Abstract: Petalocrinidae is a specialized group of Palaeozoic crinoids. It has a relatively short geological range, only occurs in the Silurian strata in Asia, Europe and North America; the last report on the Petalocrinidae was in Mu and Lin (1987). Recently, we found new material of Petalocrinidae fossils from Early Silurian Llandovery Age Shiniulan Formation of Tongzi County, Guizhou Province, China. This is a new locality for Petalocrinidae and a total of 104 well-preserved specimens were collected, including 47 Petalocrinus arm-fans, 49 Spirocrinus arm-twines. In addition, there are 8 specimens which arm-fans and arm-twines are preserved together. Our preliminary study shows the followings. (1) During the process of collecting, we have found Petalocrinidae is always associated with reef, living only in the weak hydrodynamic conditions and reef flanking beds with relatively high shale content. (2) In previous studies, they have established 3 genera and 20 species, and diagnostic table are included here. In the comparative analysis with our collected Petalocrinidae, we noticed that the given boundaries for these species are vague and the key characteristic is not specified, and interspecific difference is not obvious. The fact that some of the so-called different species of arm-fans are always preserved together may indicate some of them could belong the same individual or the same population of one species. (3) Commonly arm-fans and arm-twines are found together on a given bedding surface. This interesting field observation leads us to speculate the possible ecologic relationships between Petalocrinus and Spirocrinus.

Study fossils (NIGP158431-158446) are
deposited at the Nanjing Institute of Geology and Palaeontology.

Key words: palaeontology, Petalocrinidae, Silurian, Shiniulan Formation, Guizhou

Acknowledgements

This work was supported by Chinese Academy of Sciences (KZCX2-YW-BR-23) and National Science Foundation of China (41240015, J1210006). The field work was assisted by Professor Li Yue, Jiang Liping and Ma Lu.

References


Figure 1: arm-fans and arm-twines of Petalocrinidae (NIGP158431-158446). Scale bars:1 cm
Table. 2 Comparison of the characters of the arm-twines in different species of *Spirocrinus* (modified from Mu and Lin, 1987)

<table>
<thead>
<tr>
<th>Name</th>
<th>Length (mm)</th>
<th>Diameter (mm)</th>
<th>Degree of Rotation (°)</th>
<th>Triangular Area</th>
<th>Number of Venral Furrows</th>
<th>Character of Ventral Ridges</th>
<th>Articular Facet Width (mm)</th>
<th>Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. typicus</td>
<td>18.5-25.5</td>
<td>1.5</td>
<td>360</td>
<td>coarse, granular structure smooth, some with granular structure</td>
<td>10</td>
<td>flat or slightly concave, slightly narrower than furrows or approximate to furrows</td>
<td>2.5</td>
<td>1.6</td>
</tr>
<tr>
<td>S. longas</td>
<td>20-38</td>
<td>6</td>
<td>189-360</td>
<td>coarse, granular structure</td>
<td>10</td>
<td>flat or slightly concave, slightly narrower than furrows</td>
<td>3</td>
<td>1.8</td>
</tr>
<tr>
<td>S. uniformis</td>
<td>26.5-32.5</td>
<td>6</td>
<td>549-720</td>
<td>coarse, granular structure</td>
<td>10</td>
<td>flat or slightly concave, slightly narrower than furrows or approximate to furrows</td>
<td>2.8</td>
<td>1.5</td>
</tr>
<tr>
<td>S. absormis</td>
<td>20-25</td>
<td>8</td>
<td>360</td>
<td>smooth</td>
<td>10</td>
<td>flat, approximate to furrows or slightly narrower than furrows</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>S. pauciramus</td>
<td>24-30</td>
<td>5.4</td>
<td>360</td>
<td>smooth</td>
<td>9</td>
<td>flat, approximate to furrows</td>
<td>2.3</td>
<td>1.7</td>
</tr>
<tr>
<td>S. multiramus</td>
<td>21-24.1</td>
<td>6.2</td>
<td>189-360</td>
<td>granular structure</td>
<td>12</td>
<td>flat or slightly concave, approximate to furrows</td>
<td>2.8</td>
<td>1.9</td>
</tr>
</tbody>
</table>

