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Two *Pictonia* (Perisphinctidae) from the Subbetic Upper Jurassic of Spain

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With 4 figures in the text

Kurzfassung: Aus dem Unterkimmeridgium des Subbeticums von West-Andalusien werden zwei Ammoniten beschrieben, die zum Genus *Pictonia* BAYLE, 1878 (Subgenus *Pachypictonia* SCHNEID, 1940) zu stellen sind. Es handelt sich um den ersten Nachweis der Gattung im mediterran-tethydischen Oberjura.

Abstract: Two ammonites belonging to the genus *Pictonia* BAYLE, 1878 (subgenus *Pachypictonia* SCHNEID, 1940) are described from the Lower Kimmeridgian of the Subbetic of Western Andalusia, this being the first evidence of the presence of this genus in the Mediterranean (Tethydan) Upper Jurassic.

Resumen: Se describen dos ammonites que pertenecen al género *Pictonia* BAYLE, 1878 (subgénero *Pachypictonia* SCHNEID, 1940). Se trata de la primera descripción en el Jurásico Superior del dominio mediterráneo. Los ejemplares proceden de la Zona Subbética (Andalucía).

Geologic remarks

Location and geological sketches are shown in Fig. 1.

(A) – A klippe of Upper Jurassic age included in the "Serie de Base" of Aljibe Unit is analyzed. In the profile studied, an anticline structure whose southern limb dips subvertically is shown. The sequence consists of 8-10 m of biomicritic and micritic red limestones, 34 numbered levels, partially of nodulous character and with thin intercalated marly horizons. Ammonites, collected bed by bed permitted the recognition of the *Strombecki*, *Divisum* and *Beckeri* zones in the Kimmeridgian, according to the biostratigraphical scheme for the Subbetic mountains in OLÓRIZ (1978: 663-666). Unfortunately, sampling limitations have to date precluded a greater precision. For more detailed information, see OLÓRIZ & FERNÁNDEZ-LLEBRES (1981).

(B) – The Almola is one of many calcareous discontinuous outcrops located in the boundary-zone between internal and external zones of the Betic mountains. 1-2 m of grey-ochre biomicritic limestones overlie more than 150 m of Liassic limestones in the Almola series. It is possible to deduce the extremely reduced and foreseeably condensed character of the Kimmeridgian from the ammonite fauna contained in these materials. At present, seemingly, according to the faunal spectrum, only the *Platynota* zone can be precluded from the biostratigraphical scheme of the Subbetic area. For more complete information see MARTIN-ALGARRA et al. (1981).

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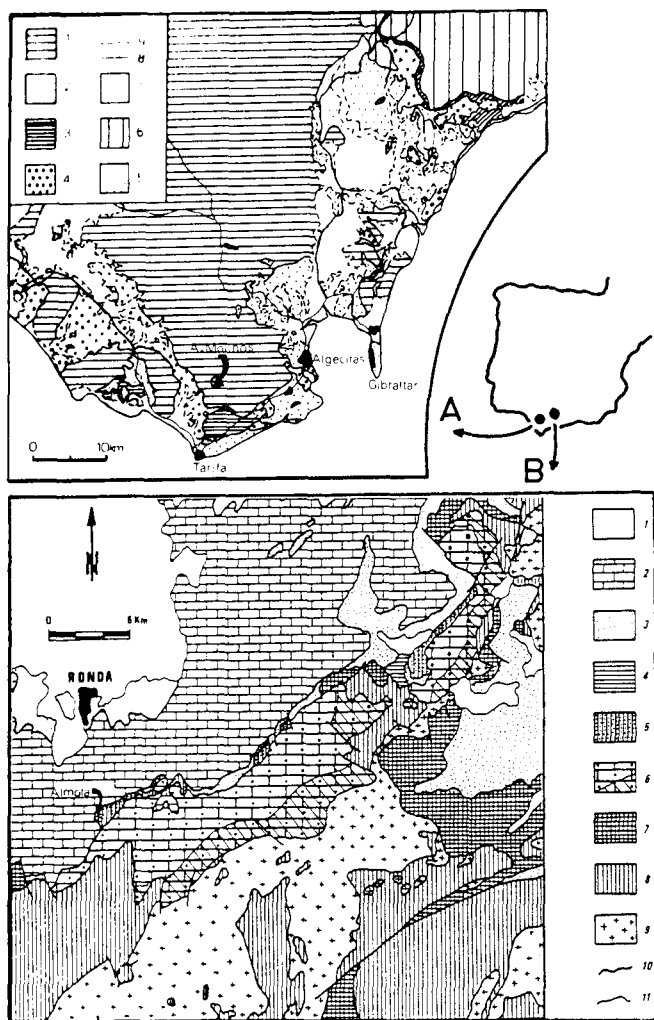


Fig. 1. Geographic and geologic setting of the localities "Arroyo de los Molinos" (A) and "La Almola" (B) in Southern Spain. Legend A: 1 = Aljibe unit, 2 = Algeciras unit, 3 = Bolonia unit, 4 = diverse units (Almarchal, Tarigüdes, Nogales, Predorsalian), 5 = transgressive Lower Miocene, 6 = Internal zones (Alpujarrides, Malagüdes, and "Calcareous Dorsal"), 7 = postorogenic materials, 8 = tectonic contact, 9 = unconformity. Legend B: 1 = postorogenic materials, 2 = Internal Subbetic (Penibetic and Ronda unit), 3 = Campo de Gibraltar units, 4 = Cañada Perella unit, 5 = Enamorados unit, 6 = Nieves unit (sedimentary and metamorphic rocks), 7 = Malagüde complex, 8 = Alpujarride complex, 9 = peridotites, 10 = tectonic contact, 11 = unconformity.

Taxonomic remarks

The forms allied to the genus *Pictonia* BAYLE, 1878 (with the subgenera *Pictonia* s. str., *Triozites* BUCKMAN, 1924, *Vinalesphinctes* SPATH, 1931, and *Pachypictonia* SCHNEID, 1940) are medium-sized to large, moderately to strongly evolute perisphinctids of rounded to compressed whorl section and body chamber lengths of up to one whorl. Their ribbing is strong.

Pictonia s. str. (type species: *Pictonia baylei* SALFELD, 1913) has a depressed to round whorl section, and ribbing intermediate in character between perisphinctoid and rasenioid, i. e. strong primaries, each of which branches into 2 or 3 secondaries or intercalatory ribs. Each whorl shows 3 or 4 more or less pronounced constrictions. *Pictonia* s. str. was previously known from the Uppermost Oxfordian and Lower Kimmeridgian of Northwestern and Central Europe (upper part of *Idoceras planula* zone till *Ataxioceras hypselocyclum* zone).

Triozites (type species: *Triozites semimudatus* BUCKMAN, 1924) is a large form which bears distant triplicate ribs. Conspicuous on the inner whorls, the ribs grow fainter and fade away completely before the beginning of the body chamber. This poorly known subgenus has been mentioned from the Lower Kimmeridgian of Greenland and England.

Vinalesphinctes (type species: *Vinalesphinctes roigi* SPATH, 1931), perhaps best to be grouped together with *Triozites*, has likewise a large shell and a body chamber with lacking or very feeble ornamentation. According to JUDOLEY & FURRAZOLA-BERMEUDEZ (1968: 103–107) each whorl has between 3 and 5 constrictions. The inner whorls are ornamented with fine to somewhat coarser perisphinctoid ribbing, with bipartite rib units and external intercalatory ribs. This subgenus has been described as an endemic group from the Cuban Upper Oxfordian. There are doubtless morphological affinities between those species of the subgenus which display finer ribbing, and the *Decipia-Pomerania* group. The same is true for the species with coarser ornamentation with respect to *Pachypictonia*.

Pachypictonia (type species: *Pachypictonia dacquei* WEGELE, 1929; see GEYER 1961: 116–123) has, in its typical forms, coarse nodiform to cuneiform primaries, most of which branch into two secondaries and an additional intercalatory rib. On the body chamber appear characteristic stuffed ribs. Constrictions are seldom to be observed. Frequently the shells are large. This subgenus has previously been described from the Franconian, and more rarely, Swabian Lower Kimmeridgian (*Sutneria platynota* zone and *Ataxioceras hypselocyclum* zone).

SALFELD (1917: 70–73), ARKELL (1937: 45), SCHNEID (1940: 79–81), GEYER (1961: 114–118, 124–126) and ENAY (1966: 550–554) have drawn attention to the difficulty presented by the setting of taxonomic delimitation within the Pictoniinae. With regard to the differing conceptions we refer to these works.

Taxonomical observation by O. F. GEYER: In my publication on the Perisphinctidae from the Southern German Lower Kimmeridgian (1961) I was as yet uncertain about the taxonomical location and rank of *Pomerania* and *Pachypictonia*. In my monography I considered the genus *Pomerania* (with the subgenus *Pachypictonia*) provisionally on a par with the genera *Pictonia* and *Ringsteadia*, on the other hand, I assigned to the latter the subgenera *Vineta* DOHM, 1925, and *Decipia* ARKELL, 1937. Today, 20 years later, I would still consider *Decipia* a subgenus of the genus *Ringsteadia*, as long as the so-called »megagenera« with many subgenera are to be preferred to a large number of taxonomic »minigenera« – in other words, if one does not wish to carry taxonomic splitting too far. This holds especially true in the case of unclear taxonomic relationships. On the other hand, today I wish to follow my colleague R. ENAY (Lyon) in considering *Decipia* and *Pomerania* a taxonomic unit, without however including *Pachypictonia* in the genus *Decipia*. I wish to leave open the question as to whether or not these *Decipia* are actually *Microbiplices*, or *Orthosphinctes* macroconchs (ENAY 1980: 587). Nevertheless, I do not consider the fusion of many species into a few – as I did for example in the case of *Pomerania schmidti* (DOHM, 1925) or with the Pictoniids of SCHNEID – a kind of "mystère", but rather as subjective

taxonomic understanding which cannot be bound by rules. When SCHNEID (1940) describes 39 "species" of *Pictonia*, 35 of which are new, and bases this wealth of names upon a total of 55 specimens from the Franconian Upper Jurassic, many a revising author is sure to have problems following this wilful "taxonomia franconica" (which has found its adepts).

Description of the specimens

Pictonia (Pachypictonia) perornatula SCHNEID, 1940

Fig. 2, 3A, 4A

✓ 1940 *Pictonia perornatula*. – SCHNEID: p. 84, pl. 5, fig. 4 (? fig. 5).

✓ 1940 *Pictonia velata*. – SCHNEID: p. 86, pl. 5, fig. 6 (? pl. 6, fig. 1).

✓ 1961 *Pomerania (Pachypictonia) perornatula*. – GEYER: p. 122, pl. 22, fig. 3, text-figs. 137g and 145.

Material: A single specimen: F. AG₁R (Depto. Paleont. Granada).

Locality: "Arroyo de los Molinos"; topographic sheet of Tarifa: 36°05'40" N – 1°54'21" W.

Geological setting: A Jurassic klippe in the allochthonous Flysch Complex of "Campo de Gibraltar".

Type horizon: Uncertain, loose specimen.

The shell of the specimen (SP) has a diameter (D) of 152 mm. The body chamber takes up approximately all of the last whorl. Fig. 3A shows the whorl section, of rather steep umbilical slope, the only slightly curved flanks and the likewise lightly curved to flattened external area. The phragmocone displays strong primary ribs with nodous thickening on the umbilical edge, and biplicate to triplicate branching (Fig. 4A). This ornamentation gives way to much less prominent, simple ribs after the first quarter of the body chamber. The shell dimensions and number of ribs of our specimen (SP) as well as those of the holotype quoted in the synonym list (H) and those of GEYER's syntype (S) are:

| | D | width of umbilicus | whorl height | number of primary ribs/whorl |
|----|--------|--------------------|--------------|------------------------------|
| SP | 150 mm | 46.0 | 27.5 | 25 |
| S | 145 mm | 44.0 | 31.0 | 26 |
| SP | 130 mm | 45.5 | 26.5 | 21 |
| H | 120 mm | 47.0 | 28.0 | 27 |
| SP | 100 mm | 40.0 | 32.0 | 20 |
| H | 80 mm | | | 21 |

Pictonia (Pachypictonia) cf. peregrinaria SCHNEID, 1940

Fig. 3B, 4B

✓ 1940 *Pictonia peregrinaria*. – SCHNEID: p. 82, pl. 5, fig. 3.

1961 *Pomerania (Pachypictonia) perornatula* (partim). – GEYER: p. 122 (non figs.).

Material: A single specimen: F.A.M.30 (Depto. Paleont. Granada).

Locality: "La Almola"; topographic sheet of Ronda: 5°8'45" N – 36°40'30" W.

Geological setting: The outcrop belonging to the Almola series (Enamorados unit) of uncertain paleogeography to the south of the Internal Subbetic.

Type horizon: Condensed bank of Kimmeridgian age.

We assign the second, not so well conserved Spanish specimen, with "confer" to *Pictonia peregrinaria*. The specimen is 143 mm in diameter. Its body chamber is at least in part conserved, but the demarcation of the limit between it and the phragmocone is not visible with absolute certainty. Fig. 3B shows the whorl section with rather steep umbilical slope, lightly curved flanks and rounded venter. The ornamentation of the phragmocone consists of markedly prorsiradiate ribs, these have hardly reinforced primaries which branch into triplicate secondaries (Fig. 4B). The latter fade away externally. It is difficult to see the ribbing on the body chamber, however, it seems that some distance from the phragmocone only simple ribs are present. The shell dimensions of the specimen (SP) and those of SCHNEID's holotype (H) are:



Fig. 2. *Pictonia (Pachypictonia) perornatula* SCHNEID, 1940. × 1.

| | D | width of umbilicus | whorl height | number of primary ribs/whorl |
|----|--------|--------------------|--------------|------------------------------|
| SP | 140 mm | 44.0 | 33.0 | |
| SP | 120 mm | | | 20–23 |
| H | 100 mm | 47.0 | 31.0 | 26 |

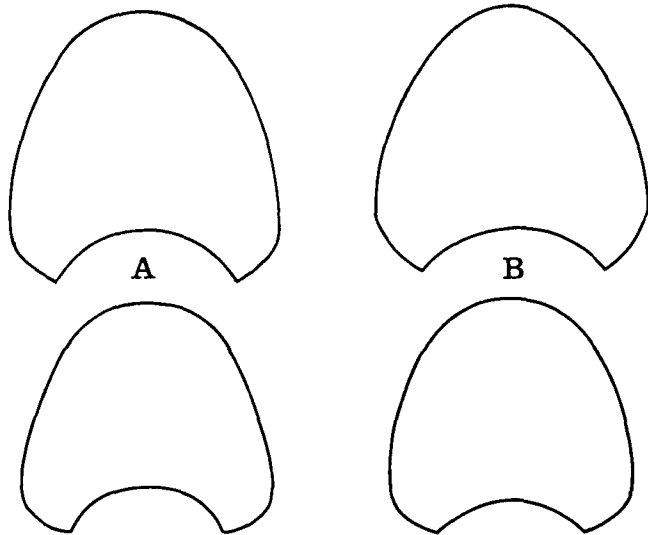


Fig. 3. Whorl sections. A = *Pictonia (Pachypictonia) perornatula*; above: diameter approx. 150 mm, below: diameter approx. 125 mm. B = *Pictonia (Pachypictonia) cf. peregrinaria*; above: diameter approx. 145 mm, below: diameter approx. 115 mm.



Fig. 4. Schematic graphs of the ribbing. A = *Pictonia (Pachypictonia) perornatula*; diameter approx. 80 mm. B = *Pictonia (Pachypictonia) cf. peregrinaria*; diameter approx. 110 mm.

As differences to the holotype of *Pictonia peregrinaria* we may mention the lower rate of branching (holotype: approximate 3.8 per whorl) and the primaries which are hardly thickened at all. GEYER (1961) joined the species *Pictonia peregrinaria* to *Pictonia perornatula*. One species is hardly distinguishable from the other – as in many other cases of the Pictoniids – as soon as one allows for a minimum of variability. As, however, one only has single specimens to work with, it is best to assign these to previously described and illustrated “species”. The find and results lose no significance thereby.

On the age of the specimens

Due to the circumstances of the discovery, an accurate and direct biostratigraphy of the specimens is difficult. F.AG.R is a loose specimen from an outcrop in which the biostratigraphically representative fauna is:

- level 20 – *Hybonoticeras pressulum pressulum* (NEUMAYR), *Hybonoticeras pressulum cerestioicum* (HERBICH), *Taramelliceras* sp. ex gr. *compsum* (OPPEL), *Virgalithacoceras* sp., *Aspidoceras rafaelli* (OPPEL).
- level Y – *Garniersphinctes* sp., *Aspidoceras uhlandi* (OPPEL), *Aspidoceras* sp. ex gr. *longispinum* (SOWERBY).
- level X – *Nebrodites* sp. aff. *grecoi* (CANAVARI), *Mesosimoceras teres* (NEUMAYR), *Mesosimoceras herbichi* (VON HAUER), *Crussoliceras divisum* (QUENSTEDT), *Garniersphinctes* sp. ex gr. *championnetti* (FONTANNES).
- level 19 – *Aspidoceras* sp. ex gr. *longispinum* (SOWERBY), *Aspidoceras acanthicum* (OPPEL), *Orthaspidoceras* sp. ex gr. *schilleri* (OPPEL).
- level 18 – *Physodoceras* sp. ex gr. *contemporaneum* (FAVRE).

Unfortunately, no fauna is found in this profile below level 18, whose exact biostratigraphical location is uncertain. In the level X the *Divisum* zone is clearly developed. Between both, the level 19 without common *Nebrodites* and *Mesosimoceras*, and without *Crussoliceras*, perhaps belongs to the upper part of the *Strombecki* zone (see OLÓRIZ 1978). With the present data the complete recognition of the Lower Kimmeridgian is not possible.

On the other hand, F.AM.30 comes from a bank, 1 m thick approximately without inner differentiated layering and from which several significant biostratigraphic species have been collected:

- Taramelliceras* sp. ex gr. *compsum* (OPPEL), *Taramelliceras pugile pugiloides* (CANAVARI), *Aspidoceras longispinum* (SOWERBY), *Physodoceras altenense* (D'ORBIGNY), *Physodoceras contemporaneum* (FAVRE), *Orthaspidoceras liparum* (OPPEL), *Orthaspidoceras schilleri* (OPPEL), *Pseudowaagenia sesquimodosum* (FONTANNES), *Mesosimoceras herbichi* (VON HAUER), *Crussoliceras* sp., *Garniersphinctes* sp. ex gr. *championnetti* (FONTANNES), *Hybonoticeras pressulum* (NEUMAYR), *Torquatisphinctes* sp. and *Pachysphinctes* sp. ex gr. *grandti* (SPATH)/*marelli* (COLLIGNON).

With this fauna, apart from *Divisum* zone, the biostratigraphical accuracy in the rest of the Lower Kimmeridgian is not possible. Again, the impossibility to recognize internal differential horizons has increased the uncertainty as to the precise biostratigraphic level of the specimen.

According to all this, the only one possible approximation, at present, is the one derived from the proposed taxonomy. *Pictonia perornatula*, *Pictonia peregrinaria* and allied forms occur in the southern German Jurassic in the older Lower Kimmeridgian (*Sutneria platynota* zone, ? *Ataxioceras hypselocyclum* zone). The entire subgenus *Pachypictonia* occurs in the same area from the highest Oxfordian (*Sutneria galar* subzone) up to the Lower Kimmeridgian (*Ataxioceras hypselocyclum* zone); see GEYER (1961: 118). It appears, however, that *Pachypictonia* reaches the *Katrolliceras divisum* zone in the French Jurassic (ENAY 1980: 588). Therefore an older Lower Kimmeridgian age could be assumed to be fairly certain for the two Spanish specimens.

Nevertheless, neither of the Spanish profiles provides any indication of the existence of the *Sutneria platynota* Zone, nor is the *Taramelliceras strombecki* Zone (= *Ataxioceras hypselocy-*

clum Zone of the Submediterranean Upper Jurassic) recognizable with absolute certainty, even though there are indications of its presence. Only the *Katrolliceras divisum* Zone of the Lower Kimmeridgian is well represented. Thus, a younger age of the Spanish Pictoniids would seem more probable, i.e. they could belong in the upper *Taramelliceras strombecki* – or even in the *Katrolliceras divisum* Zone. This would not contradict the relationships in the French Upper Jurassic.

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Taxonomische Konsequenzen aus der Synonymie von *Mojsisovicsia* STEINMANN und *Falloticerias* PARONA & BONARELLI (Ammonoidea, Alb)

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Mit 3 Abbildungen im Text

Abstract: *Mojsisovicsia* STEINMANN 1881 and *Falloticerias* PARONA & BONARELLI are synonymous. Further discussion includes the re-introduction of *Dipolocerooides* BREISTROFFER 1947 as a subgenus of *Dipoloceras* HYATT 1900, possible dimorphism between *Mojsisovicsia* (= *Falloticerias*) and *Dipoloceras* (*Dipolocerooides*); and a re-description of *Mojsisovicsia dürfeldi* STEINMANN and *Dipoloceras* (*Dipolocerooides*) *semicorutum* SPATH.

Kurzfassung: *Mojsisovicsia* STEINMANN 1881 und *Falloticerias* PARONA & BONARELLI 1897 sind synonym. *Dipolocerooides* BREISTROFFER 1947 wird als Untergattung von *Dipoloceras* HYATT 1900 wieder eingeführt, ein möglicher Dimorphismus zwischen *Mojsisovicsia* (= *Falloticerias*) und *Dipoloceras* (*Dipolocerooides*) wird diskutiert, und *Mojsisovicsia dürfeldi* STEINMANN und *Dipoloceras* (*Dipolocerooides*) *semicorutum* SPATH werden neu beschrieben.

Einleitung

Eine Überprüfung des Holotypus der Typusart von *Mojsisovicsia* STEINMANN 1881 (*M. dürfeldi* STEINMANN) hat ergeben, daß es sich nicht um ein Synonym von *Ammonites ventanillensis* GABB handelt, sondern daß er zur Gattung *Falloticerias* PARONA & BONARELLI 1897 gehört, die damit ein jüngeres Synonym von *Mojsisovicsia* darstellt.

Nach einem historischen Überblick sollen im folgenden die sich ergebenden taxonomischen Fragestellungen und die Möglichkeit eines Dimorphismus diskutiert werden.

Historischer Überblick

- 1842 D'ORBIGNY stellt die Art *Ammonites proteus* aus dem Alb von Clars (Escragnolles, Var, SE-Frankreich) auf.
- 1877 GABB beschreibt *Ammonites ventanillensis* aus dem Alb von Parietambo (Peru), hält ihn aber für unterjurassisch.
- 1881 STEINMANN begründet die Gattung *Mojsisovicsia* mit der Typusart *M. dürfeldi* STEINMANN 1881.
- 1882 STEINMANN nimmt in einem Nachtrag zu GABB Stellung und sagt bezüglich *Amm. ventanillensis*: »Als Typus des GABB'schen *Ammonites Ventanillensis* muß man die Bruchstücke älterer Exemplare betrachten, denn ob die kleinen Stücke wirklich Jugendformen sind, erscheint mir sehr zweifelhaft; ebensowenig dürften sie zu einer Gattung *Mojsisovicsia* gehören, da sie einen Kiel besitzen und keine Einschnürungen.« Er vergleicht *Amm. ventanillensis* mit *Schloenbachia inflata* (SOWERBY) und reiht ihn in diese Gattung ein.

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