Late Devonian benthic ostracods from South China and their response to the Frasnian–Famennian event

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Abstract- Late Devonian ostracods are described for the first time from the Frasnian-Famennian (F-F) transition of the Zengpiyan section, Guangxi, South China. 45 ostracod species belonging to 25 genera are identified and figured. The Frasnian-Famennian boundary (F-FB) in the Zengpiyan section coincides with the lithological boundary between the Guilin and the Dongcun formations, and could be marked by the disappearance of *Rectobairdia proximischimensis* (Lethiers & Casier, 1998) and *Jenningsina guilinensis* Song, 2021. The ostracods belong to the Eifelian Mega-Assemblage, which implies a shallow-water palaeoenvironment. The ostracod fauna and sedimentary features of the Guilin and Dongcun formations at the Zengpiyan section suggest a transition from subtidal to low energy tidal flat on the Guilin Platform. The extinction rate of benthic ostracod species is about 61% during the F-F event in the Zengpiyan section. Two stages of faunal changes have been recognized in the event and the second stage is more severe than the first one.

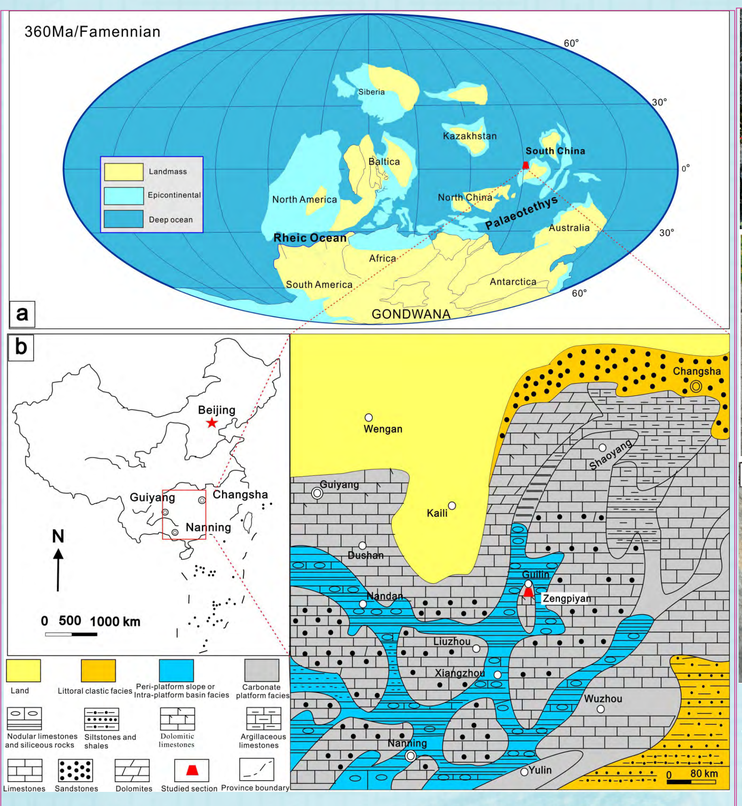

FIG. 1 (a) Late Devonian palaeogeographical map showing location of the studied area. (b) Late Devonian lithofacies and palaeogeography of South China (part), with the location of the studied section indicated.

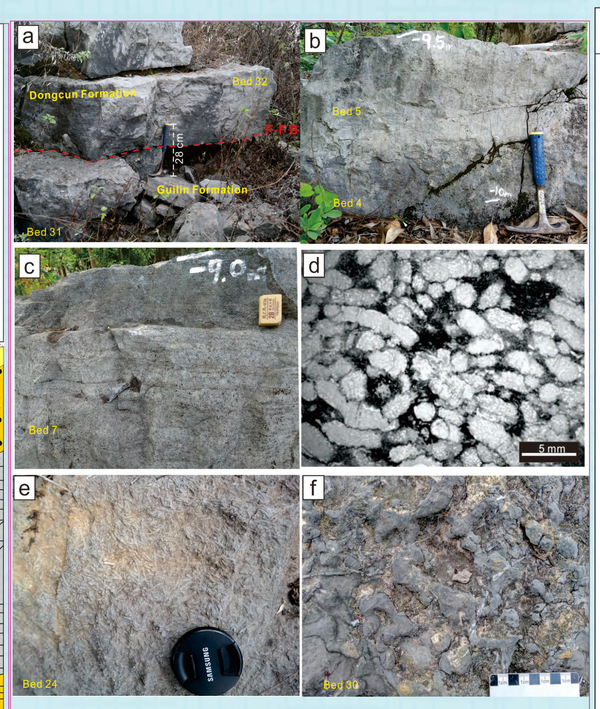

FIG.2 Representative lithofacies and microfacies types of the Zengpiyan section. (a). field photo of the lithological boundary between the peloidal grainstones (Bed 31) of the Guilin Formation and the laminated bindstones (Bed 32) of the overlying Dongcun Formation; (b). field photo of bioclastic wackestones of Bed 4 and lime dolomites of Bed 5; (c). field photo of greyish-white dolomites and grey bioclastic wackestones in Bed 7; (d,e) *Amphipora* rudstones in Bed 24, (e). field photo, (d). thin-section photo; (f). field photo of *Amphipora* floatstones with abundant trace fossil *Thalassinoides*.

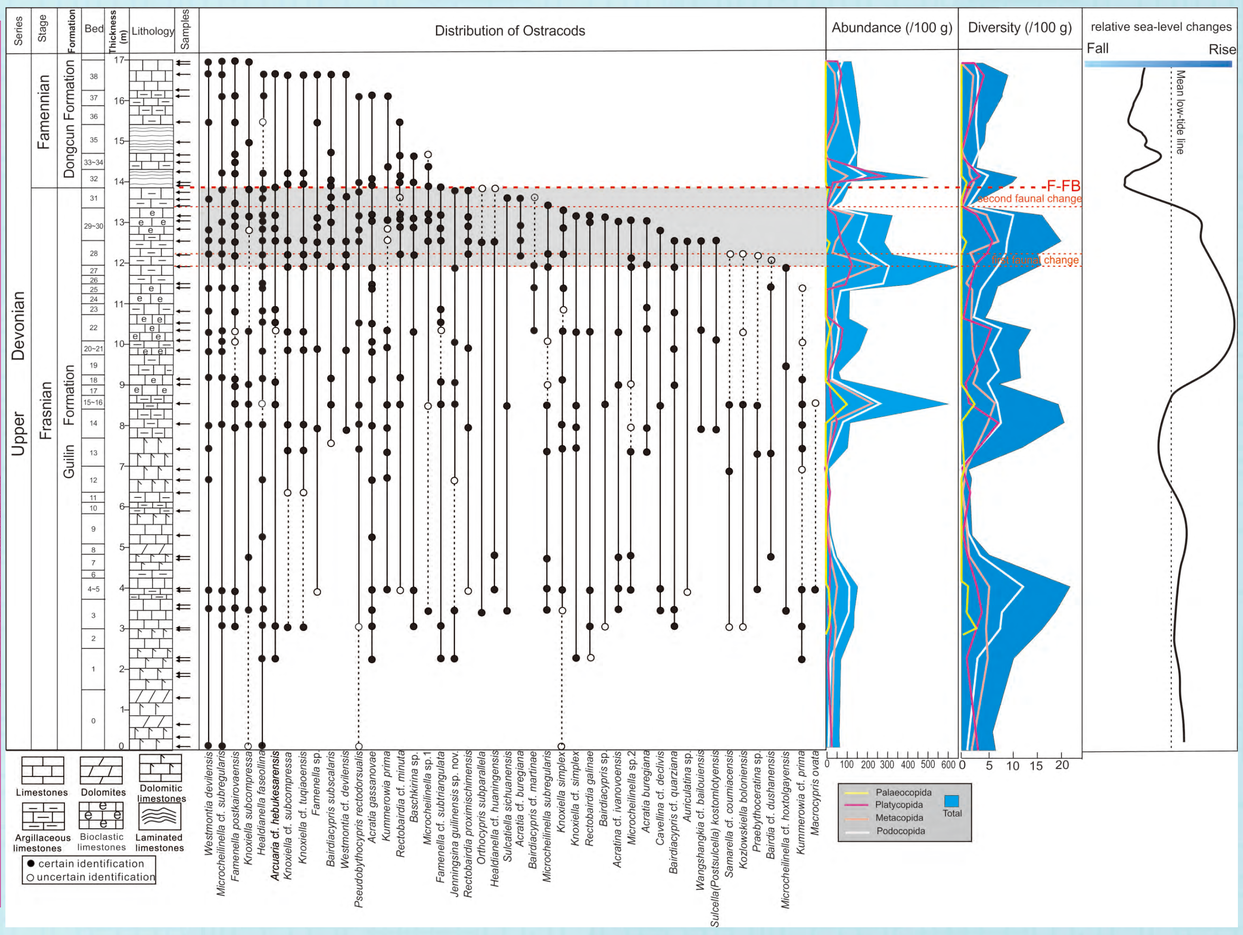

FIG. 3 Ostracod distribution, changes in ostracod diversity and abundance, and sea-level changes across the F–F transition at the Zengpiyan section, Guangxi, South China

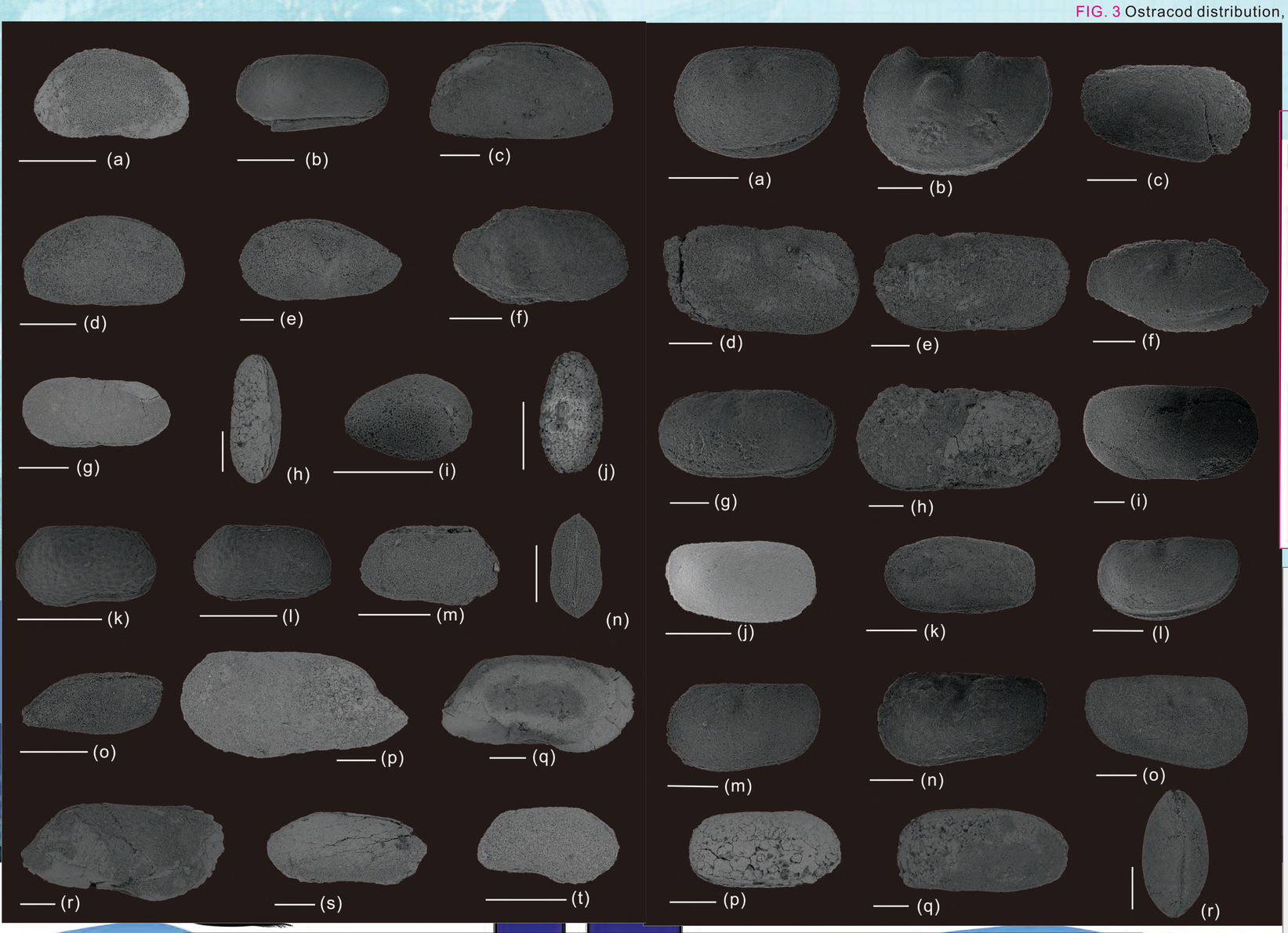

FIG.4 Ostracods (part) from the Upper Devonian in the Zengpiyan section, Guangxi, South China. Scale bars represent 200 μm.

TABLE 1 Ostracods from the Upper Devonian in the Zengpiyan section

Order	Superfamily	Species
Palaeocopida	Primitiopsoidea	*Auriculatina* sp., *Kozlowskiella boloniensis* Milhau, 1983, *Sulcatiella sichuanensis* Wei, 1983, *Samarella* cf. *coumiacensis* Lethiers & Casier, 1995
Platycopida	Kloedenelloidea	*Knoxiella subcompressa* Wang & Ma, 2007, *K.* cf. *subcompressa* Wang & Ma, 2007, *K.* cf. *tuqiaoensis* Wei, 1988, *K. simplex* Xie, 1983, *K.* cf. *simplex* Xie, 1983
	Cytherelloidea	*Sulcella (Postsulcella) kostomlotyensis* Casier & Lethiers, 2000, *Westmontia devilensis* Casier & Lethiers, 1998c, *W.* cf. *devilensis* Casier & Lethiers, 1998c
Metacopida	Healdioidea	*Arcuaria* cf. *hebukesarensis* Song & Crasquin, 2017, *Baschkirina* sp., *Kummerowia prima* Adamczak, 1976, *K.* cf. *prima* Adamczak, 1976, *Orthocypris subparallela* (Polenova, 1952), *Healdianella faseollina* Rozhdestvenskaya, 1959, *H.* cf. *huaningensis* Jiang, 1983, *Wangshangkia* cf. *bailouiensis* Song & Gong, 2018, *Pseudobythocypris rectodorsualis* Lethiers, 1981, *Cavellina* cf. *declivis* Wei, 1988
	Quasillitoidea	*Jenningsina guilinensis* sp. nov.
Podocopida	Bairdioidea	*Bairdia* cf. *dushanensis* Shi, 1964, *Bairdiacypris subscalaris* Wei, 1988, *B.* cf. *martinae* Casier & Lethiers, 1997, *B.* cf. *quarziana* (Egorov, 1953), *B.* sp., *Famenella postkairovaensis* Lethiers & Casier, 1996, *F.* sp., *F.* cf. *subtriangulata* Wang & Ma, 2007, *Rectobairdia galinae* (Egorov, 1953), *R. proximischimensis* (Casier & Lethiers, 1998), *R.* cf. *minuta* Wei, 1988, *Acratia buregiana* Egorov, 1953, *A.* cf. *buregiana* Egorov, 1953, *A. gassanovae* Egorov, 1953, *Acratina* cf. *ivanovoensis* Egorov, 1953, *Macrocypris ovata* Cooper, 1941
	Sigillioidea	*Microcheilinella subregularis* Wang, 1983, *M.* cf. *subregularis* Wang, 1983, *M.* cf. *hoxtolgayensis* Song & Crasquin, 2017, *M.* sp.1, *M.* sp.2
	Cytheroidea	*Praebythoceratina* sp.

Conclusions

1. The ostracods belong to the Eifelian Mega-Assemblage, which implies a shallow water palaeoenvironment. The changes of the ostracod fauna and sedimentary features from the Guilin to the Dongcun formations suggest a shallowing-upward trend i.e., from the subtidal to tidal flat in the Zengpiyan section, and the strata at F-FB was deposited during a regressive process.

2. Seventeen species belonging to 12 genera survived from the F-F event in the Zengpiyan section and the extinction rate of species is about 61%. Two stages of faunal changes have been recognized in the event and the second stage is more severe than the first one. There is a survival interval (i.e., beds 33-38) after the F-F event in the Zengpiyan section.