

OSTRACODES FROM THE DEVONIAN-CARBONIFEROUS BOUNDARY BEDS IN THURINGIA (GERMANY)

by

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(1 figure and 2 plates)

ABSTRACT.- 83 species of ostracodes belonging to faunas of the Thuringian and of the Entomozoe Ökotype are known from the uppermost limestone layers of the *Wocklumeria* Stage and the lowermost layers of the *Gattendorfia* Stage in the Thuringian Slate Mountains (Schwarzburg Anticline). 35 species and 6 genera died out at the Devonian-Carboniferous boundary; only 18 range across the boundary and 44 new species appeared in the lower part of the *Gattendorfia* Stage. There is a break in ostracode assemblages at the Devonian-Carboniferous boundary, which is particularly noticeable among the highly specialised and short ranging taxa of the Thuringian Ökotype. The changes must be related to a super-regional global event.

GENERAL

Studies of Upper Devonian and lower Carboniferous ostracodes of Thuringia, especially from classic localities nearby Saalfeld/Saale (Schwarzburg Anticline), have a long history beginning in the middle of last century until the present and continuing the first descriptions of ostracodes where given by Rh. Richter (1848, 1856, 1869).

Ostracodes of the Entomozoe Ökotype occur in slates and nodular limestones; they appear common only in weathered rock material, the so-called Cypriinen-Schiefer.

A completely new ostracode assemblage has been discovered as a result of conodont studies (Helms, 1959). The new faunas were described by Blumenstengel (1965, 1979) and by Gründel (1961, 1962). They were picked out from insoluble residues of limestones dissolved in monochloroacetic acid. The shells of ostracodes are well preserved in silicified matrix; they are characterized by spines and processes typical of an Ökotype named by Becker (1969,

1987) and Becker & Bless (1990) the Thuringian Ökotype. This type occurs world-wide in marine sediments formed under low energy conditions.

Ostracodes of both the Entomozoe and the Thuringian Ökotype are well known from slates and limestones in sections immediately at the Devonian-Carboniferous boundary where there is excellent stratigraphical control through the studies of cephalopods and conodonts by Bartsch & Weyer (1982, 1986).

MATERIAL

The results presented here are based on material published by Gründel (1961, 1962) and by Blumenstengel (1979). Entomozoids on surfaces of slates and limestones and silicified specimens from insoluble residues of limestones have been acquired from the highest part of the Upper Clymenia beds (*Wocklumeria* Stage), immediately below the Upper Quartzite, and from the basal parts of the Uppermost nodular limestone (*Gattendorfia* Stage).

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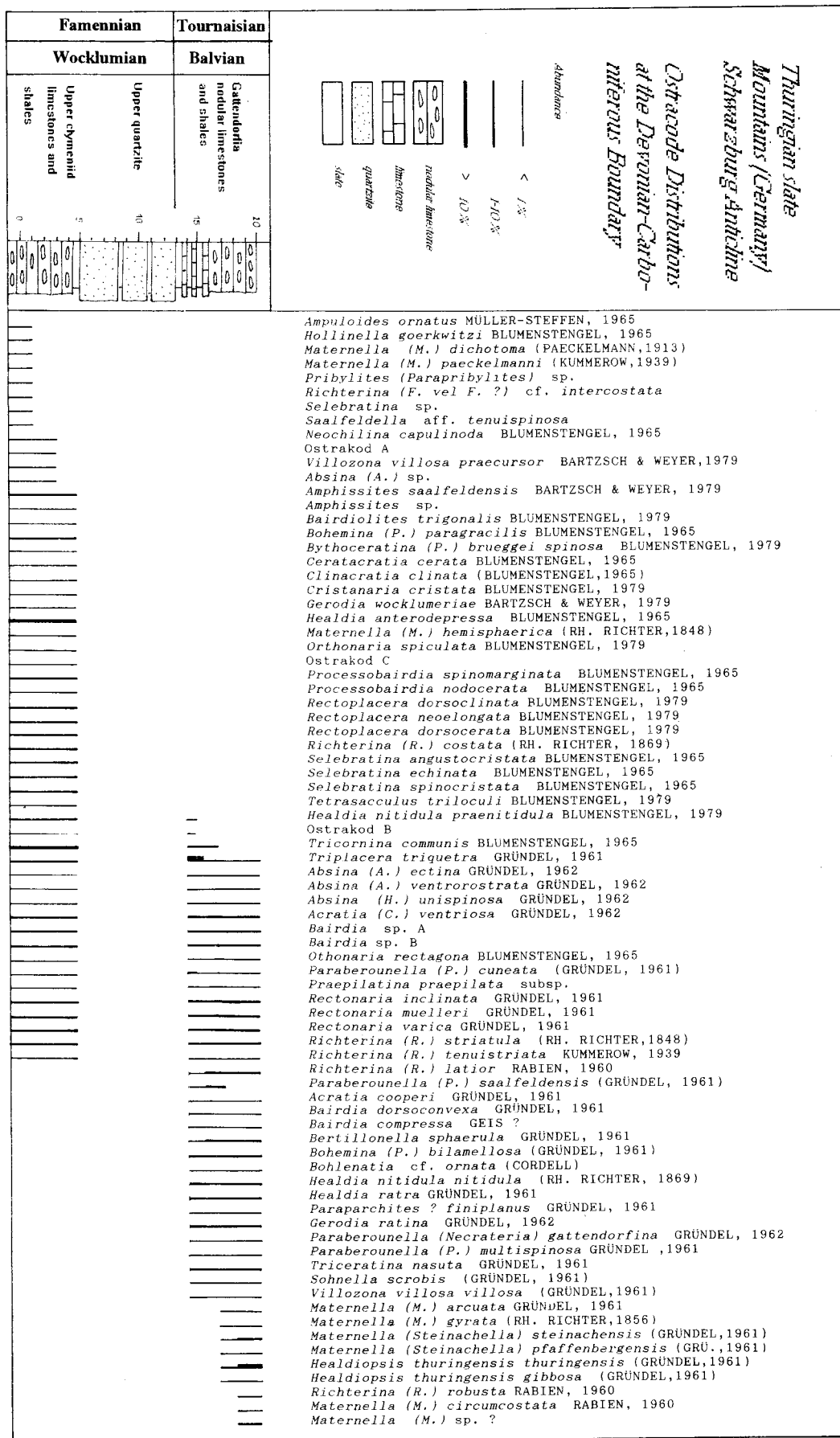


Fig. 1. Ostracode Distributions at the Devonian-Carboniferous Boundary in Thuringian slate Mountains (Germany) Schwarzburg Anticline.

In addition to the collections of material from the surfaces of slates described by several authors, 7000 specimens from the *Wocklumeria* Stage and 5000 specimens from the *Gattendorfia* Stage were investigated from the following outcrops : Fischersdorf West, Fischersdorf Ost, Bahneinschnitt Gleitsch, Dachschiefergrube Blaues Glück and Bohrung Lehesten.

More detailed investigations (layer by layer) are planned in connection with a programm "Comparison of Upper Devonian Faunas between Saxothuringicum and Rhenohercynium" supported by the Deutsche Forschungsgemeinschaft (1991-1993).

FAUNAS

83 species of ostracodes belonging to 40 genera are known from the beds spanning the Devonian-Carboniferous boundary. Further, more detailed, investigations will certainly increase the number of taxa, especially the smooth-shelled species. The distributions and the frequency of species are shown in Figure 1.

The Upper Devonian assemblages are characterized by such groups as healdiids, retonariids and tricorinids. Altogether 53 species have been described; 35 of these became extinct within the uppermost layers of the *Clymenia* beds and 18 range across the Devonian-Carboniferous boundary.

44 species are known from the uppermost nodular limestone of the Lower Carboniferous *Gattendorfia* Stage. 17 new species occur for the first time in the first limestone layer (Bed 1) above the Upper Quartzite and 9 species enter step by step in the following beds.

The change in the assemblages of ostracodes at the Devonian-Carboniferous boundary is rather sharp. Highly specialised and shortlived forms became extinct first, for example *Ceratacratia cerata*, *Clinacratia clinata*, *Cristanaria cristata* or *Orthonaria spiculata*.

The absence of hollinids (*Holinella*, *Tetrasacculus*) and of *Berounella* in the rocks of the *Gattendorfia* Stage might be a consequence of facies change. The Entomozoid zonation used for the Upper Devonian in Thuringia is the same as postulated for the Rhenish Slate Mountains by Rabiën (1954, 1960). The most important date concerning the distribution of the index fossils are : *Maternella hemisphaerica* extends up to the last fossiliferous layer of the *Wocklumeria* Stage and *Richterina latior* first occur in the first layer of the *Gattendorfia* Stage. A *hemisphaerica-latior* Interregnum is not discernable.

CONCLUSIONS

In localities investigated in the Thuringian Slate Mountains (Schwarzburg Anticline), a remarkable change in ostracode assemblages is recorded at the Devonian-Carboniferous boundary in faunas of both the Thuringian and the Entomozoe Ökotype. In view of the continuity of facies, the change and the extinction of many species and genera can be explained only by a super-regional, global event. The extinction mainly affected the highly specialised and short-ranging taxa.

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PLATE 1

- 1-2. *Tetrasacculus triloculi* BLUM. 1979
1. RV, exterior, X30
2. RV, interior, X30
3. *Hollinella goerkwitzii* BLUM. 1965
LV, exterior, X25
4. *Selebratina* sp.
LV, exterior, X30
- 5-6. *Healdia anterodepressa* BLUM. 1965
5. LV, exterior, X30
6. Carapace, dorsal view, X30
- 7-8. *Bairdiolites trigonalis* BLUM. 1979
7. LV, exterior, X25
8. LV, exterior, X25
- 9-10. *Processobairdia posterocerata* BLUM. 1965
9. RV, exterior, X25
10. LV, exterior, X25
- 11-12 *Processobairdia nodocerata* BLUM. 1965
11. RV, exterior, X30
12. LV, exterior, X30
- 13-14 *Ceratacratia cerata* BLUM. 1965
13. RV, exterior, X25
14. LV, exterior, X25
- 15-16 *Orthonaria spiculata* BLUM. 1979
15. RV, exterior, X25
16. LV, exterior, X25
- 17-18 *Clinacratia clinata* (BLUM. 1965)
17. Carapace, dorsal view, X25
18. LV, exterior, X25
- 19,26 *Rectoplacera dorsocerata* BLUM. 1979
19. RV, exterior, X25
26. LV, exterior, X25
- 20, 25 *Rectoplacera dorsoclinata* BLUM. 1979
20. LV, exterior, X25
25. RV, exterior, X25
- 21-22 *Gerodia wocklumeriae* BA. & W. 1979
21. LV, exterior, X25
22. RV, exterior, X25
- 23-24 *Rectoplacera neolongata* BLUM. 1979
23. RV, exterior, X25
24. LV, exterior, X25
27. *Maternella (M.) dichotoma* (PAECKELM.)
LV, exterior, X25
28. *Maternella (M.) hemisphaerica* (RH. RICHTER)
LV, exterior, X25
- 29-30 *Cristanaria cristata* (BLUM. 1965)
29. RV, exterior, X25
30. LV, exterior, X25
31. *Richterina (R.) costata* (RH. RICHTER)
RV, exterior, X25
32. *Maternella (M.) paeckelmanni* (KUM.)
- 33-34 *Gerodia ratina* GRÜ.
33. LV, exterior, X25
34. RV, exterior, X25

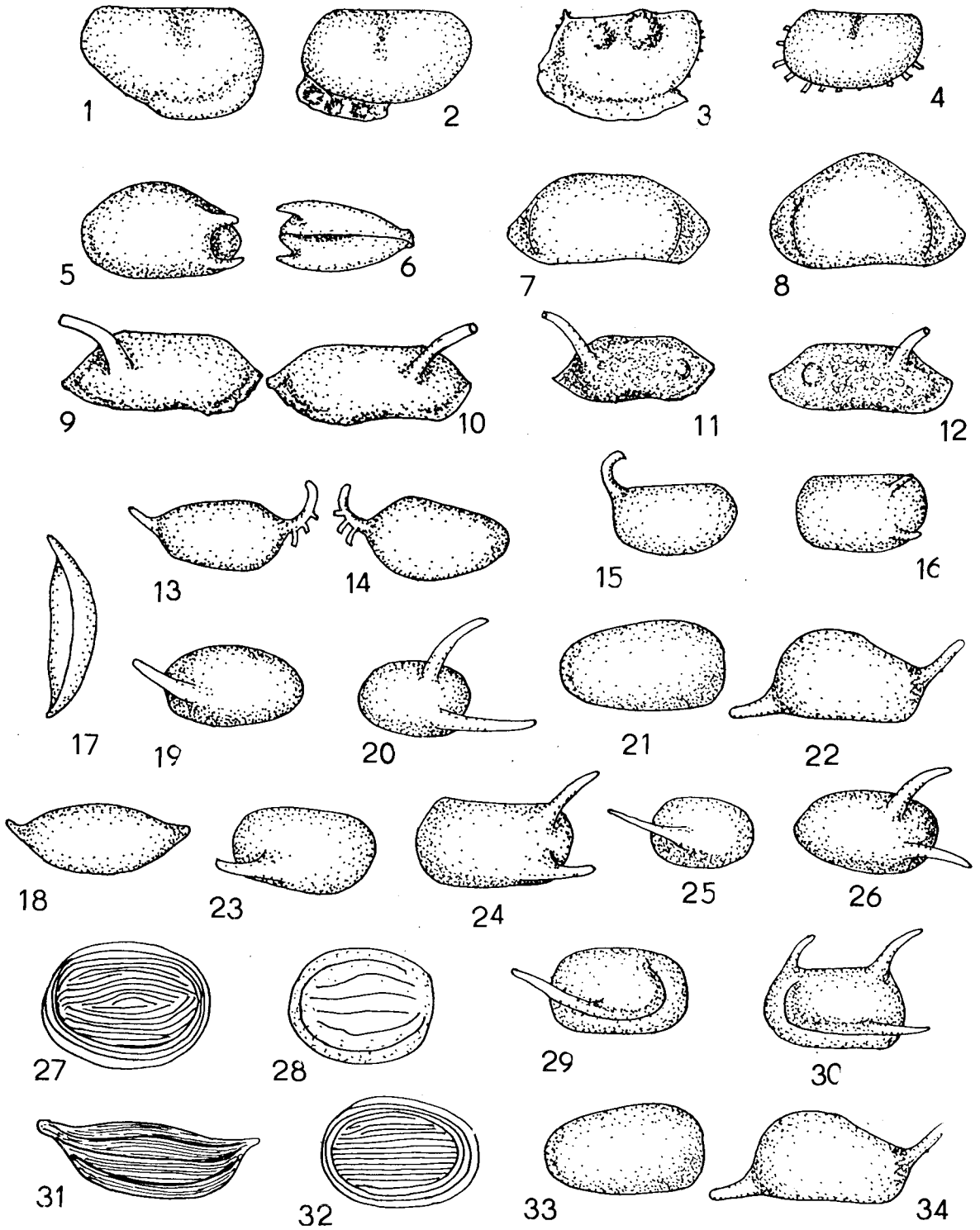


PLATE 2

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|-------|--|--------|--|
| 1. | <i>Paraberounella multispinosa</i> (GRÜ.)
LV, exterior, X25 | 15. | <i>Healdiopsis thuringensis gibbosa</i> GRÜ.
LV, exterior, X25 |
| 2. | <i>Sohnella scrobis</i> (GRÜ.)
RV, exterior, X25 | 16. | <i>Healdiopsis thuringensis thuringensis</i> GRÜ.
LV, exterior, X25 |
| 3. | <i>Paraberounella saalfeldensis</i> (GRÜ.)
LV, exterior, X25 | 17-18. | <i>Gerodia ratina</i> GRÜ.
17. RV, exterior, X25
18. LV, ventral view, X25 |
| 4. | <i>Triceratina nasuta</i> GRÜ.
RV, exterior, X25 | 19-20. | <i>Triplacera (Necrateria) trapezoidalis</i> GRÜ.
19. Carapace, dorsal view, X25
20. RV, exterior, X25 |
| 5. | <i>Paraparchites finiplanus</i> GRÜ.
RV, exterior, X25 | 21. | <i>Richterina (R.) latior</i> RABIEN
LK?, exterior, X25 |
| 6. | <i>Villozona villosa villosa</i> (GRÜ.)
LV, exterior, X25 | 22. | <i>Maternella (M.) pfaffenbergensis</i> GRÜ.
RK?, exterior, X25 |
| 7-8. | <i>Triplacera (Necrateria) gattendorфина</i> GRÜ.
7. Carapace, exterior from left, X25
8. Carapace, exterior from right, X25 | 23. | <i>Maternella (M.) circumcostata</i> RABIEN
K?, exterior, X25 |
| 9-10. | <i>Bohlenatia cf. ornata</i> (CORD.)
9. LV, exterior, X25
10. RV, exterior, X25 | 24. | <i>Maternella (M.) rabieni</i> GRÜ.
RK, exterior, X25 |
| 11. | <i>Healdia ratra</i> GRÜ.
RV, exterior, X25 | 25. | <i>Maternella (M.) arcuata</i> GRÜ.
RK?, exterior, X25 |
| 12. | <i>Healdia nitidula nitidula</i> (RH. RICHTER)
LV, exterior, X25 | 26. | <i>Maternella (M.) gyrata</i> (RH. RICHTER)
RK?, exterior, X25 |
| 13. | <i>Bairdia venterba</i> GRÜ.
LV, exterior, X25 | 27. | <i>Maternella (M.) steinachensis</i> GRÜ.
LK?, exterior, X25 |
| 14. | <i>Bairdia dorsoconvexa</i> GRÜ.
RV, exterior, X25 | 28. | <i>Maternella (M.) ? sp.</i>
LK?, exterior, X25 |

