

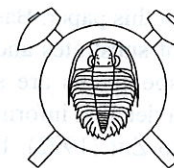
Orientation of *Spondylus* valves cemented to the hard-rock substrates (Bivalvia, Upper Cretaceous, Bohemia)

Orientace misek rodu *Spondylus*, přitmělených k pevným horninovým substrátům (Bivalvia, svrchní křída, Čechy) (Czech summary)

(6 text-figs., 4 plates)

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Data on orientation of *Spondylus* sp. encrusting the rocky bottom and boulders in the nearshore facies (upper Cenomanian-lower Turonian, Bohemian Cretaceous Basin) are summarized and compared with those on encrusting bivalve *Atrreta*. While the subhorizontal rocky surfaces bear both *Spondylus* sp. and *Atrreta* orientated chaotically, on sloping substrates (the dip equal to or exceeding 10°) they are usually orientated preferentially, i.e., umbos of valves are directed to the upper left quadrant (so-called slope orientation). In agreement with Seilacher (1960) we tentatively consider this posture to be advantageous for nutrition and providing other biological functions. Most recently, a modified orientation of *Spondylus* was found on the overhanging roof of a small cavity, sheltered from the exterior by a clast barrier. The *Spondylus* valves are here mostly directed to the lower left quadrant by their umbos. It means that, under the local conditions, the posterior margins of valves were turned to the barrier, through which the cavity communicated with the exterior water environment. A fragment of an irregular cluster with partial radial orientation of *Spondylus* valves was also found on another substrate of the same locality (Skalka near Velim, central Bohemia). Several extra-Bohemian examples of Mesozoic encrusters are discussed.

Introduction

From the Bohemian Cretaceous Basin (BCB), the spondylids encrusting hard-rock substrates (mostly clasts) have been known for a rather long time (see Frič 1870, 1910, Culek 1944, Zázvorka 1946, Klein 1962, Soukup 1966, Bouček 1968, Macák et al. 1968, Ziegler 1982). Unpublished observations are also frequent (see table 1). Fauna encrusting the rocky bottom and large boulders which both occur in the nearshore facies, was, however, intensively studied only during the last few years (Houša - Nekvasilová 1984, Nekvasilová - Žítt 1988, Žítt - Nekvasilová 1989, 1990, 1991, 1992, 1993, Žítt 1992). The bivalve *Spondylus* sp. was ascertained to be relatively frequent in the studied communities. Most recently, the authors found new rocky surfaces colonized by these bivalves which are so far the richest in number of specimens per area measured and which provided new interesting information on their distribution and orientation. As a result, all the data on cemented *Spondylus* sp. are summarized from the BCB, and this bivalve growth orientations are compared with those of *Atrreta* in search for preferred orientation causes.

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Geology, substrates, localities

Localities of the studied encrusters are situated in the Korycany Member of the Peruc-Korycany Formation and in the basal parts of the overlying Bílá Hora Formation. Korycany Member consists mostly of conglomerates (containing gneiss or silicite clasts at the studied localities), usually clast supported, very coarse and unsorted, with lithologically complicated but prevailing limestone-claystone matrix. They are of upper Cenomanian age. The base of the lower Turonian Bílá Hora Formation is formed mostly by clayey-silty sediments which pass upwards into siltstones with sponges. There exists a hiatus between the mentioned formations, spanning probably the uppermost Cenomanian. During this interval, sedimentation rate rapidly decreased and phosphogenesis occurred followed by a period of reworking (see Žítt - Mikuláš 1994). At the studied localities, the sediments of both units usually fill the depressions eroded in the rocky bottom by transgressing Cenomanian sea (see pls. I and III).

Though *Spondylus* encrusts several types of hard substrates in the BCB (such as the bioclasts, rock clasts, and rocky bottom), only the specimens from the rocky bottom, and from rock clasts undisturbed in their position since their encrustation till now, are included