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| University of Baghdad | | | | | | |
| **Faculty of Veterinary Medicine** | | | | | | College Name |
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| **Professor** | | **Assistant Professor** | **Lecturer** | **Assistant Lecturer** | | Career |
| **1. Collagenase and Sodium Iodoacetate - Induced Experimental**  **Osteoarthritis Model in Sprague Dawley Rats** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **Asian Journal of Scientific Research** | | | | | | Published Journal title |
| **2 (4)** | | | | | | Volume Number |
| **167-179** | | | | | | Page |
| **2009** | | | | | | Year |
| The objective of this study was to apply and compare two different experimental osteoarthritis (OA) methods in the rat, namely: Collagenase (COL) induced OA and monosodium iodoacetate (MIA) OA models. The assessment of OA development and progression were performed through three different durations (2, 4 and 6 weeks).Intra-articular injection of either 4 mg/joint collagenase type II or 3 mg/joint MIA, were administered to the adult male Sprague Dawley rats into their right knee joints. Evaluation of OA changes in the knees was achieved with both histopathology score system and radiography approach.Gross results revealed earliest changes such as swelling and redness of the right knee joints of all rats injected with either COL or MIA. Joint dissection revealed distinct thickening of the joint capsule in MIA-injected rats than in COL group.  Present finding revealed early development of radiographical as well as histopathological changes in MIA injected group. However, both OA injected groups resulted in a chronic joint degeneration, measured by cellular changes, matrix degradation, subchondral changes and marginal osteophyte formation. Further findings showed significantly higher histopathological score in MIA injected group than those of COL in each of the three selected periods of OA induction. In conclusion, present results demonstrated that MIA could induce OA changes in a shorter period of time than COL in the Sprague Dawleyrats. Radiography approach could be a useful tool to evaluate osteoarthritic changes in knee joints. | | | | | | Abstract |

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| **2. Chondroprotective effect of Zerumbone on monosodium iodoacetate**  **induced osteoarthritis in rats** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **Journal of Applied Sciences** | | | | | | Published Journal title |
| **10 (4)** | | | | | | Volume Number |
| **248-260** | | | | | | Page |
| **2010** | | | | | | Year |
| The objective of this investigation was to evaluate chondroprotective effect of zerumbone; a purified compound of *Zingiber zerumbet* Smith against monosodium iodoacetate (MIA) induced knee osteoarthritis (OA) in the rat. The effect of zerumbone on the articular cartilage was compared with the effect of celecoxib (Celebrex®), a non-steroidal anti-inflammatory drug (NSAID). Forty adult male Sprague Dawley rats were divided into four groups (n=10). MIA was injected into their right knee joints to induce OA. Rats from first and second groups were treated with zerumbone in a dose of 2 ml/kgbody weight of 0.2% and 0.4% w/v of zerumbone in corn oil, respectively. Rats in the third group were treated with celecoxib which served as positive control whereas the fourth group were treated with corn oil and served as negative control. Evaluation of OA changes in the knees was assessed with the aid of both radiography and histopathology score. Gross and microscopic examinations revealed curative effect of zerumbone in a dose dependent manner on the osteoarthritic knee joints. Apart from this, our data also revealed very poor anti-OA property of celecoxib. We concluded thatoral administration of zerumbone in a dose of 2ml/kg body weight of 0.4% w/v diluted with corn oil for a period of 4 weeks has some chondroprotective effects. | | | | | | Abstract |

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| **3. Response of *Channa striatus* extract against monosodium iodoacetate**  **induced osteoarthritis in rats** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **Journal of Animal and Veterinary Advances** | | | | | | Published Journal title |
| **10(4)** | | | | | | Volume Number |
| **460-469** | | | | | | Page |
| **2011** | | | | | | Year |
| The main aim of this study was to evaluate the effect of oral administration of *Channa striatus* extract against monosodium iodoacetate induced knee osteoarthritis in rat. Forty rats were randomly assigned to four groups. Rats in the 1st and 2nd groups were treated with 10 ml/kg body weight aqueous *Channa striatus* extract but with two different courses of therapy. Rats in the 3rd group were treated with celecoxib as a positive control where as the 4th group was treated with normal saline as a negative control. Evaluation of osteoarthritis changes was assessed with the aid of radiology, histopathology score and immunohistochemistry to explore immunoreactivity in the synovium. Assay of prostaglandins in the serum had been implemented to explore their role in osteoarthritis events and regulation. Gross and microscopic results revealed curative effects of the extract on the osteoarthritis accompanied with improved immunoreactivity of the synovium. Data showed significant hormonal changes in different treated groups, indicating their role in osteoarthritis. In conclusions the extract showed inhibitory effect on joint degradation and its earlier therapeutic application reflects importance of earlier treatment on the disease progression. Immunoreactivity as well as serum prostaglandins concentrations could be used as good markers to evaluate osteoarthritis events in the affected joints | | | | | | Abstract |

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| **Professor** | | **Assistant Professor** | **Lecturer** | **Assistant Lecturer** | | Career |
| **4. Zerumbone improve immunoreactivity of neuropeptides in monosodium**  **iodoacetate induced knee osteoarthritis in rat.** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **African Journal of Biotechnology** | | | | | | Published Journal title |
| **10(18)** | | | | | | Volume Number |
| **3646-3653** | | | | | | Page |
| **2011** | | | | | | Year |
| The main objective of this investigation was to explore the improvement effect of oral administration of zerumbone on density of protein gene product 9.5; calcitonin gene related peptide and neuropeptide Y immunoreactive nerve fibers against monosodium iodoacetate induced osteoarthritis changes in the rat’s knee synovial membrane. Prostaglandin (PG) E2 and F2α were determined to assess their role during osteoarthritis events and post zerumbone application. Forty rats were divided equally into four groups. Rats in the first and second groups were treated with two different concentrations of zerumbone. Rats in the third group received celecoxib (Celebrex®) and served as positive control; whereas the fourth group were given corn oil and served as the negative control. The results revealed lower pathology score apart from an improvement of the immunoreactive nerve fibers densities in zerumbone treated groups compared with negative control. Different prostaglandin levels were detected within the different treated groups. The data showed that zerumbone had dose dependent effect against the depleted immunoreactive nerve fibers which occurred after monosodium iodoacetate injection. Prostaglandin E2, but not PGF2α showed distinct role during the osteoarthritis events and the post oral treatment with zerumbone | | | | | | Abstract |

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| **Professor** | | **Assistant Professor** | **Lecturer** | **Assistant Lecturer** | | Career |
| **5. Zerumbone significantly improved immunoreactivity in the synovium**  **compared to *Channa striatus* extract in monosodium iodoacetate (MIA)-**  **induced knee osteoarthritis in rat** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **Journal of Medicinal Plants Research** | | | | | | Published Journal title |
| **5(9)** | | | | | | Volume Number |
| **1701-1710** | | | | | | Page |
| **2011** | | | | | | Year |
| The main aim of this study was to compare the immunoreactivity of some osteoarthritis related neuropeptides following oral administration of two natural remedies that is *Channa striatus* extract and zerumbone against monosodium iodoacetate induced knee osteoarthritis changes in the rat’s synovial membrane. Assay of PGE2 and PGF2α in the serum were performed to evaluate their role during osteoarthritis events and post oral application of the treatment. Forty rats were divided equally into four groups. Rats in the first and second groups were treated with *channa* extract and zerumbone, respectively. Rats in the third group were treated with celecoxib, whereas the fourth group was treated with normal saline. Evaluation of immunoreactivity of the following neuropeptides: Protein gene product 9.5, calcitonin gene related peptide and neuropeptide Y in the synovial membranes was implemented with the aid of both histopathology and immunohistochemistry approaches. Results revealed lower pathology score in both first and second groups accompanied with markedly improved immunoreactivity in zerumbone treated group compared to *channa* extract group. Significant different concentrations of PGE2 but not PGF2α were detected within studied groups. Both remedies significantly improved the immunoreactivity which appeared more apparent in the group treated with zerumbone. Prostaglandin E2 has a role in osteoarthritis development and regulation. | | | | | | Abstract |

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| **Professor** | | **Assistant Professor** | **Lecturer** | **Assistant Lecturer** | | Career |
| **6. Response of hepatic metabolizing enzymes and oxidative stress in orally**  **administrated zerumbone against MIA-induced osteoarthritis in rats** | | | | | | Research Title |
| Single |  | | | | Shared name | Shared or Single |
| **Journal of Animal and Veterinary Advances** | | | | | | Published Journal title |
| **10 (5)** | | | | | | Volume Number |
| **566-573** | | | | | | Page |
| **2011** | | | | | | Year |
| The main objective of this study was to elucidate the extent of hepatic oxidative stress following oral administration of zerumbone against monosodium iodoacetate induced osteoarthritis (OA) in rats by monitoring microsomal cytochrome P450 and glutathione *S*-transferase enzymes as well as determination of oxidative stress biomarkers, i.e. glutathione and malondialdehyde. Forty rats were randomly assigned into five groups. Rats in the first and second groups were treated with two different doses of zerumbone. Rats in the third group (positive control) were given celecoxib whereas the fourth group (negative control) was given corn oil. Rats of the fifth group were untreated not induced with OA and were used as a basal group. Results showed significant induction of cytochrome P450 and glutathione *S*-transferase and insignificant changes in both glutathione and lipid peroxidation levels in zerumbone treated groups compared to corn oil and basal groups. Levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in zerumbone treated groups were comparable to the level in the basal group indicating absence of liver damage. Prostaglandin E2 level significantly reduced following zerumbone administration. Safety profile of zerumbone in this study, attract new investigation to explore its advantageous effect on using higher dosage regimen and/or longer duration against OA or other disease. | | | | | | Abstract |