



# **XII Congreso de la Asociación Paleontológica Argentina**

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VIRTUAL



y *Pholadella*). En este intervalo, se registra un género endémico, que tuvo su primera aparición en el Ludlow–Pridoli de Bolivia (*Pleurodapis*). El Devónico Medio a parte del Superior (Eifeliano a Frasniano), presenta 18 géneros, de los cuales, 16 son cosmopolitas y ecuatoriales en su mayoría y dos son endémicos, y ya estaban presentes en la cuenca (*Notonucula* y *Pleurodapis*). Esta reconstrucción de las afinidades paleobiogeográficas de los bivalvos registrados permite documentar el carácter cosmopolita de los intervalos de la cuenca en los que el nivel del mar alto conectaba varias cuencas entre sí, es decir, entre el Ludlow y el Lochkoviano temprano y entre el Eifeliano y el Frasniano. Por otro lado, entre el Lochkoviano terminal y el Emsiano, el Reino Malvinokáfrico o Bioregión Malvinohosan, de endemismo pronunciado en otros *phyla*, registra en cambio, en el caso de los bivalvos, presencia de géneros mayoritariamente cosmopolitas.

## FIRST PALYNOLOGICAL RECORD FROM THE WINNIPEG SHALE (UPPER ORDOVICIAN) IN THE NORTHERN BLACK HILLS OF SOUTH DAKOTA, U.S.A.

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The marine Winnipeg Formation exposed in the northern Black Hills of South Dakota is composed of the Icebox and Roughlock members, which represent the southern extension of transgressive episodes documented in the northern Great Plains (Williston Basin) of the USA and Canada. The typically dark green to black shales of the Icebox grade up into argillaceous carbonates of the Roughlock. The first palynologic analysis of the Icebox and lower Roughlock members includes a well-preserved and diverse palynoflora from 14 unweathered samples collected from Spearfish Canyon (U.S. Highways 14 and 85). The lower 10 samples were taken approximately every meter from the nine meters of Icebox shales and three additional samples from thin transitional layers into the calcareous shale of the Roughlock (1 m), from which another sample was collected. The 14 assemblages are variably composed of chitinozoans (25 species) and acritarchs (23 species), with fewer cryptospores, cyanophycean *Gloecapsomorpha prisca*, and five scolecodonts. Frequency trends from the last four samples, corresponding to the transition of Icebox to Roughlock, show chitinozoans dominating the lower sample with a lesser proportion of acritarchs that dominate in the next two samples. *Gloecapsomorpha prisca*, an Ordovician colonial marine microorganism, was found intermittently through the entire interval but is especially abundant in the sample from the Roughlock; hence interpreted as blooms related to environmental changes. Although many chitinozoans and acritarchs are long-ranging Ordovician species, the chitinozoans *Calpichitina lenticularis*, *Euconochitina (Jenkinochitina) tanvillensis* and *Belonechitina robusta*, documented from the base up to the mid-upper Icebox, support a correlation of our studied interval with the mid Caradocian (equivalent to North American Trentonian and current Sandbian–Katian stages) homonymous palynozones of North Gondwana. The acritarchs *Elektoriskos aktinotos*, *Peteinosphaeridium accintulum* and *Sylvanidium paucibrachium*, known from the Ashgillian of Missouri, and *Peteinosphaeridium septuosum* from the Caradocian and Ashgillian of Kansas, Missouri and Oklahoma, and *Belonechitina punctata* (recorded in the upper Icebox), reinforce this age. This is in concordance with previous studies of conodonts from upper Icebox and Roughlock at Icebox Gulch and Whitewood Creek in the Black Hills, where lower and mid Caradocian species were documented (*Belodina (Panderodus) compressa*, *Chirognathus duodactylus (= delicatula)*, *Distacodus insculptus*, *Falodus prodentatus*, *Oulodus serratus*, *Plectodina dakota*, *Plectodina tenuis*, *Ptiloconus gracilis*, *Scyphiodus primus*, and several species of *Panderodus*). A preliminary paleobiogeographic affinity indicates a close relationship to Northern Gondwanan, Baltic and Laurentian chitinozoan assemblages during the late Ordovician.

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## BIOSTRATIGRAPHY OF DEVONIAN–MISSISSIPPIAN SAPPINGTON FORMATION IN SOUTHWESTERN MONTANA, U.S.A.

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New conodont results from the Sappington Formation in southwestern Montana revise its age from primarily Devonian to Mississippian and question the utility of using global species like *Siphonodella praesulcata* and *Siphonodella sulcata* and the palynomorph *Retispora lepidophyta* for delineating the Devonian/Mississippian boundary. This boundary has been placed at the top of the upper Sappington Formation (Unit 5) for over 40 years based on the latest Devonian conodont *Siphonodella praesulcata* and the latest Devonian miospore *Retispora lepidophyta* found in the underlying Unit 4. An unconformable contact with the overlying Cottonwood Canyon/Lodgepole Formation is confirmed by conodonts of the Early Mississippian *crenulata* Zone with several missing zones at the contact. In this study, 33 localities were studied using large sample sizes and close sample spacing. Diverse miospore assemblages bearing *Retispora lepidophyta* were retrieved throughout the Sappington Formation in the lower Shale (U1), the middle shale (U4) and from rare shales occurring in the upper clastics (U5). In contrast, several localities yielded Early Mississippian conodonts and primary observations are: (1) siphonodellids *Siphonodella sulcata* and *Siphonodella praesulcata* were found coexisting in U3 from Beaver Creek East and in U5 at Snake Pit, Horseshoe Canyon West and Vermont, all barren of palynomorphs. Previous studies only found *Siphonodella praesulcata* without *Siphonodella sulcata* in U3 and U5 at Lick Creek and other localities in the Basin; (2) an Early Mississippian conodont with nodose ornamentation and rostral ridges, identified as *Siphonodella* cf. *S. hassi*, occurs with *Retispora lepidophyta* in a unique, fossiliferous lower U4 channel sandstone at Antelope Valley; (3) an Early Mississippian conodont *Siphonodella bransoni* occurs in the middle of U5 at Horseshoe Canyon West and near the top of U5 at Devils Fence West; neither outcrop contains palynomorphs; (4) an Early Mississippian conodont *Siphonodella cooperi* was found in oolitic grainstones within lower U5 at Moose Creek, above *Retispora lepidophyta*-bearing U4. These new data show that *Siphonodella praesulcata* and *Siphonodella sulcata* coexist with Early Mississippian conodonts and further work is needed to determine if they are morphotypes of the same species or can still be used to indicate the Devonian/Mississippian boundary as previously thought. As well, a controversy remains as to whether or not *Retispora lepidophyta* is *in situ* everywhere in the Northern Rockies since it has now been documented in Early Mississippian strata in the Sappington, Bakken, and Banff formations. Globally, it is frequently found reworked from Late Devonian deposits, triggered by global regression of glacio-eustatic origin confirmed by diamictites in South America, Africa, and eastern North America. Considering all this information, the boundary in the Sappington Formation must be below U4 and could be as old as U3, but it would be difficult to identify without the diagnostic Tournaisian conodonts found using large sample sizes. These results are consistent with previously published Early Mississippian conodonts from the top of the Middle Bakken in East-Central Alberta.

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## ASPECTOS TAFONÓMICOS DE LA FLORA FÓSIL DE LA FORMACIÓN BAJO DE VELIZ (CARBONÍFERO–PÉRMICO), SAN LUIS, ARGENTINA

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La Formación Bajo de Veliz es el depósito sedimentario más antiguo de la provincia de San Luis, y constituye un excelente ejemplo de paleosistema fluvial-lacustre con abundante contenido paleontológico (megaflora, microflora, entomofauna y trazas fósiles) que le asignan una edad carbonífera superior–pérmica inferior. En esta contribución, se aborda el estudio sedimentológico de las rocas fosilíferas y aspectos tafonómicos de la flora fósil. La megaflora estudiada se encuentra depositada en repositorios de la Universidad Nacional de San Luis, Universidad de Buenos Aires y Academia Nacional de Ciencias (Córdoba). El estudio sedimentológico de las localidades Cantera Santa Rosa y Loma de Árbol, permitió reconocer siete litofacies clásticas y una litofacies carbonática, agrupadas en cuatro asociaciones de facies: I) y IV) dominan las litofacies lacustres con pelitas laminadas interrumpidas por areniscas finas a medianas con laminación y estratificación horizontal y masivas; y II) y III) dominan las litofacies fluviales formadas por areniscas muy finas a medianas con estructuras