

DEVONIAN PLANTS FROM HORNACHOS (BADAJOZ), SPAIN

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ABSTRACT

The palaeoflora of a new bed of the Devonian in Spain is described here for the first time. The flora is very abundant and, although fragmentary and in a defective state of fossilization, allows a very acceptable morphological-systematic determination. Of the twentyone species reported here and all of them, except Psilophyton, for the first time in Spain.

Key-words — Psilophytales, Plant fossils, Devonian, Spain.

सारांश

स्पेन में हॉर्नकांस (बादाहोज) से डिवोनियन पौधे - सी० अल्वारेज रेमिस

स्पेन में डिवोनियन के एक नवीन संस्तर का पुरावनसृतिजात सर्वप्रथम वर्णित किया गया है। यह वनस्पतिजात बाहुल्यता में उल्लेख है तथा खंडित एवं अपूर्ण पादवाश्मन अवस्था में परिरक्षित होते हुए भी आकारिकीय वर्गीकरण निर्धारण में यथातथ्य योगदान देता है। इक्कीस विवर्णित जातियों में से साइलो-फ्राइटॉन के अतिरिक्त शेष सभी स्पेन के लिए नई हैं।

INTRODUCTION

THE specimens reported here were supplied by Mr P. Herraz*, who had collected them on the occasion of his studies in the region of Hornachos (Badajoz). This paper should be considered only as a progress report of a more complete work to be published later on in collaboration and which will include both geological aspects and a complete description of the flora from the six fossiliferous levels.

LOCATION AND STRATIGRAPHY OF THE BED

The bed, discovered by P. Herraz, is located in the south-west of the Hesperian Massif, in western Sierra Morena, an area cut by big Pre- and Post-Carboniferous fractures in direction north-west to south-east.

The bed is located about three km south-east of Sierra de Hornachos, and it is made up of rhythmic series of graywakes and mudstones, with a visible thickness of about

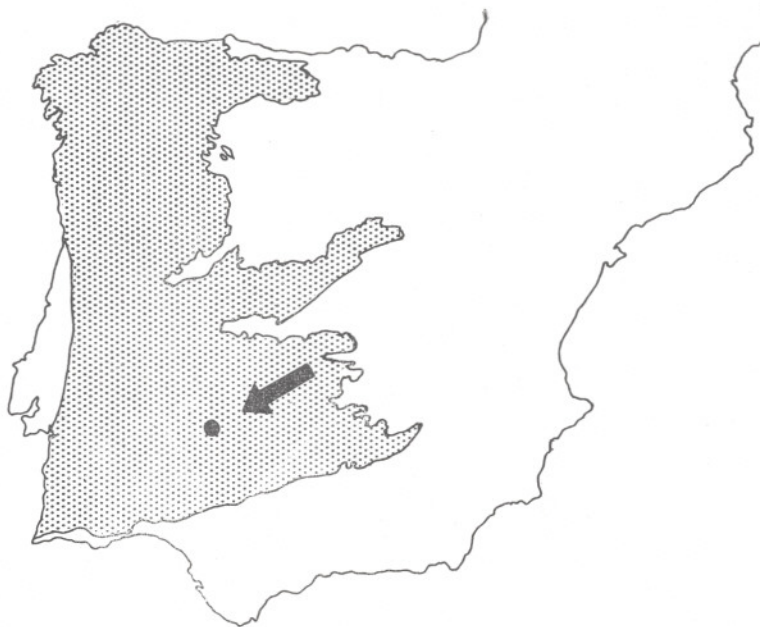
25 m, and inbedded in a much thicker aggregate (larger than 500 m) which begins with conglomerates and ends with pelites and marine limestones. Within this series there are six fossiliferous levels constituted exclusively by plants, as floated in the graywakes, which contain elements of igneous sedimentary origin.

TAPHOFLORA

MORPHOLOGICAL CLASSIFICATION

- Sporogonites* sp. (A)
- Sporogonites* sp. (B)
- Zoosterophyllum* aff. *australianum* Lang. & Cook.
- Psilophyton* sp.
- Thursophyton* sp.
- Psilophytites* sp.
- Hostimella* sp.
- Dawsonites* sp. (A)
- Dawsonites* sp. (B)
- Ginkgophytopsis* sp.
- Drepanophycus* sp.
- Archaeosigillaria* cf. *vanuxemi* (Goeppert) Kidston

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MAP 1

Fragment of leaf of *Lycophyta*
Cyclostigma sp.

Anisopteris cf. *circularis* Walt. ?

Archaeocalamites sp.

Rhacophyton mirabilis (Nath.) Leclerk

Rhacophyton sp. ?

Archaeopteris roemeriana Goepp.

Archaeopteris sp. ?

cf. *Neurocardiopteris broilii* Lutz ?

Most of the specimens collected in the Hornachos bed belong to Psilophite Flora, represented by axial fragments (*Psilophyton* sp., *Thursophyton* sp., *Hostimella* sp. and *Psilophytites* sp.) and by sporangia and capsular bodies (*Zoosterophyllum* aff. *australianum*, several types of *Sporogonites* sp. and of *Dawsonites* sp.). The number of these specimens is really big and it stands out in quantity and variety over other groups, which are represented by *Licophites* (*Drepanophycus* sp., *Archaeosigillaria* cf. *vanuxemi* and *Cyclostigma* sp.), *Paleophytes* (*Ginkgophytopsis* sp.), *Pteridophiles* (*Anisopteris* cf. *circularis*?), *Esfenophytes* (*Archaeocalamites*

sp.) and finally the groups of *Filicophytes* and *Prespermaphytes* (*Rhacophyton mirabilis*, *Archaeopteris roemeriana*, *Archaeopteris* sp.? and cf. *Neurocardiopteris broilii* ?).

Only plant elements were collected in the palaeobiocenosis. It is observed that the fossil plants are constituted by a very dense mixture of floated fragmented plants. The 21 forms given here correspond to Devonian levels.

Ginkgophytopsis sp. is very similar, both morphologically and also in size with the species found in Sullivan Country (New York State), which belongs to the lower part of the Upper Devonian.

The flora of the Upper Devonian are characterized by a progressive enrichment in species genuine of the Carboniferous (Lycopodiales, Equisetales, arborescent ferns, Pteridospermales, etc.) which constitute the outpost of those plants that dominate the lands of the northern hemisphere and give place to the immense Carboniferous forests.

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EXPLANATION OF PLATES

PLATE 1

1. *Sporogonites* sp. (A); two sporangia. $\times 3$.
2. *Sporogonites* sp. (B); single sporangium. $\times 3$.
3. *Sporogonites* sp. (B) and axis of *Psilophyton* sp. $\times 1$.
4. *Zosterophyllum* aff. *australianum* Lang & Cookson.; Sporangia.
5. *Psilophyton* sp.; several axis showing spines and scars. $\times 1$.
6. *Psilophyton* sp.; axis detail showing remains of points of attachment. $\times 3$.
7. *Psilophyton* sp.; axis fragments. $\times 1$.
8. *Thursrophyton* sp.; side branches. $\times 1$.
- 9-12. *Psilophytites* sp.; several axis fragments. $\times 1$.
- 13, 14. *Hostimella* sp.; naked, dichotomously divided plant axis. $\times 1$.
15. Sporangia of *Dawsonites* sp. (A) on axis of *Psilophyton* sp. and megaspore type "Triletes". $\times 1$.
16. *Dawsonites* sp. (B); group of sporangia on an axis. $\times 3$.
17. *Drepanohyctus* sp.; axis fragment with spines and typical points of attachments. $\times 3$.

PLATE 2

18. *Ginkgophytopsis* sp.; fragmented leaf. $\times 1$.
19. The previous remain magnified to show its characteristic venation. $\times 3$.
20. *Archaeosigillaria* cf. *Vanuxemi* (Goeppert) Kidston. $\times 3$.
21. *Cyclostigma* sp. $\times 3$.
22. Fragment of leaf of *Lycopsidea*. $\times 1$.
23. cf. *Neurocardiopteris broilii* Lutz? pinnules, and *Rhacophyton mirabilis* (Nath.) Leclerk, end of sterile pinna. $\times 1$.
24. The previous remain magnified. $\times 3$.
25. *Rhacophyton* sp.?.; assemblage of ripe sporangia.
26. *Rhacophyton mirabilis* (Nathorst) Leclerk.; main axis showing the branches characteristic attachment. $\times 1$.
27. *Archaeocalamites* sp. $\times 3$.
28. *Archaeopteris* sp.?.; axis. $\times 1$.
29. *Anisopteris circularis* Walton? or abnormal pinnule of *Archaeopteris roemeriana* Goeppert? $\times 2$.
- 30, 31. *Archaeopteris roemeriana* Goeppert; two normal pinnules. $\times 3$.
- 32, 33. *Archaeopteris roemeriana* Goeppert; two scale-like folioles. $\times 3$.



PLATE 1

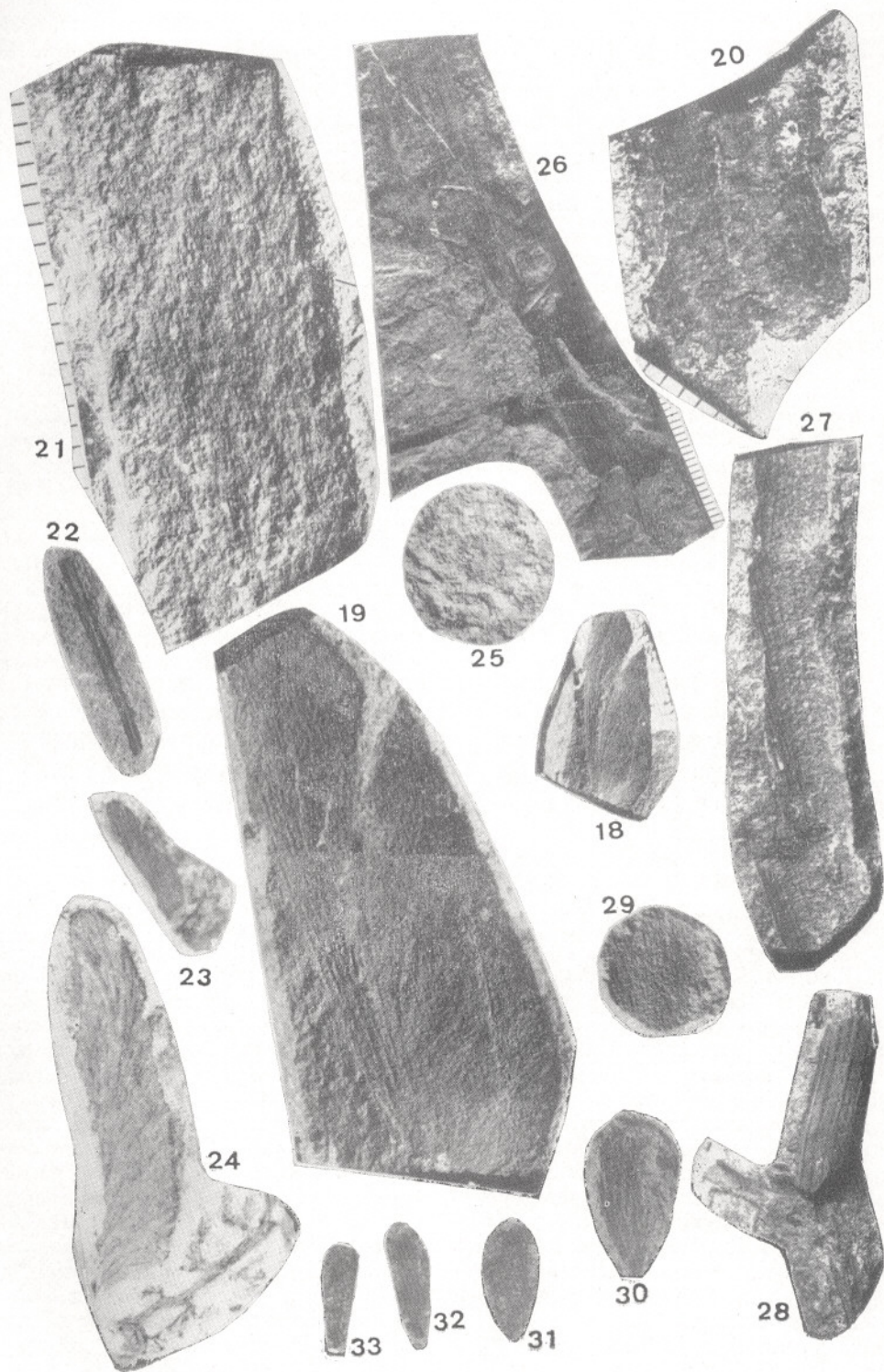


PLATE 2