DRILLING PREDATION ON JUVENILE BRACHIOPODS AND BIVALVE MOLLUSKS FROM PRESENT-DAY SUB-TROPICAL WATERS OF THE BRAZILIAN SHELF

RODRIGUES, S.C.[1,2]; LEME, J.M.[1,2]; STÜKER, F.[3]; NEVES, J.P.[2]; KOTZIAN, C.B.[3]; SIMOES, M.G.[2];KOWALEWSKI, M.[4]; CORRÊA, I.C.S.[5]

[1] Depto. Geol. Sedimentar, USP, PG/GSA, São Paulo, SP, scoelho@usp.br; leme@usp.br
[2] Depto. Zoologia, IBB-UNESP/Botucatu, Botucatu, SP, btsimoes@ibb.unesp.br, dollybio@hotmail.com
[3] Depto. de Biologia, UFSM, Santa Maria, RS, mickey@ccne.ufsm.br, fecasminf@yahoo.com.br
[4] Department of Geosciences, Virginia Tech, 4044, Blacksburg, VA 2406, michalk@vt.edu
[5] CECO, Inst. Geociências, UFRGS, Porto Alegre, RS, iran.correa@ufrgs.br

We compare drilling frequencies for present-day juveniles of the sympatric bivalve mollusks and brachiopods from sub-tropical waters of the Brazilian shelf. Samples were collected during various GEOMAR operations, ranging from the north of Santa Catarina State (26°32') to Chui (RS) (34°22'5"). These operations, carried out in the 1980s across the Brazilian platform and continental slope, encompassed the depth range from 17 to 2900 m. Samples were obtained using Van Veen and Dietz Lafond grab samplers, which acquire the several uppermost centimeters of the bottom sediments. Out of 90 sampling stations from the states of Santa Catarina (26°32'-29°46', n=16 stations) and Rio Grande do Sul (30°03'5"-34°22'5", n=74 stations), only 11 yielded brachiopod and bivalve shells. In these stations (depth range: 126–180 m) bottoms are mainly characterized by siliciclastics, mostly sands. Notably, shells larger than 8 mm are rare in the studied sediments. However, small bioclasts (<2 mm) are abundant offering us a unique opportunity to assess the rates of drilling predation/parasitism in juvenile bivalve mollusks and brachiopods from the same sub-tropical shelfal waters. A total of 3811 valves (2331 bivalves, 1480 brachiopods) were analyzed. Bivalves (epifaunal, semi-infaunal, infaunal) and epifaunal, free-lying brachiopods (*Bouchardia rosea*) were found at 126, 130, 149, 150, 153, 154, 180 meters of depth. Of 1480 brachiopod shells, only 2 shells displayed drill holes (drilling intensity, DI=0.14%). A total of 2331 bivalve specimens were studied, and 233 specimens were drilled (DI=10%), including infaunal (n=222, 95.28%) and epifaunal (n=11, 4.72%) shells. The highest frequency of drilling on bivalve mollusks (17.24%) was found in station 42 (Geomar operation 14) at 153 meters of depth. Brachiopod and bivalve shells were grouped according to their size into three categories 2 mm, 1mm and 0,5 mm. Drilled bivalves were found in the three size classes, whereas the two drilled brachiopods were found in 1 mm and 0.5 mm size classes. Pooling the data, bivalves DI values are 19.46%, 9.56% and 7.80%, respectively. Brachiopod DI values are 0.24% and 0.13%, respectively. Hence, the higher drilling frequencies occur in the largest size categories. This may be due to the fact that smaller prey items tend to provide less nutritional values to the predator/parasites. Our data for sub-tropical bivalve mollusks and brachiopods suggest that the intensity of drilling predation/parasitism on juvenile brachiopods is very low compared to juvenile bivalves from the same environment. This pattern is similar to that recently described to adult forms of bivalves and brachiopods from tropical shallow waters of the Brazilian platform (the coast of São Paulo State). As for tropical waters, drilled brachiopods are restricted to a few sampling stations only. Drilling frequencies in bivalves are rather low (DI=10%) too, given that assemblage-level estimates for the Late Mesozoic, Cenozoic, and Recent mollusk assemblages typically exceed 20%. Anyway, bivalves from the Brazilian shelf experienced higher drilling frequency than brachiopods from the same samples, reinforcing the idea that drilling organisms preferentially drilled bivalves over brachiopods, both in the Recent and in the fossil record. However, assemblage-level estimates for the two shelly benthos drilled throughout the Phanerozoic may be underestimated. As demonstrated here, small individuals of bivalves from a given assemblage may be intensely drilled, but the analysis of drilling predation/parasitism in the fossil record of marine shelly benthos rarely focuses on shells smaller than 2 mm.