POTENTIAL OF COLLAGEN EXTRACTED FROM TILAPIA SKIN AS AN ATTENUATOR OF LOCAL EFFECTS OF BOTHROPS JARARACUSSU SNAKE VENOM

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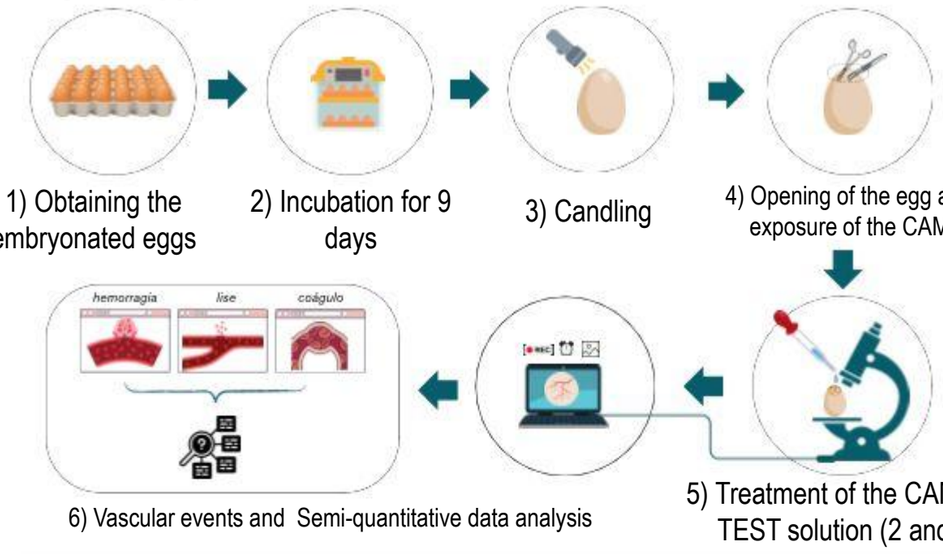
INTRODUCTION

Snakebites are a major public health problem in tropical and subtropical countries, causing systemic and local effects of envenomation. Local effects are mainly induced by the action of metalloproteinases, enzymes that degrade proteins. Collagen is a protein whose structure can be fragmented into smaller molecules by enzymatic activity, presenting varied biotechnological potential. In view of this, it is believed that collagen derived from tilapia skin is capable of attenuating local tissue injuries caused by snake venom, acting as a "sacrificial protein".

OBJECTIVES To obtain collagen derived from tilapia skin and investigate its protective effect on Bothhrops jararacussu snake venom; To evaluate the irritant potential of the species' venom in the absence and presence of collagen derived from tilapia skin using the HET-CAM (Hen's Egg Test Chorioallantoic Membrane) model.

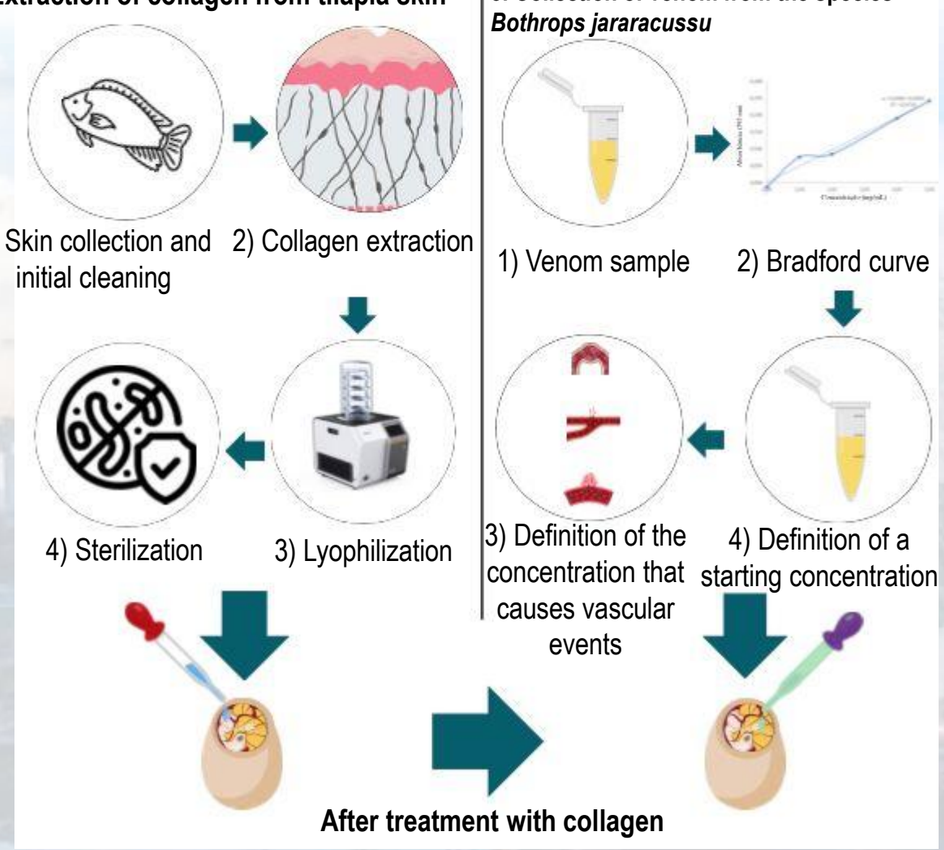
METHODOLOGY

1. HET-CAM Test



2. Extraction of collagen from tilapia skin

3. Collection of venom from the species *Bothrops jararacussu*



Figures 1, 2, and 3. Schematic representation of the HET-CAM methodology (1), representation of collagen extraction from tilapia skin (2), and representation of venom collection from *Bothrops jararacussu* snakes (3).

RESULTS

The collagen extracted from tilapia skin was able to reduce the vascular effects of the venom on the Chorioallantoic Membrane (CAM).

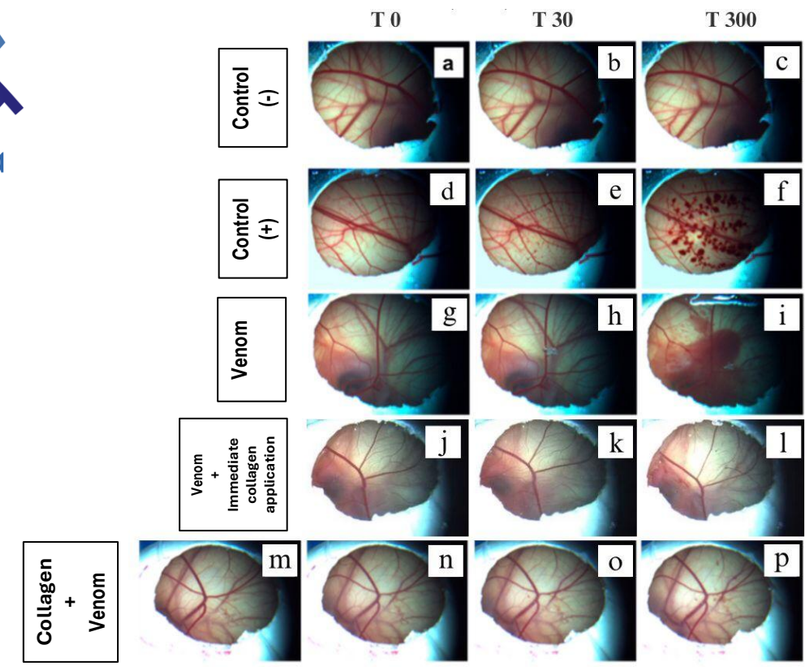


Figure 4. Representative images at time points 0 (before treatment), 30 seconds, and 300 seconds, showing the effects of the control (−) (a–c) and control (+) (d–f) in the absence of tilapia skin collagen; of *Bothrops jararacussu* snake venom on the chorioallantoic membrane, in the absence (g–i) and presence (j–p) of tilapia skin collagen, with (j–l) representing treatment with collagen after venom application and (m–p) treatment with collagen before venom application, with image (m) showing the moment before collagen application. **Source:** Research data, 2025.

The Collagen + Venom groups showed a 50% reduction in the Mean Irritation Score (Mean IS) compared to the Venom groups.

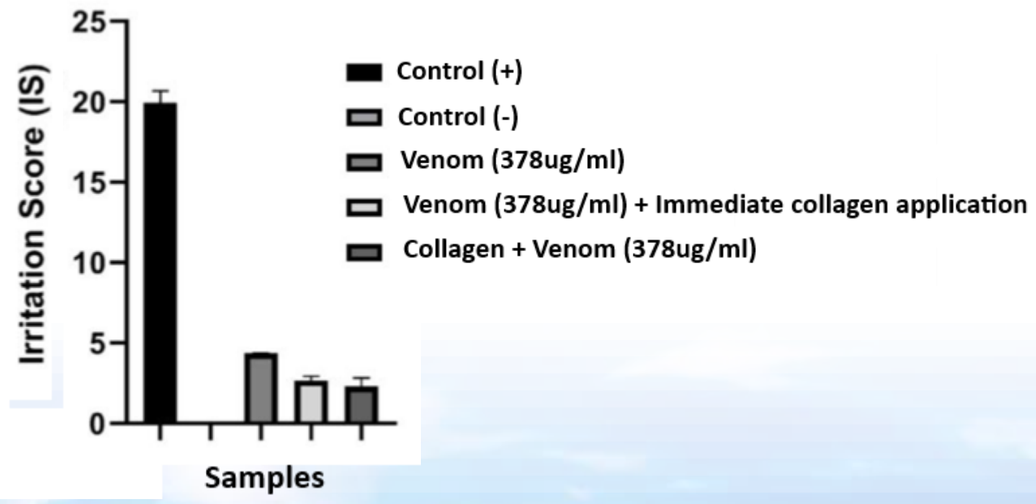


Figure 5. Statistical figure illustrating the mean irritation scores (mean MS) of the tested samples. **Source:** Author's own.

CONCLUSION

The results of this study suggest that collagen extracted from tilapia skin is a potential protective agent against the local effects of Bothrops jararacussu snake venom. Although further studies are needed to better understand the mechanism involved in this effect, this is a relevant preliminary result, since it suggests the creation of new therapeutic approaches for local injuries caused by snakebites. Thus, collagen extracted from tilapia skin, used as a sacrificial protein, could become an innovative therapy.

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"I have no conflict of interest""

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