

SUPPLEMENTARY ONLINE MATERIAL FOR

Late Silurian palynomorphs from the Los Espejos Formation, Precordillera of San Juan, Argentina: Diversity, palaeoenvironmental, and palaeogeographic significance

Victoria J. García Muro, Claudia V. Rubinstein, and Philippe Steemans

Published in *Acta Palaeontologica Polonica* 2018 63 (1): 41-61. https://doi.org/10.4202/app.00400.2017

Supplementary Online Material

- **SOM 1.** Stratigraphic distribution of the chlorophytes, acritarchs, non-marine palynomorphs (NMP), trilete spores and cryptospores recorded from the Cerro La Chilca section.
- **SOM 2.** Stratigraphic distribution of the chlorophytes, acritarchs, non-marine palynomorphs (NMP), trilete spores and cryptospores recorded from the Quebrada Ancha section section (lower part).
- **SOM 3.** Stratigraphic distribution of the chlorophytes, acritarchs, trilete spores and cryptospores recorded from the Quebrada Ancha section (upper part).

SOM 1. Stratigraphic distribution of the chlorophytes, acritarchs, non-marine palynomorphs (NMP), trilete spores and cryptospores recorded from the Cerro La Chilca section, and the proposed ages for the unit. Black rectangles mean presence of the species, grey rectangles indicate doubtful classification. Species recorded for the first time in Gondwana are written in bold. (a) in Le Hérissé, 1989. Wen.?: Wenlock?; Home.?: Homerian?; Gorst.?: Gorstian?; Ludf.?: Ludfordian?

| | | Silurian | | | | | | |
|----------------|--|----------|---------|----------|---------|---------|---------|---------|
| | Species Sample | Wen.? | | | | llow | | |
| | Species Sample | Home.? | | / Ludf.? | | | ordian | |
| | 2: | 1-61065 | 2-61057 | 3-61058 | 4-61059 | 5-61060 | 6-61061 | 7-61062 |
| | Cymatiosphaera paucimembranae cf. Melikeriopalla sp. | | | | | | | |
| | Cymatiosphaera spp. | | | | | | | |
| | Leiosphaeridia sp. | | | | | | | |
| | Baculatireticulatus baculatus | | | | | | | |
| | Dictyotidium alvoaletum | | | ı | | | | |
| | Dictyotidium alveolatum Melikeriopalla polygonia | | | | | | | |
| | Dictyotidium spp. | | | | | | | |
| S | Cymatiosphaera salopensis | | | | | | | |
| Chlorophytes | Cymatiosphaera cf. multisepta | | | | | | | |
| | Cymatiosphaera octoplana | | | | | | | |
| | Cymatiosphaera cf. jardinei Cymatiosphaera cf. lawsonii | | | | | | | |
| | Cymatiosphaera cf. mirabilis | | | | | | | |
| | Cymatiosphaera multicristata | | | | | | | |
| | Cymatiosphaera nimia | | | | | | | |
| | Duvernaysphaera aranaides | | | | | | | |
| | Pterospermella elliptica | | | | | | | |
| | Pterospermella martinii Polyedryxium wenlockium | | | | | | | |
| | Dictyotidium tenuiornatum | | | | | | | |
| | Dictyotidium stellatum | | | | | | | |
| | Cymatiosphaera cf. ledburica | | | | | | | |
| | Nanocyclopia spp. | | | | | | | |
| | Veryhachium trispinosum Group | | | | | | | |
| | Ammonidium waldronense Cymbosphaeridium spp. | | | | | | | |
| | cf. Schismatosphaeridium algerense | | | | | | | |
| | Eupoikilofusa striatifera | | | | | | | |
| | Multiplicisphaeridium spp. | | | | | | | |
| | Dorsennidium spp. | | | | | | | |
| | Leiofusa bernesgae | | | | | | | |
| | Leptobrachion sp. | | | | | | | |
| | Dactylofusa maranhensis | | | | | | | |
| | Dorsennidium europaeum Fimbriaglomerella divisa | | | | | | | |
| | Gorgonisphaeridium spp. | | | | | | | |
| | Comasphaeridium brevispinosum | | | | | | | |
| | cf. Eisenackidium argentinum | | | | | | | |
| | Eupoikilofusa cantabrica | | | | | | | |
| | cf. Ammonidium sp. | | | | | | | |
| | Leiofusa estrecha | | | | | | | |
| દ્ર | Lophosphaeridium magnum | | | | | | | |
| arch | Multiplicisphaeridium mingusi Tylotopalla deerlijkianum | | | | | | | |
| Acritarch | Micrhystridium spp. | | | | | | | ı |
| Ă | Ammonidium ludloviense | | | | | | | · |
| | Oppilatala grahni | | | | | | I | |
| | Ozotobrachion palidodigitatus | | | | | | | |
| | Dactylofusa sp. | | | | | | | |
| | Multiplicisphaeridium cladum | | | | | | | |
| | Ammonidium maravillosum Buedingiisphaeridium lunatum | | | | | | | |
| | Dactylofusa cf. striatogranulata | | | | | | | |
| | Dateriocradus lindus | | | | | | | |
| | Diexallophasis remota Group | | | | | | | |
| | Estiatra barbata | | | | | | | |
| | Hoegklintia gogginensis | | | | | | | |
| | Onondagella asymmetrica | | | | | | | |
| | Oppilatala insolita cf. Oppilatala frondis | | | | | | | |
| | Percultisphaera incompta | | | | | | | |
| | Neoveryhachium carminae | | | | | | | |
| | Salopidium sp. | | | | | | | |
| | Villosacapsula sp. | | | | | | | |
| | cf. Schimatosphaeridium sp. B (a) | | | | | | | |
| NMP | Quadrisporites sp. Clypeolus tortugaides | | | | | | | |
| | Ambitisporites avitus-dilutus Morphon | | | | | | | |
| | Retusotriletes spp. cf. Concentricosisporites agradabilis | | | | | | | |
| | cf. Concentricosisporites agradabilis Emphanisporites spp. | | | | | | | ı |
| | Emphanisporites spp. Punctatisporites sp. | | | | | | | |
| Frilete spores | Emphanisporites? tenuis | | | | | | | |
| | Coronaspora sp. | | | | | | | |
| l s | Synorisporites verrucatus | | | | | | | |
| ilet | Vermiverruspora rumneyi | | | | | | | |
| Έ | Archeozonotriletes chulus | | | | | | | |
| | C. verrucata var. verrucata Morphon Emphanisporites rotatus | | | | | | | |
| | Empnanisporites rotatus Coronaspora cromatica | | | | | | | |
| | Chelinospora cf. cantabrica | | | | | | | |
| | Chelinospora sanpetrensis | | | | | | | |
| res | Gneudnaspora divellomedia | | | | | | | |
| osbo | Tetrahedraletes medinensis | | | l | | | | |
| Cryptospores | Hispanaediscus lamontii Hispanaediscus wenlockensis | | | | | | | |
| U | i napanaculocus weiliockelisis | I | | | | | | |

SOM 2. Stratigraphic distribution of the chlorophytes, acritarchs, non-marine palynomorphs (NMP), trilete spores and cryptospores recorded from the Quebrada Ancha section (lower part), and the proposed ages for the unit. Black rectangles mean presence of the species, grey rectangles indicate doubtful classification. Species recorded for the first time in Gondwana are written in bold. (a) in Le Hérissé, 2000, (b) in Mullin, 2001, (c) in Le Hérissé, 1989, (d) in Richardson et al., 2001. Gorst.?: Gorstian?

| | | | Silurian | | |
|--------------|--|-----------------------------------|--|-----------------------|-------------------------------|
| | Species Samples | Gorst.? -60667 2-60704 3-60659 4- | Ludlow Ludfordian 62521 5-62523 6-6066 | 2 7-60736 8-60677 | Přídolí 9-60664 10-60673 |
| | Leiosphaeridia spp. Cymatiosphaera spp. | | | | |
| | Cymatiosphaera cf. densisepta (a) Pterospermella spp. | | | | |
| | Duvernaysphaera aranaides Melikeriopalla polygonia | | | | |
| | Cymatiosphaera jardinei cf. Melikeriopalla sp. | | | | |
| | Dictyotidium alveolatum Dictyotidium faviforme | | | | |
| | Dictyotidium stellatum Dictyotidium dictyotidium | | | | |
| | Dictyotidium callum Dictyotidium spp. | | | | |
| | Quadraditum incisum Cymatiosphaera prismatica | | | | |
| se | Quadraditum fantasticum Dictyotidium tenuiornatum | | | | |
| Chlorophytes | Cymatiosphaera aff. multisepta (b) Polyedryxium spp. | | | | |
| 양 | Pterospermella cf. pertonensis (b) Pterospermella martinii | | | | |
| | Cymatiosphaera aff. ledburica (b) Cymatiosphaera octoplana | | | | |
| | Dictyotidium biscutulatum Pterospermella bernardinae | | | | |
| | Baculatireticulatus sp. Helios aranaides | | | | |
| | Polyedryxium wenlockium Cymatiosphaera nimia Cymatiosphaera lawsonii | | | | |
| | Cymatiosphaera lawsonii Pterospermella marysae Cymatiosphaera acuminata | | | _ | |
| | Cymatiosphaera cf. mirabilis Cymatiosphaera salopensis | | | | |
| | Pterospermella elliptica Cymatiosphaera heloderma | | | | |
| | cf. Pterospermella circumstriata Polyedryxium cf. embudum | | | | |
| | Veryhachium trispinosum Group Neoveryhachium carminae | | | | |
| | Diexallophasis remota Group Micrhystridium spp. | | | | |
| | Leiofusa bernesgae Eupoikilofusa striatifera | | | | |
| | Buedingiisphaeridium pyramidale Leiofusa estrecha | | | | |
| | Villosacapsula sp. Gorgonisphaeridium saharicum Fimbriaglomerella divisa | | | | |
| | Oppilatala sp. Eupoikilofusa cantabrica | | _ | | |
| | Cymbosphaeridium spp. Schismatosphaeridium cf. rugulosum | | | | |
| | Buedingiisphaeridium lunatum Salopidium granuliferum | | | | _ |
| | Onondagella asymmetrica Lophosphaeridium sp. | | | | |
| | Cymbosphaeridium cariniosum Ammonidium ludloviense | | | | |
| | Dilatisphaera cf. williereae Gorgonisphaeridium sp. A (c) Schismatosphaeridium longhonense | | | | |
| | Schismatosphaeridium longhopense Tylotopalla caelamenicutis Tylotopalla robustispinosa | | | | |
| | Dorsennidium europaeum Estiastra barbata | | | | |
| | Cordobesia uruguayensis Lophosphaeridium parverarum | | | | |
| | Multiplicisphaeridium monki Dateriocradus sp. | | | | |
| Acritarchs | Tylotopalla deerlijkianum Leptobrachion sp. | | | | |
| Acrita | Cymbosphaeridium pilar Multiplicisphaeridium spp. | | | | |
| | Dorsennidium pertonense Veryachium lairdii Group | | | | |
| | cf. Gorgonisphaeridium spp. Tylotopalla sp. Leiofusa banderillae | | | | |
| | Leiofusa fusiformis Ammonidium waldronense | | | | |
| | Ammonidium maravillosum Ammonidium sp. A (b) | | | | |
| | Nanocyclopia spp. Ammonidium sp. | | | | |
| | Carminella maplewoodensis Helosphaeridium pseudodictyum | | | | |
| | Hoegklintia longispina cf. Hoegklintia gogginensis Leptobrachion arbusculiferum | | | | |
| | Multiplicisphaeridium arbusculum forma A (b) Oppilatala grahni | | | | |
| | Oppilatala insolita Oppilatala ramusculosa | | | | |
| | Ozotobrachion palidodigitatus Cymbosphaeridium sp. A (b) | | | | |
| | Ammonidium cornuatum Visbysphaera cf. pirifera | | | | |
| | Helosphaeridium spp. Dactylofusa cf. maranhensis Helosphaeridium malvernense | | | | |
| | Helosphaeridium malvernense Multiplicisphaeridium rochesterensis Salopidium sp. | | | | |
| | Villosacapsula setosapellicula Lophosphaeridium cf. microgranulosum | | | | |
| NMF | Schimatosphaeridium sp. B (c) Clypeolus tortugaides | | | | |
| | Emphanisporites rotatus C. verrucata var. verrucata Morphon | | | | |
| | Archeozonotriletes chulus Emphanisporites? tenuis Ambitisporites avitus-dilutus Morphon | | | | |
| | Ambitisporites avitus-dilutus Morphon Coronaspora cromatica Emphanisporites protophanus | | | | |
| | Stellatispora infram. var. infram. Chelinospora obscura | | | | |
| | Retusotriletes spp. Emphanisporites spp. | | | | |
| rn | Concentricosisporites agradabilis Breconisporites sp. B (d) | | | | |
| sbores | Emphanisporites neglectus Ambitisporites sp. | | | | |
| Trilete | Synorisporites verrucatus Chelinospora cf. hemiesferica (d) Synorisporites trinanillatus | | | | |
| ľ | Synorisporites tripapillatus Chelinospora cf. cantabrica Retusotriletes cf. maccullockii | | | | |
| | Synorisporites sp. Emphanisporites cf. rotatus | | | | |
| | Breconisporites sp. Apiculiretusispora sp. | | | | |
| | Brochotriletes foveolatus Chelinospora sanpetrensis | | | | |
| | Cymbosporites cf. catillus Leonispora argovejae | | | | |
| | Scylaspora cf. scripta (d) Scylaspora vetusta Consultantes disallementia | | | | |
| | Gneudnaspora divellomedia Hispanaediscus spp. Chalipphilates lorgensis | | | | |
| | Chelinohilates Iomensis Pseudodyadospora petasus cf. Rugosphaera tuscarorensis | | | | |
| | Tetrahedraletes medinensis Artemopyra urubuense | | | | |
| spores | Confossuspora sp. Sphaerassacus glabellus | | | | |
| Cryptospores | Hispanaediscus verrucatus Hispanaediscus wenlockensis | | | | |
| | Rugosphaera sp. Rimosotetras probematica | | | | |
| | Imperfectotriletes patinatus Segestrespora membranifera D. murusdensa/murusat. Morphon | | | | |
| | Vestitusdyadus sp. Hispanaediscus lamontii | | | _ | |
| | 1Namasanana minorini | | | | |

SOM 3. Stratigraphic distribution of the chlorophytes, acritarchs, trilete spores and cryptospores recorded from the Quebrada Ancha section (upper part), and the proposed age for the unit. Black rectangles mean presence of the species, grey rectangles indicate doubtful classification. Species recorded for the first time in Gondwana are written in bold. (a) in Le Hérissé, 1989.

| | | Silurian | | | | |
|----------------|--|----------|----------|----------|----------|--|
| | Species Sample | | Příd | dolí | | |
| | | 11-61020 | 12-60986 | 13-60984 | 14-60982 | |
| | Cymatiosphaera jardinei | | | | | |
| | Cymatiosphaera salopensis | | | | | |
| es | Leiosphaeridia spp. | | | | | |
| Chlorophytes | Melikeriopalla polygonia | | | | • | |
| l g | Dictyotidium spp. | | | | | |
| 일 | Polyedryxium spp. | | | | | |
| 0 | Dictyotidium dictyotidium | | | | | |
| | Helios aranaides | | | | | |
| | Quadraditum fantasticum | | | | | |
| | Micrhystridium spp. | | | | | |
| | Veryhachium trispinosum Group | | | | | |
| | Dorsennidium europaeum | | | | | |
| | Eupoikilofusa striatifera | | | | | |
| | Schismatosphaeridium longhopense | | | | | |
| | Leiofusa bernesgae | | | | | |
| | Leptobrachion sp. | | | | | |
| S | Multiplicisphaeridium spp. | | | | | |
| Acritarchs | Cymbosphaeridium sp. | | | | | |
| rita | Eupoikilofusa cantabrica | | | | | |
| Ac | Fimbriaglomerella divisa | | | | | |
| | Oppilatala sp. | | | | | |
| | Ozotobrachion sp. | | | | | |
| | Schimatosphaeridium sp. B (a) | | | | | |
| | Veryachium lairdii Group | | | ı | | |
| | Cymbosphaeridium pilar | | | | | |
| | Gorgonisphaeridium sp. | | | | | |
| | Neoveryhachium carminae | | | | | |
| | Tylotopalla caelamenicutis | | | | | |
| | Emphanisporites neglectus | | | | | |
| | Coronaspora cromatica | | | | | |
| | C. verrucata var. verrucata Morphon | | | | | |
| | Archeozonotriletes chulus | | | | | |
| | Emphanisporites? tenuis | | | | | |
| | Synorisporites verrucatus | | | | | |
| S | Amicosporites spp. | | | | | |
| ore | Emphanisporites rotatus Emphanisporites spp. | | | | | |
| Trilete spores | Retusotriletes cf. maccullockii | | | | | |
| ete | Emphanisporites protophanus | | | | | |
| <u> </u> | Chelinospora obscura | | | | | |
| | Retusotriletes spp. | | | | | |
| | Synorisporites sp. | | | | | |
| | Scylaspora vetusta | | | | | |
| | Amicosporites streelii | | | | | |
| | cf. Concentricosisporites sagittarius | | | | | |
| | Emphanisporites cf. splendens | | | | | |
| | Retusotriletes cf. warringtoni | | | | | |
| | Gneudnaspora divellomedia | | | | | |
| | Hispanaediscus verrucatus | | | | | |
| res | Imperfectotriletes cf. patinatus | | | | | |
| Cryptospores | D. murusat./murusdensa Morphon | | | | | |
| | Pseudodyadospora petasus | | | | | |
| , ryp | Tetrahedraletes medinensis | | | | | |
| | Sphaerassacus glabellus | | | | | |
| | Rugosphaera sp. Imperfectotriletes sp. | | | | | |
| | Imperiectotilietes sp. | | | | | |