

## Middle Triassic (Anisian-Ladinian) Palynomorphs

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Initial results of the palynostratigraphical research in the Triassic of northeast Libya indicate the presence of Middle Triassic in several deep-wells. There is some evidence that the uppermost part of the Early Triassic (Late Scythian) as well as the early part of the Late Triassic (Karnian) may also be present. Additional palynological samples will need to be studied to confirm this view.

Most Triassic assemblages in northeast Libya show a striking dominance of the monolete lycopodiophytic miospore *Aratrisporites*; this genus is represented by a large number of species (*A. centratus*, *A. parvispinosus*, *A. strigosus*, *A. saturni*, *A. paenulatus*, *A. tenuispinosus*, *A. ovatus*). A similar development is known to occur in the Middle Triassic of Australia and Pakistan. Bisaccate pollen is commonly present in the assemblages. Representatives of *Triadispora* and *Lunatisporites* are also frequently recorded.

On the basis of a few additional forms, two palynologically distinctive intervals may be recognized within the Middle Triassic:

**Anisian interval.** On the basis of *Stellapollenites thiergartii*, *Strotersporites* n. sp. of Visscher and Brugman 1981 (not illustrated) and *Angustisulcites*

*grandis*, an Anisian age for the lower interval is indicated. The latter two species suggest the Early Anisian. The assemblages can be compared with similar assemblages from the Alpine Anisian in Europe (Visscher & Brugman, 1981; Brugman, in prep) and the Salt Range, Pakistan (Brugman & Baud, in prep).

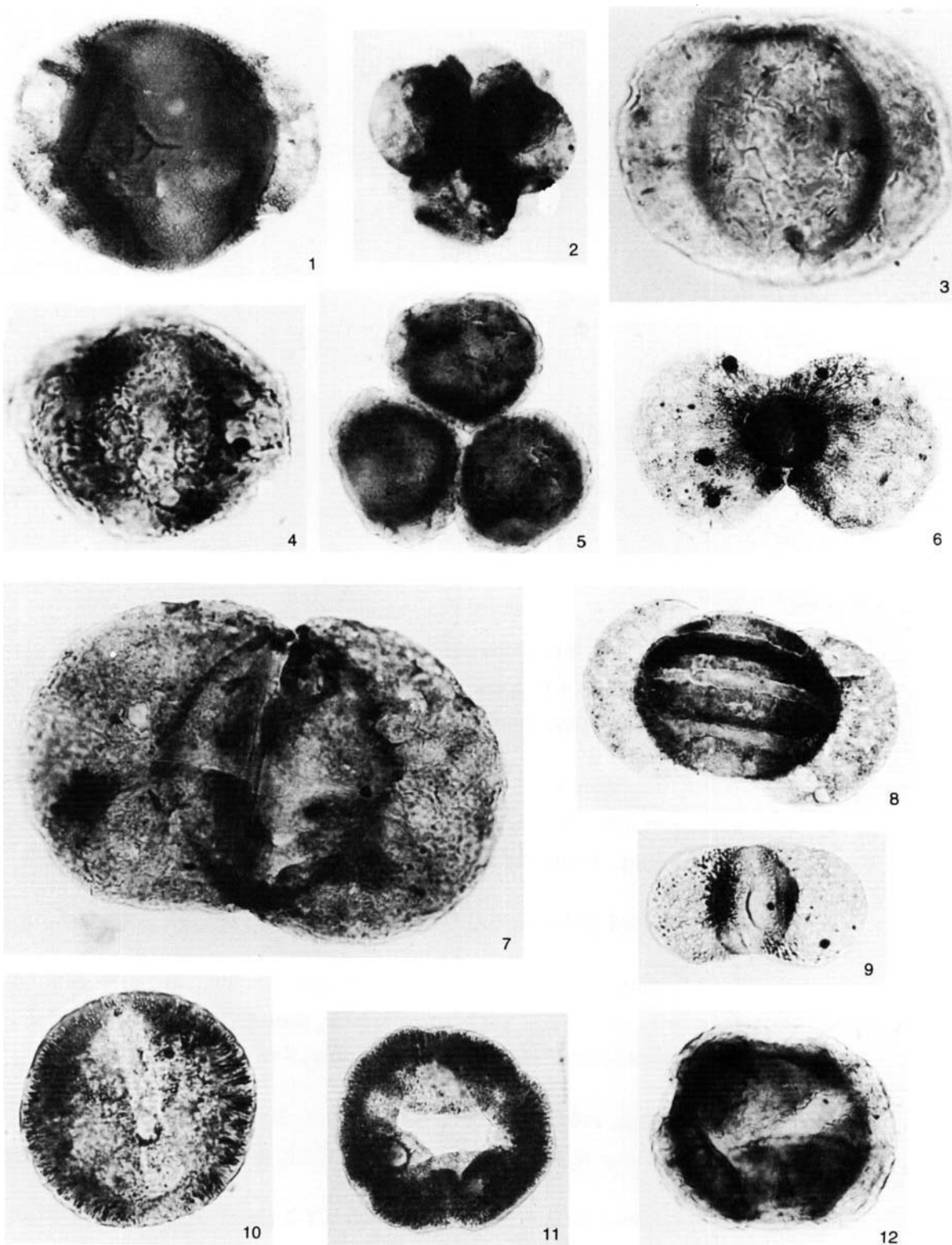
**Ladinian interval.** The upper part of the Libyan Middle Triassic is characterised by the absence of characteristic Anisian elements, and the incoming of rare representatives of the Circumpolles-group (*Partitisporites*, *Duplicisporites*). These forms, together with some trilete miospores (*Keuperisporites baculatus*, *Palaeospongisporis europaeus*) indicate a Ladinian age for the upper interval. The assemblages can be compared with Ladinian assemblages from the Southern Alps (Visscher & Brugman, 1981; Van der Eem, 1983).

### REFERENCES

- Van der Eem, J. G. L. A. 1983. Aspects of Middle and Late Triassic palynology. 6. Palynological investigations in the Ladinian and Lower Karnian of the western Dolomites, Italy. *Rev. Palaeobot. Palynol.*, **39**, 189–300.
- Visscher, H. & Brugman, W. A. 1981. Ranges of selected palynomorphs in the Alpine Triassic of Europe. *Rev. Palaeobot. Palynol.*, **34**, 115–128.

### Explanation of Plate 43

- Fig. 1. *Triadispora crassa* Klaus, 1964. C1-2, 9400-9450ft., Slide 3, K35/2,  $\times 1000$ , AGC 461.
- Fig. 2. *Triadispora crassa* Klaus, 1964. L4-51, Core 2, 10836-10837ft., S.G. 38-LIB,  $\times 500$ , AGC 462.
- Fig. 3. *Triadispora plicata* Klaus, 1964. L4-51, Core 2, 10844ft., S.G. 1-LIB,  $\times 1000$ , AGC 463.
- Fig. 4. *Triadispora plicata* Klaus, 1964. L4-51, Core 2, 10838ft., S.G. 3-LIB,  $\times 1000$ , AGC 464.
- Fig. 5. *Triadispora plicata* Klaus, 1964. L4-51, Core 2, 10844ft., S.G. 8-LIB,  $\times 500$ , AGC 465.
- Fig. 6. *Platysaccus papilionis* Potonié & Klaus, 1954. C1-2, 10350-10400ft., S.G. 13-LIB,  $\times 500$ , AGC 466.
- Fig. 7. *Angustisulcites grandis* (Freudenthal, 1964) Visscher, 1966. L4-51, 10838ft., S.G. 31-LIB,  $\times 500$ , AGC 467.
- Fig. 8. *Lunatisporites noviaulensis* (Leschik, 1956) Scheuring, 1970. L4-51, 10838ft., S.G. 10-LIB,  $\times 500$ , AGC 468.
- Fig. 9. *Vitreisporites pallidus* (Reissinger, 1950) Nilsson, 1958. C1-2, 9400-9450ft., Slide 3, X35/1,  $\times 1000$ , AGC 469.
- Fig. 10. *Kuglerina meieri* Scheuring, 1978. C1-2, 9500-9550ft., Slide 2, T21/2,  $\times 1000$ , AGC 470.
- Fig. 11. *Stellapollenites thiergartii* (Mädler, 1964) Clement-Westerhof *et al*, 1974. A1-19, 9600-9700ft., Slide 4, N44/1,  $\times 500$ , AGC 471.
- Fig. 12. *Stellapollenites thiergartii* (Mädler, 1964) Clement-Westerhof *et al*, 1974. L4-51, Core 2, 10844ft., S.G. 10-LIB,  $\times 500$ , AGC 472.



#### Explanation of Plate 44

- Fig. 1. *Aratrisporites centratus* Leschik, 1956. C1-2, 9400-9450ft., S.G. 14-LIB,  $\times 1000$ , AGC 473.
- Fig. 2. *Aratrisporites parvispinosus* Leschik, 1956 emend. Playford & Dettmann, 1965. C1-2, 9500-9550ft., Slide 3, W38/3,  $\times 1000$ , AGC 474.
- Fig. 3. *Aratrisporites strigosus* Playford, 1965. C1-2, 9150-9200ft., Slide 2, X30/3,  $\times 1000$ , AGC 475.
- Fig. 4. *Aratrisporites saturni* (Thiergart, 1949) Mädlar, 1964. C1-2, 9400-9450ft., S.G. 20-LIB,  $\times 1000$ , AGC 476.
- Fig. 5. *Aratrisporites saturni* (Thiergart, 1949) Mädlar, 1964. C1-2, 10350-10400ft., S.G. 21-LIB,  $\times 1000$ , AGC 477.
- Fig. 6. *Aratrisporites paenulatus* Playford & Dettmann, 1965. L4-51, Core 2, 10838ft., S.G. 16-LIB,  $\times 1000$ , AGC 478.
- Fig. 7. *Duplicisporites granulatus* Leschik, 1956. L4-51, Core 2, 10836-10837ft., S.G. 28-LIB,  $\times 1000$ , AGC 479.
- Fig. 8. *Partitisporites novimundanus* Leschik, 1956. C1-2, 9500-9550ft., Slide 2, T22/2,  $\times 1000$ , AGC 480.
- Fig. 9a-b. *Palaeospongisporis europaeus* Schulz, 1965. C1-2, 9400-9450ft., S.G. 11-LIB,  $\times 500$ , AGC 481. Fig. 9a: proximal view; 9b: distal view.
- Fig. 10. *Keuperisporites baculatus* Schulz, 1965. C1-2, 9350-9400ft., Slide 3, R31/4,  $\times 500$ , AGC 482.
- Fig. 11. *Aratrisporites ovatus* (Kar, Kieser & Jain, 1972) nov. comb. C1-2, 9400-9450ft., S.G. 18-LIB,  $\times 500$ , AGC 483.
- Fig. 12. *Aratrisporites ovatus* (Kar, Kieser & Jain, 1972) nov. comb. C1-2, 9400-9450ft., S.G. 19-LIB,  $\times 500$ , AGC 484.
- Fig. 13. *Aratrisporites tenuispinosus* Playford, 1965. C1-2, 9200-9250ft., S.G. 17-LIB,  $\times 500$ , AGC 485.

