Seasonal changes in Li/Ca ratio and inferred phytoplankton abundance as analyzed by daily growth increments of *Pecten albicans* (Bivalvia)

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To evaluate the potentials of scallop shells as paleoenvironmental archives, Li/Ca ratio and other geochemical data were obtained using LA-ICP-MS for the *Pecten albicans* specimen (KSG-th001) collected alive on April 29, 2011, from Tosa Bay, and was analyzed in relation to the seasonal changes of environmental parameters including water temperature and Chlorophyll *a* (Hirota and Ichikawa, 2012). In the analysis, fine striae on the left valve of *P. albicans*, were used as daily growth marker.
As a result, the analyzed specimen displayed overall higher rate of shell growth from spring to summer, while shell growth slowed down in fall and winter in 2010. A white band (annual ring) on the generally brown left valve corresponds to the lower rate interval of shell growth. However, another lower shell growth interval is recognized between spring (ca. 50 days) and late summer (ca. 20 days). This corresponds to the lower water temperature interval in late June and early July at 100 m depth in Tosa Bay, which is interpreted as representing upwelling associated with anticlockwise rotational current in Tosa Bay when the Kuroshio current became close to the shore.
These microgrowth patterns of the shell of *Pecten albicans* displayed a close similarity to the Li/Ca profile. Li enrichment in scallop shells is considered to have originated from the frustules of edible species in the digestive tract of scallops, and Li/Ca ratio of *P. maximus* in a bay in France was proposed as a proxy of timing and magnitude of diatom bloom (Thébault and Chauvaud, 2013). Our study confirms the validity of Li/Ca in scallop shells as a proxy of diatom bloom for different scallop species in a distant biogeographic province.
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Keywords: Li/Ca, Pecten albicans, daily growth increment, seasonal change, plankton bloom

