

## MARIOPTERIS NERVOSA : FACT OR FAKE ?

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### ABSTRACT

Well-preserved material of *Mariopteris* from Friedrichsthal (Saar, German Federal Republic) has convinced the author that *Mariopteris nervosa* (Brongniart, 1834) Zeiller, 1879 emend. Boersma, 1972 must be looked upon as a withered aspect of *M. muricata* (Sternberg, 1826) Zeiller, 1879 var. *dilatata* Lutz, 1938. Since up to the present *M. nervosa* has been regarded as the type-species of the form genus *Mariopteris* Zeiller, 1879 emend. Boersma, 1972 it is here proposed that *M. muricata* (Sternberg, 1826) Zeiller, 1879 will be the future type-species of the genus.

*Key-words* — Pteridophytes, *Mariopteris*, Netherlands.

### सारांश

मैरिऑप्टेरिस नर्वोसा : तथ्य अथवा असत्य ? — मियन्टे बोयर्समा

फ्रीड्रिखस्थाल (सार, जर्मन जनवादी गणराज्य) से मैरिऑप्टेरिस के सुपरिरक्षित पादपाषाणों ने लेखक को निश्चय कराया है कि मैरिऑप्टेरिस नर्वोसा (ब्रॉन्गिनार्त, 1834) जाइलर, 1879 संशोधित बोयर्समा, 1972 को मै० म्यूरिकेटा (स्टर्नबर्ग, 1826) जाइलर, 1879 उपजाति डाइलेटेटा लुट्ज, 1938 का एक शीर्ष स्वरूप समझा जाना चाहिये। क्योंकि अभी तक मै० नर्वोसा अनंतिम वंश मैरिऑप्टेरिस, 1879 संशोधित बोयर्समा, 1972 की प्रादर्श-जाति मानी जाती है अतः यहाँ यह प्रस्तावित किया गया है कि मै० म्यूरिकेटा (स्टर्नबर्ग, 1826) जाइलर, 1879 इस वंश की भावी प्रादर्श-जाति होगी।

### INTRODUCTION

WITHIN the form genus *Mariopteris* Zeiller, 1879 the relation between *M. muricata* (Sternberg, 1826) Zeiller, 1879 and *M. nervosa* (Brongniart, 1834) Zeiller, 1879 has been a problem ever since the genus was established.

Zeiller, who at first treated the taxa as separate species, considered in his later works, e.g. Zeiller (1886-1888), *M. nervosa* a variety of *M. muricata*. In the first monograph on *Mariopteris* too, viz., Huth (1912), *M. nervosa* was included in *M. muricata*. Neither Zeiller nor Huth, however, gave an explanation of the optically different appearances of their *M. muricata* var. *muricata* and *M. muricata* var. *nervosa*.

During my investigation of *Mariopteris* I observed that the essential characteristic of *M. nervosa*, viz., its thick venation, is caused by a strongly vaulted intervenium, the veinlets themselves being of a thickness comparable with that of *M. muricata*.

In 1972, therefore, I emended the diagnosis of *M. nervosa* describing the venation pattern as 'strongly marked off', avoiding the wrong description 'veins thick' of Brongniart's original diagnosis of his *Pecopteris nervosa* (Boersma, 1972, p. 98). Moreover, I stressed the fact that larger pinnules show up to three basiscopic incisions.

It may be clear that it is difficult to distinguish *M. nervosa* in its emended sense from *M. muricata*. However, in my 1972 paper, I was more interested in the generic level than in the species level and I decided to treat the taxa as separate species.

Since then I have studied many additional specimens of both *M. muricata* and *M. nervosa*. Important new material was only recently brought to light at Friedrichsthal, a Westphalian D age locality in the Saar region (German Federal Republic). Among this material a rich variety of *Mariopteris* frond fragments is present, giving a satisfactory answer to my questions with regard to the relation *M. muricata*-*M. nervosa*,

## DESCRIPTION

From the rich material of *Mariopteris* found at Friedrichsthal two specimens are described here. For the terminology used the reader is referred to Boersma (1972, text-fig. 1). The illustrations of the cuticles will form part of the Ph.D. thesis of Mrs Drs C. L. Oostendorp-Bourgonjon (in progress).

Specimen 52 (LPP collection number 7171) shows a 13 cm long part of a sP2ext and a small portion of a sP2int. The optimum developed pinnules of the sP2ext (at 'A' in Pl. 1, fig. 1) have entire margins, are 8 mm long and 4 mm wide. The optimum developed pinnules of the sP2int (at 'B' in Pl. 1, fig. 1) are 16 mm long, 7 mm wide, and show slightly incised basispic margins.

Because of the strongly vaulted intervenium the veinlets give an impression of thickness; they are, in reality, of average thickness. Part of the specimen has been figured on Pl. 1, fig. 1. The enlargement, Pl. 1, fig. 2 (at 'C') shows a pinnule in which the basispic part gives the impression of thick veinlets, whereas the acrosopic part shows veinlets of average thickness.

Cuticle preparations have been made of both the adaxial and abaxial sides of the pinnules. Cuticle preparation Fr. 002a shows part of the adaxial side of the pinnule. The epidermal cells are oblong, polygonal. Length: 125-225  $\mu\text{m}$ , width: 20-30  $\mu\text{m}$ . Scattered over the surface a few trichome bases are visible with a diameter of approx. 37  $\mu\text{m}$  surrounded by 6-8 cells. No stomata have been observed on the adaxial side. The form of the epidermal cells of the abaxial side of the pinnules is hardly visible in preparations 225 through 228. In some places oblong, polygonal cells are discernible. Length: 90-130  $\mu\text{m}$ , width: 18-22  $\mu\text{m}$ . The abaxial side of the pinnules is crowded with monocyclic, haplocheilic stomata, 15-50  $\mu\text{m}$  long and 11-20  $\mu\text{m}$  wide. The aperture has a diameter of 7-11  $\mu\text{m}$ . The stomata are surrounded either by two lateral subsidiary cells or by four lateral and two polar subsidiary cells. The subsidiary cells partly cover the aperture with papillae.

Specimen 55 (LPP 7079) shows a complete P3, 9.8 cm long, attached to a R3, probably a R3 int. The pinnules show veinlets of average thickness, the intervenium is flat, the pinnule margin denticulate. Part of the specimen is figured on Pl. 1, fig. 3.

Cuticle preparation Fr. 003a shows part of the adaxial side of a pinnule. The cells are irregularly polygonal. Length: 116-290  $\mu\text{m}$ , width: 15-30  $\mu\text{m}$ . Scattered over the surface trichome bases are visible with a diameter of 27-30  $\mu\text{m}$  surrounded by 8 cells. No stomata have been observed on the adaxial side.

The cuticle of the abaxial side of the pinnules (preparation Fr. 003b) does not disclose the form of the epidermal cells. Closely packed stomata are visible only. The stomata are monocyclic, haplocheilic. Length: 20-35  $\mu\text{m}$ , width: 15-26  $\mu\text{m}$ . The aperture has a diameter of 10-15  $\mu\text{m}$ . The stomata are surrounded either by two lateral subsidiary cells or by four lateral and two polar subsidiary cells. The subsidiary cells partly cover the aperture with papillae.

## DISCUSSION

The specimens here described come from an Upper Westphalian locality in the Saar Basin. Specimen 52 (LPP 7171) is conspecific with the lectotype of *Mariopteris nervosa* as figured by Brongniart (1828-1837, pl. 95, fig. 1) and Corsin (1932, pl. 61, figs 1, 2). Specimen 55 (LPP 7079) is conspecific with *M. muricata* var. *dilatata* as originally figured by Lutz (1938, pl. 5/6, fig. 1). In the first specimen we observe adaxially convex pinnules with enrolled, entire margins, a strongly vaulted intervenium, appearing thick veinlets and a thick fleshy appearance; the latter shows flat pinnules with denticulate margins, veinlets of average thickness and a rather delicate appearance. However, in Pl. 1, fig. 2 (at 'C') a pinnule is shown in which the basispic part gives the impression of thick veinlets whereas the acrosopic part shows veinlets of average thickness. Moreover, in Pl. 1, fig. 1 (at 'B') pinnules may be observed with slightly incised basispic margins.

As I look upon it now, the two specimens represent two different aspects of the same taxon. I regard the specimens, identified at first as *M. nervosa*, as withered aspects of *M. muricata* var. *dilatata*. If my interpretation is accepted it gives a plausible explanation of the characteristics of pinnules of *M. nervosa* as indicated in the literature "entire margins, thick, fleshy appearance,



appearingly thick veinlets". According to Oostendorp-Bourgonjon the results of the cuticular analysis do not contradict my conclusion based on macroscopic evidence.

Already Jongmans and Dijkstra (1960, p. 1575) arrived at the conclusion that *M. muricata* var. *dilatata* and *M. nervosa* belong to the same taxon. However, they included *M. muricata* var. *dilatata* in *M. nervosa*, whereas I, regarding *M. nervosa* as the withered (=abnormal) condition, include *M. nervosa* in *M. muricata* var. *dilatata*. It must be pointed out that the type material of both *M. nervosa* and *M. muricata* var. *dilatata* originate from Upper Westphalian sediments of the Saar Basin.

If my view is accepted that *M. nervosa* merely represents a withered aspect of an Upper Westphalian variety of *M. muricata* it provides an explanation for the aberrant occurrences of specimens identified as *M. nervosa* in sediments as old in age as Westphalian A. These specimens, then, may be looked upon as withered aspects of Lower Westphalian forms of *M. muricata*.

Palaeobotanists are requested to study their specimens identified as *M. nervosa* to make up their minds.

#### CONCLUSION

The conclusion that *M. nervosa* is merely a withered condition of *M. muricata* var. *dilatata* would necessitate the choice of a new type-species of the form genus *Mariopteris* Zeiller, 1879 emend. Boersma, 1972. Since it has been made clear that the type specimen of *M. nervosa* should be included in the well-known taxon *M. muricata*, I would like to propose *M. muricata* (Sternberg, 1826) Zeiller, 1879 as the type-species of *Mariopteris* Zeiller, 1879 emend. Boersma, 1972.

#### ACKNOWLEDGEMENTS

Mrs Drs C. L. Oostendorp-Bourgonjon (Laboratory of Palaeobotany & Palynology, Utrecht, The Netherlands) is thanked for providing the description of the cuticles of the macroscopic remains discussed in this paper.

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#### EXPLANATION OF PLATE

##### PLATE 1

*M. muricata* (Sternberg, 1826) Zeiller, 1879 var. *dilatata* Lutz, 1938

1. Fragment of frond. LPP 7171.  $\times 1.5$ .
2. Fragment of pinna enlarged. LPP 7171.  $\times 5$ .
3. Pinnule enlarged. LPP 7079.  $\times 5$ .



PLATE 1