

NOTA PALEONTOLÓGICA

# The orthocerid *Dawsonoceras?* (Nautiloidea) from the Lipeón Formation (Silurian, Northwestern Argentina)

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## Introduction

Turic *et al.* (1982) erected the name "*Rectoghloma*" *zaplensis* for a problematic fossil found at Las Capillas River, 20 km northeast of San Salvador de Jujuy city (figure 1). The fossil was collected from beds belonging to the Lipeón Formation (Turner, 1960), on the western flank of the Zapla range (Subandean Ranges). Based on the work of Antelo (1978), the Lipeón Formation was assigned to the Llandovery-Wenlock interval. The fossil was assigned to the problematic genus *Rectoghloma*, described by Tuyl and Berckhemer (1914) for *R. problematica*, but based on a more complete ornamentation and the presence of sinuous striations, which denotes its better preservation state, they defined a new species: "*Rectoghloma*" *zaplensis* (Turic *et al.*, 1982). A restudy of the specimen indicates that the fossil is a nautiloid cephalopod that can be assigned with reservation to the genus *Dawsonoceras* Hyatt, 1884.

Studies of Silurian cephalopods in Argentina are very scarce. Cecioni (1949, in Cecioni, 1953) drew attention to the presence of the genus *Dawsonoceras* in the Silurian of the Zapla range, in particular *D. cf. annulatum* (Sowerby, 1816). This author neither illustrated nor described this form. Unidentified nautiloids from the Lipeón Formation at the Zapla range were mentioned by Cuerda and Baldis (1971). In the same report, these authors mentioned *Dawsonoceras* within a list of trilobite genera from the same stratigraphic unit (based on Cecioni's work). This genus was also recognized with reservation from the Upper Ordovician beds of Puesto Viejo range (in Precordillera) by Aceñolaza (in Aceñolaza and Beressi, 2002).

## Geological setting

The Lipeón Formation consists mainly of shales interbedded with fine micaceous sandstones. Red to grey hematitic beds characterize the basal part of the unit (Turic *et al.*, 1982; Ortega *et al.*, 2003). The fossil locality is in the upper part of the Las Capillas River, 20 km northeast of the San Salvador de Jujuy city (figure 1). The Lipeón Formation at this locality has a thickness of about 520 m. The nautiloid was found within the upper third of the unit, in very fine to coarse sandstones, with iron oxide impregnations (Turic *et al.*, 1982).

The age of the Lipeón Formation is not well-defined (*e.g.* Baldis *et al.*, 1976; Sánchez, 1989; 1991; Benedetto, 1991; Grahn and Gutiérrez, 2001). Considering the maximum age intervals biostratigraphically dated, this unit could have been deposited between the Llandovery (Aeronian) and the Prídolí (Benedetto *et al.*, 1992).

## Systematic paleontology

In the original paper by Turic *et al.* (1982), authors did not mention any repository for the studied specimen. It is now housed in the Area de Paleontología, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, under the prefix CPBA.

Order ORTHOCERIDA Kuhn, 1940

Family DAWSONOCERATIDAE Flower, 1962

Genus *Dawsonoceras?* Hyatt, 1884

**Type species.** *Orthoceras annulatum* Sowerby, 1816.

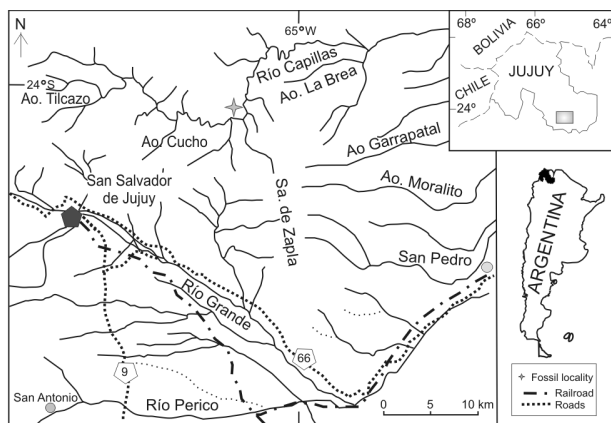
*Dawsonoceras?* sp.

Figures 2.1-2

1982. "*Rectoghloma*" *zaplensis*; Turic, Ramos and Oliver, p. 4, fig. 3.

**Material.** The specimen (CPBA 20397) consists of a broken body chamber, of which only the ornamentation pattern of the shell

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**Figure 1.** Location map of the Capillas River locality (from Turic *et al.*, 1982) / mapa de ubicación de la localidad de Río Capillas (de Turic *et al.*, 1982).

could be seen. The body chamber is preserved as an internal mould cover in part by the remains of the shell wall. The adapical part does not show the siphuncle. This latter condition is probably the reason why Turic *et al.* (1982) failed to identify the fossil as a cephalopod.

**Description.** On one side of the specimen, the shell wall is preserved and the pattern of ornamentation can be seen (figure 2.1). The maximum length of the preserved portion of the body chamber is 120 mm, and the maximum adapical width is 42 mm.

The fossil is somewhat depressed because of diagenetic compaction. The shell ornamentation consists of regularly spaced annulations (with 15 annulations in the overall length), combined with festooned lirae. There are about five lirae between pairs of annulations. There are also inconspicuous longitudinal ridges that form nodes at the ridges of the annulations (figure 2.1).

**Remarks.** Based on the revision of the annulated

orthocerid cephalopods of the Baltoscandic Ordovician, Kröger and Isakar (2006) considered the ornamentation of the shell was only of value for generic diagnosis. Since the specimen lacks a phragmocone, there are no diagnostic characters that will allow an assignment of any higher taxonomic group. Until more complete material can be collected, only the pattern of the ornamentation is available for taxonomic determination. Based on the above, and considering the age of the unit, together with the previous citations with regard to cephalopods from this area (Cecioni, 1953), this specimen is preliminarily assigned to the genus *Dawsonoceras?*. As an additional consideration, the ornament of the studied specimen also resembles that of the pseudorthocerid genus *Gorbyoceras* Shimizu and Obata, 1935, which is known from the Upper Ordovician of North America, United Kingdom and Baltoscandia. This alternative identification is less likely for the Lipeón Formation specimen since the age of the unit is considered to be Silurian.

**Occurrence.** Zapla range, Río Capillas, Lipeón Formation. Silurian.

## Discussion

The Lipeón Formation represents a deep marine shelf environment, deposited during a temperate to cold climate (Sánchez, 1989) due to the high paleolatitude where the western margin of Gondwana (specially the Argentine Central Andean Basin) was located by the Silurian (Fortey and Cocks, 2003).

Crick (1993) indicated that after the Late Ordovician, the dispersal potential of the orthoceridans increased and decreased with sea level rises and falls. The early Silurian was generally a period of eustatic rises in sea-level (Benedetto and Sánchez, 1990 and reference herein), favouring the migration of some



**Figure 2. 1-2, *Dawsonoceras?*** Lipeón Formation / Formación Lipeón, CPBA 20387. **1,** Lateral view of the body chamber / *vista lateral de la cámara habitación*; **2,** apical view of the body chamber / *vista apical de la cámara habitación*. Both figures x 1 / *Ambas figuras x 1*.

faunal elements. The orthoceridans may be an example of this migration event. Although Evans (2000) related the presence of orthoceridan genera with high paleolatitude environments, since *Dawsonoceras* is a cosmopolitan genus, it is not possible to associate it with temperate environments in particular, as it was found in low paleolatitudes as well (e.g. Flower, 1943; Teichert and Glenister, 1952). It was probably a eurytopic genus, with a high potential for migration, and capable of inhabiting a variety of paleoenvironments.

Although a taphonomic bias can not be discarded, the low diversity and scarcity of nautiloids in the Lipeón Formation could be related to the high paleolatitude of this part of the western margin of Gondwana during the Silurian, implying a temperate climate, which may not have been optimal for nautiloids (Crick, 1993).

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