



GEOESPELEOLOGIA Y CLASIFICACIÓN ESPELEOTEMÁTICA DE LA CUEVA DE DOÑA LUCRECIA (RIONEGRO, SANTANDER)



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GRUPO DE GEOESPELEOLOGÍA
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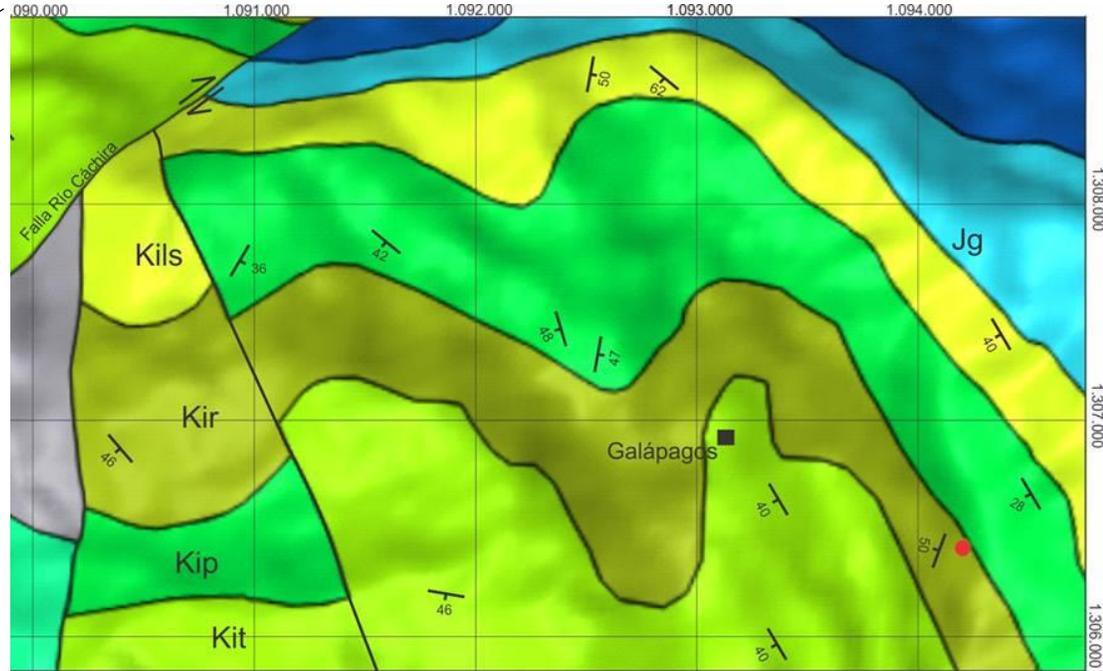
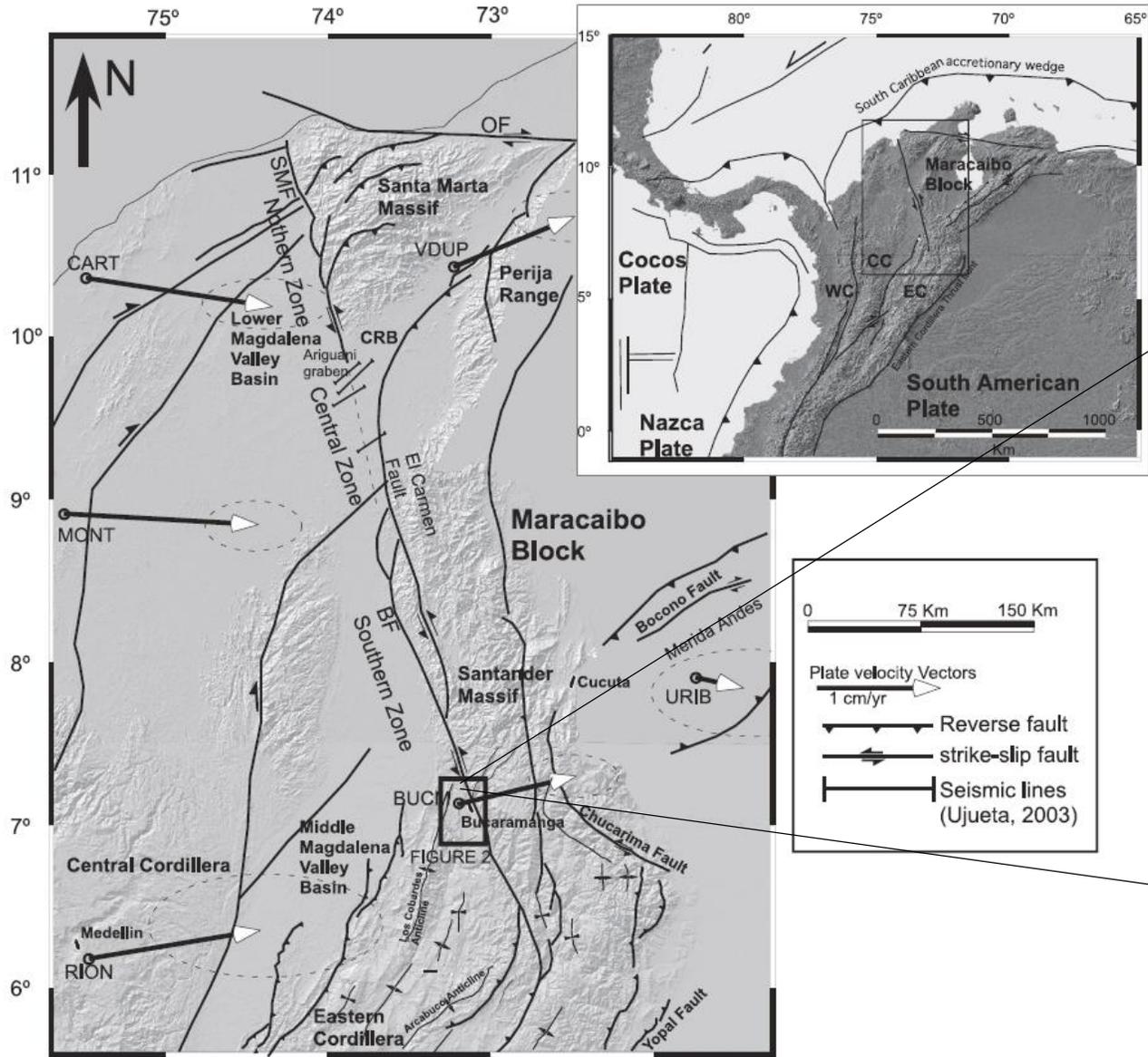


Fig. Marco tectónico del cono Noroeste de Suramérica. Jimenez et al.,2016

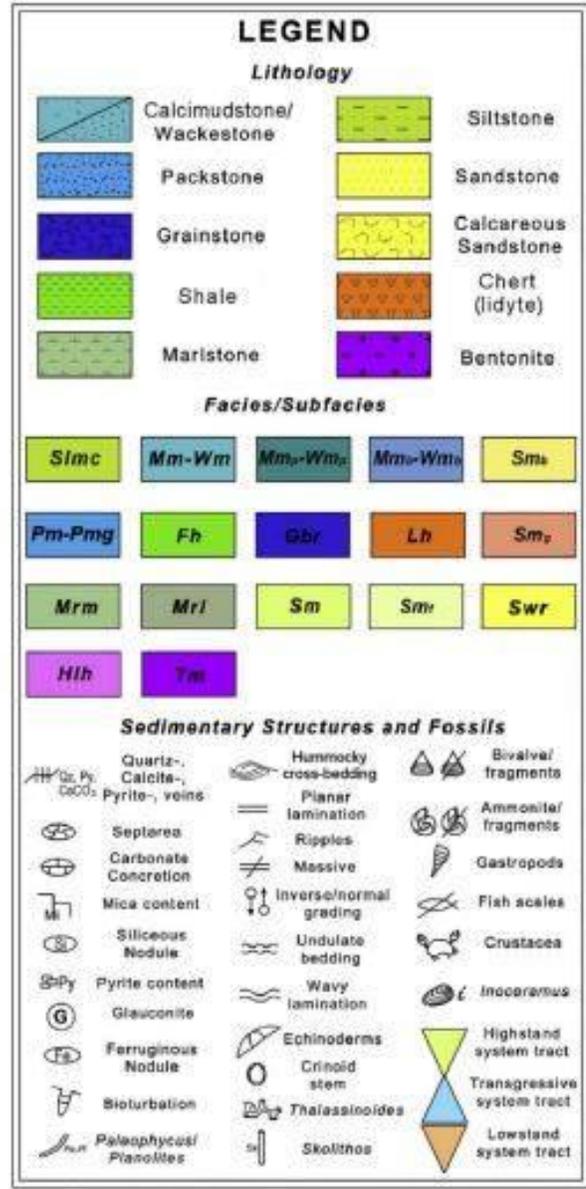
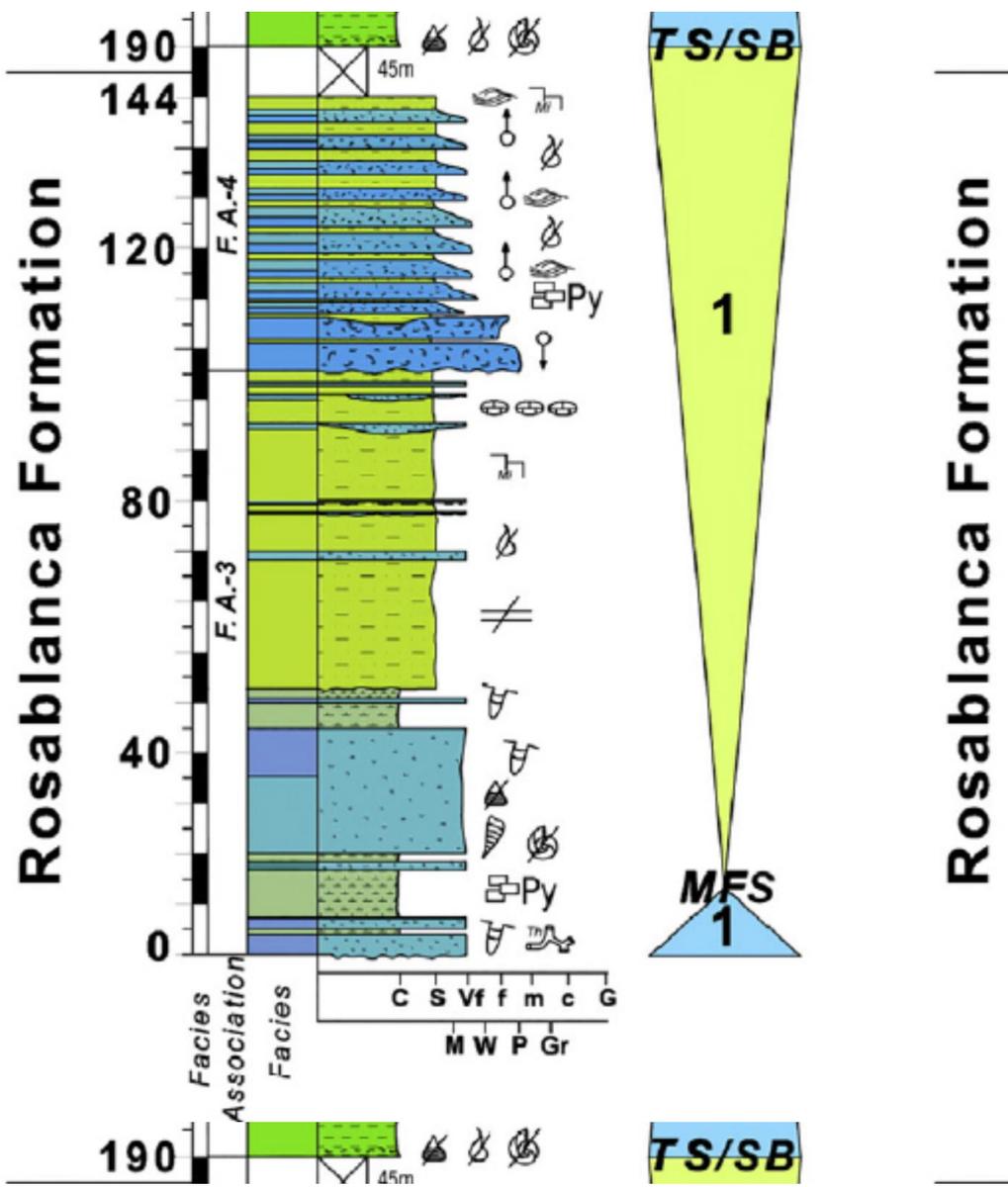
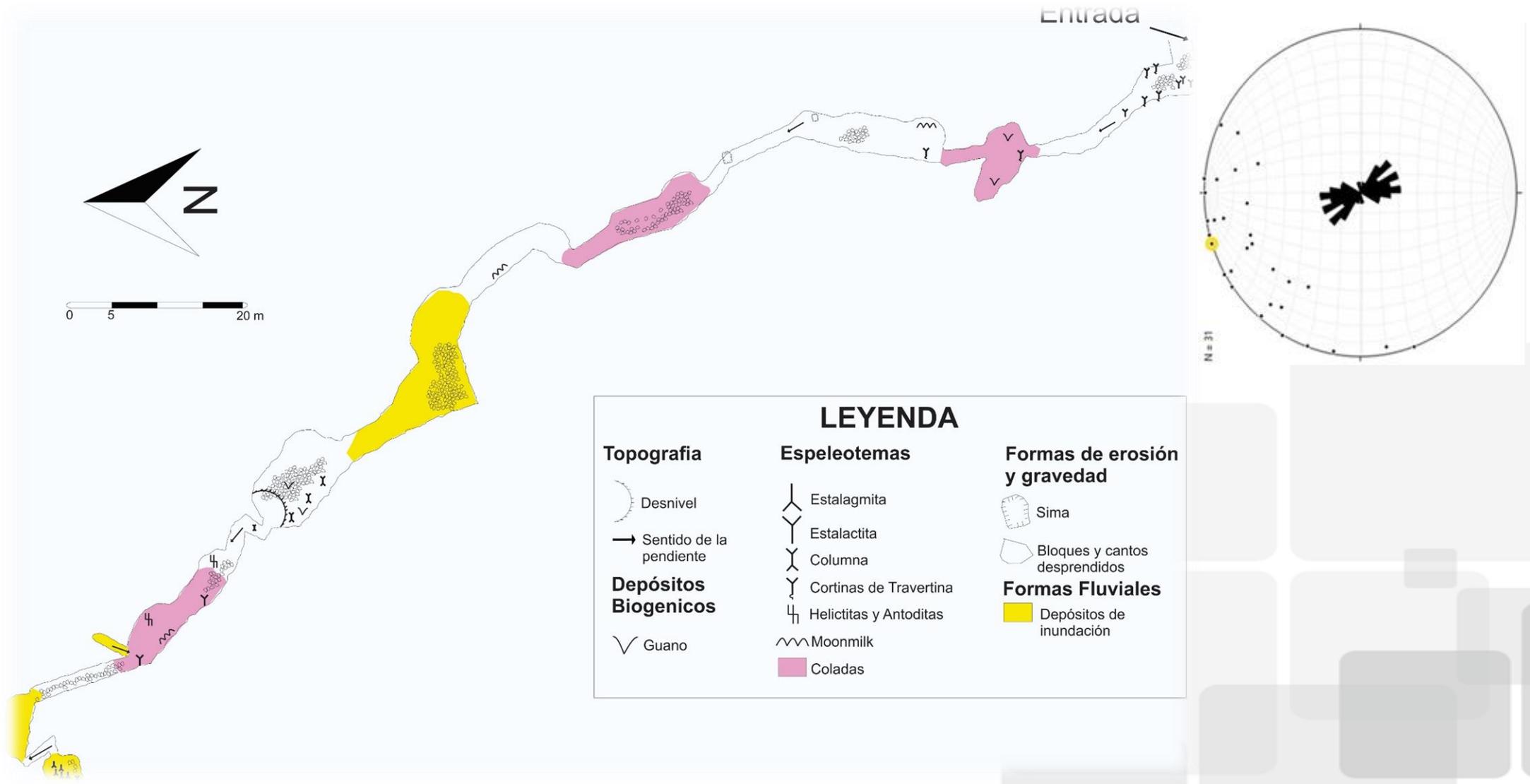


Fig. Columna estratigrafica de la Formación Rosa Blanca Rivera et al.,2018

CARTOGRAFÍA DE LA CUEVA LUCRECIA





PATRIMONIO EN LA VEREDA GALAPAGOS, MUNICIPIO DE RIO NEGRO, SANTANDER



Fig. Laguna, El León Dormido de América



Fig. Campo de lapiaz, cercano a la cueva



PATRIMONIO EN LA VEREDA GALÁPAGOS, MUNICIPIO DE RIO NEGRO, SANTANDER



Fig. Entrada principal a Lucrecia



Fig. Vista interna de la entrada a Lucrecia



Fig. Pasadizo interno en
Lucrecia

FORMAS ZENITALES



Fig.1: Banderas, Estalactitas y Antodita



Fig.2&3: Estalactitas y Helictífitas en formación

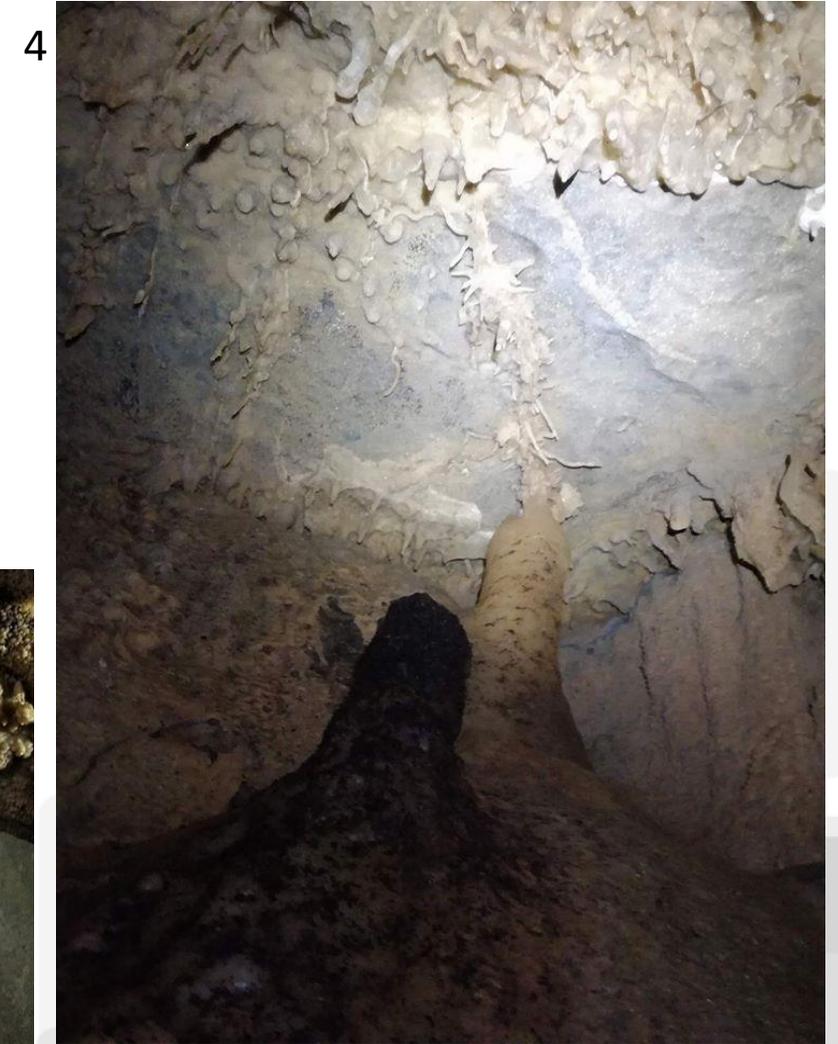


Fig.4: Fractura evidenciada por intensidad de material reconstructivo

FORMAS PARIETALES



Fig.1: Helictita tipo caracol, Fig.2: Coladas con vetillas de calcita, Fig.3: Antoditas y Helictitas, Fig.4: Dientes de sierra, Fig.5: Agrupación de coladas formando un pseudokarren

FORMAS PAVIMENTARIAS



Fig. Estalagmita en formación
variedad Huevo frito



Fig. Estalagmitas, algunas de variedad
Arbol de Navidad.



Fig. Espeleotemas caídos,
Pavimentación en proceso



FAUNA Y FLORA EN LA CUEVA LUCRECIA

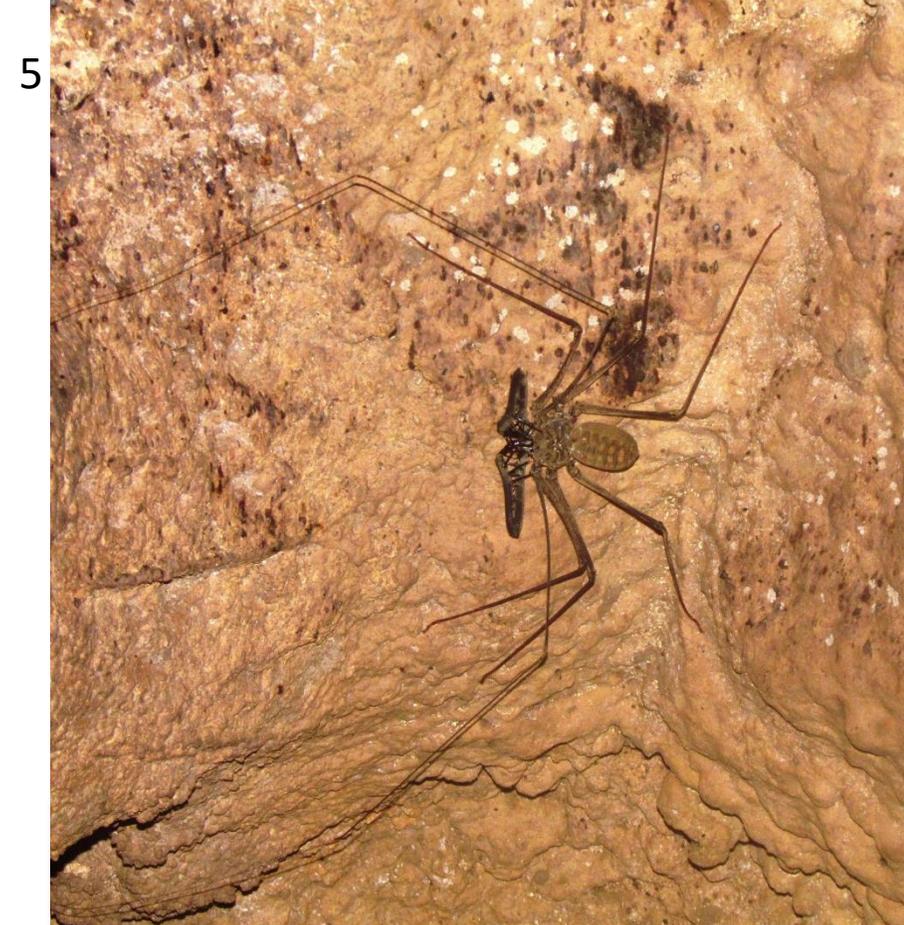


Fig1: Murciélagos, Fig2: Tinajo, Fig3: Plantas en nacimiento,
Fig4: Falsa Coral, Fig5: Arañas



MICROESTRATIGRAFIA EN ESPELEOTEMAS

Architectural Element philosophy
building units, generated under
relatively homogeneous conditions

Sequence Stratigraphy philosophy
genetically related stratal
units and bounding surfaces

Speleothem Architectural Analysis (stratigraphic elements in stalagmites)

1st Order
Individual
crystallites

3rd Order
Speleothem
fabrics

5th Order
Morpho-
stratigraphic units

2nd Order
Single growth
layers

4th Order
Stacking
patterns sets

6th Order
Unconformity
bounded units

season

years

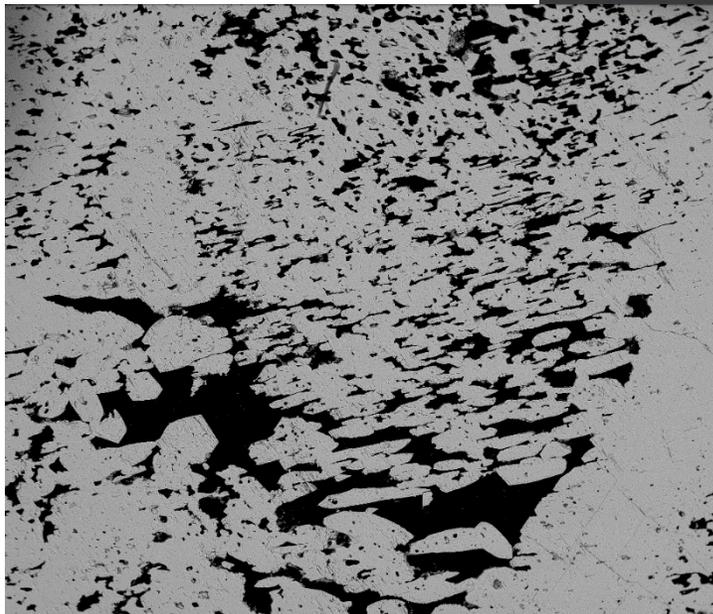
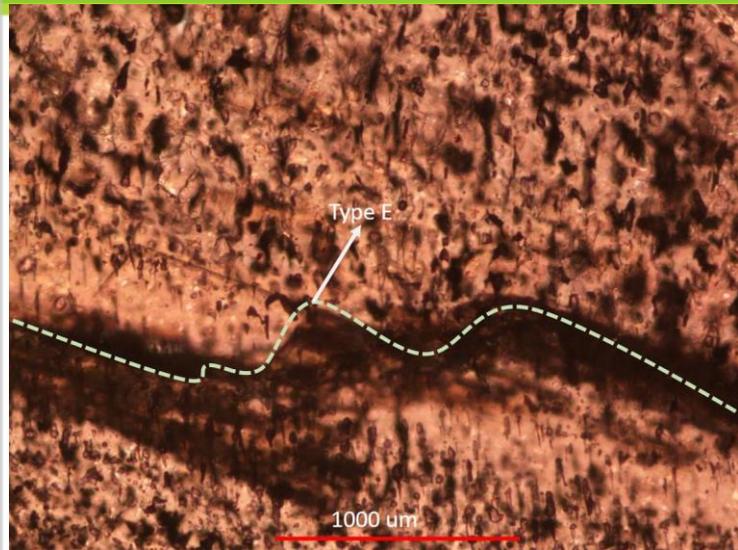
decades

centuries

millennia

- Martín-Chivelet et al. SPELEOTHEM ARCHITECTURAL ANALYSIS
- Railsback et al. LAYER BOUNDING SURFACES IN STALAGMITES

Una detallada estratigrafía de espeleotemas podría ser la base para hacer reconstrucciones robustas de series de paleoclimas (Martín-Chivelet et al., 2017).



HV 25.00 kV mag 80 x det BSED mode Z Cont HFW 3.73 mm WD 13.7 mm 1 mm QUANTA FEG 650

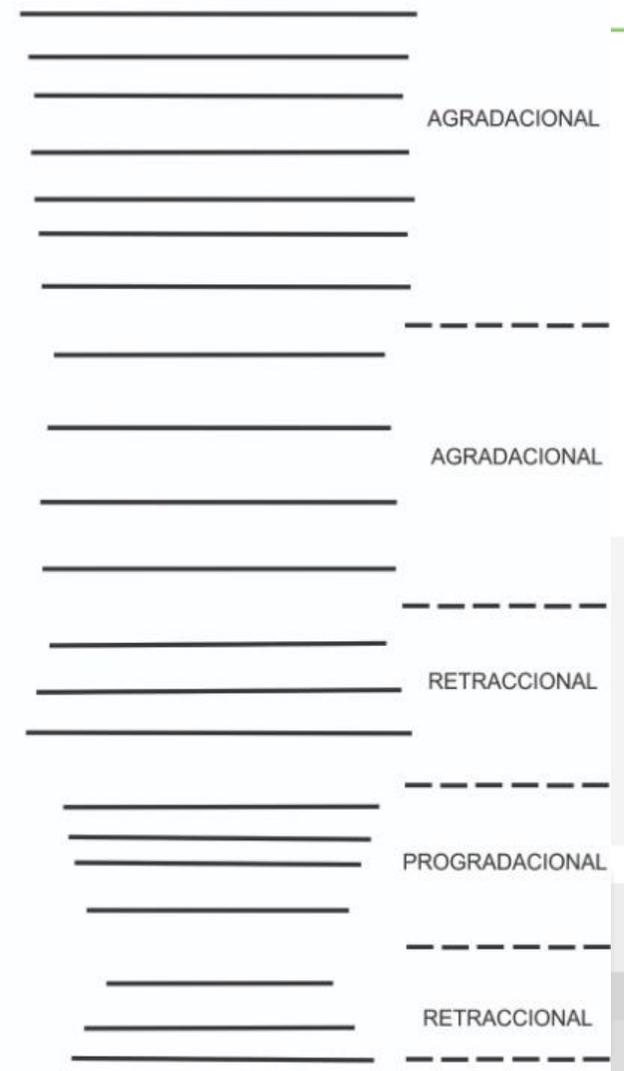


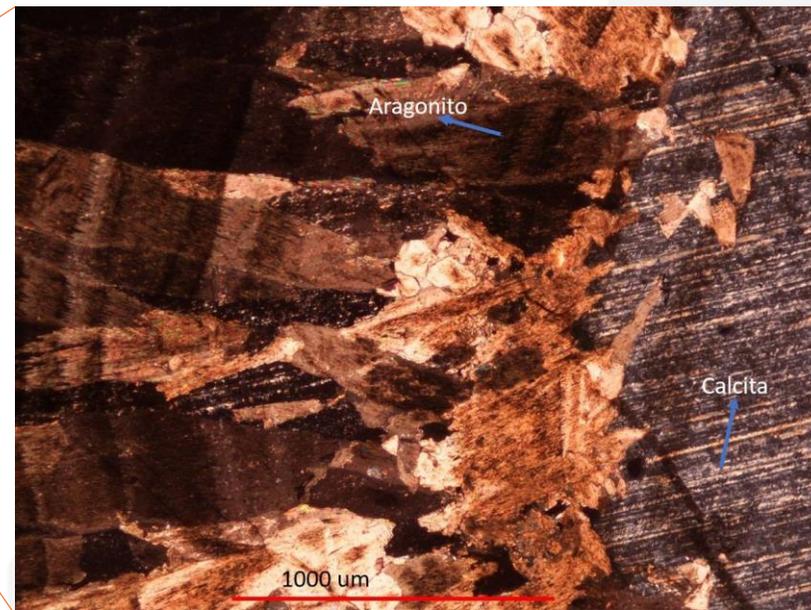
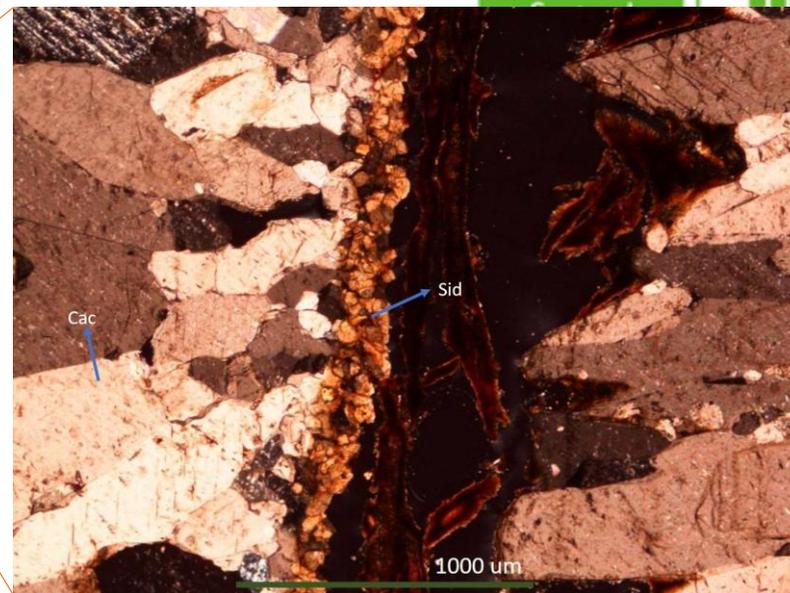
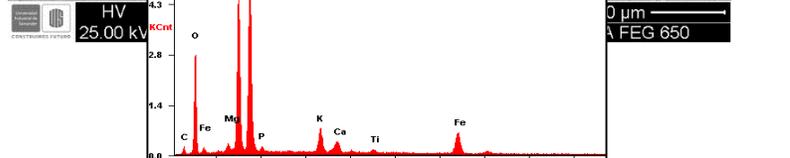
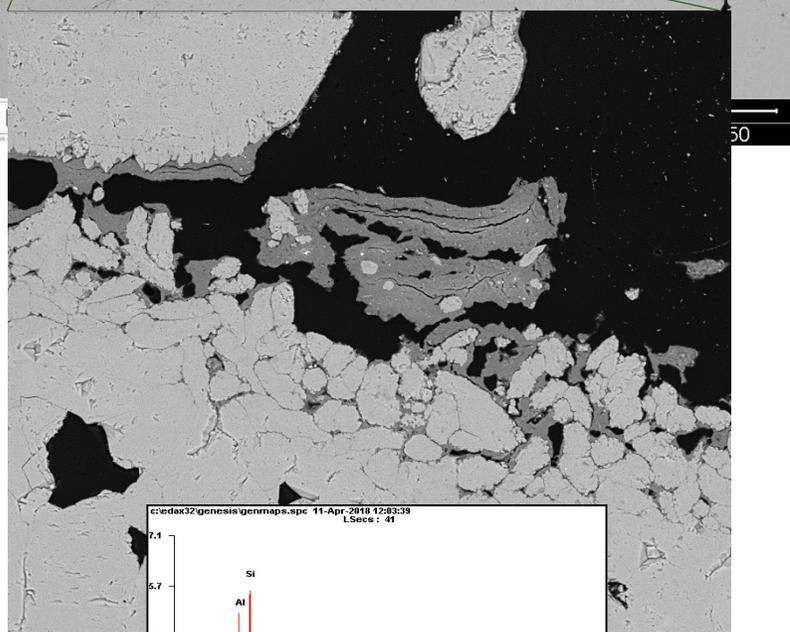
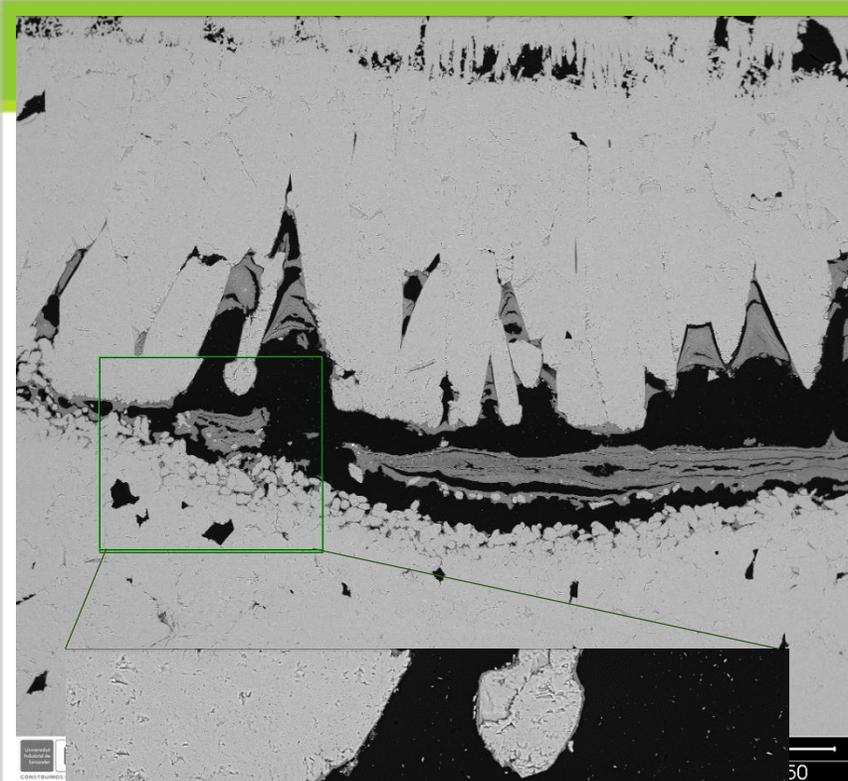
Table 1

Third order architectural elements. Common fabrics in calcite stalagmites (simplified from Frisia, 2015). In this table, we have used (for coherence with the rest of the paper) the terms "crystallite" and "crystal" respectively instead of "crystal" and "polycrystal" used in Frisia (2015).

Type (code)	Features	Drip rate	Drip stability	Impurities
Columnar compact	-L/W ratio < 6:1 -Competitive growth with complete coalescence of crystallites -Straight to serrated boundaries -Uniform extinction	Relative slow and constant	High	Low content
Columnar open	-L/W ratio < 6:1 -Competitive growth with incomplete coalescence of crystallites -Linear intercrystalline porosity and inclusions -Uniform extinction	Relative slow but higher than Compact	High	Low content
Columnar elongated	-Length/Width (L/W) ratio > 6:1 -Competitive growth with incomplete coalescence of crystals -Uniform extinction	Very stable conditions	High	High Mg/Ca ratio
Columnar microcrystalline	-L/W ratio < 6:1 -Irregular intercrystalline boundaries -Intracrystalline microporosity -Uniform extinction, with patches	Variable (seasonal)	Relative low	Rich in colloidal particles
Dendritic	-Branching crystals -Irregular intercrystalline boundaries -Very porous	Variable	Low	Foreign ions and particulates

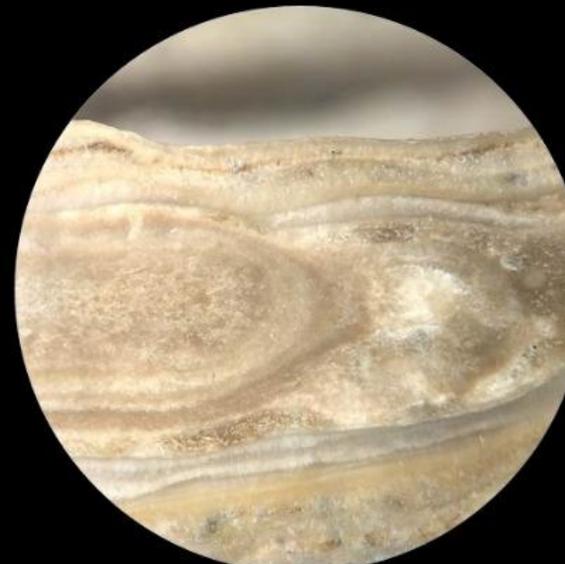
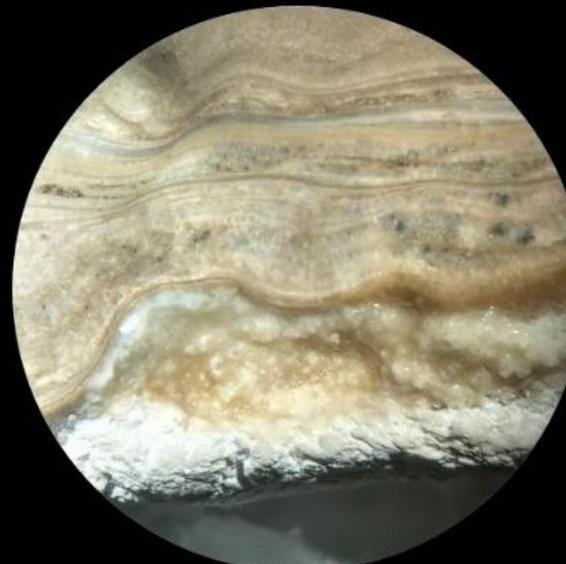
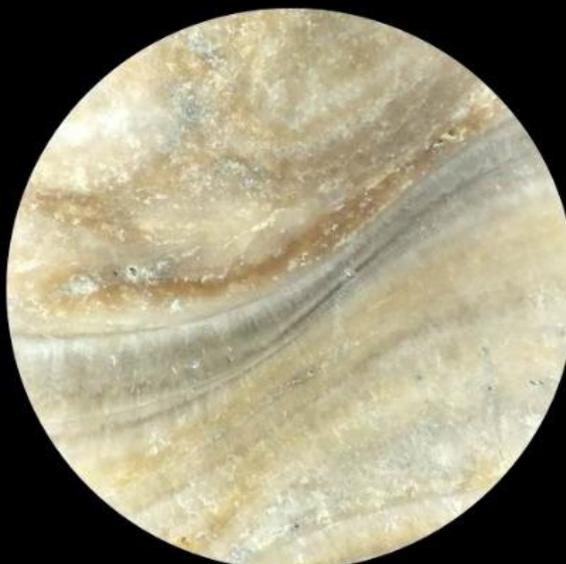
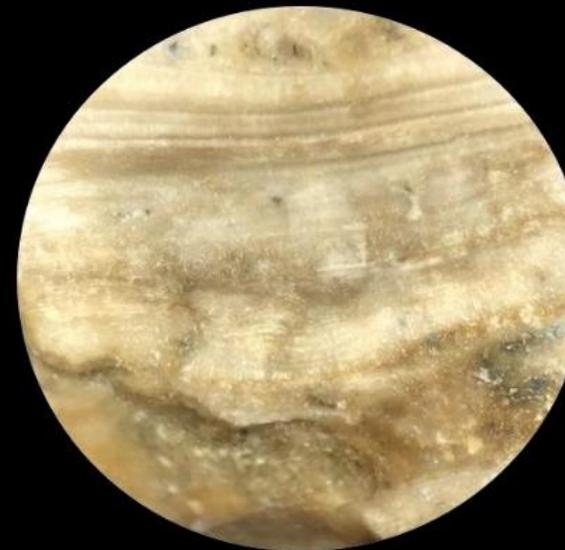
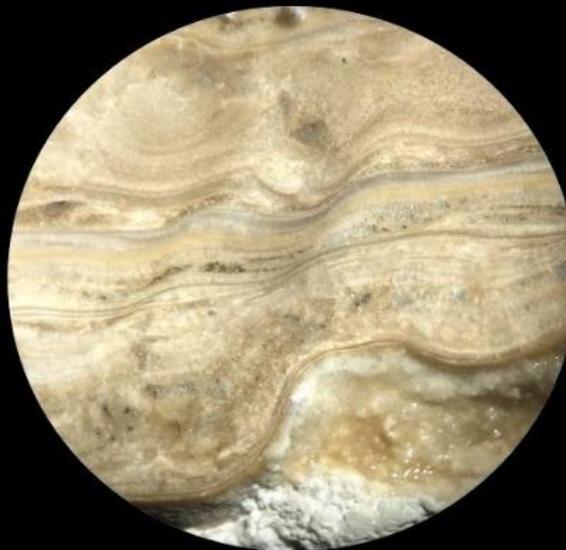
Rimmed	Cylindrical to truncated-conical shape in which the top of the stalagmite is not flat but defined by a peripheral bulge which confines a central inner basin (rimmed geometry).	Growth layers show concave up patterns in the central part of the stalagmite (the "inner basin"), and concave down geometries in the sides (peripheral bulge). Stacking patterns are mainly aggradational, with possible progradational or retractions trends superimposed.	Strong differentiation of fabrics can occur between central part and peripheral bulge. Dendritic or micro-crystalline fabrics are typical of the rim.	Moderate to high drip-rates, which can vary seasonally. The "splash effect" can be high. Moderate to high calcite supersaturation.	patterns. Candle: the cylindrical shape and the rimmed top resembles the morphology of an used candle. Dominance of aggradation. Flame-like: irregular growth layers in the central part, with milky aspect. Net dominance of dendritic fabric. Unstable or irregular dripping, with significant "splash effect".
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DISCUSION





DISCUSION





CONCLUSIONES

- Series confiables en las capas de estalagmitas para la investigación de paleoclimas del cuaternario requieren la precisa caracterización de la microestratigrafía interna de la estalagmita, una tarea muy a menudo mal lograda a pesar de los recientes avances en la investigación de espeleotemas.
- La Paz en Colombia ha habilitado muchos terrenos que esperan a los científicos que pretendan por su estudio y preservación.
- Potencial geoturístico en la zona de Rionegro que aporte al desarrollo sostenible de la región y a su vez a la Geoconservación de su patrimonio.