

Stratigraphic horizons of the chemosynthetic fossil assemblages, northwestern coastal area of Leyte Island, Philippines.

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Chemosynthetic molluscan assemblages have been found along the coastal area of northwestern Leyte, Philippines (Kase et al., 2005; Majima et al., 2007). The strata of this area consist of two cycles of upward-coarsening (mudstone-dominated facies, sandy mudstone- and muddy sandstone-dominated facies, and sandstone-dominated facies, in the ascending order) to upward-fining (sandstone-dominated facies, sandy mudstone- and muddy sandstone-dominated facies, and mudstone-dominated facies, in the ascending order) sedimentary sequences. We dated three horizons of the succession: 6.8-3.8Ma in the mudstone-dominated facies of upward-coarsening sequence of the first cycle by nannofossil dating (Formation B of Majima et al., 2007), 3.8-3.65Ma in the mudstone-dominated facies of the upward-coarsening sequence of the second cycle by nannofossils (Formation C of Majima et al., 2007), and 3.12-3.09Ma in the sandstone-dominated facies of the upward-fining sequence of the second cycle by foraminifer dating. These ages suggest that the two cycles of sedimentary successions had been probably controlled by the third-order eustatic sea-level changes.

The Burabud Tuff, consisting mainly of pumiceous lappili and coarse ash tuffs, occurs just below the sandstone-dominated facies of the upward-coarsening sequence of the second cycle, and is a key bed to construct the stratigraphy of the study area. Chemosynthetic fossil assemblages occur dominantly just below this tuff bed. Ridges seen along the coasts of this area probably consist of the authigenic carbonates precipitated just above, below, and itself of the Burabud Tuff, due to methane seep activities. Slumping structures are abundantly observed in the second cycle of the sequence, and frequently interrupt the lateral continuities of the lithofacies including the Burabud Tuff.

Chemosynthetic fossil assemblages in this area consist of vesicomid, lucinid, thyasirid, solemyid, and mytilid bivalves, and their species composition and the modes of occurrences greatly differ in each location. At the Cambantug village, a small colony of *Calypptogena* and *Bathymodiolus* species occurs in mudstone in associations with authigenic carbonates (micritic dolomite) that depleted largely of ¹³C (-37.2 to -30.9 per mill vs. PDB). This colony is surrounded by *Conchocele* bivalves, probably reflecting the proximal to distal relations with the seepage. At the Liog-liog Peninsula, disarticulate vesicomids and solemyids sporadically occur in slump facies. This occurrence suggests a close relationship between methane seepage and slump activities. At the Antipolo Peninsula, articulated lucinids are greatly aggregated in authigenic carbonates. This mode of the occurrence is very similar to those of the cold-seep fossil assemblages in Japan (Kazusa and Miyazaki Groups) (Majima et al., 2005).

References

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