Active structures of the Sagami Bay Fault by high-resolution sub-bottom profiling and pin-point core sampling

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Seafloor knolls called the Okinoyama Bank Chain are aligned in the eastern slope of the NW trending Sagami Trough. Existence of the Sagami Tectonic Line is estimated at the slope base and interpreted as a tectonic boundary of a subdution zone (Kimura, 1973, Kagaku). Ohkochi (1990, Chigaku Zasshi) reported active faults and an anticlinal fold based on seismic profiles. An eastward dipping reflector is recognized at the southeastern extension of the Kozu-Matsuda Fault by onshore-offshore integrated seismic imaging and interpreted as a splay fault of the plate boundary fault (Sato et al., 2010, Annual Meeting abstract of the Geological Society of Japan). However, Deformation of shallow sediment recording recent activity has not been clarified. The purpose of this study is to reveal recent fault activity by high resolution subbottom survey and sediment sampling. We carried out deep towed subbottom survey and pinpoint sediment sampling by remotely operqated vehicle NSS in the southwest slope of the Misaki Knoll during the Hakuho-maru cruises KH-10-3, KH-11-9 and KH-16-5. NSS can take piston cores at pinpoint accuracy by four propeller thrusters, video cameras and a payload fuck. Deep towed subbottom survey can obtain high resolution subsurface structure by pinging 1.1 to 1.6 kHz chirp frequency and receiving near the seafloor. Subbottom profiles across the southwest slope base of the Miura Knoll show a reflector suggesting a fault plane at the scarp base. The reflector dips 30 degree to northeast. Although the hanging wall shows structureless, the foot wall exhibits horizontal reflectors or chaotic suggesting talus deposit. We successfully obtained a 6-meter-long core after confirming a dipping reflector of a possible fault plane. The upper 1.2 meters of the core sample consists of alternation of dark green silty mud and pebbly mud with shell fragments of Calyptogena fossils. Thin silt layers are intercalated with dark green clay at about 15 cm intervals. A 5-mm thick zone, which suggesting a fault plane and consists of silty mud and granule size clasts, is recognized at 2.25 m from the core top. This zone, dipping 30 degree toward north to east after paleomagnetic restoration, is interpreted to correspond to the reflector of the fault plane on subbottom profiles. We also present shallow subsurface structures around the Miura Knoll.

Keywords: active fault, talus deposit, active fold

