

AMMONITES FROM THE CURAÇAO LAVA FORMATION, CURAÇAO, CARIBBEAN

JOST WIEDMANN¹

ABSTRACT

Wiedmann, J. (1978). Ammonites from the Curaçao Lava Formation, Curaçao, Caribbean. In: H. J. Mac Gillavry & D. J. Beets (eds.): The 8th Caribbean Geological Conference (Willemstad, 1977). Geol. Mijnbouw, 57, p. 361-364.

Ammonites have been discovered for the first time in some thin pelagic intercalations in the Curaçao Lava Formation. Since this is the oldest rock unit which occurs on the island, its dating is of extreme interest. The rather poorly preserved and partly baked ammonites can be attributed to the genera *Beudanticeras*, *Cleoniceras* (*Grycia*), *Gastropilites*, *?Dipoloceras*, *Hysterocheras* and *?Pervinquieria*. The Curaçao Lava Formation is, thus, of upper Middle Albian age. This is consistent with the available equivalent K/Ar-data of 118 ± 10 and 126 ± 12 M.A.b.p. (Santamaría & Schubert, 1974), since submarine extruded basalts dated by this method generally give ages somewhat too high.

Paleobiogeographic relationships point to the Western Interior and Pacific faunal provinces of North America, and, to a minor degree, to the European Tethys. Moreover, this is exactly the time when Northern and Southern Atlantic became connected for the first time (WIEDMANN & NEUGEBAUER, 1978).

INTRODUCTION

During the 8th Caribbean Geological Conference in 1977, ammonites were discovered in some rather thin, silica-rich, pelagic intercalations in the hyaloclastites (thermal-shock breccias) and pillow breccias of the more than 1000 m thick Curaçao Lava Formation. These submarine basaltic extrusions are the oldest rock units of the island of Curaçao. Up to the moment, they have been dated by K/Ar-ages only. The ages of 118 ± 10 and 126 ± 12 M.A.b.p. published by SANTAMARÍA & SCHUBERT (1974) support a Lower Cretaceous age of the lavas, but generally K/Ar-ages of submarine basaltic extrusions are found to be too old. The discovery of the ammonite fauna here described therefore provides a means of testing the radiometric data.

Thanks are due to E. G. Kauffman (Boulder, Colorado), H. J. Mac Gillavry & D. J. Beets (Amsterdam) for making this interesting fauna available and for the necessary locality data, and to W. Wetzel (Tübingen) for his efforts to produce recognizable pictures of these rather poor fossil material.

DISCUSSION OF THE LAVA AMMONITES

Preservation and systematics

Unfortunately the preservation of the ammonites is rather poor, due to low-grade metamorphism and deformation. Many important features have been destroyed (shell, suture lines, etc.). All the specimens are rather small, probably juveniles; very few are complete, but even then distorted. Generally only small fragments are preserved, which makes their identification a rather difficult task.

All specimens or fragments available have been collected at Ronde Klip in the SE part of the island (Fig. 1).

The specimens seem to belong to six generic groups; any specific determinations are, however, impossible.

(1) The desmoceratid genus *Beudanticeras* seems to be represented by some relatively involute forms with biconvex constrictions on the smooth whorls (Figs. 2A, B).

(2) The majority of specimens (Figs. 2C, E), however is more involute and shows smooth lateral sides covered with fine, flexuous radial ribs. These ribs converge at the narrow venter. No umbilical tubercles can be observed. These specimens

¹ Geol.-Paläont. Institut, Universität, D-74 Tübingen

show close relationships to the early hoplitid *Cleoniceras* (*Grycia*) *sablei* Imlay.

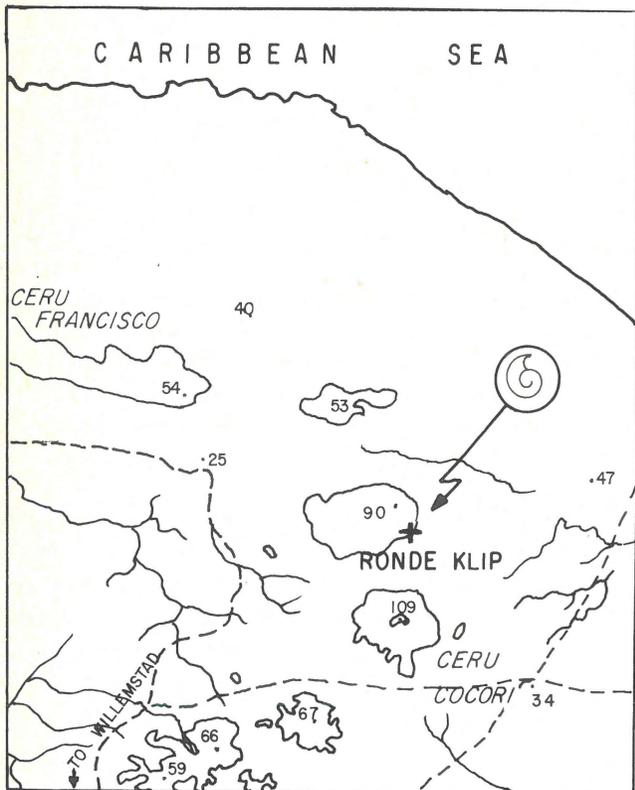
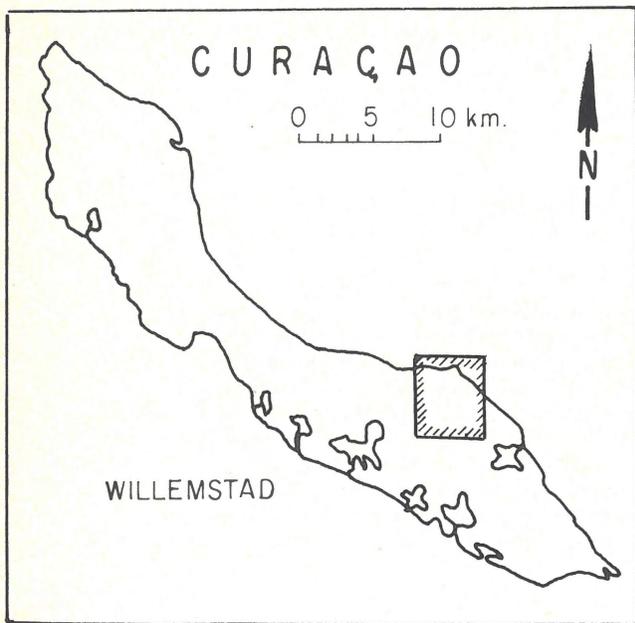


Fig. 1
Locality map of amonite occurrences in the Curaçao Lava Formation.

(3) There seem to be all transitions to forms where the ribs bifurcate near the umbilical margin which is likewise narrow. The ribs are flexuous as well, but become flat and broad on the external lateral sides and, especially, when they cross the relatively broad venter. These specimens (Figs. 2G, K, L) can be attributed to the hoplitid genus *Gastrolites*.

(4) Moreover there are some fragments with stronger and more radial ribs on the evolute whorls (Fig. 2D, F). They may belong to the early acanthoceratid genus *Hysterocheras*.

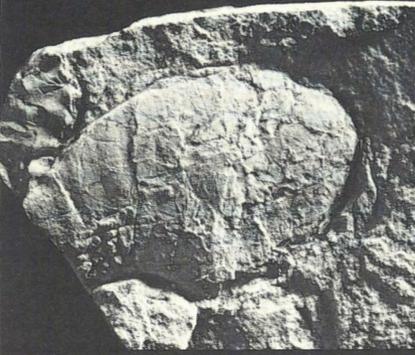
(5) Two specimens (Fig. 2H) show the strong flexuous ribbing and the irregular external tuberculation of Mojsisovicsiinae. They are doubtfully referred to the genus *Dipoloceras*.

(6) And, finally, there are some fragments (Fig. 2 I) which have single, radial ribs with a very weak tuberculation. They might be referred to *Pervinqueria*.

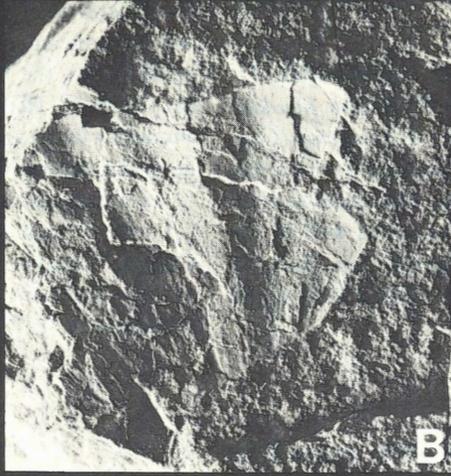
Fig. 2
Selected amonites of the Curaçao Lava Formation. Upper Middle Albanian.

- A: *Beudanticeras* sp.
USNM^{x)} coll.
Lateral view 2/1.
- B: as above
USNM coll.
Lateral view. 2/1.
- C: *Cleoniceras* (*Grycia*) sp.
USNM coll.
Lateral view. 2/1.
- D: *Hysterocheras* sp.
GIAU^{xx)} coll.
Lateral view. 2/1.
- E: *Cleoniceras* (*Grycia*) sp.
USNM coll.
Ventral view. 2/1.
- F: *Hysterocheras* sp.
USNM coll.
Lateral view. 2/1.
- G: *Gastrolites* sp.
USNM coll.
Lateral view. 2/1.
- H: *Dipoloceras* sp.
USNM coll.
Lateral view. 2/1.
- I: *Pervinqueria* sp.
USNM coll.
Lateral view. 2/1.
- K: *Gastrolites* sp.
USNM coll.
Lateral view. 2/1.
- L: as above.
USNM coll.
Lateral view. 2/1.

^{x)} U.S. National Museum, Washington
^{xx)} Geological Institute University, Amsterdam



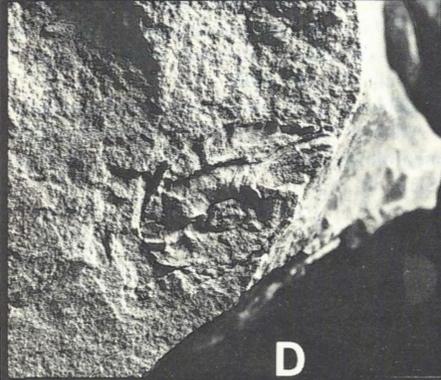
A



B



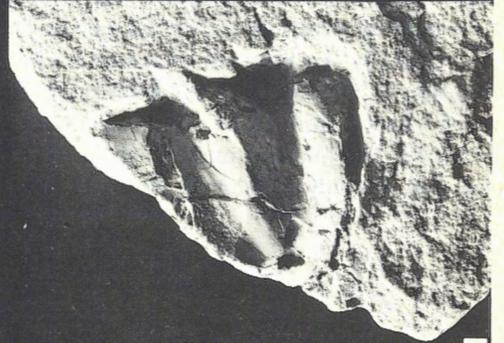
C



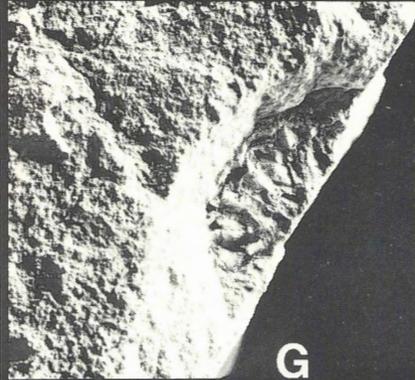
D



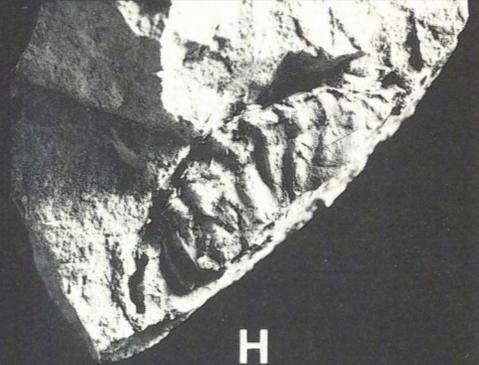
E



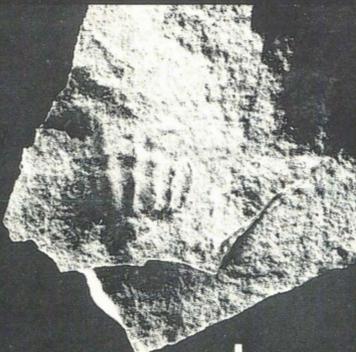
F



G



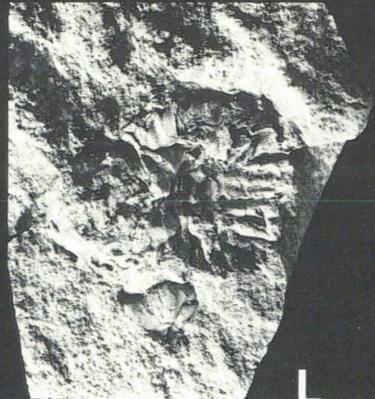
H



I



K



L

Age of the fauna

This faunal association clearly indicates an upper Middle Albian age of this part of the Curaçao Lava Formation. *Beudanticeras* runs through the complete Albian, *Cleonicer* (*Grycia*) is known from the Middle Albian, associated with a rich fauna of *Gastrolites* and *Paragastrolites*. *Dipoloceras*, *Hysteroceras* and *Pervinquieria*, however, occur as well in the upper Middle Albian as in the lower Upper Albian. Thus, the common range of all members of this association is the upper part of the Middle Albian.

Paleobiogeography

Beudanticeras is a cosmopolitan genus which occurs from Europe to Australia, and is known from North, Central and South America. Nearly the same is true for *Hysteroceras* and *Pervinquieria*, which have their main occurrence in Eurasia and Africa, but are represented as well in Central and South America. *Dipoloceras* is a predominant Eurafriean genus, which is known from Texas as well. But *Gastrolites* is nearly restricted to the Western Interior and Pacific Albian of North America; it is only occasionally observed in western Europe.

Cleonicer (*Grycia*), however, is up to the moment known only from the upper Torok Formation of northern Alaska, and attributed to the Middle Albian *Gastrolites kingi* Zone by IMLAY (1961). The most obvious relationships of the Curaçao ammonite fauna are with that described by IMLAY (1961) from northern Alaska, but also some European influences appear to have existed.

Finally, it should be noted that the age of extrusion of the Curaçao Lava Formation is about the same as the connection of the Northern and Southern Atlantic (WIEDMANN & NEUGEBAUER, 1978).

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