

The bajocian biomicrofacies from the Burgundy high to the Subalpin basin.

Piuz, André

Museum of Natural History, Case postale 6434, 1211 Genève 6, Switzerland, email
andre.piuz@ville-ge.ch

The Bajocian is a privileged period in the Jurassic faunal evolution. It is the first time in earth history that scleractinian corals are so active in constructing coral reefs. Moreover, a major renewal of the benthic and necto-benthic marine invertebrates at the Aalenian – Bajocian boundary speeds up the colonization of new ecological niches developed during the bajocian transgression. However, the micropaleontology of this period is yet still poorly known.

Up to now, a comprehensive micropaleontological study of the bajocian limestone, and more generally the bioclastic echinodermic shelf environment, has never been carried out. Here we present the common and diverse microfossils observed in the various facies grouped in «bajocian crinoidal limestone», studied from the shallow platform of the Burgundy high, up to the peculiar environments of the Subalpine basin.

Jurassic foraminifers are fairly well known regarding the large complex agglutinated species (Lituolidae) and the small calcareous or agglutinated benthic forms withdrawn from marlstones (Nodosariacea, Epistominidae, Spirillinidae, small agglutinated, etc.). The first group could roughly be considered as representative of carbonate shelf and lagoons of Kimmeridgian – Tithonian type, and the second group as characteristic of more open and deeper seas. However, a very abundant group of small species found in the limestones still remains poorly studied. Rarely used in stratigraphy and paleoecology, requiring study in thin section that rarely permits infrageneric determination, they have often been neglected in Bajocian studies.

In the present study, about 10 genus with hyaline wall (*Spirillina*, *Tethysiella*, *Radiospirillina*, *Hungarillina*, *Paalzowella*, *Tentilenticulina*, *Bullopore*, *Lenticulina* and *Nodosariidae*), 5 genus with dark microgranular wall (*Troglogtella*, *Earlandia*, *Glomospira*, *Planiiinvoluta*, *Nautiloculina*), 4 genus with porcelanous wall (*Nubecularia*, *Labalina*, *Ophthanlimidium*, *Cornuspira*), 9 genus with agglutinated wall (*Trochamminidae*, *Verneuilinidae*, *Textularidae*, *Valvulina*, *Belorussiella*, *Placopsilina*, *Ammobaculites*, *Callorbis*, *Mesoendothyra*) and 3 aragonitic genus (*Epistomina*, *Trocholina* and *Protoglobigerine*) were determined (Piuz, 2004). The bajocian limestones revealed also different calciphaerulids, globochatetids, «filaments», ostracods, microbialites, as well as infrequent *Girvanella* (Cyanophyceae) and very scarce radiolarians. Some microfacies are essentially composed of macrofaunal fragments, recognised as debris of crinoids, corals, sponges, bivalves, brachiopods, gastropods, bryozoans, urchins, serpulids, as well as uncommon cephalopods and solenopores.

The taxa listed above split in a relatively selective manner between the 3 principal studied facies:

The crinoidal limestone s.s. and other bioclastic facies mostly reveal low diversity faunal assemblages, essentially composed of fragments of crinoids, brachiopods, bivalves, gastropods, bryozoans, coral debris, *Lenticulina*, *Nubecularia*, serpulids and calcareous sponges, in high energy grainstone facies.

The coral beds and lateral facies reveal a diversified fauna, often rich in foraminifers particularly the ones with monocristalline wall (*Spirillina*, *Paalzowella*, *Tethysiella*), as well as ostracods, «filaments», calcispherulids, microbialites, and siliceous sponge spicules. The facies is usually muddy (mudstone – wackestone) and testify a calm environment. Surprisingly, these faunal assemblages are the same from the shallow Burgundian reefal constructions up to the Jurassic biostomal reefs, where the corals live in environments at the limit of hermatypism.

The alternating marl – limestone facies reveal abundant porcelanous foraminifers (*Labalina*, *Ophthalmidium*, *Cornuspira*), agglutinated ones (Textulariidae, Verneulinidae, Trochaminidae, *Callorbis*), as well as some other like *Planinivoluta* and Nodosariidae, and sometimes abundant peloids. Although this facies is interpreted as the deepest in the southern Jura, the Subalpine calcareous – marl alternations facies is still deeper. The latter shows a very peculiar facies of little diversified and very dense spongolite. It is almost only composed of sponge spicules, with rare nodosarids and lenticulinids which are always very poorly developed, as well as very scarce *Spirillina*, Textularidae and *Ophthalmidium* and very rare radiolarians. The scarce crinoidal fragments encountered in these deposits are cyclocrinoids, different from the assemblages known in the Burgundy or the Jura at the same period (mostly pentacrines).

The lateral and vertical distribution of these biomicrofacies (Piuz & Durllet, in progress) depend on numerous ecological factors regarded by most authors as related to the bathymetry. Although often considered as main factor, depth (i.e. eustatism) might influence the biofacies on this vast echinodermic shelf, together with a strong climatic influence (Piuz 2004) affecting the light and organic flux (affluence of trophic resource) in this bajocian sea.

This study shows that small species of foraminifers and other microfossils, often overlooked in the limestones, provide important data for characterising the facies of the bajocian echinodermic shelf.

REFERENCES

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