

**Fossil *Lingula* as indicators of environmental changes ;
 example of a Lower Devonian bed in Spitsbergen**

par

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Abstract - In light of recent ecological investigations, particularly on abiotic environmental requirements, the conditions of fossilization of various populations of living *Lingula* have been defined and the results transposed to fossil beds : fossilization occurs under drastic environmental changes, due to one or several factors. Tolerances against some factors are different in regard to the occurrence and history of the studied populations of *Lingula*. Consequently, the interpretation of a fossil bed can infer neither the general limits of tolerance of the genus *Lingula* nor yet those of the particular species. Normal conditions of life of a fossil population must be investigated before the fossilization occurred. Thus, the palaeoecological interpretations obviously needs a careful analysis of the biotope. The marine origin of the palaeoenvironment of a Devonian bed (top of the Wood Bay formation), North of Mount Gaborg in Eckmanfjord (Spitsbergen) is corroborated by the analysis of *Lingula* fossilization and the palaeoecological interpretation. This is contrary to classical interpretations. The *Lingula* bed (in flat laying valves) occurred in the littoral zone through effect of very low salinity waters, due to strong rains and/or river swelling, with high fine-sand sedimentation leading to valve fossilization. Consequently : (1) Here the *Lingula* are indicator of a drastic change of the biotope, from marine to fresh water (or at least very low salinity) ; (2) The deeper layers, under the *Lingula* bed, were obviously "marine" ; (3) This bed does not represent the natural biotope of *Lingula* which normally undergoes fossilization due to catastrophic events ; (4) The absence of fossil *Lingula* in deeper geological layers in this locality does not preclude their absence (shells of *Lingula* are not preserved in normal life conditions).

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