Title	Changes in fatty acid composition of the Japanese oyster across environmental gradients
Author(s)	Abdulkadir, Sakdullah; Tsuchiya, Makoto
Citation	琉球大学21世紀プログラム「サンゴ礁島嶼系の生物多様性の総合解析」平成17年度成果発表会
Issue Date	2006-03-06
URL	http://hdl.handle.net/20.500.12000/844
Rights	

PE-15 **Changes in fatty acid composition of the Japanese oyster across environmental gradients**

Sakdullah Abdulkadir and Makoto Tsuchiya
Laboratory of Ecology and Systematics, Faculty of Science, University of the Ryukyus, Senbaru-1, Nishihara, Okinawa 903-0213, Japan

Changes in environmental conditions can influence and modify community dynamics and food webs in marine ecosystems. Among benthic filter feeders the Japanese oyster, *Crassostrea gigas*, is one of the commonest filter feeders along intertidal area of Okinawa Island. In order to elucidate the origin and changes in dietary sources of the Japanese oyster in respect to environmental conditions, fatty acid compositions of the Japanese oyster were examined from local scale (100s to 1000s m) to meso-geographical scale (6s to 30s km) across ecosystems. The Japanese oysters, *C. gigas*, were collected from 6 different sites covering 3 estuaries, i.e. Manko, Ajagawa and Hijagawa Estuaries, and 3 ports, i.e. Nakagushuku, Sashiki and Azama Ports, and then each site was split to 2 sampling stations with respect to environmental gradient, i.e. in landward and seaward near the mouth of estuary or port. Along this study in situ environmental variables such as suspended particulate matter (SPM), chlorophyll a as well as salinity and temperature were sampled. Great changes in fatty acid compositions of the Japanese oyster were found among sites for fatty acid classes, i.e. branched (BrFA), monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids e.g. 3 and 6 PUFA, but not for saturated one (SAFA). The most significant variations in fatty acid compositions were observed across different type of ecosystems, i.e. between estuaries and ports. The significant differences were also recorded among estuaries and among ports it self. Moreover within local scale a significant change was detected for BrFA within the Hijagawa and MUFA within the Hijagawa and the Ajagawa Estuaries. However there was no any significant variation within local scale for port ecosystems. Changes in fatty acid compositions of the Japanese oyster are likely to reflect not only originating from the dietary sources but also possibly due to a physiological response. The 3 and 6 PUFA were responsible for dietary changes, while 18:0 *anteiso* BrFA seemed to be related to the physiological response of the oyster. The significant variations in dietary sources were particularly contributed by diatoms and dinoflagellates as indicated by 20:5 3 and 22:6 3 fatty acids, respectively, which were the major contributors for PUFA. Unusual high contribution of 18:0 *anteiso* in the fatty acid composition of the Japanese oyster from all sites indicates that this fatty acid might be synthesized de novo by the oyster. However changes in 18:0 *anteiso* seem to be also modulated by environmental factors affecting metabolic process of the oyster. Further more, the presences of long chain fatty acids (LCFA) in the oyster from all sites, with mangrove or without mangrove habitats, suggested that terrestrial plant materials had been drifted to coastal areas. The greatest significant changes in environmental conditions, i.e. SPM and chlorophyll a, were recorded among sites across ecosystems (between estuaries and ports) and then among sites of the same type of ecosystems (among estuaries or among ports), while the lowest variations were found within sites except the Hijagawa Estuary. As a result, changes in the fatty acid compositions of the Japanese oyster are presumably affected by environmental conditions with greater variations across the different type of ecosystems and little changes within the local ecosystems.