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# Immunoregulatory and Chondroprotective activity of Philippine Endemic Plant *Alpinia elegans* (C. Presl) K. Schum Leaf Extracts against Osteoarthritis

## Introduction

Osteoarthritis (OA) is the most common musculoskeletal disease and the leading cause of disability worldwide. To date, medications available for OA can only treat symptoms. *Alpinia elegans* K. Schum, locally known as “Tagbak” a Philippine endemic plant, is traditionally used as a medicine for musculoskeletal diseases. Therefore, this study aimed to conduct the pioneering pre-clinical studies of *A. elegans* leaf extracts in MIA-induced osteoarthritis rat model by targeting the major immune regulatory pathways involved in OA pathogenesis. Methods: The crude ethanolic

## Methods

The crude ethanolic and sub-extracts of *A. elegans* leaves were subjected to in vitro tests using hydrogen peroxide, hydroxyl radical and nitric oxide scavenging assays. Chondroprotective activity was assessed in vivo by measuring the expression of SOD, Catalase, MMP13, MMP3, TNF- $\alpha$  and IL-1 $\beta$  in the rat serum using ELISA. Furthermore, macroscopic evaluation was conducted to determine cellular abnormalities and proteoglycan loss in rat cartilages. To confirm the presence of compounds responsible for its activity LC/MS analysis was also performed.

## Results

Both the crude ethanolic and ethyl acetate sub-extract exhibited a potent chondroprotective effects by inhibiting oxidative stress, reducing the expression of pro-inflammatory cytokines and cartilage degrading enzymes. In addition, cellular abnormalities and proteoglycan loss were significantly decreased on rat cartilages following *A. elegans* leaf extracts treatments. This is attributed to the presence of putative compounds which are known to be highly effective in the attenuation of OA disease. Conclusion/Recommendation: Therefore, the *A. elegans* crude ethanolic and ethyl acetate leaf extracts can be a promising therapeutic option for the development of novel treatment for OA.

## Conclusion

This study was able to report a rare, complex rearrangement of multiple exons and deletions in PAX6 causing an isolated aniridia phenotype. Patient was managed by a multi-disciplinary team and the guardians were counseled regarding the prognosis and complications.

**Keywords:** *Alpinia*; chondroprotection; osteoarthritis