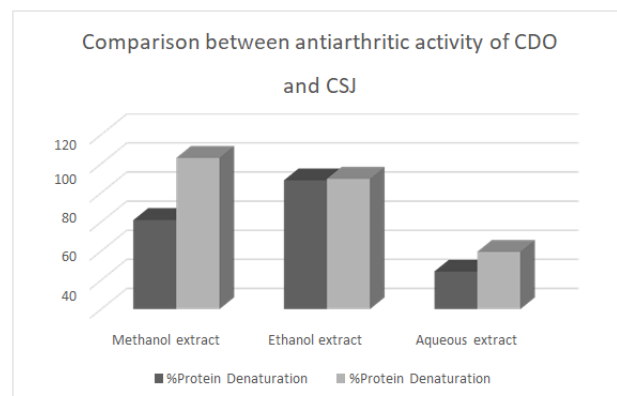
#### Formula:

$$\% \text{ Inhibition} = \frac{(\text{OD of test} - \text{OD of product control})}{\text{OD of control}}$$

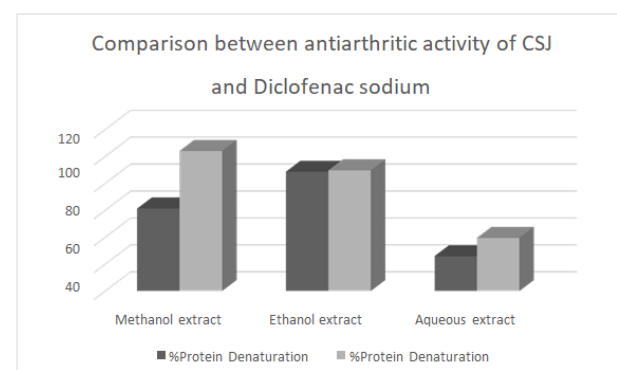
#### Calculations:

$$= \frac{100 (0.0600 - 0.0474)}{0.0147}$$

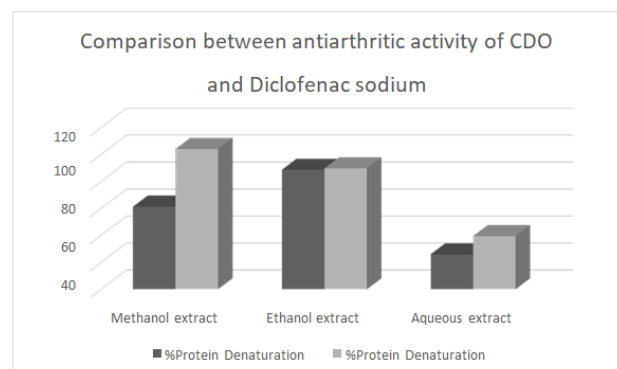
$$= 85.71\%$$



**Figure 1: Comparison between antiarthritic activity of CDO and CSJ**



**Figure 2: Comparison between antiarthritic activity of CSJ and Diclofenac sodium**



**Figure 3: Comparison between antiarthritic activity of CDO and Diclofenac sodium**

**CONCLUSION:**

The present research examines the therapeutic properties of *Cymbidium devon odessey* and *Cymbidium Sarah Jean*, including their antibacterial and antiarthritic properties. Crude extracts of both plants were examined for their antiarthritic properties in a preliminary bioassay using a variety of species, including *E. Coli*, *S. Aureus*, *Bacillus subtilis*, and *Pseudomonas aeruginosa*. Additionally, TLC and HPLC analyses were performed on the methanolic plant extract to determine the amount of ursolic acid, which is necessary for anti-arthritic action.

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