



Antioxidant and Antihypertensive Activities of Giant Grouper (*Epinephelus lanceolatus*) Egg Protein Hydrolysates

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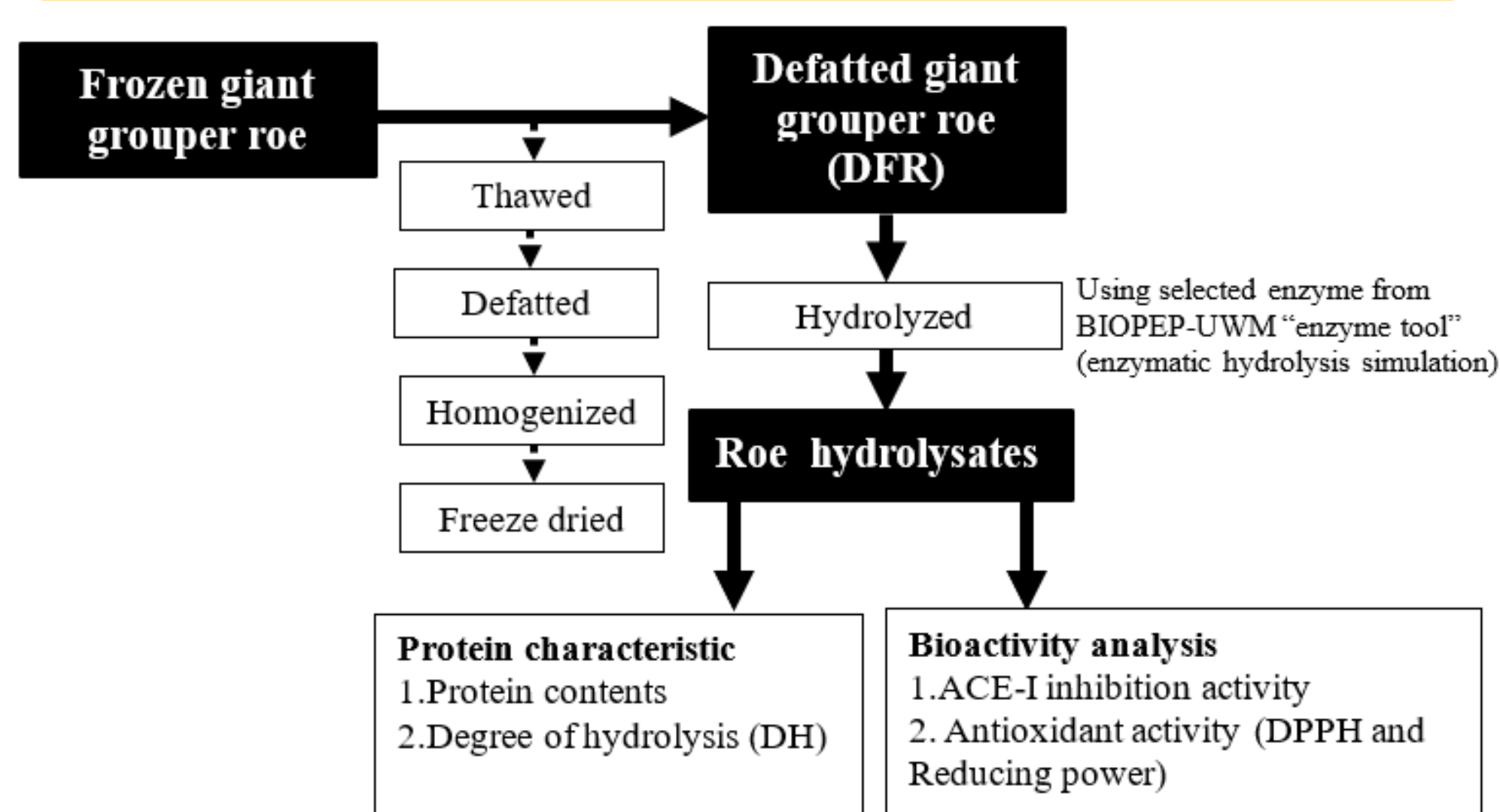
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Research Background

- Fish eggs have been recognized as a potential source of bioactive peptides due to their high protein content. Accordingly, the utilization of roe by-products from the giant grouper as sources of biopeptides to increase their value appears to be feasible. This research aimed to identify the bioactivities of giant grouper roe, particularly on antioxidant and angiotensin-I-converting enzyme (ACE-I) inhibitory activities.
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Experimental design



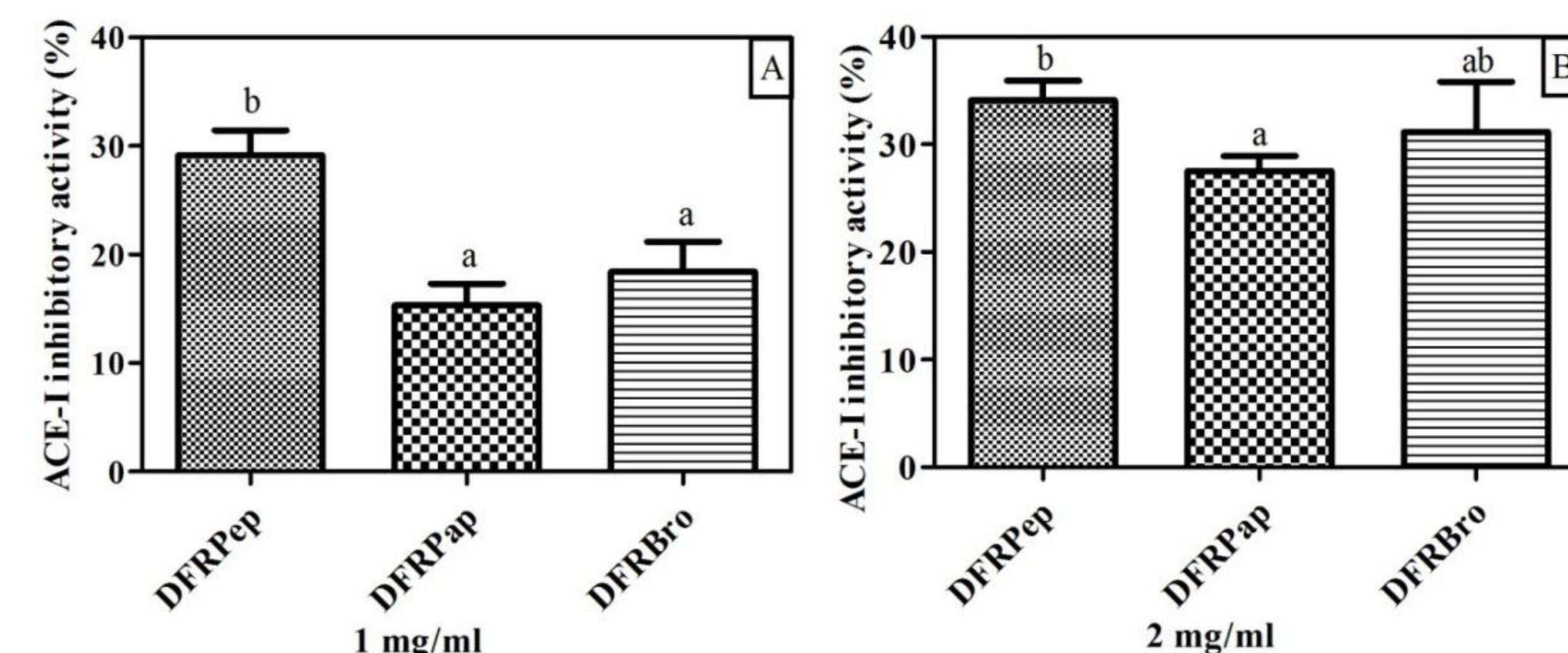
Bioactivity analysis

Antioxidant capacity

Sample	DPPH scavenging radical activity (%)		Reducing power activity (absorbance 700 nm) (nm)	
	1 mg/ml	2 mg/ml	1 mg/ml	2 mg/ml
DFR	9.35 ± 0.53 ^a	15.25 ± 0.54 ^a	ND	0.110 ± 0.019 ^{ab}
DFRpep	11.17 ± 0.06 ^b	19.27 ± 0.14 ^b	0.080 ± 0.002 ^a	0.092 ± 0.005 ^a
DFRpap	12.17 ± 0.54 ^c	21.36 ± 0.37 ^c	0.084 ± 0.005 ^a	0.151 ± 0.040 ^{ab}
DFRbro	11.21 ± 0.36 ^b	19.58 ± 0.14 ^b	0.105 ± 0.016 ^b	0.160 ± 0.045 ^c

- Grouper roe treated with papain and bromelain showed greater potential for DPPH scavenging activity at 21.36 ± 0.37% and reducing power activity at 0.151 ± 0.040%, respectively, than pepsin hydrolysates.

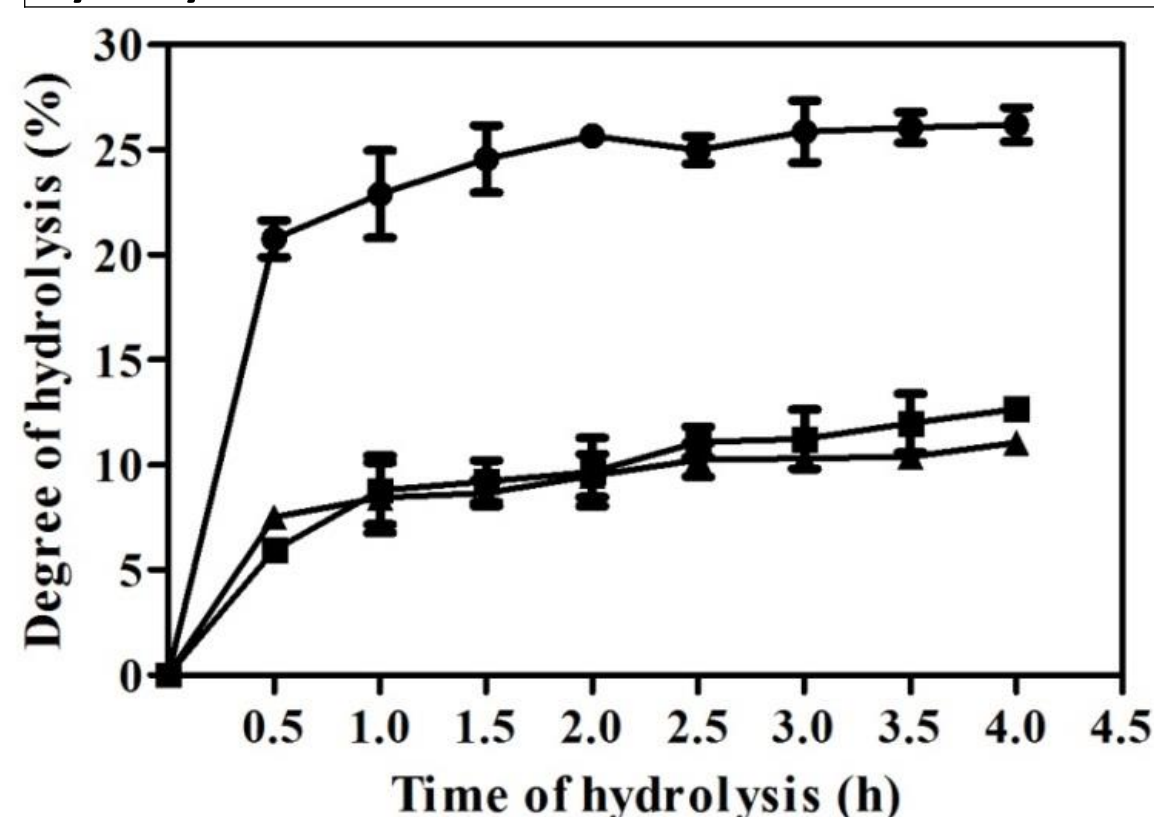
Angiotensin-I-converting enzyme (ACE-I) inhibitory



- At a concentration of 2 mg/ml, pepsin hydrolysates exhibited the strongest ACE-I inhibition, achieving 34.09 ± 1.83%, compared to bromelain and papain hydrolysates, which showed inhibitions of 31.15 ± 4.65% and 21.51 ± 1.41%, respectively.

Protein Characteristic

Sample	Abbreviation	Protein content (%)	Yield (%) [*]	Maximum DH (%)
Defatted giant grouper roe pepsin hydrolysates	DFRpep	91.46 ± 0.30 ^c	59.99	26.20 ± 0.80 ^c
Defatted giant grouper roe papain hydrolysates	DFRpap	73.03 ± 0.76 ^b	23.43	12.66 ± 0.42 ^b
Defatted giant grouper roe bromelain hydrolysates	DFRbro	52.17 ± 0.52 ^a	17.09	11.07 ± 0.24 ^a



● Pepsin
■ Papain
▲ Bromelain

- Pepsin hydrolysates produced the highest yield at 59.99%, followed by papain (23.43%) and bromelain (17.09%), with protein content at 91.46%, 73.03%, and 52.17%, respectively.

Conclusions

- In vitro ACE-I inhibiting analysis of roe hydrolysates from pepsin proteolysis generated the strongest activity.
- Pepsin roe hydrolysates greatly possessed neither DPPH scavenging activity nor reducing power activity.
- Giant grouper roes can be considered as a potential and promising raw material for the generation of desirable bioactive peptides, especially ACE-I inhibitory peptides.

Future work

- Fractionation of roe pepsin hydrolysates could be conducted to improve the activity of ACE-I inhibitory.
- In vivo analysis of roe hydrolysates could be performed to examine the influence of gastrointestinal enzymes towards bioactive peptides generation, while the simulation of gastrointestinal digestion are potentially produced greater amount of ACE-I inhibitory peptides.

References

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