

# EARLY RENAL HISTOPATHOLOGICAL AND FUNCTIONAL CHANGES IN STAR FRUIT INDUCED ACUTE OXALATE NEPHROPATHY

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## INTRODUCTION AND AIMS

The star fruit (*Averrhoa carambola* - Figure 1), besides causing neurotoxicity in patients with renal failure, produces nephrotoxic effects. The acute oxalate nephropathy is characterized by tubulointerstitial lesion caused by massive precipitation of calcium oxalate crystals. Cases of acute renal failure due to acute oxalate nephropathy induced by star fruit have been reported in the literature. The lesions and the mechanisms involved in this disease are not yet very clear and need further studies.



Figure 1 – Star fruit (*Averrhoa carambola*)

The aim of this research is to evaluate early histopathological and functional changes in acute nephropathy induced by the ingestion of star fruit juice.

## METHODS

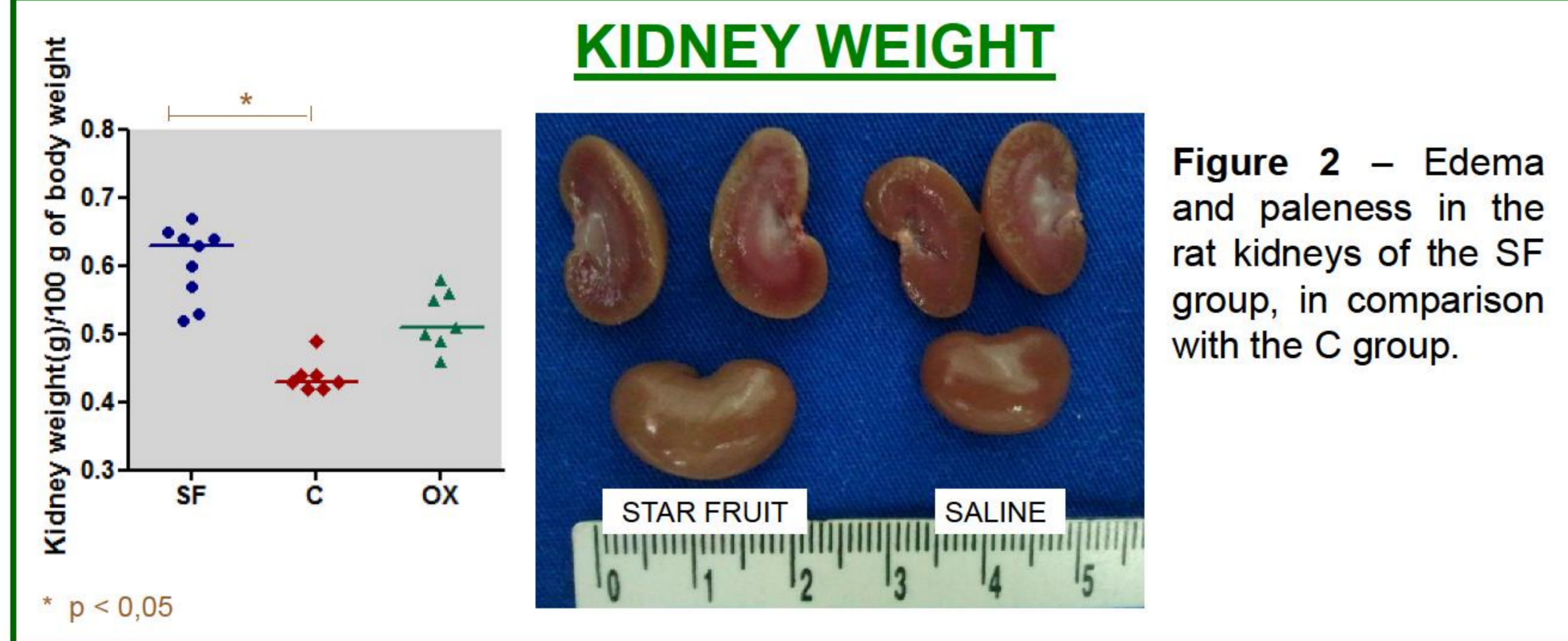
Three groups of Wistar rats were treated (gavage), after 15-hour fasting and deprivation of water intake, with 4mL per 100g of body weight of one of the following solutions: **group SF** - pure star fruit juice (oxalate concentration: 4.7 mg/mL, pH 2.3, osmolality 518 mOsm); **group C** - saline solution (control); **group OX** - oxalate solution (concentration: 4.7 mg/mL with similar pH and osmolality). After 24 hours, the following studies were performed:

- Renal function: glomerular filtration rate (GFR) by inulin clearance, fractional excretion of sodium (FENa), fractional excretion of potassium (FEK), and urine osmolality (Uosm);
- Histopathological: acute tubular necrosis (ATN), apoptosis and oxalate crystals under polarized light, scored by modified Shih scale as follows: 0 = absent, 0.5 = mild and focal, 1 = mild (< 10%), 2 = moderate (10-25%), 3 = intense (25-50%), 4 = intense (50-75%), and 5 = higher than 75%;
- Immunohistochemical: proliferating cell nuclear antigen (PCNA) and macrophage (ED1+).

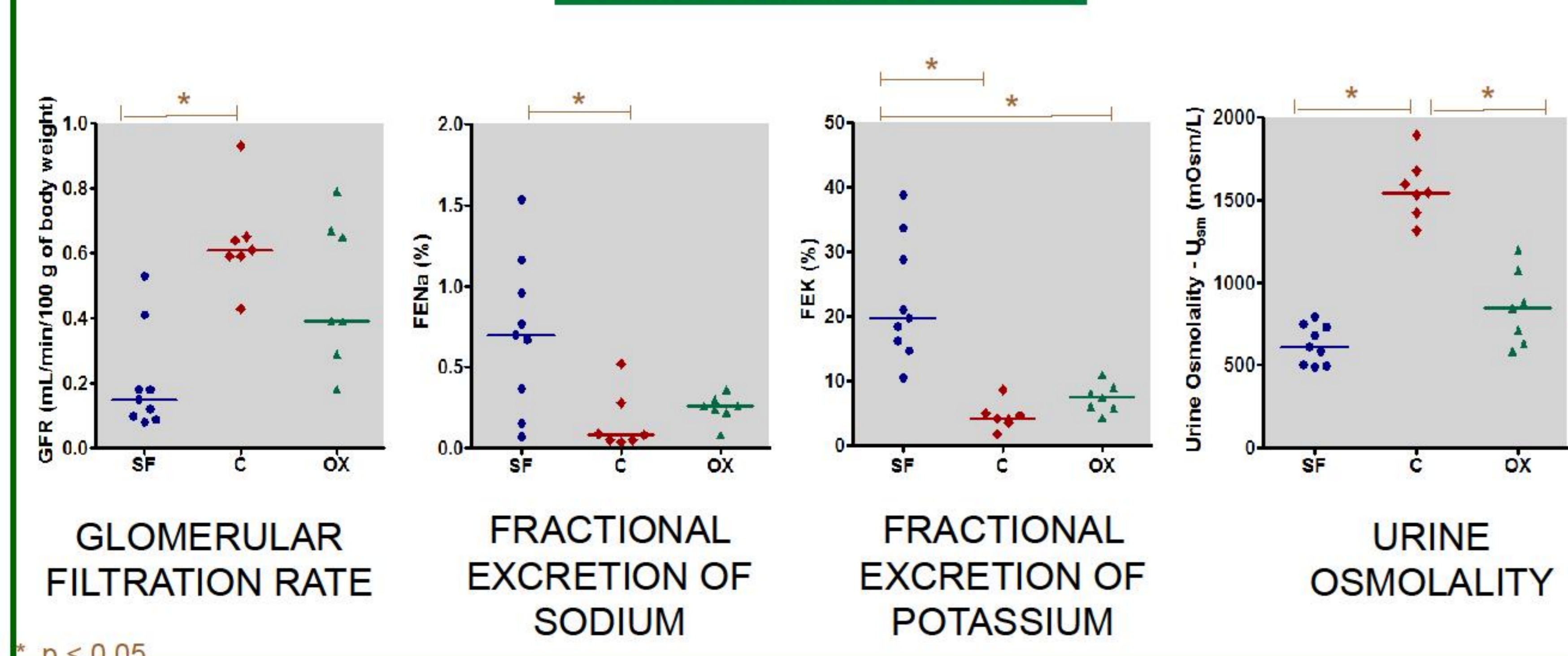
Statistical analyses were carried out using the Kruskal-Wallis test.

## RESULTS

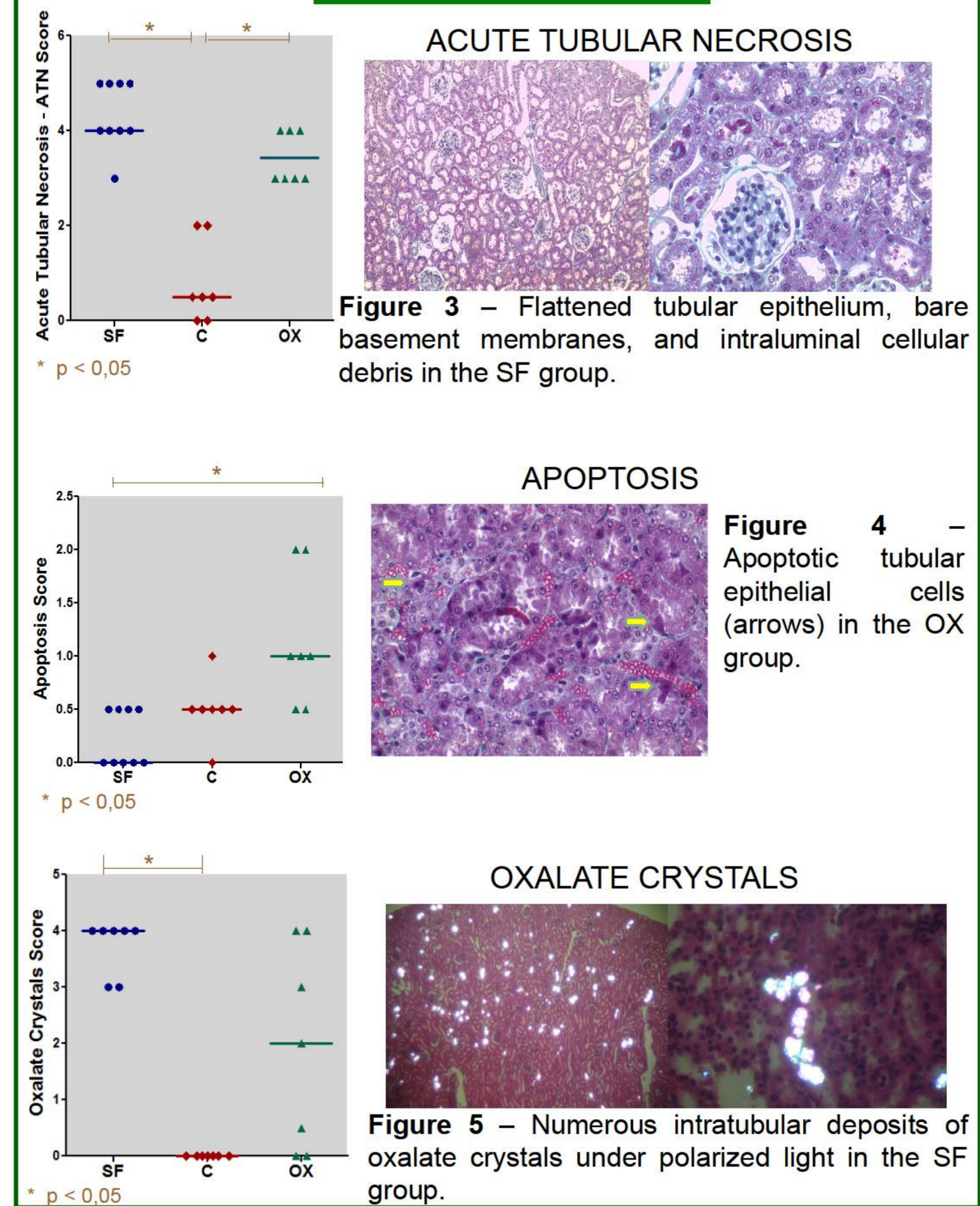
### KIDNEY WEIGHT



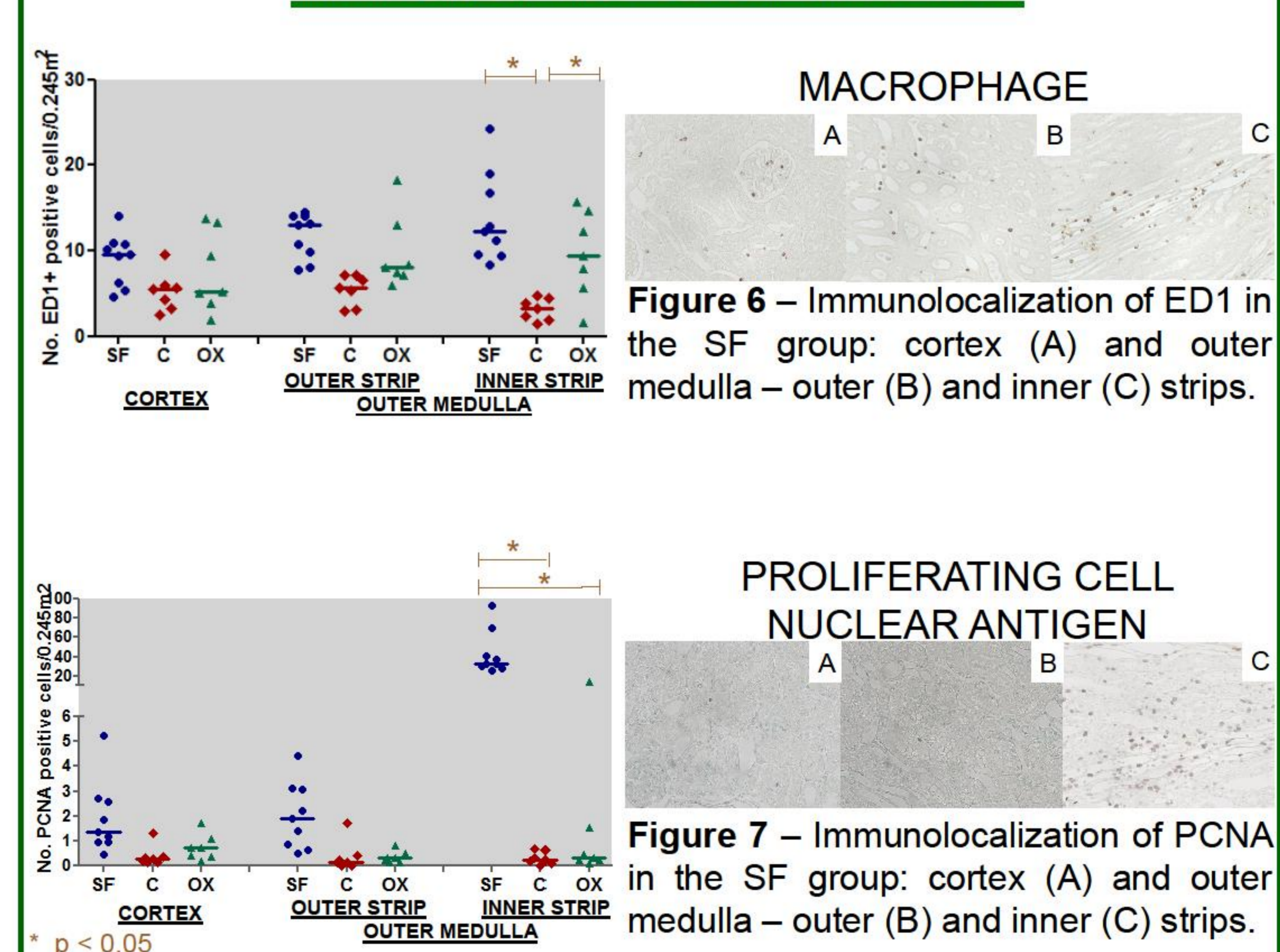
### RENAL FUNCTION



### HISTOPATHOLOGY



### IMMUNOHISTOCHEMISTRY



## CONCLUSIONS

Typical histopathological and functional changes of ATN were present 24 hours after the administration of star fruit juice. This ATN can be attributed to intratubular deposition of oxalate crystals. Likewise, there was a reproduction of this nephropathy, although less severe, in the group treated only with oxalate solution.

## REFERENCES

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