**ABSTRACT**

Nowadays, diabetes and its complication as organs inflammation are important public health problems in all countries. Market limitations of drugs with dual actions as anti-inflammatory and anti-diabetic have been led to a temptation for focusing on the dis­covery and development of new compounds with potential anti-inflammatory and anti-diabetic activities. Herein, we synthesized two new series containing pyrazole ring with vicinal diaryl rings as selective COX-2 moiety and thiazolidinedione (series **12a-f)** or thiazolidinone (series **13a-f)** as anti-diabetic moiety and the two moieties were linked together with methylene or methylenehydrazone functionality. The two series were evaluated for their COX inhibition, anti-inflammatory activity and ulcerogenic liability while for the anti-diabetic activity; **12a-f** and **13a-f** were assessed *in vitro* against α-glucosidase, β- glucosidase, *in vivo* hypoglycemic activity (one day and 15 days studies) in addition to PPARγ activation study. Four compounds (**12c**, **12f**, **13b** and **13f**) had higher COX-2 S.I. (8.69 – 9.26) than the COX-2 selective drug celecoxib (COX-2 S.I. = 8.60) and showed the highest AI activities and the lowest ulcerogenicity than other derivatives. Also, two thiazolidinedione derivatives **12e** and **12f** and twothiazolidinone derivatives **13b** and **13c** showed higher inhibitory activities against *α-* and *β-*glucosidase (% inhibitory activity = 62.15, 55.30, 65.37, 59.08 for α-glucosidase and 57.42, 60.07, 58.19, 66.90 for β-glucosidase respectively) than reference compounds (acarbose with % inhibitory activity = 49.50 for α-glucosidase and *D*-saccharic acid 1,4-lactone monohydrate with % inhibitory activity = 53.42 for β-glucosidase) and also showed good PPAR-γ activation and good hypoglycemic effect in comparison to pioglitazone and rosiglitazone. Moreover, Shape comparison and docking studies were carried out to understand their interaction and similarity with standard drugs.