Simaspodiceras bauschi sp. nov. (Ammonitina, Physodoceratinae).
The evolutive meaning of Submediterranean Simaspodiceras

By Antonio Checa

With 2 text-figures and 1 plate

Introduction

The present work takes as its starting point the revision of the Aspidoceratinae and Physodoceratinae subfamilies recently carried out by Checa (1985). During that phase of our research project the study of a great amount of material collected in various European institutions was necessary, to obtain as clear a view as possible of the association present in the different paleobiogeographical areas recognized during upper Jurassic. Within this material it has been possible to determine the existence of specimens belonging to the genus Simaspodiceras and distributed in two species, one of which, S. bauschi, turned out to be exclusively submediterranean. The aim will be, therefore, to present a detailed study of the Submediterranean fauna of Simaspodiceras and its contribution to our knowledge of the evolutive history of the group.

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Abbreviations

Dm  Diameter in mm
U   Umbilicus in mm
H   Whorl height in mm
W   Whorl width in mm
T   Number of tubercles in a complete whorl

Species description

Family Aspidoceratidae ZITTEL, 1895
Subfamily Physodoceratinae CHEREA, 1985
Genus Simaspidoceras SPATH, 1925

Simaspidoceras bauschi sp. nov.
Plate 1; figure 1

Material: 5 specimens. Two of them stored at the Bayer. Staatslg. Paläont. hist. Geol. (München), 1980 XV 13 (Malm Delta, Petersbuch) and 1957 XVIII 14 (Malm Delta 1b, Wettelsheim); another with no registration number at the Geol. Paläont. Inst. (Tübingen) and registered as T398 in CHECA (1985), from Malm Delta 1 at Ringingen; an unregistered specimen at the Staatliches Museum Naturk. (Stuttgart), recorded as L308 in CHECA (1985), from an unknown locality in Baden-Württemberg; specimen 100728 (Univ. Claude Bernard, Dept. Sci. Terre, Lyon) from Middle Kimmeridgian at Grand Colombier de Culoz, “La Croix” (Southeastern France).


Type locality, type stratum: Middle Kimmeridgian (Malm Delta) of Petersbuch near Eichstätt, Südliche Frankenalb (Southern Germany).

Derivatio nominis: To Prof. Dr. H. Bausch (Institut für Geologie und Mineralogie, Erlangen-Nürnberg) for his great kindness and constant help.

Diagnosis: A new species of the genus Simaspidoceras of large to very large size and median involu­tion; section with subpentagonal outline; coarse tubercles placed on the umbilical edge; wide ribs with radial tracing and little relief, markedly coarsened at lateroventral portion.

Measurements

<table>
<thead>
<tr>
<th></th>
<th>Dm</th>
<th>U</th>
<th>H</th>
<th>W</th>
<th>T</th>
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<tbody>
<tr>
<td>1980 XV 13</td>
<td>220,2</td>
<td>63,3</td>
<td>93,8</td>
<td>10-11</td>
<td></td>
</tr>
<tr>
<td>L 308 (in CHECA, 1985)</td>
<td>197,6</td>
<td>55,5</td>
<td>89,5</td>
<td>109,0</td>
<td>9</td>
</tr>
</tbody>
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Description: An infrequent species including large to very large forms with median involu­tion. The section is rounded, more or less depressed and with a subpentagonal outline, due to the presence of ornamentation coarsened at the lateroventral band. The flanks are slightly convex and convergent. The umbilical edge is sharp and the umbilical wall approximately vertical. The ornamentation is composed of coarse tubercles placed on the umbilical edge and directed inwards over the umbilicus, obliquely to the flank. There are also wide ribs with radial tracing and little relief, placed on the flank; they are markedly coarsened at the lateroventral portion and cross the ventral region without interruption. The relation between both types of ornamental
Figure 1: Section (A) and suture (B) of the holotype (1980 XV 13) of Simaspidoceras hauschi sp. nov.. Broken lines show both the umbilical edge and tubercle location. Natural size.

elements is not constant, but when they coincide ribs seem to grow from periumbilical tubercles, those that are left taking on the appearance of intercalary ribs.

The suture line clearly agrees with the model previously observed in the genus Simaspidoce-ras, although its elements are not so deep and indented; the outer saddle stands out due to its considerable size.

Observations: The specimen designated as the holotype corresponds to an adult, almost complete phragmocone, somewhat laterally deformed following the symmetry plane. Even though it is not the best preserved specimen, it is certainly the only one which allows a complete identification of specific characteristics, together with a precise biostratigraphical and geographical assignment. In spite of the wide biostratigraphical range (Malm Delta) facilitated by
Kästle (1983), it could be attributed to the lower part (Acanthicus zone) of this interval, according to the species list given by this author (pages 36 and 37) and the demonstrated existence of this species within the said interval.

On the other hand, any comment on intraspecific variability is hardly significant at the present time given the scarcity of material, although it is possible to point out a certain fluctuation in section shape (common in Physodoceratinae) and in the prominence of ribbing, sometimes very slightly marked.

Affinities: S. bucki Checa shows a very reduced size, denser tuberculation and, usually, more marked ribbing, even though within its specific spectrum some morphologies are ornamentally very close to the present species.

In S. argobbae (Dacque) – irregulare (Dacque) the ornamentation is more prominent, although some extreme forms may be erroneously taken for S. bauschi sp. nov. (see Venzo, 1959).

O. liparum shows a coarser and more spaced tuberculation and it only develops a certain swelling (which disappears at the middle flank) as a continuation of tubercles.

Biostratigraphic and geographic distribution: Malm Delta 1 (lower Acanthicus zone) of Petersbuch, Wettelsheim and Ringingen (Southern Germany). Uncertain levels (possibly equivalent) of Grand Colombier de Culoz (Southeastern France).

The evolutive significance of Submediterranean Simaspidoceras (Figure 2)

Following the studies by Dacque (1905), Scott (1943) and Venzo (1959), the genus Simaspidoceras was interpreted as representing a set of forms linked exclusively to the Ethiopian province. Later (Olóriz, 1976), its presence in the Betic Cordillera was recognized, although under specific denominations previously assigned to the Eastafrican material. In Checa (1985) Mediterranean forms are individualized as S. bucki (also present in Southern Germany) and their place as the possible evolutive basis of the Ethiopian stock is established. From the data presently available, S. bucki is considered as the first species of Simaspidoceras, originating in the lower Divisum zone of the Mediterranean province from the genus Orthaspidoceras (specifically O. ziegleri). Likewise, and in spite of the inaccuracy of the Ethiopian record, S. argobbae and S. irregulare, whose specific segregation is not presently clear, would derive from S. bucki, so making up a set with a really remarkable paleobiogeographic characterization.

The origin of S. bauschi, even though open to diverse interpretations, seems also to be related to Mediterranean representatives of the genus, given that, as has already been shown (Checa, 1985), the presence of S. bucki has been recognized at the lower-middle Kimmeridgian (Gamma-Delta) boundary in Southern Germany (Ries area). On the other hand, the increasing morphological distance and the absence of the Ethiopian species of this genus in the Submediterranean province, makes the solution of a direct relation between S. bauschi and S. argobbae-irregulare highly improbable.

The evolutive process originating the morphology of S. bauschi from that of S. bucki looks to be parallel to that adduced in the case of S. argobbae-irregulare (Checa, 1985). Although it is not possible to give more precise information due to the scarcity of material, the result is a recapitulation (sensu Gould, 1977), with which is associated or implied (depending on the detailed consideration of the result) a marked increase in size, even greater than in the case of the Ethiopian forms.

From what has been stated above it can be deduced that, within the evolutive history of the genus Simaspidoceras, S. bauschi may be considered as a Submediterranean vicariant of S. argobbae-irregulare, both originating from the same ancestor by means of a similar evolutive pro-
cess. On the other hand, their respective positions within the evolutive framework of Physodoceratinae seem to be equivalent, for they occupy, in morphological terms, the space of the genus *Orthaspidoceras*, which will later take over their place on these shelves.

Thus, the evolutive history of the genus *Simaspidoceras*, as it is interpreted here, fits in with the vicariance model, as a result of parallel evolutions from a Mediterranean ancestor on separate shelves that give rise to very similar morphological products.

Acknowledgements

I am specially indebted to Dr. G. SCHAIRER (Bayer. Staatsslg. Paläont. hist. Geol., München) for supplying complementary material and information, essential for the working out of the present paper. Prof. Dr. F. OLÓRIZ (Departament of Paleontology, Univ. Granada) has kindly carried out the critical reading of the manuscript. This paper is part of the project 33.21 of the C.A.I.C.Y.T. (Spanish Ministry of Education and Science).

References


Simaspiloceras bauschi sp. nov. (Holotype). BSP 1980 XV 13. Middle Kimmeridgian (Malm Delta), Petersbuch. × 0.7.

CHECA, A.: Simaspiloceras