ACTA PALAEONTOLOGICA POLONICA

Functional anatomy and mode of life of the latest Jurassic crinoid *Saccocoma*

Michał Brodacki
Acta Palaeontologica Polonica 51 (2), 2006: 261-270

Loose elements of the roveacrinid *Saccocoma* from the Tithonian red Rogoża Coquina, Rogoźnik, Pieniny Klippen Belt, Poland, are used to test the contradictory opinions on the mode of life of *Saccocoma*. The investigated elements belong to three morphological groups, which represent at least two separate species: *S. tenella, S. vernioryi*, and a third form, whose brachials resemble those of *S. vernioryi* but are equipped with wings of different shape. The geometry of brachials' articular surfaces reveals that the arms of Saccocoma were relatively inflexible in their proximal part and left the cup at an angle of no more than 45°, then spread gradually to the sides. There is no evidence that the wings were permanently oriented in either horizontal or vertical position, as proposed by two different benthic life-style hypotheses. The first secundibrachial was probably more similar to the first primibrachial than to the third secundibrachial, in contrast to the traditional assumption. The winged parts of the arms were too close to the cup and presumably too stiff to propel the animal in the water efficiently. Swimming was probably achieved by movements of the distal, finely branched parts of the arms. The non-horizontal attitude of the winged parts of the arms is also not entirely consistent with the assumption that they functioned as a parachute. Moreover, the wings added some weight and thus increased the energy costs associated with swimming. The hydrodynamic benefits balancing these extra costs are not entirely clear, but it seems probable that the wings reduced the sinking rate of the animal not by increasing the pressure drag, as suggested by the parachute-analogy, but by increasing the surface drag (friction drag), which also harmonize with the presence of spines, reticulate sculpture and conspicuous vacuolar ornamentation in some species of *Saccocoma*.

Key words: Crinoidea, Roveacrinida, *Saccocoma*, brachial articulations, functional anatomy, Tithonian, Rogoża Coquina.

Michał Brodacki [m.brod@wp.pl], Instytut Paleobiologii PAN, ul. Twarda 51/55, 00-818 Warszawa, Poland. Present address: ul. Korotyńskiego 19/37, 02-123 Warszawa, Poland.


Full text (833.5 kB)