

FucoMAX™ Fucoidan Protects Gastrointestinal Health

What is FucoMAX™?

- BGG's FucoMAX™ is a product name of fucoidan polysaccharide-rich extract that is extracted from brown seaweed.
- Features of FucoMAX™:
 - Physical Appearance: Slightly viscous white powder
 - Specification: Fucoidan $\geq 50\%$

BGG FucoMAX™ Fucoidan

Product Name	Code	Botanic Name	Fucoidan (%)	SO ₄ ²⁻ (%)	Fucose (%)
FucoMax™ Fucoidan 50% Powder	LA-50	<i>Laminaria japonica</i>	50.00% Min.	7.00% Min.	17.00% Min.
FucoMax™ Fucoidan 80% Powder	GD-247	<i>Cladosiphon okamuranus</i>	80.00% Min.	10.00% Min.	47.00% Min.

Dry seaweed



Okinawa seaweed



What is Fucoidan?

- Fucoidan is a sulfated polysaccharide found mainly in various species of brown algae and brown seaweed such as kelp, wakame and mozuku.
- Fucoidan is a polymer of L-fucose mainly linked with $\alpha(1\rightarrow2)$ and $\alpha(1\rightarrow4)$ bonds. It can be made of several thousands of fucose units with a molecular weight around 200,000.
- Fucoidan is reported to have biological activities such as liver function improvement, blood pressure suppression, cholesterol lowering, antimicrobial activity and anti-allergy.

Gastrointestinal Protection Effect of FucoMAX™



- Background: Fucoidan is expected to have protective effect against gastric mucosal due to its polysaccharide viscosity. However, to date there has been no solid research reported on this feature.
- Purpose: To study the gastric mucosal protection effect of fucoidan by using FucoMAX™ in the animal tests.
- Method: The protection effect of FucoMAX™ is studied on the gastric mucosal damage animal model induced by alcohol.

The Experiment

Test animal: 10 SD male rats in each group

Material: FucoMAX™ (FMx)

Method: Oral administration of 5 mL/kg solution for 30 days.
Anhydrous ethanol is fed one hour before sacrifice.

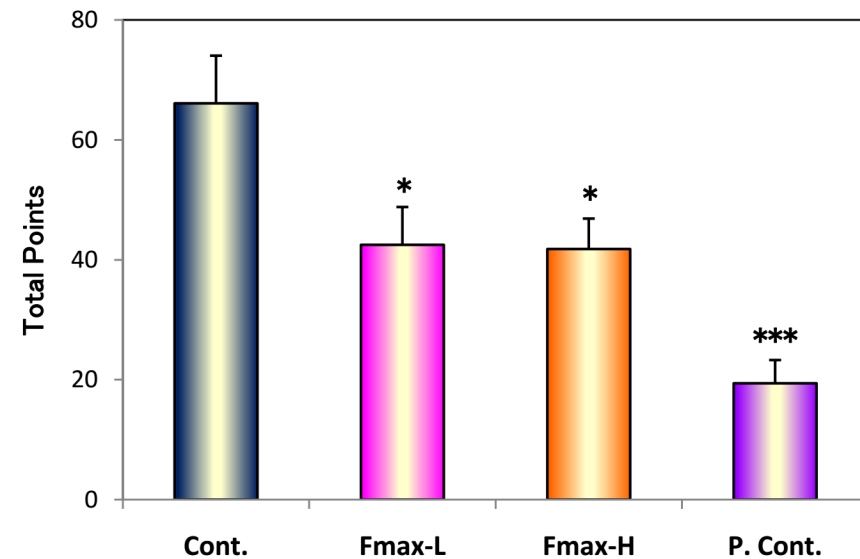
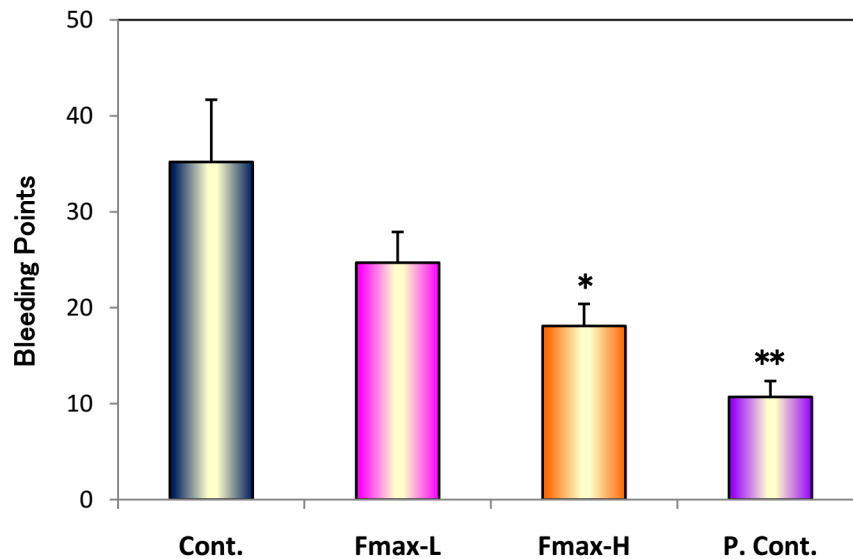
Study items: Pathological observation of gastric mucosal bleeding
Biochemical study of PGE₂, MDA, and NO concentrations and SOD activity.

Material	Group	Ethanol (1ml/each)	Dose (mg/kg)	Times of Recommended Dose for Human
Sterile Water	Nor	—	—	—
Sterile Water	Cont	○	—	—
FucoMAX™	FMx-L	○	25	1
FucoMAX™	FMx-H	○	167	10
Cimetidine	P. Cont	○	160	—

Result-1 : Gastric Mucosal Bleeding

Method

- The damage point is given based on damage severity observed by microscopy.
- Numbers of bleeding points, length of bleeding, and width of bleeding band are recorded.
- A total score is given based on the combination of separate scores.



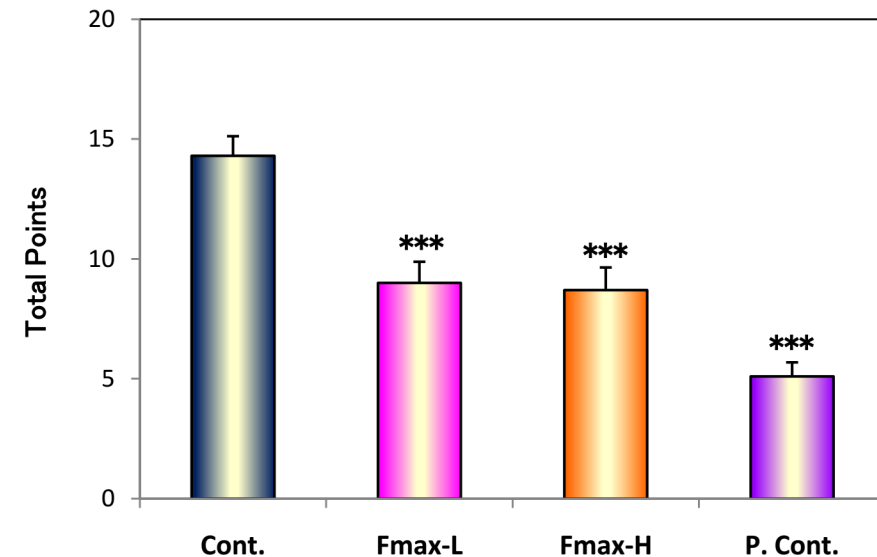
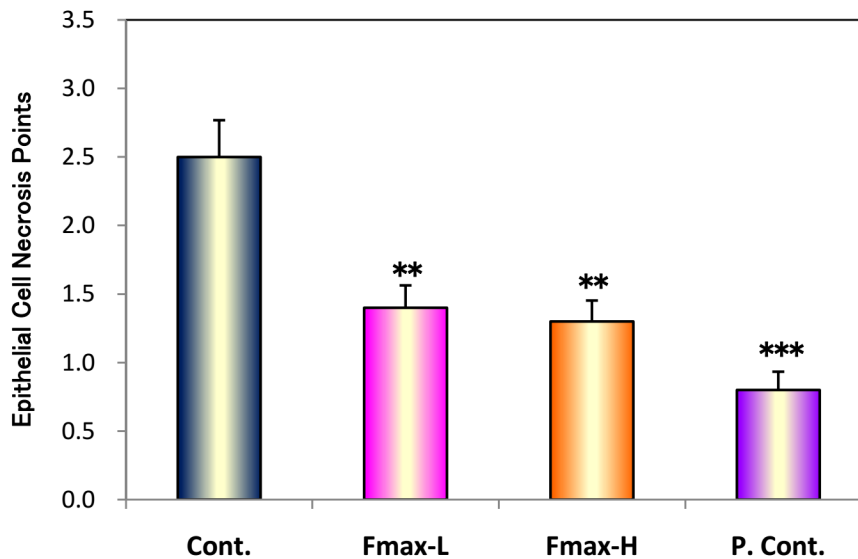
Mean \pm SE, T-test

vs Cont, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Result-2: Pathological Study of Gastric Mucosa

Method

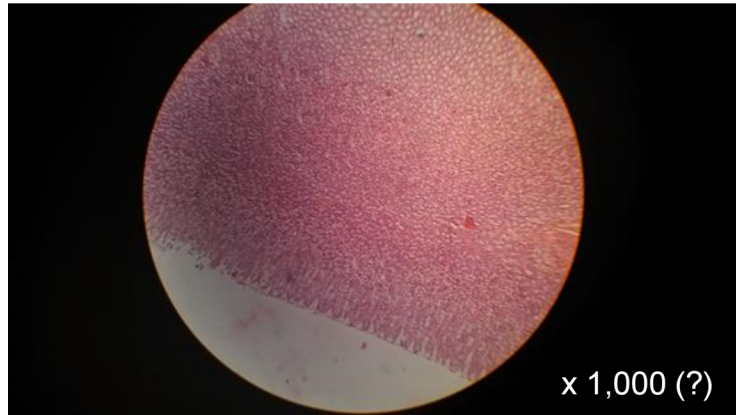
- A 10 x 2 mm area of gastric mucosa with most intense damage is cut off and stained.
- Observation of hyperemia, bleeding and epithelial cell necrosis.
- A total score is given based on the combination of separate scores.



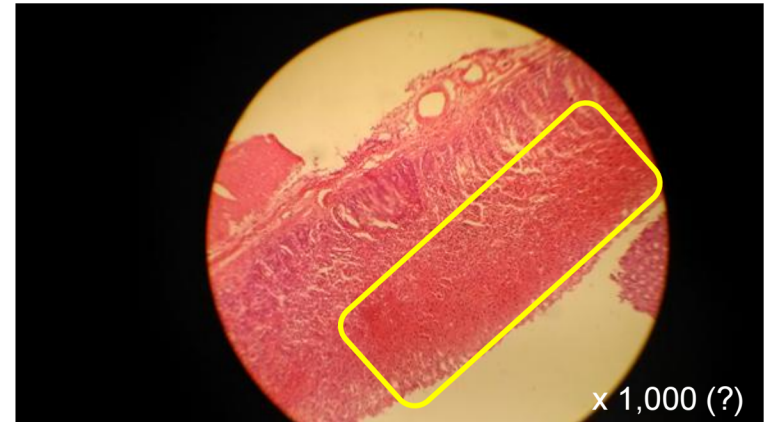
Mean \pm SE, T-test

vs Cont, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Microscopy Images



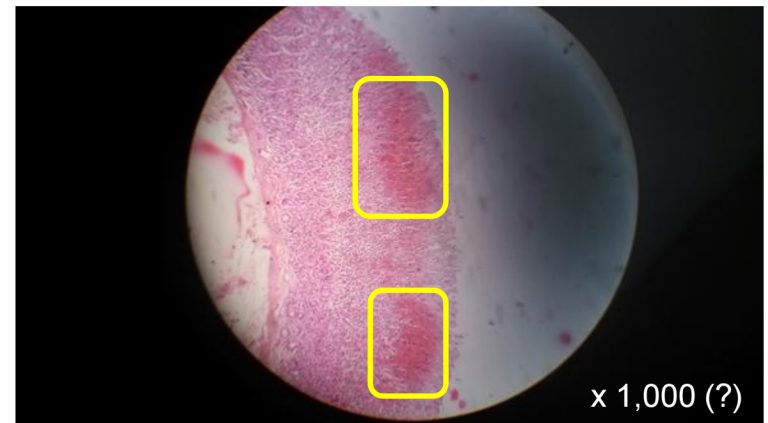
Nor Group



Cont Group

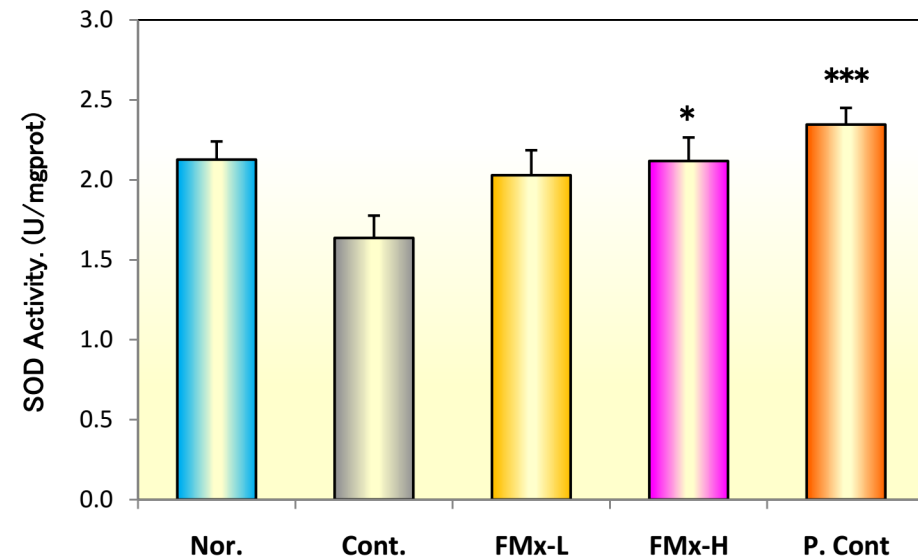
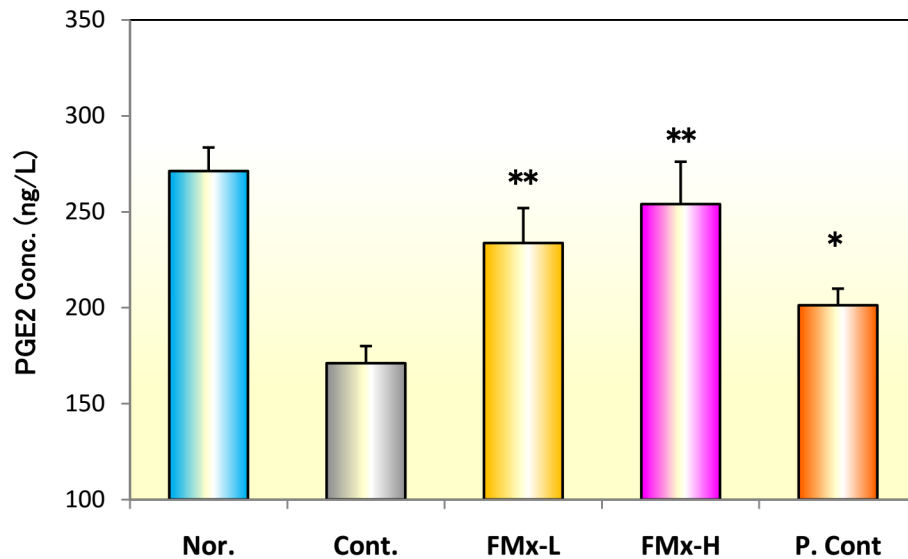


FMx-H Group



P. Cont Group

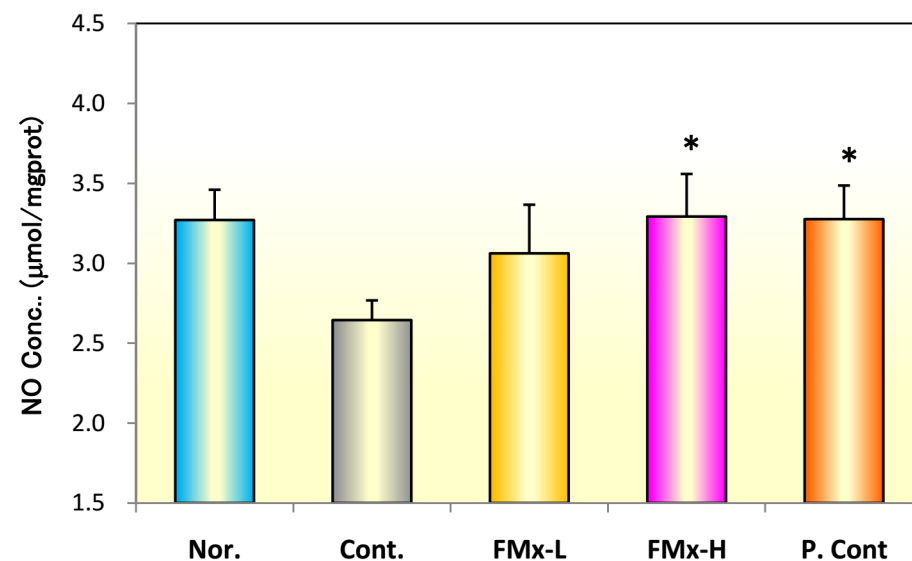
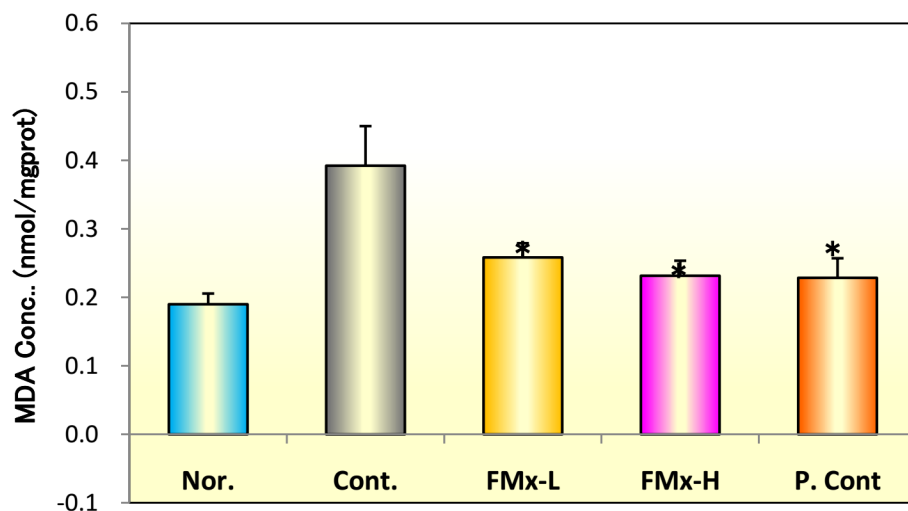
Result-3 : Biochemical Studies (PGE2 and SOD Activity)



Mean \pm SE, T-test

vs Cont, * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Result-3 : Biochemical Studies (MDA and NO)



Mean ± SE, T-test

vs Cont, * p < 0.05; ** p < 0.01

Summary

- FucoMAX™ shows obvious protective effect against gastrointestinal mucosa damage induced by ethanol in rats.
- The histopathology and biochemical markers of gastric mucosa were significantly improved by administration of FucoMAX™, compared with model groups.