

New peri-Gondwanan records of the Hirnantia Fauna in the latest Ordovician of Spain

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The Hirnantia Fauna represents a widespread assemblage of opportunistic species of brachiopods and trilobites with almost global distribution that developed at the time of the latest Ordovician Extinction Event. This was caused by the drastic climate change of the Hirnantian glaciation on the Gondwana continent. In Ordovician polar and subpolar paleolatitudes, the Hirnantia Fauna is of extremely low diversity (the “Bani province” assemblage of present-day North Africa and Ibero-Armorica), but diversity increases in slightly more temperate paleolatitudes beyond the circumpolar region (the “Kosov province” assemblage of Bohemia, Sardinia, Carnic Alps and Pontides), and it reaches a maximum in the tropical and subtropical paleolatitudes (the “Edgewood province” assemblage of Laurentia, Baltica or southern China).

In the Iberian Massif of Portugal and Spain, the Hirnantia Fauna is represented by two occurrences of brachiopods in the Central Iberian Zone and by one in the Cantabrian Zone, plus two single records of a typical Hirnantian trilobite from glaciomarine sediments in the Iberian Cordillera and the Ossa-Morena Zone. All these assemblages, poorly studied so far except the one documented from the Criadero Quartzite of Almadén (Villas et al., 1999), belong to the “Bani province” based on the occurrence of the brachiopods *Hirnantia sagittifera* (M’Coy), *Plectothyrella crassicosta chaweli* (Havlíček), *Arenorthis* sp. and the trilobite *Mucronaspis* cf. *mucronata* (Brongniart).

Recent field studies in the Cantabrian Zone of NW Spain resulted in the discovery of a new locality with the Hirnantia Fauna near Argovejo (León province) with a surprising high-diversity assemblage of rhynchonelliform brachiopods belonging to 11 genera (a.o. *Hirnantia*, *Hindella*, *Eostropheodonta*, *Arenorthis*, *Plectothyrella*, *Dalmanella*, *Cliftonia* and *Leptaena*), occurring in association with diverse trilobites (*Mucronaspis*, *Flexicalymene*, plus minute odontopleurids, lichids and homalonotids), bryozoans, gastropods, pelmatozoans, poriferans, machaeridians and escolecodonts. This assemblage can be ascribed to the “Kosov province” type (except for *Arenorthis*) and occurs within an area where Hirnantian tunnel valleys coeval with the Gondwanan glaciation and a “atypical” (Bani province) Hirnantia Fauna have been found (Gutiérrez-Marco et al., 2010).

The co-occurrence of Bani and Kosov faunas in the same palaeogeographic location reopens the question of whether temperature or paleolatitude was limiting factor for the geographical distribution of the Hirnantia Fauna, or alternatively, if other environmental factors such as substrate or depth, also played a significant role.

Apart from this important occurrence of a diverse Hirnantia Fauna in subpolar Gondwanan latitudes, we report a new locality with *Plectothyrella crassicosta chaweli* and *Eostropheodonta* sp. from the Los Puertos Quartzite of the Iberian Cordillera. Also we add to the known occurrences of the “atypical” Hirnantia Fauna from the Cantabrian Zone with the first record of *Eostropheodonta* sp. in the Luna Quartzite of Valdeteja locality; and in the Central-Iberian Zone with the first identification of *Kinnella kielanae* (Temple) among the assemblage of the Criadero Quartzite from Almadén.

This research is a contribution to the projects CGL2012-39471 of the Spanish MINECO and IGCP 591 (IUGS-UNESCO).

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Recent field studies in the Cantabrian Zone of NW Spain resulted in the discovery of a new locality with the *Hirnantia* Fauna near Argovejo (León province) with a surprising high diversity assemblage of rhynchonelliform brachiopods belonging to 11 genera (a.o. *Hirnantia*, *Hindella*, *Eostropheodonta*, *Arenorthis*, *Plectothyrella*, *Dalmanella*, *Cliftonia* and *Leptaena*), occurring in association with diverse trilobites (*Mucronaspis*, *Flexicalymene*, plus minute odontopleurids, lichids and homalonotids), bryozoans, gastropods, pelmatozoans, poriferans, machaeridians and esolecodonts. This assemblage can be ascribed to the "Kosov province" type (except for *Arenorthis*) and occurs within an area where Hirnantian tunnel valleys coeval with the Gondwanan glaciation and a "atypical" (Bani province) *Hirnantia* Fauna have been found (Gutiérrez-Marco et al., 2010).

The co-occurrence of Bani and Kosov faunas in the same palaeogeographic location reopened the question of whether temperature or paleolatitude was limiting factor for the geographical distribution of the *Hirnantia* Fauna, or alternatively, if other environmental factors such as substrate or depth, also played a significant role.

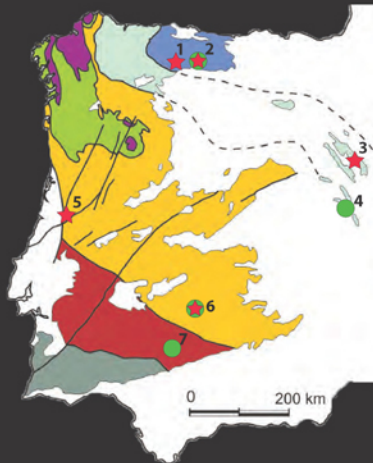
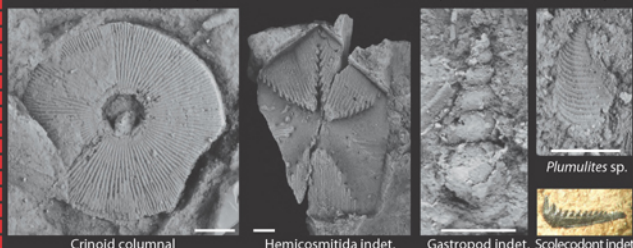
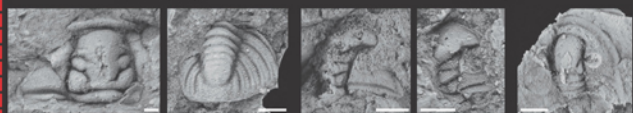
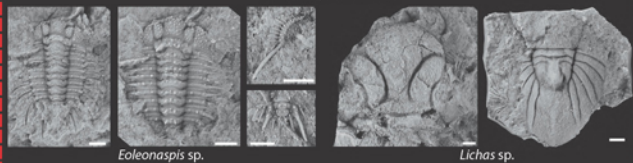
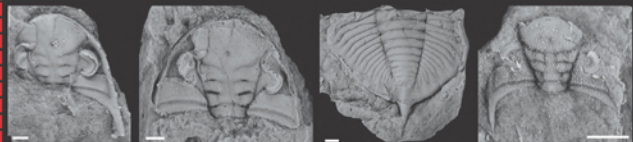
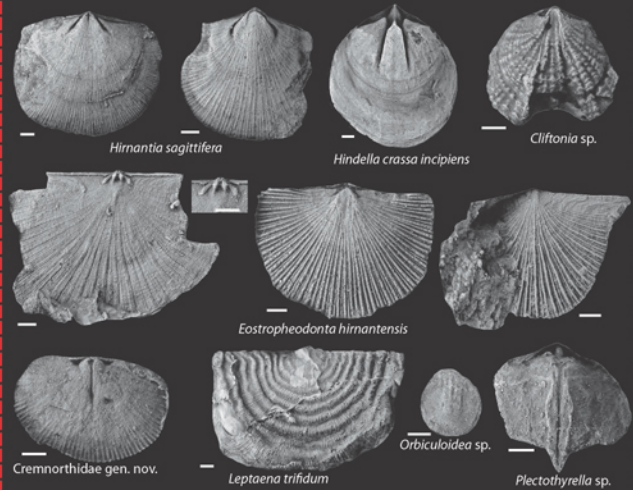
Apart from this important fossil occurrence of a diverse *Hirnantia* Fauna in subpolar Gondwanan latitudes, we report a new locality with *Plectothyrella crassicaosta chauveli* and *Eostropheodonta* sp. from the Los Puertos Quartzite of the Iberian Cordillera. Also we add to the known occurrences of the "atypical" *Hirnantia* Fauna from the Cantabrian Zone with the first record of *Eostropheodonta* sp. in the Luna Quartzite of Valdeteja locality; and in the Central-Iberian Zone with the first identification of *Kinnella kielanae* (Temple) among the assemblage of the Criadero Quartzite from Almadén.

VALDETEJA



All bars = 2 mm

ARGOVEJO



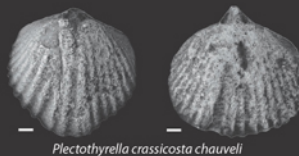
- Cantabrian Zone
- West Asturian-Leonese Zone
- Central Iberian Zone
- Galicia - Trás-os-Montes Zone a: Allochthonous complex
- Ossa-Morena Zone
- South Portuguese Zone

Hesperian Massif showing localities where the *Hirnantia* Fauna has been recorded:

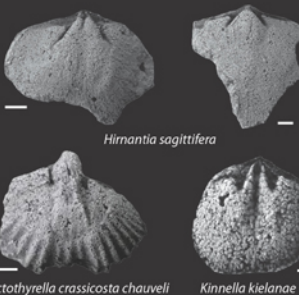
1. Valdeteja; 2. Argovejo; 3. Cerveruela; 4. Noguera;
5. Buçaco; 6. Almadén; 7. Valle Syncline.

★ Trilobites ● Brachiopods

CERVERUELA



ALMADÉN



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GONDWANA 15
North meets South



ABSTRACTS
BOOK

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North meets South

Madrid (Spain)

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