

INTRODUCTION

1

- Even though cowhage is the “gold standard” pruritogen in experimental itch research, it possesses numerous drawbacks.¹
- Thus, papain is suggested to produce prompt non-histaminergic itch in the absence of wheal and flare.²

AIM

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The aim was to investigate a potential non-histaminergic experimental itch model based on the papain protease.

METHODS

3

Experimental design

- 19 subjects participated in two sessions with 7 days in between.
- Each volar forearm was divided into two squared areas.
- 1st session: randomly exposure to 10µg, 50µg, and 100µg papain, and a vehicle by skin prick test (SPT) lancets.
- 2nd session: delivery of 100µg papain through 1 prick, 5 pricks, and 25 pricks by SPT lancets, and heat-inactivated cowhage spicules.

Assessment parameters

- Itch and pain were monitored for 15 minutes after the application on a visual analogue scale (VAS). Area under the curve (AUC) and peak itch and pain were analyzed.
- This was followed by multiple sensory testing: Touch pleasantness; Hyperknesis; Mechanical pain threshold and sensitivity; Cold detection and pain threshold; Warm detection and pain threshold; Supra-threshold heat stimuli.

RESULTS

4

VAS recordings

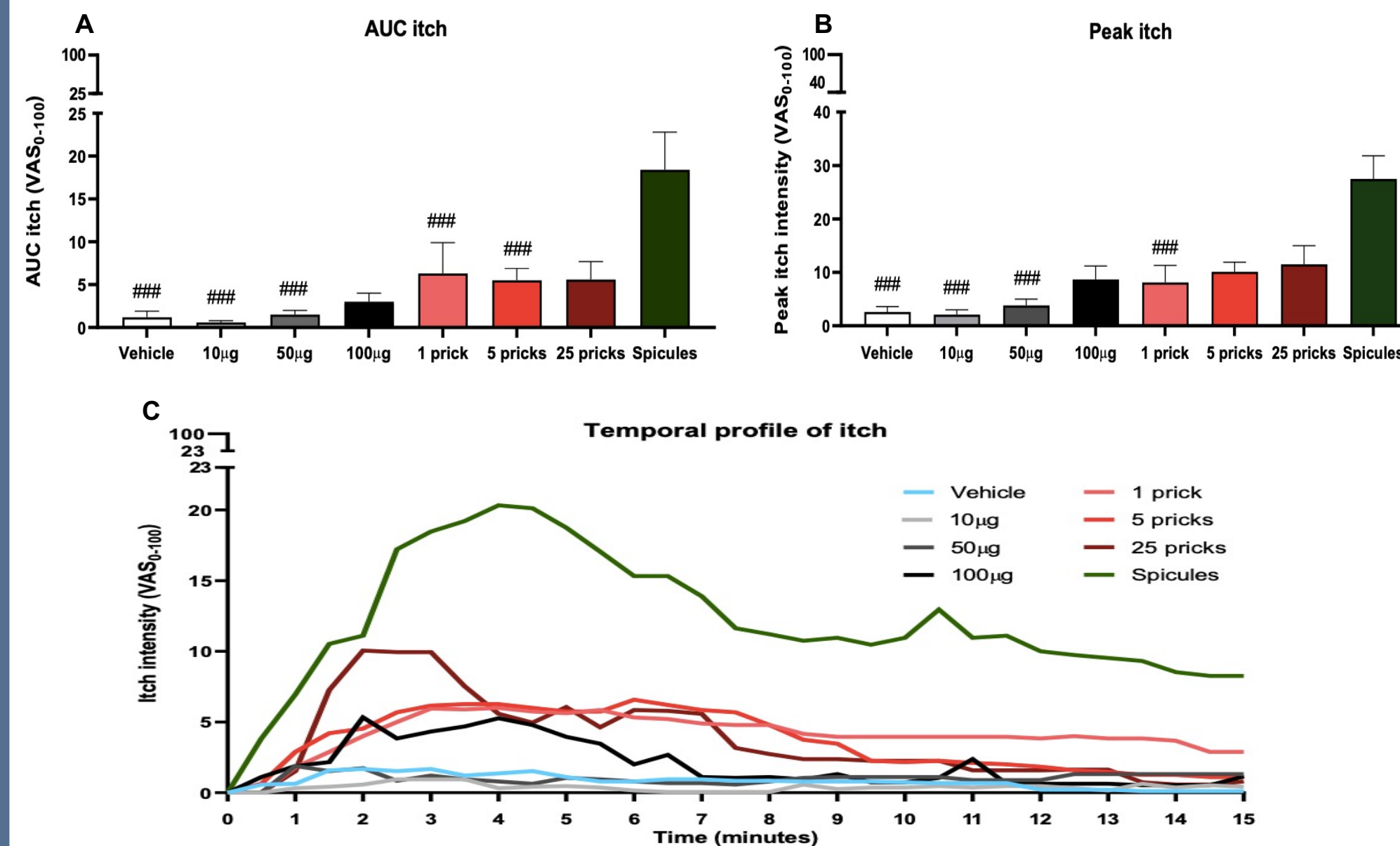


Figure 1: Itch profile. A) AUC itch; B) peak itch; C) temporal profile of itch.

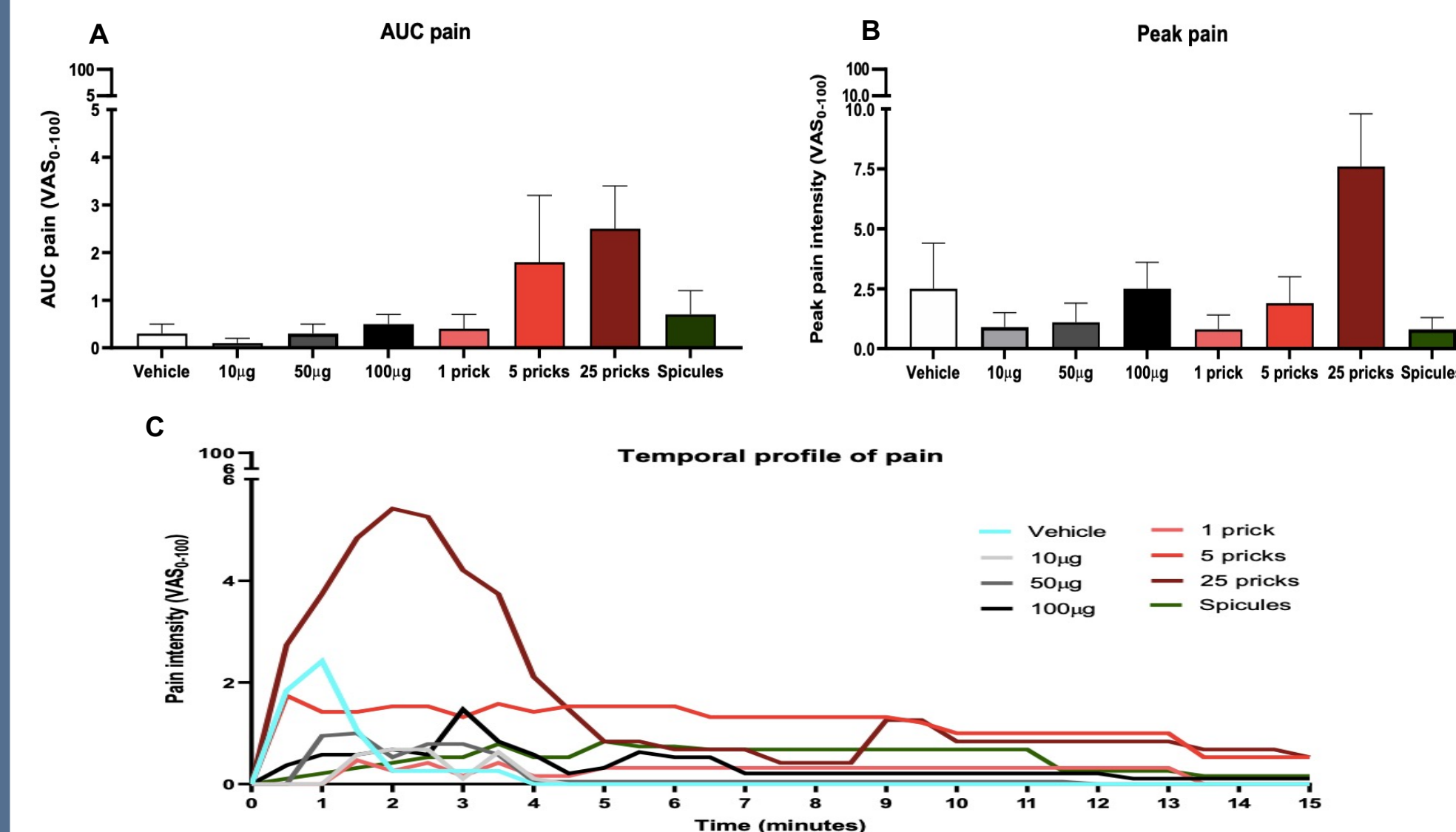


Figure 2: Pain profile. A) AUC pain; B) peak pain; C) temporal profile of pain.

RESULTS (CONT.)

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Sensory testing

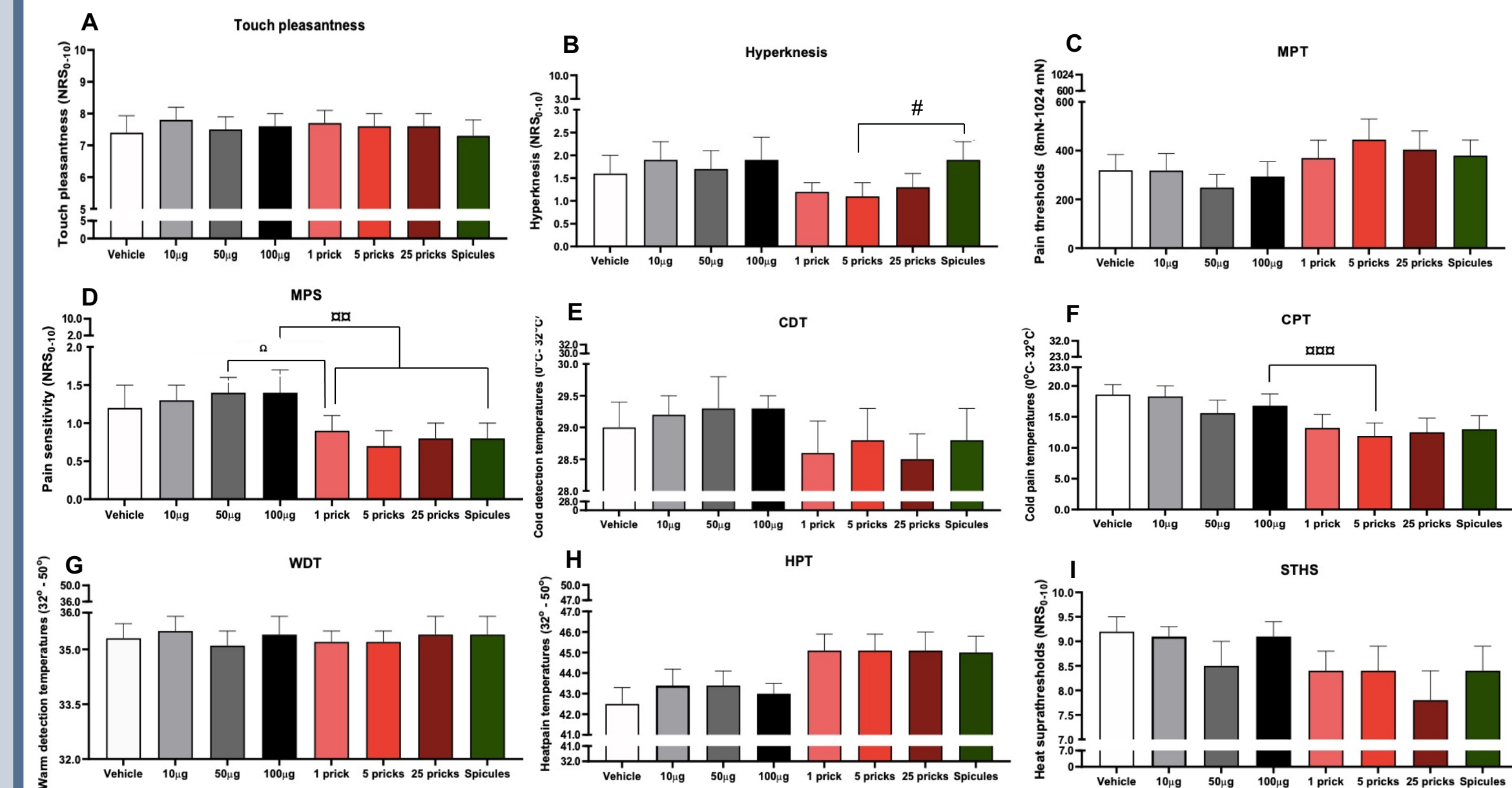


Figure 3: Sensory testing. A) Touch pleasantness; B) Hyperknesis; C) Mechanical pain threshold (MPT); D) Mechanical pain sensitivity (MPS); E) Cold detection threshold (CDT); F) Cold pain threshold; G) Warm detection threshold (WDT); H) Heat pain threshold (HPT); I) Supra-threshold heat stimuli.

CONCLUSIONS

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- Papain is an effective itch inducer when applied through inactivated cowhage.
- Further investigations using anti-histamine treatment are needed to confirm the selective non-histaminergic pathways of papain-induced itch.

REFERENCES

1. Andersen HH, Elberling J, Arendt-Nielsen L. Human surrogate models of histaminergic and non-histaminergic itch. Acta Derm Venereol. 2015;95(7):771-777.
2. Reddy VB, Lerner EA. Plant cysteine proteases that evoke itch activate protease-activated receptors. Br J Dermatol. 2010;163(3):532-535.