1. INTRODUCTION

Inflammation is the reaction in the living tissue which is both a defensive and a repairative process put forth in response to a noxious stimulus. In the first century AD Roman physician Cornelius Celsus provided what is still used as the standard definition of inflammation, *rubor et tumor cum calore et dolore* (redness and swelling with heat and pain). To these four cardinal signs, a fifth sign, *functio laesa* (loss of function) added by Galen.

Microscopic and biochemical details reveal the participation of a large number of cellular and plasma derived components of blood in an inflammatory process. Prostaglandins are few of the many mediators, which play their pivotal roles in the augmentation of an inflammatory process and catalyzing the production of such vital compounds is by a group of enzymes known as cyclo-oxygenases. It was not too late, when harmful effects of inflammation came to light with the emergence of rheumatic arthritis. To counter this problem, a large number of non-steroidal anti-inflammatory drugs (NSAIDs) have been employed.

Vane (1971) described the principle mode of action of NSAIDs as cyclo-oxygenases inhibitors. Hippocrates, Galen, early Greek and Roman herbalists used extracts of barks, which contained salicylates. In 1763, the Reverend Edmund Stone reported to the Royal Philosophical Society in London that extracts of bark from the willow tree, *Salix alba*, provided a successful cure for fever.

A commercial method for synthesizing aspirin, the acetyl derivative of salicylic acid was first developed by Hoffman of the Bayer Pharmaceutical Company in 1893.

These historical investigations laid the foundation for the use of NSAIDs in
veterinary practice. However, it is questionable whether many of the subsequently developed drugs offer marked advantages over aspirin or not. Since then, several NSAIDs including salicylates played a pivotal role in alleviating pain related disorders.

NSAIDs are routinely used in veterinary practice in the treatment of febrile states and inflammatory disorders of several animal species, including cats, dogs, horses, swine and cattle.

In avian medicine, NSAIDs are sparingly used in the treatment of wide variety of clinical conditions (trauma, inflammation, heat stress, and pain related to beak trimming). Although, NSAIDs are essential to manage the pain and inflammatory conditions in food producing birds (chickens, ducks, turkeys, gheese, swans, quails, guinea fowls, ostrich, emu etc), pet birds and game birds as well as in zoo birds, these drugs are rarely prescribed. The main reasons could be, until date, no anti-inflammatory drug approved for its use in birds and the other reason could be due to the scarcity of scientific research on inflammation, pain and NSAIDs in avian species.

Besides, the toxicology aspects of NSAIDs are mainly studied in mammalian species and seldom reported in avian species. The toxicities reported in mammals are mainly related to gastro-intestinal, hematopoietic and renal systems. Miscellaneous effects associated with use of NSAIDs include hepatotoxicity, diarrhoea and depression of central nervous system. The majority of aforesaid adverse reactions were linked to the inhibitory effects of NSAIDs on prostaglandin activity. However, in avian species, the basic knowledge regarding the toxic effects of these NSAIDs on various organs are inadequate.
Hence, the present study was designed to evaluate the safety of certain NSAIDs viz. aspirin, paracetamol, ketoprofen, nimesulide, meloxicam and celecoxib in broiler chickens with the following objectives;

1. To evaluate safety of certain NSAIDs in birds in terms of clinical signs and biochemical parameters.

2. To correlate the findings with gross and histopathological lesions.