

## High-tech dredge system for abyssal bedrock research; dredge system with acoustic real time monitoring on deep sea floor.

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It is very important to recover geological samples including hard rocks and soft materials from ocean floor to investigate bedrocks itself as well as sea floor environment on the basis of the material scientific aspects. Dredge haul methods being a simple and easy way with low costs, have been widely used for recovering the bedrocks. One of author (TI) has been working on the dredge hauls during about 40 years on the several Japanese and American Research Vessels (R/Vs), that is, R/V Tansei Maru, R/V Hakuho Maru, R/V Yokosuka, and R/V Kairei as well as R/V Atlantis-II, R/V Melville (2 times), R/V Moana Wave, and R/V Thomas Thompson, respectively. He has been proposing the (1) ORI-TI type dredge system, which has been improved and still improving on the basis of the better ideas gathered from the above mentioned all cruises. The dredge systems in the US Research Vessels have been continuing the conventional and basic technical methods, that is, box type chin-bag dredge (within or without fishing net) and using tension-meter as well as pinger.

On the other hand, Japanese scientists have been recently improving the traditional dredge systems with active introduction of high technique, for example, (2) transponder system and/or (3) deep sea TV camera system during dredge hauls. (4) new underwater acoustic transmission system of real-time TV-image.

(1)ORI-TI (Ocean Research Institute T. Ishii) type dredge system is composed of box type chain-bag dredge with steel bucket which can recover any sea bottom material including hard rocks as well as sand, mud and organisms(Ishii, 2017).

(2)Acoustic transponder attached on the dredge wire can mention real-time position of the dredge system on monitor showing pre-surveyed bathymetric map in the navigation room, This system helps safe and reliable rock sampling (Machida et al, 2011).

(3) Box-cage type dredge with installed deep sea TV camera system can record occurrence of bed rocks during dredge hauls (Sakamoto et al, 2017).

(4) New underwater acoustic transmission system of real-time TV -image with every 2 second from Shinkai 6500 to R/V Yokosuka put to practical use (Sakurai, 2018) on the basis of the new underwater acoustic communication system (Kida et al, 2018). If we can get low price (about USD\$10,000) above mentioned system in a near future, it will be applied to the dredge hauls with real-time monitor on the sea bottom. The author (T.I.) assumes that its application fields are very wide; piston core, mooring system, ocean bottom seismometer, net fishing etc.

### Reference

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