

# NEGLECTED MICROFOSSILS – EARLY JURASSIC ECHINODERM LARVAL SKELETONS FROM GERMANY AND FRANCE

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Larvae of brittle stars, sea urchins, and allies are common, ecologically important members of marine ecosystems in all oceans today. It has been recognized that all modern echinoderm representatives, with the exception of Crinoidea, have feeding (planktotrophic) larvae, whereas benthic, free-living feeding larvae are missing. Lecithotrophic (non-feeding) larvae with benthic or planktonic habits have been reported in all modern echinoderms. All of these types of echinoderm larvae have unique morphologies, and, with the exception of the bipinnaria of Asteroidea, a calcitic skeleton. In contrast to modern representatives, the fossil record of echinoderm larvae is essentially non-existent and biased due to missing studies or lack of awareness of such small and fragile microfossils. However, modified micropalaeontological techniques and detailed study of sieve residues below 0.1 millimetre have the promise to provide microscopic larval skeletons as shown recently by Reich (2021). Our study reports a few hundreds of ophiopluteus and echinopluteus skeletons from Sinemurian, Pliensbachian and Toarcian strata of Germany (Lower Saxony, Saxony-Anhalt) and France (Ardennes). Most of the specimens found (>95%) belong to ophiuroids, only a few correspond well to echinoid larval skeletons. All plutei skeletons found are of compound type including unique characteristics, revealing evolutionary changes between Mesozoic and Cenozoic forms. Our new findings provide a window into the poorly known fossil record of echinoderm larvae, showing a hidden diversity of such fragile microfossils and the possibility of direct geological recording.