

PASTREE

New Plant Architectural Strategies and Terrestrialisation patterns in the Early Eifelian

DURATION
1/10/2013 - 31/12/2016

BUDGET
150.000 €

PROJECT DESCRIPTION

Context

In the Devonian (419–358 Ma), in the course of the Terrestrialisation process (greening of lands), plants underwent important evolutionary changes linked to the adaptation to emerged lands. The conquest of new habitats has favoured an important diversification and led to the apparition of most important high rank groups that we know today (lycophytes, ferns, seed plants). During this project, we have tried to understand three main evolutionary nodes. In order to fulfil this goal, three sites have been studied because particularly rich in fossils. These are: the Eifelian Marche-en-Famenne locality (1), the Late Devonian Waterloo Farm locality in South Africa (2) and the Argentinian Precordillera in Sierra de las Minitas (3).

Objectives

Three objectives have been pursued in the framework of the present project. They are a consequence of the broadening of the project in the course of the research taking advantages of new opportunities. These objectives are:

- 1- A better characterisation of the Trimerophyte/Euphyllophyte transition based on the analyses of new plant remains from the Eifelian locality of Marche-en-Famenne.
- 2- A better characterization of the Aneurophyte/Spermatophyte transition based on new material from the Late Devonian Waterloo farm locality (South Africa).
- 3- And an analysis of the evolution of bipolarity in Lycopsids and Spermatophytes based on Late Devonian/Lower Carboniferous material from Belgium and Argentina.

Conclusions

The Marche-en-Famenne assemblage has shown the presence of a plant presenting a particularly primitive Euphyllophyte anatomy. It has been characterized and included in a global evolutionary scheme. The first Euphyllophytes are basal to a wider group that include the lignophytes and thus the first seed plants. The latter have been studied during this work through two plants, the first is from South Africa and the second from Belgium (*Thorezia vezerensis*). Based on this study, a proposition has been made in order to explain the progressive acquisition of characters such as the cupule or the integument that mark the first spermatophytes. Moreover, the evolution of seed plants but also that of the other groups is marked by the development of the first forests. Here, we have seen this problem under the scope of the evolution of bipolarity in seed plants notably. We are able to highlight that this character is absent in earliest spermatophytes. Finally, a similar approach has been undertaken for the lycophytes allowing to demonstrate that this character evolved between the end of the Devonian and the beginning of the Carboniferous.

CONTACT INFORMATION

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