

Antioxidant Peptides Released by the Simulated Digestion of a Novel Chickpea Genotype (GB Cappuccino): A First Insight

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INTRODUCTION & AIM

Chickpeas have gained prominence as a sustainable source of protein, combining high nutritional value with potential health benefits. Recently, bioactive peptides derived from chickpea proteins have been investigated for their antioxidant properties, including their ability to neutralize free radicals and chelate metals. In this context, the new Cappuccino variety has emerged as a promising yet underexplored material. Preliminary studies suggest that protein hydrolysates from chickpeas may release active peptides, paving the way for applications in functional foods and nutraceuticals.

This study aimed to evaluate the release of antioxidant peptides during the simulated digestion of globulins, the major protein fraction (60–70%) of chickpeas, correlating the degree of hydrolysis with antioxidant activity.

METHOD

In vitro digestibility was assessed using the pepsin–pancreatin method. The amount of α -amino groups released (nmol leucine equivalents/mg protein) and antioxidant activity (μ mol TROLOX equivalents—TE/mL hydrolysate) were quantified via ABTS assay.

RESULTS & DISCUSSION

The hydrolysis profiles indicated low protein breakdown during the gastric phase, with 596.8 nmol leucine/mg protein released, whereas the intestinal phase led to a significant increase in hydrolysis, reaching 1650.83 nmol leucine/mg. Antioxidant activity showed a direct correlation with the degree of hydrolysis. For the obtained hydrolysates, antioxidant activity ranged from 854.99 to 1378.35 nmol TE/mg protein or from 2858.4 to 4838.7 μ mol TE/mL hydrolysate.

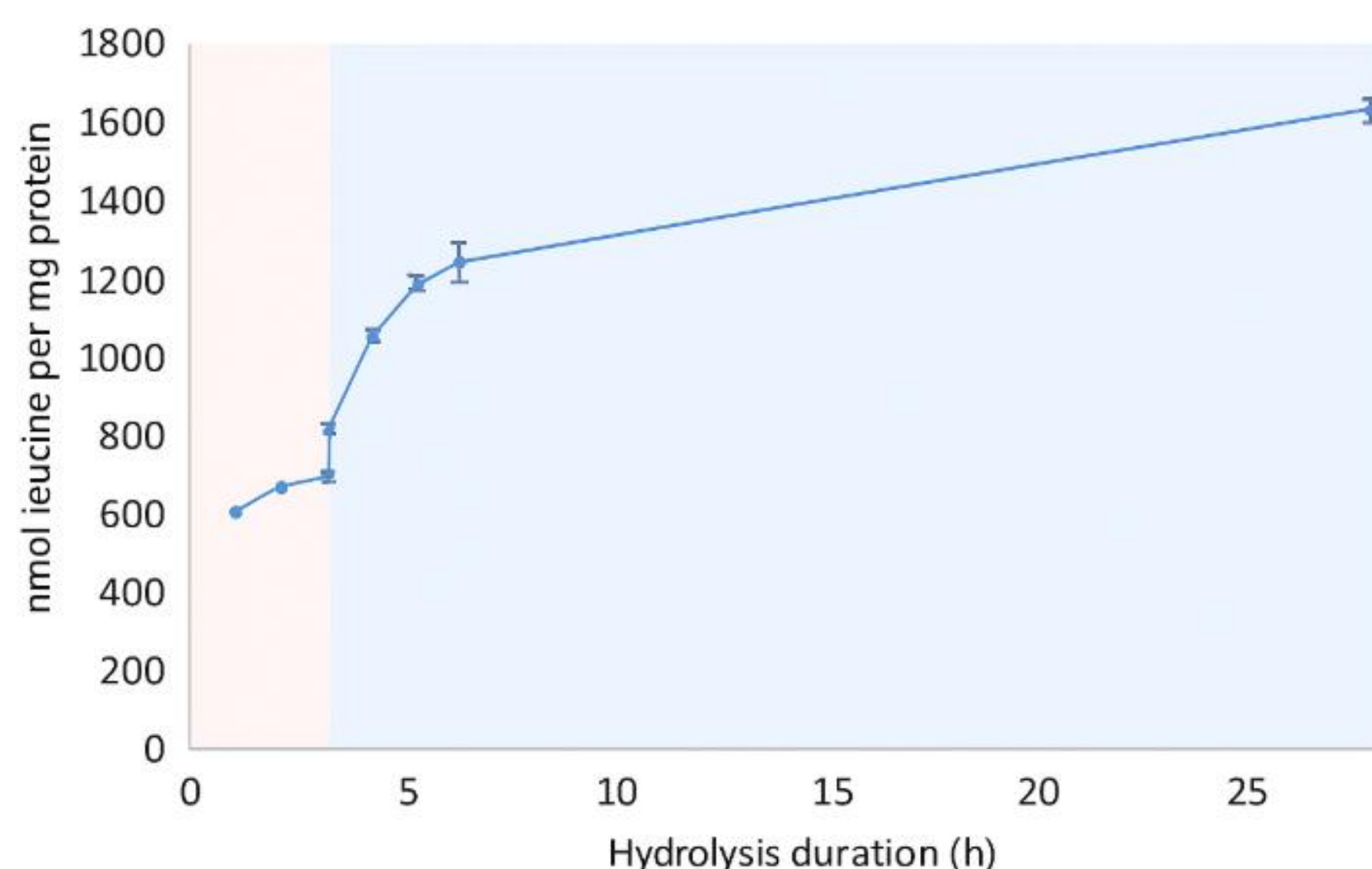


Figure 1. Hydrolysis degree of globulins extracted from the flour of chickpeas (GB Cappuccino type) during simulated digestion by enzymes pepsin (gastric phase: pink background) and pancreatin (intestinal phase: blue background), evaluated by the release of α -amino groups (nmol leucine/mg of protein). Data represent average of three repetitions.

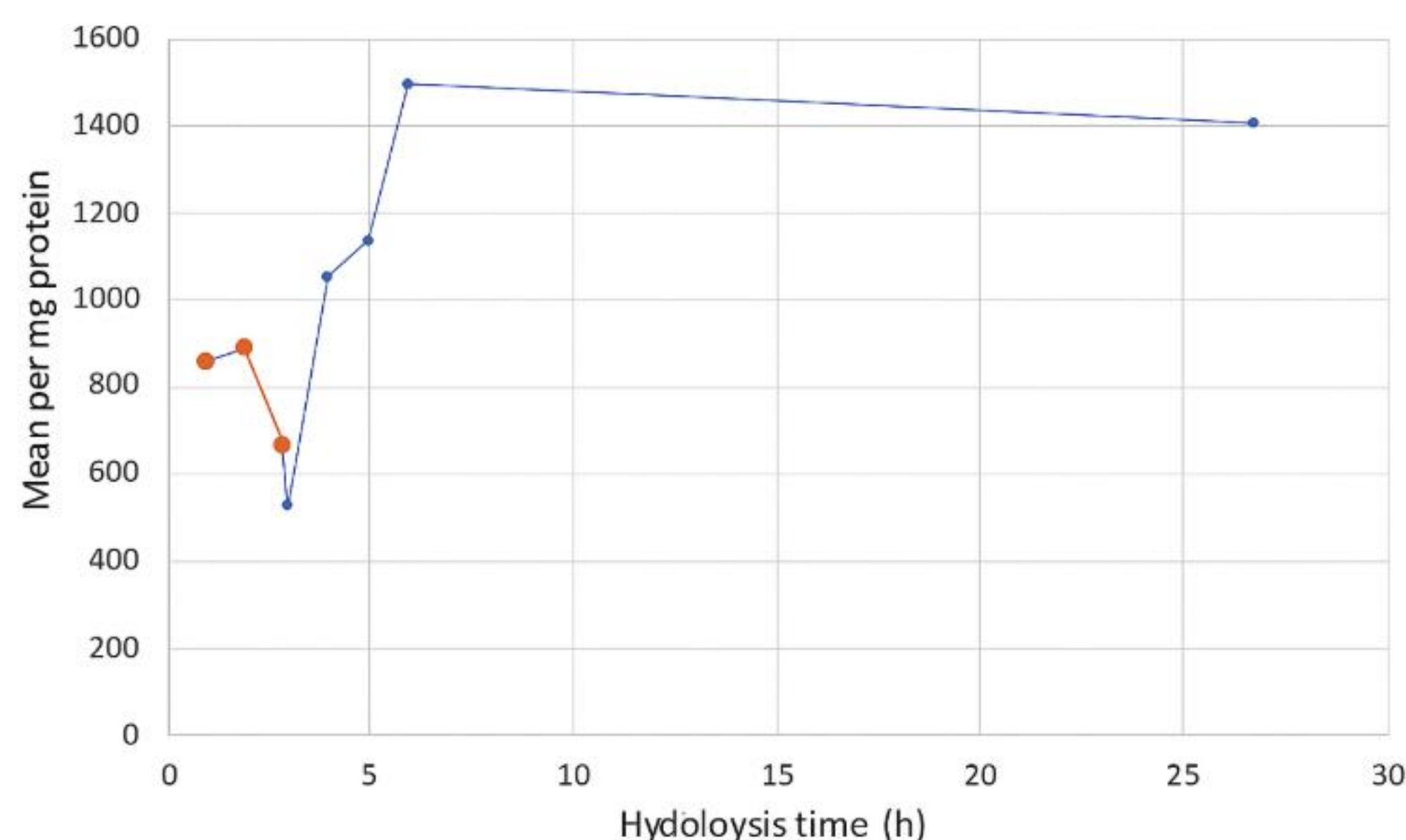


Figure 2. Antioxidant activity of hydrolysates from the globulin fraction of chickpea (GB Cappuccino variety), obtained by simulated enzymatic digestion with pepsin (1 h to 4 h) and pancreatin (5 min to 24 h). The activity was determined using the ABTS method, and the results are expressed as nmol Trolox equivalents per mg of protein.

CONCLUSION

These findings suggest a progressive release of peptides with higher antioxidant activity throughout simulated digestion. The *in vitro* digestion of globulins from the GB Cappuccino chickpea variety revealed a phase-dependent pattern of antioxidant peptide release, with a marked intensification during the intestinal phase. The correlation between protein hydrolysis and increased antioxidant activity reinforces the potential of this variety as a promising source of bioactive peptides for functional and nutraceutical formulations.

FUTURE WORK / REFERENCES

