

COBBLESTONE AREA ON THE WESTERN MEDITERRANEAN RIDGE : RE-VISITED AGAIN. A PRELIMINARY REPORT

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During the 4th Training-through-Research Cruise (1994), the underway 2-day investigations in the Cobblestone area on the western Mediterranean ridge were carried out with the OKEAN long-range sidescan sonar and the MAK-1 deep-tow acoustic system. This area was chosen by two reasons :

(i) the Prometheus mud diapir in this locality was the first one discovered on the Mediterranean Ridge, and its mud breccia contains the fragments of the oldest (Middle Cretaceous) rocks (CITA *et al.*, 1981; RYAN *et al.*, 1982);
(ii) on the Gloria mosaic, compiled by KENYON *et al.* (1982), some highly reflective patches arranged along a single lineament are seen in the Cobblestone area. The position of one of them coincides with the known position of the Prometheus mud diapir, that is why other dark patches were supposed to be mud diapirs and mud volcanoes as well.

Two parallel tracks ran with the OKEAN sidescan sonar roughly in a N-S direction allowed us to make the mosaic for the area with a total swath range of about 25 km. Some features with intensive backscatter on that mosaic turned to be wide outcrops Hellenic Trench system. However, at least four dark patches looked very similar to mud volcano images obtained in the Olimpi mud diapir field in 1993 (LIMONOV *et al.*, 1994). On the basis of that mosaic, a MAK-1 line was run between the two OKEAN lines and continued further North, beyond the area covered by the OKEAN swath. The length of the line is about 40 km with the swath range of 2 km. Along this line, six circular structures have been recorded. All of them have a diameter of 2-2.2 km and a relative height of up to 130 m. These structures are closely spaced and sometimes have common borders. Three of them are typical mud volcanoes with craters 100-200 m in diameter and extensive mud flows on their slopes. The cores from them gave the mud breccia below a few tens of centimetres of oxidized Holocene sediments. The clasts from the mud breccia are very variable in composition, and, according to the preliminary shipboard microfossil definitions, may have the age from Cretaceous to Pliocene. The rest of the circular structures are probably inactive extinct mud volcanoes. They have well-defined rims and are covered by an approximately 30-m layer of acoustically stratified sediments pinching out toward the rim. The margin of one of them is protruded by a narrow cone-like feature which could be a clay diapir. The new discovered mud volcanoes are undoubtedly related to a system of thrust plains parallel to the general trend of the Mediterranean Ridge and they may reflect several stages of tectonic activity of the ridge.

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