1. Introduction

The Mississippian was an important time in the evolution of marine vertebrates, with the emergence of the first ecosystems dominated by jawed fish. Despite this, understanding of Mississippian fish ecology remains poor. Here, we present preliminary findings about new fish assemblages, representing differing ecologies, recovered from Serpukhovian carbonates at St Brendan’s Well in County Clare.

2. Locality

Three horizons (BW01, BW03 BASE and BW03 TOP) were sampled (Fig. 1) in order to extract microvertebrates (Fig. 2).

3. Sample Preparation

Both the Slievenaglasha and Magowna formations have produced early Serpukhovian conodont faunas (Fig. 3) typical of the outer shelf/platform Gnathodus-Lochriea Biofacies.

The top of the Slievenaglasha Fm. (the Lissylisheen Member) produced a noticeably richer and more diverse conodont fauna in comparison to the overlying Magowna Fm. samples. Including over half of the total specimens recovered.

The Magowna Fm. yielded fewer specimens, but contains a wider range of fish groups, including Xenacanths (Fig. 4).

The reason for this difference in microfaunal composition is unclear - it may reflect more favourable ecological conditions in the Slievenaglasha Fm., or subtle differences in water depth or sedimentary regime between the two formations. The Lissylisheen Member has generally been interpreted as very shallow marine in character with a palaeokarstic top.

4. Microvertebrate Range and Composition

The presence of the xenacanthiforme Bransoneilla in the Magowna Fm., a marine unit, supports a euryhaline adaptation in these fish.

5. Discussion

The Xenacanth material recovered from the Magowna Fm. suggests possible shallow nearshore conditions; however, this is open to debate (Box 5).

6. Xenacanthiforme Physiology

Xenacanths have traditionally been considered to be freshwater sharks, restricted to rivers and lakes (Gray, 1988). Recent evidence has indicated that these sharks were euryhaline (Carpenter et al. 2011), allowing them tolerate a wide salinity range, permitting them to live in marine to freshwater environments.