CONCLUSIONS
In pharmacognostic study, *Woodfordia fruticosa* flowers showed the presence of unicellular trichomes, rosettes and cluster of calcium oxalate crystals; and anomocytic, actinocytic and anisocytic stomata. In physicochemical analysis, crude powder and methanol extract of *Woodfordia fruticosa* flowers were free from heavy metals. The highest extractive value was obtained from water and methanol. The solubility of the extract was maximum in polar solvents like DMF, methanol and DMSO; the extract was acidic in nature. In qualitative phytochemical analysis tannins and alkaloids were present in higher amount, while cardiac glycosides and steroids were totally absent. In quantitative analysis of phytoconstituents, total phenol content was higher than flavonoid content. Hence, the determination of pharmacognostical and phyto-physicochemical profile of *Woodfordia fruticosa* Kurz. flowers may be useful to supplement information in respect to its identification, authentication and standardization of herbal drugs. In other words, the pharmacognostic features examined in the present study may serve as tool for identification of the plant for validation of the raw material and for standardization of its formulations at herbal industrial level in the coming days.

In anti-inflammatory studies the methanol extract of *Woodfordia fruticosa* flowers inhibited the carrageenan induced paw edema at both early and late phase. The action of early phase may be due to the inhibition of histamine and serotonin. The action of later phase may be due to the inhibition of prostaglandins, proteases and lysosome. Dose dependent inhibition of inflammation was observed in histamine and dextran induced paw edema. This may be due to antihistaminic activity of WFM. The extract also significantly reduced the paw volume in serotonin induced edema, and the activity of WFM-400 was almost similar to that of standard diclofenac treated group. The subcutaneous injection of formaldehyde into paw of rats produces localized inflammation. WFM and standard diclofenac administered continuously for 7 days successfully inhibited edema induced by formaldehyde. From the results of acute inflammatory models, it can be concluded that the WFM showed antiedematogenic effects on carrageenan, histamine, dextran, serotonin and formaldehyde induced edema, which may be related to inhibition of inflammatory mediators formation. In
chronic cotton pellet induced granuloma model, WFM reduced the granuloma formation in dose dependent manner. In analgesic study, WFM effectively reduced the frequency of paw licking in formaldehyde induced paw licking test at both early (0-5 min) and late (15-30 min) phases. But better analgesic effect of WFM was observed at later phase.

In hepatoprotective studies, the induced diclofenac toxicity elevated levels of serum marker enzymes ALT, AST, ALP and the level of BUN along with the decrease in total protein and albumin levels. It also increased the relative liver weight and decreased the level of liver total protein and GSH. The activity of catalase and GPx significantly decreased in diclofenac intoxicated animals. The pre-treatment of methanol extract of *Woodfordia fruticosa* at dose levels of 400 and 600 mg/kg had restored the ALT, AST, ALP and BUN levels towards normalization and the effects were comparable with standard drug (Silymarin 100 mg/kg). The total protein, albumin, GSH levels and catalase, GPx activity increased significantly in the animals received pre-treatment of the WFM. The histopathological study showed the reduction of hepatic damage in WFM treated animals.

In CCl₄ and acetaminophen induced hepatotoxicity models, the serum biochemical parameters and liver antioxidants were altered when animals were intoxicated with CCl₄ and acetaminophen. The treatment with WFM restored the level of serum biochemical parameters as well as liver antioxidants in both the animal models. The administration of acetaminophen and WFM did not have any effect in serum total protein level, catalase and GPx activity. The treatment with WFM prevented the structural damage of hepatocellular membrane.

In acute toxicity study, the methanol extract of *Woodfordia fruticosa* flowers had no mortality and observable acute toxic effect on the experimental animals and therefore can be considered as non-toxic. However, acute toxicity data sometimes is of limited clinical application since accumulative toxic effect may not be seen in short period with a single dose application. Hence, sub acute and chronic evaluation of the extract should be carried out in evaluating the safety profile of *Woodfordia fruticosa*. 
These studies have shown that the methanol extract of flowers of *Woodfordia fruticosa* contain some active ingredients with the potential of being good anti-inflammatory, analgesic and hepatoprotective agents. NSAIDs like diclofenac, used as standard drug in anti-inflammatory study, is having good anti-inflammatory and analgesic property, but is also having side effects on liver. Therefore, *Woodfordia fruticosa* may become the alternative to the NSAIDs. For that, further study for detailed investigation of the mechanism of action of WFM is needed.