

マッコウタコイカ *Gonatopsis makko* の筋肉および肝臓のジ アシルグリセリルエーテル成分

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Short Paper

Diacyl Glyceryl Ethers in the Flesh and Liver of Gonatid Squid *Gonatopsis makko*Kenji Hayashi*¹ and Ken-ichi Kawasaki*²

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Recently, it has been shown that all of a number of gonatid squids *Beryteuthis magister*^{1,2)} and *Gonatopsis borealis*³⁾ contained unusually high amounts of glyceryl ethers (GE) in the form of diacyl glyceryl ethers (DAGE)

Table 1. Compositions of lipid classes and glyceryl ethers and fatty acids of the flesh and liver lipids of *G. makko*

	Flesh	Liver		
Lipid content %* ¹	1.5	44.1		
Lipid component %* ²				
SE	0.1	2.3		
DAGE	0.3	84.7		
TG	—	—		
ST	11.5	1.2		
PL	74.3	3.4		
Unsaponifiable material content %* ²	12.3	36.1		
Unsaponifiable material component %* ³				
ST	90.3	7.8		
GE	3.2	90.3		
Component* ⁴	GE	FA	GE	FA
	Peak area %			
14:0	1.5	2.1	0.8	3.4
16:0	68.6	18.8	67.2	5.3
18:0	3.8	1.6	4.0	0.8
16:1	1.0	2.7	0.6	7.8
18:1	18.1	12.1	22.5	40.4
20:1	2.0	5.4	3.0	12.2
22:1	tr* ⁵	0.6	0.6	10.1
20:5 ω 3		16.8		5.3
22:6 ω 3		31.5		2.2

*¹ % to wet weight basis of tissue.*² % to total lipid.*³ % to unsaponifiable material.*⁴ No. of carbon atom: no. of double bond.*⁵ Trace (less than 0.05%).

SE: Steryl ester, DAGE: Diacyl glyceryl ether, TG: Triglyceride, ST: Sterol, PL: Phospholipid, GE: Glyceryl ether, FA: Fatty acid.

in this livers. Also, one specimen of an other gonatid squid species *G. makko*⁴⁾ was found to have a high level of these compounds in its liver. A further study was made for the compositions of lipid classes and GE and fatty acids of the flesh and liver lipids of another one specimen of *G. makko*, 89 g in body weight, caught in the Japan Sea.

Lipid extraction and analysis were performed as described in a previous report.³⁾

The compositions of lipid classes and GE and fatty acids of each tissue lipid of *G. makko* are given in Table 1. As shown in Table 1, liver lipids were characterized by a high level of DAGE (84.7%), comprised mainly of chimyl alcohol (16:0, 67.2%) and selachyl alcohol (18:1, 22.5%). DAGE were also observed in the flesh lipids in minute quantities. However, significant quantities of phospholipids (74.3%) were observed. The component GE of the flesh was very similar in composition to those of the liver. The unsaponifiable materials consisted predominantly of 90.3% of GE for the liver and 90.3% of sterols for the flesh. The fatty acid composition of the liver was markedly different from that of the flesh. The former contained largely of monoenoic acids (74.4%) with 18:1, 20:1 and 22:1, while the latter consisted of more polyenoic acids (54.9%) with 20:5 ω 3 and 22:6 ω 3.

The compositions of lipid class and GE from the examined liver of *G. makko* in this study were in agreement with those of the same species⁴⁾ reported previously. The *G. makko*, as well as *B. magister*^{1,2)} and *G. borealis*³⁾ all belong to the family Gonatidae. They were of a peculiar squid species which contained significant amounts of DAGE in their livers. On the other hand, the biological role of a high content of DAGE in marine organisms is not well known. From the viewpoint of physiological or ecological roles in the marine environment, it is interesting to note that the gonatid squid species contains DAGE in its livers.

References

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