

A LATE PRECAMBRIAN EDIACARA-TYPE FOSSIL FROM CALICIA (NW SPAIN)¹J.J. DOZY²

ABSTRACT

Dozy, J.J. 1984 A Late Precambrian Ediacara-type fossil from Galicia (NW Spain) – Geol. Mijnbouw 63: 071-074.

For the first time a Precambrian trace fossil, possibly a sea pen, has been found in Spain. A description of the find and its stratigraphic position is given.

INTRODUCTION

During 1977 the author found problematic markings, possibly trace fossils, on bedding planes of a probably Precambrian formation, while carrying out fieldwork with students of the Mining Engineering Faculty of the Delft University of Technology in the province of Lugo, NW Spain (DOZY, 1983 a,b). A few years later his attention was drawn to the fact that trace fossils of Precambrian age had been described from a few localities, notably from South Australia. The author gratefully acknowledges the encouragement received from Professor A. Brouwer (Leyden) and Mr. M. Elias (Kambalda, W Australia) to publish this find.

The find was made at a locality in the valley of the Lózára River (Fig. 1). A path ascending from San Cristobal towards the Collado de la Braña, to the SE of Samos (see topographical map 1:25,000 sheet 124-II), follows essentially a dip slope. Roughly above the hamlet of Outonin two loose slabs were found with what looked like some kind of surface 'Lebenspur'. They are now held in the geological collections of the museum of the Faculty of Mining Engineering at Delft, nos. 14152 and 14153 (Hist. Geol.).

DESCRIPTION

The first slab (Fig. 2) consists of finely laminated silty schist. The lamination is well recognizable in a thin section despite the chlorite facies metamorphism. The lamination is cut

obliquely by the surface with the prints. Clearly preserved on that surface are—on the right half—at least 7 horizontal or transverse rather similar depressions up to about 1 mm deep, slightly less than 1 cm wide and at least 4 cm long. To their right the bedding plane and the imprints have been worn away. Two more depressions are partly recognizable. To the left a zone with a comparable pattern is present. The separation of the horizontal elements, however, is less clear than in the right zone, with the exception of the lower three. Here about 5 cm of the transverse depressions have been preserved. A slightly upward bulging smooth surface occurs between the right and the left zones just described.

The slab of Fig. 3 represents also a wedge-shaped edge of a ripple mark. The left upper edge shows what looks like a normal bedding plane with a sericitic shine. Here the layer is about 2 cm thick. It consists of silty material with a fine lamination which is cut obliquely by the surface shown on Fig. 3, so that the thickness of the slab is zero on the side of the ruler. In most depressions a smooth veneer of shining sericitic material has been preserved. The weathering of the surface is stronger and the imprints are deeper than those of the first

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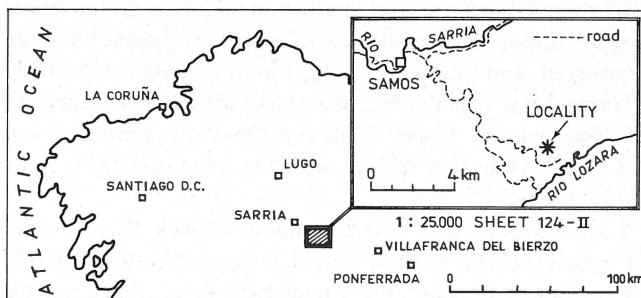


Fig. 1
Locality map, Galicia, NW Spain

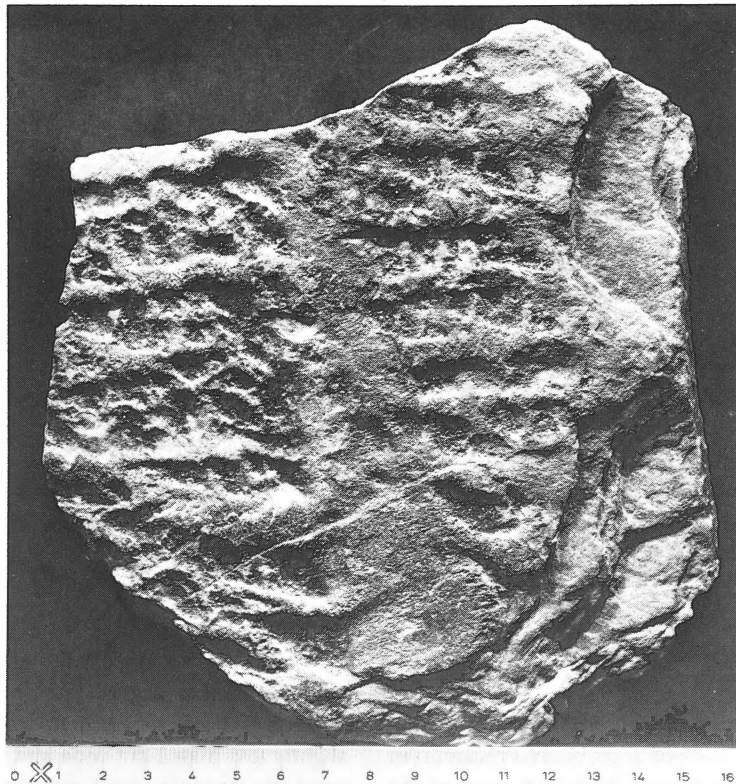


Fig. 2
Sea pen *Arborea* spec?, from the late Precambrian, Lózara valley, province of Lugo, Spain.

slab. Prints are essentially of a triangular or lozenge shape, measuring roughly 2 cm or more. A regular pattern cannot be recognized.

STRATIGRAPHIC POSITION

The imprints occur in beds that belong to the Cándana Schist Formation, the middle division of the Cándana Group. This formation consists of finely laminated and thin-bedded silty schists with intercalations of carbonate beds. The environment was probably shallow marine to sublittoral, the carbonate beds consisting of algal mats and stromatolitic bioherms, which possibly developed locally into tidal flats. In the region of the find a much reduced sedimentary thickness has been observed and the underlying Lower Cándana Quartzite Formation is absent, while also the thickness of the Cándana Schist and the Upper Cándana Quartzite Formations is reduced. At the time of deposition the area formed part of the regional high of Incio.

The age of the Cándana Group is most likely Precambrian. PARGA (1971) compared the deposits with those of the Charnian of England, the Upper Brioverian of France, the Eocambrian of Scandinavia and the Vendian of Russia. The age is also borne out by the fact that the first archaeocyatha (as

also the first trilobites) occur in the overlying Vegadeo Group. In the area where these skeletal fossils have been found and described, the stratigraphic level of the imprints is located some 1000 m or more below the base of the Vegadeo Group. Due to the reduced sedimentary thickness on the Incio high mentioned above—where Cambrian fossils have not been found so far—this distance measures some 300 m only.

DISCUSSION

What do these imprints represent? One could think of grazing traces, burrows, crawling trails or imprints of animals or plants. The first two possibilities do not seem to fit the samples. A grazing trace should have more continuity. As to burrowing, a thin section across the bedrock of Fig. 2 showed normal sedimentary lamination. However, there is no strict proof that one is dealing with the upper surface of a bedding plane. The possibility of a crawling trail or trails cannot be dismissed, obviously not with respect to Fig. 3. The examples mentioned in the literature seem smaller and the depth of the imprint more subtle. Also the apparent difference on Fig. 2 between the simple and pointed lower transverse prints and the broader and more complicated upper ones seems to argue against the crawling trail idea. The last possibility, an

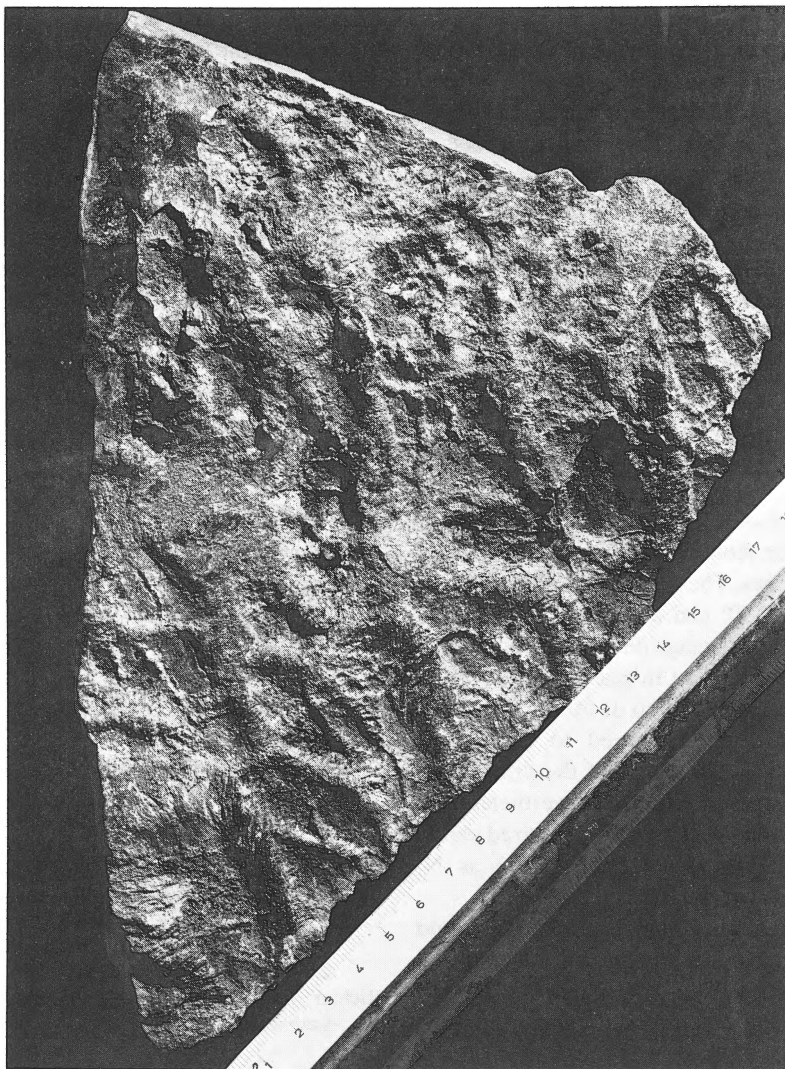


Fig. 3
Imprints of unknown origin from the late Precambrian, Lózara valley, province of Lugo, Spain.

impression of one or more bodies with a certain weight into a soft muddy sediment is thus the most likely answer, certainly for Fig. 2.

As to the slab of Fig. 2, the lack of symmetry of the marks on the right and left hand sides might indicate that one is not dealing with a single object or specimen, but with two or perhaps more. Looking at the best preserved right half, one is struck by the regular spacing of the individual transverse prints, about 1.5 cm apart. Each transverse print seems subdivided by irregular cross ridges, about 3 or 4 to each print. Since it is unlikely that seven or more specimens were lying in a clear row and the same distance apart, it would seem logical to suppose that the marks on the right hand side represent the imprint of a part of one animal or colony of animals, with rows of folds, bulges or branches. Such an animal should have measured more than the about 4×10 cm preserved on the sample.

The left zone on Fig. 2 is less clearly developed. Its straight right edge is remarkable. Elements similar to those visible on the right half of the slab can be recognised, but they seem more irregularly distributed. Assuming, however, a recurrence of such elements at 1.5 cm interval, it is possible to assume the presence of two superimposed patterns, one of which is shifted roughly 0.7 cm upward or downward with respect to the other and rotated slightly counterclockwise at the same time. The lowermost three horizontal tracks, however, appear unaffected. A flexible nature of the body material in the absence of a skeleton may explain a shift of the upper part of the original object only, causing partly two superimposed impressions.

Finally the slab might show the imprint of a single specimen, the smooth surface representing some kind of median ridge. However, the slightly bulging nature of the latter could also be explained by mud having been pushed up

somewhat by the weight of two separate bodies on either side. If a single animal is represented, it should have been at least 15 cm broad and probably more than twice as long.

An attempt was made to compare the incomplete fossil with forms described in the literature. The animal seems to resemble a sea pen (pennatulacea), as described for instance from the Ediacara Hills of South Australia (GLAESSNER, 1961, 1969, 1971; GLAESSNER & WADE, 1966) or from South Africa (RICHTER, 1955). Similar sea pens have been found in Newfoundland (ANDERSON & MISRA 1968), but a conspicuous zigzagging mid line is not present. If the print belongs indeed to a single specimen, the smooth central median ridge compares with the rhachis or dorsal track of a sea pen. In that case the present specimen is larger than the described forms of *Rangea* and might be akin to the genus *Arborea* (GLAESSNER & WADE, 1966).

The traces on the surface of Fig. 3 are puzzling. The impressions are deeper than those of Fig. 2 and surrounded by well expressed rounded ridges. The shape of the prints is often rhombic with angles of 40°-50° and about 135° so that also lozenge shapes occur. A large lozenge on the edge of the slab opposite cm 5 and 6 shows median ridges. It is possible to imagine that similar features occur also at other places, but their nature is not well enough defined to consider it characteristic in general. The abundance of the prints gives the surface an almost trampled appearance. Nevertheless, the ridges between the impressions show two preferred directions, namely, taking the upper edge of Fig. 3 as N, NNW-SSE and less clearly WNW-ESE.

These imprints need not to be of organic origin. One could imagine fragments of a dried up crust of mud, broken up and deposited on the corrugated surface. The shining bottoms of the depressions should in that case represent remnants of clay

fragments. Two facts do not quite agree with this hypothesis, the depth of the prints and the apparent preferred directions of the pushed up ridges.

The alternative hypothesis, an organic origin, is perhaps supported by the fact that the objects causing the prints must have been heavier than clay flakes in order to cause the ridges around the impressions. The shining sericite rich bottom of the prints could then represent a small amount of clayey material, which settled in the hollows from supposedly stagnant water. However, a clue as to the nature of a hypothetical animal could not be found so that the origin should be left open for the time being.

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