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DISTRIBUTIONAL PATTERNS ALONG THE MEDITERRANEAN
CONTINENTAL MARGIN (UPPER BATHYAL) USING *GYPHUS*
VITREUS (BRACHIOPODA) DENSITIES (INVESTIGATED
BY SUBMERSIBLE AD DREDGING)

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Forming a belt along the continental margin from the edge of the continental shelf (~100-120 m) down to between 160 and 250 m, the *Gryphus vitreus* biocoenosis is directly related to moderate bottom-currents (drived by the circulation of the Atlantic water masses within the Mediterranean) and occurs on 2 types of profiles :

- * Type 1, beyond the continental shelf-edge, a continuous slope (incline 5° - 14°) ;
- * Type 2, beyond a short edge, a offshore shelf followed beneath its edge (~150 m) by a continuous slope (incline 2° - 16°).

The stenotopic brachiopod *Gryphus vitreus* is an excellent indicator of the extension of the biocoenosis in relation to hydrodynamic variations (current velocity and direction). Its densities can be divided into 5 horizontal zones, directly related to the velocity the bottom-current can reach:

- . Zones 1 and 5 : 5 to 10 individuals.m⁻², under a current up to 0.5-1 knot ;
- . Zones 2 and 4 : 20 to 100 individuals.m⁻², up to 1-1.5 knots ;
- . Zone 3 : 200-700 individuals.m⁻², up to 1-5-2 knots.

The current direction over the 2 types of profiles induces 3 different models according to the distributional limits of the *G. vitreus* zones :

- * Model I, with Zones 1, 3, 5 on Type 1, and liable to an oblique direction of the current (from the continental shelf) ;
- * Model II and Model III, with the 5 zones, on Type 2, under the influence of a current parallel to the slope on Model II and perpendicular to the slope on Model III.

All the three models exhibit the same upper limit (at the edge of the continental shelf) and, below 150 m, zonal bathymetric limits directly related to the incline:

- . inclines of 10° and steeper : no change of these limits (~250 m and ~200 m)
- . inclines less than 10° : the bathymetric limits rise, correlated with a decrease of the current influence in the depth when the slope becomes weaker (more in Model I > III > II) ; but that does not affect the spatial distribution of the zones, except an extension of Zones 3 and 5 in Model II and a shortening of zone 4 in Model III.

The inversion of Zones in Model II and III is induced by the current direction. Whatever the slope is, the *Gryphus vitreus* belt is always broader in Model II > III > I .

Model I is the most simple from which derive Model II (the most complex of the three) and Model III through the occurrence of an offshore shelf, broad from some hundred meters to several km. Model III may also change into Model II (and inversely) according to the current direction.