

The decay process of and the biological community on sea turtle-falls at the Tsukumo Bay, Noto Peninsula, Japan

*Midori Suzuki¹, Robert Jenkins², Shouzo Ogiso³, Masahiro Matada³, Nobuo Suzuki³

1. Division of Environmental Science and Engineering, Graduate School of Natural Science and Technology, Kanazawa University, 2. Kanazawa University, 3. Institute of Nature and Environmental Technology Kanazawa University

The whale-fall community is one of the unique biological community formed on decaying whale carcass on the sea floor. The community thought to be changed at least four stages of ecological successions, i.e. the mobile scavenger stage, the opportunist enrichment stage, the sulphophilic stage and the reef stage. Molecular studies on some organisms included in the community suggested that the origin of the vent- and/or seep-restricted animals have come from through environments formed around such organic-falls. In this point of view, the reptile-falls would be more important than the whale-falls because of its longer fossil record than the marine mammals. Although the ecosystem on the whale-fall has been studied well, the ecosystem on the reptile-fall hasn't been studied in details. Thus, we examined the decaying process of four sea turtles deployed on shallow sea floor (11 to 14 m in depth) in Tsukumo Bay, Noto Peninsula, Japan. The carcasses were observed by scuba, and some bones of the carcasses were recovered time to time to examine organisms which lived on/in the bones.

5 days after deployment, the sea turtle carcasses were covered by white microbial mat (*Beggiatoa* spp., indicator of sulphophilic stage). 21 days after deployment, the carcass was eaten by fish (indicator of mobile scavenger stage). *Zoothamnium* sp. (indicator of sulphophilic stage) was observed on the carcass. 36 days after deployment, dorvilleid and nereidid polychaetes (indicator of opportunistic stage) lived in the bones and barnacles (Crustacea; indicator of the reef stage) were attached to the bone. Thus, all four stages of ecological succession observed on whale-falls have also been observed on the sea turtle falls within 36 days after deployment. It is noteworthy that the sea turtle-fall sustained chemosynthetic community as same as whale-falls.

To examine sustainability of opportunistic and sulphophilic stages, we compared faunal assemblages in/on the recovered bones of the sea turtle carcasses with different body size and deployment period. Organic matrix was still remained in the bones of 2016ST-1 (green turtle, carapace length (CL) = 42 cm, 144 days after deployment) and 2013ST-L (loggerhead turtle, CL = 72 cm, 3 years after deployment). There were *Beggiatoa* microbial mats, *Zoothamnium* sp. and dorvilleid polychaetes in/on the bones. In contrast, there is no organic matrix in the bones of 2013ST-S (green turtle, CL = 36 cm, 3 years after deployment), and there were no *Zoothamnium* sp. and dorvilleids. Thus, the smaller sized carcass exhausted within 3 years, but the larger carcass sustained opportunistic and sulphophilic stages more than 3 years.

Keywords: sea turtle, carcass, whale-fall