

Cambrian sponge spicules and chancelloriids of the argentine precordillera: a review

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We have collected spicule sponges and sclerites of chancelloriids in two facies from the Precordillera of western Argentina. The first facies, Cambrian, reflects deposition of a shallow carbonate platform in the eastern and central parts of the Precordillera. The second facies, Middle to Upper Ordovician, reflects deposition of slope facies in the western part of the Precordillera; this second facies includes the reworking and deposition of the first facies. Porifera and sponge-like chancelloriids are known principally from fragments of skeletal nets, dissociated spicules and sclerites from the carbonate platform facies and the olistostromic sequences from the slope facies. From these facies, two spicule assemblages can be differentiated:

a) The first is an autochthonous assemblage that corresponds to material collected from the upper Lower to Middle Cambrian sediments of the La Laja Formation (*Plagiura-Poliella* Zone) in the carbonate facies of the eastern Precordillera of the San Juan Province. This assemblage (our work and also others) consists of a variety of stauractines and sclerites of *Chancelloria* Walcott. The Protospongiidae is represented by triradiate proclianes, pentactines and hexactines, all of *Kisvetinokia* Walcott.

b) The second is an allochthonous assemblage that consists of spicules and skeletal nets collected in diverse carbonate olistoliths from the slope facies of the San Juan and Mendoza Precordillera. The Cambrian carbonate blocks were derived from the collapse and/or fragmentation of the shallow, outer platform and slope facies. These blocks were reworked and deposited in two Ordovician clastic slope sequences: Los Sombreros Formation (San Juan Precordillera) and the Empozada Formation (Mendoza Precordillera). Therefore, the first spicule assemblage, typical of the carbonate platform, can also be found in some of the olistoliths in the second assemblage. For instance, sclerites of the *Chancelloria* Walcott and other dissociated spicules identified as *Kisvetinokia*, also occur in Los Sombreros Formation and in the Middle Cambrian bioclastic wackestones found in the San Isidro (*Glossopleura* Zone) and in the dark mudstones from the San Martín (agnostids from the Upper Middle Cambrian) olistoliths of the Lower Member of the Empozada Formation.

In the Upper Cambrian, a La Cruz olistolith (*Proconodontus tenuiserratus* Zone) of the Empozada Formation, can be found isolated hexactines, pentactines and monaxons. The early hexactinellid Protospongiidae with body preservation are *Diagoniella?* and *Kisvetinokia*. The specimens were collected from an olistolith with *Pseudagnostus* (Upper Cambrian s.l.) of the Los Sombreros Formation. The external morphology and the choanosomal skeleton are moderately preserved. Isolated stauractines, anchoring and diagonally arranged spicules, are also present in this assemblage.

Demosponges have very limited record in the Cambrian of the Precordillera. Anthaspidellid sponges have been reported from the La Laja Formation and now from the San Martín olistolith (Empozada Formation). This olistolith represents an outer platform. These

unidentifiable fragments of trabs and dendroclone spicules represent the only Cambrian occurrences of anthaspidellids known thus far in South America.

The occurrence of these spicules sponges in both the platform and slope facies of the Precordillera are useful in providing help for paleoenvironmental and paleogeographical interpretations. Additionally, these sponge and spicule assemblages aid in the ongoing discussion of the relationships between the east and the west facies during the Cambrian and Ordovician of the Precordillera.