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LEARNING OBJECTIVE

Know and evaluate new alternatives for an optimized dietary management of histamine intolerance.

STUDY OBJECTIVE

The aim of the present study was to evaluate the histamine degrading capacity of a DAO extract from pig kidney combined with vitamin C.

BACKGROUND

Histamine is detoxified by intestinal diamine oxidase (DAO). A deficit of DAO activity can result in histamine intolerance, a clinical condition characterized by allergic-like symptoms. Histamine intolerance can be treated with exogenous DAO supplementation. The aim of the present study was to evaluate the histamine degrading capacity of a DAO extract from pig kidney combined with vitamin C.

MATERIALS AND METHODS

Kinetic characterization of DAO extract (DAOgest, Bioiberica S.A.U., Spain) was determined using histamine as a substrate. Histamine concentrations ranging from 1.1 to 555 mg/L were incubated with DAO extract. Histamine reduction was determined by HPLC-PDA using an *in vitro* system (sodium phosphate buffer, 20 mM; pH 8.0) in which DAO extract was incubated at 37°C for 5 h with histamine at a concentration ranging from 10 to 150 mg/L. In a subsequent experiment vitamin C was added to the medium using 10 and 20 mg/L of histamine.

RESULTS

HISTAMINE DEGRADATION KINETICS

Enzyme activity of the DAO extract increased with increasing histamine concentrations until 0.63mM (69.5 mg/L) showing substrate inhibition (figure 1).

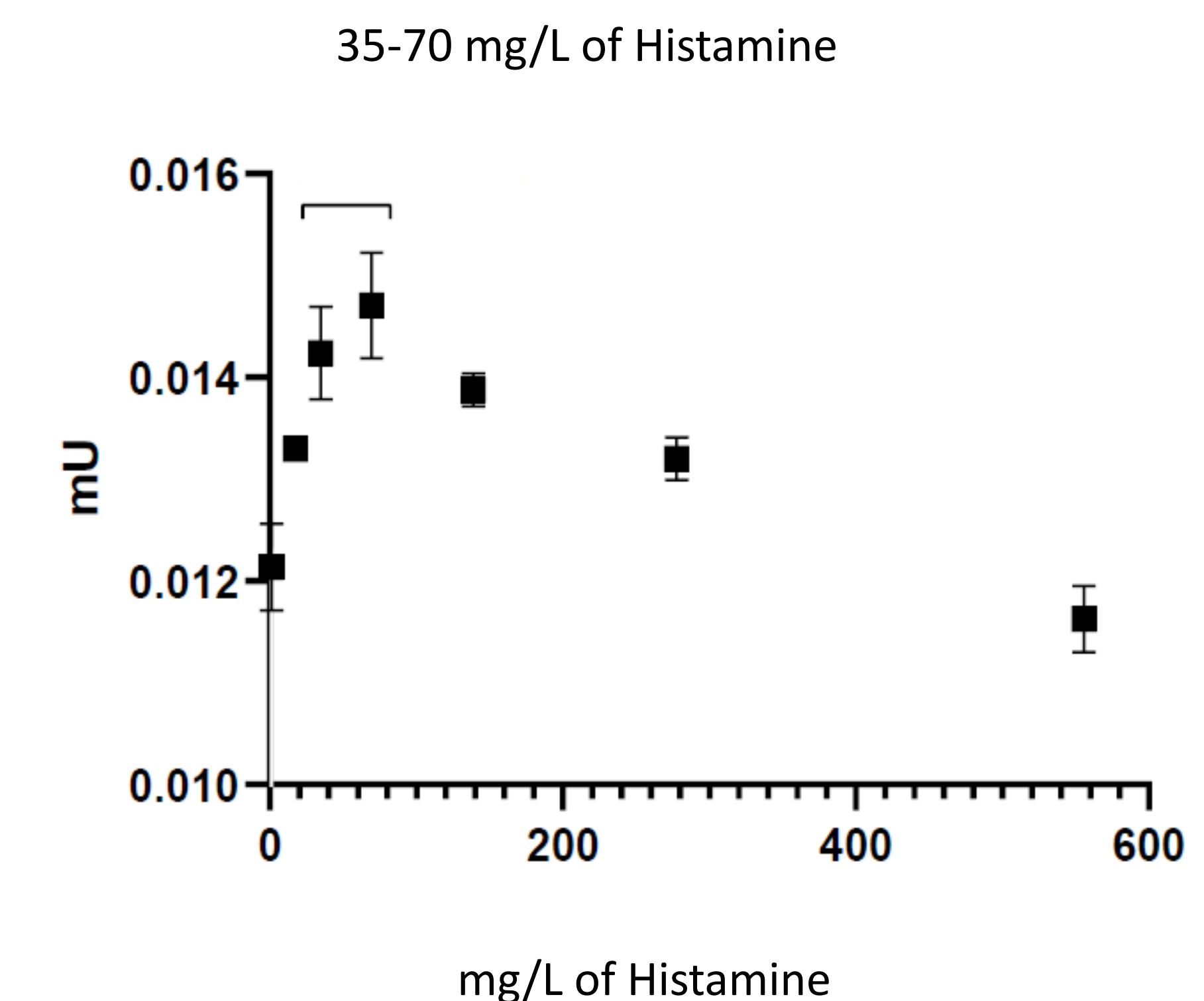


Figure 1. Kinetics of the DAO extract activity using histamine concentrations ranging from 1.1 to 555 mg/L.

PERCENTAGE OF HISTAMINE DEGRADATION

Using 4.2 mg of DAO extract, higher histamine reductions were obtained with the lower histamine concentrations (16% at 20 mg/L; 30% at 10 mg/L). The addition of 10 mg of vitamin C to the media increased the reduction of histamine reaching 77% at 20 mg/L and 73% at 10 mg/L (figure 2).

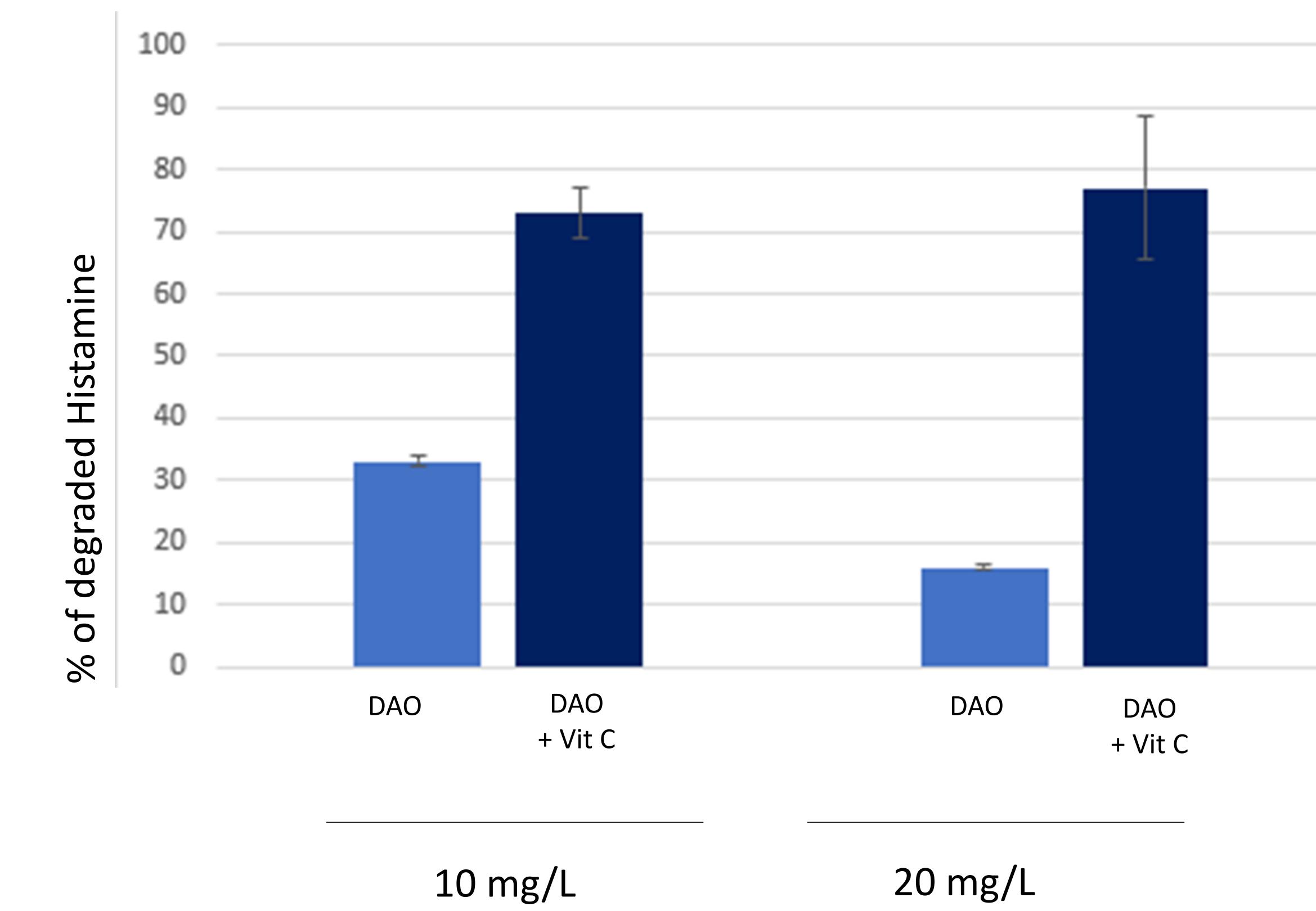


Figure 2. Histamine degradation after the incubation 5h of DAO extract with histamine at 10 and 20 mg/L

CONCLUSIONS

The supplementation of DAO extract with vitamin C increases the enzymatic activity of DAO. These results suggest that dietary supplementation with DAO from pig kidney and vitamin C might help in reducing symptoms associated with histamine intolerance.