

Major Facial and Faunal Changes in the Silurian of the Prague Basin, Bohemia

J. Kríz¹

The general facial and faunal development of the Prague Basin was during the Silurian influenced by eustatic movements, water currents, volcanism and by synsedimentary tectonics.

After the lower Silurian transgression anoxic conditions in the basin persisted up to the upper Aeronian (middle Llandovery) when ventilated, shallow bottom conditions developed due to the volcanic activity. This caused the development of shallow water benthic communities formed of the new, most probably endemic species which originated by very quick adaptive radiation on the slopes of virgin volcanic island.

In the upper Wenlock and in the lower Ludlow the volcanic archipelago originated in the Prague Basin and the situation was analogous with that in the middle Llandovery. New shallow water brachiopod and trilobite dominated benthic communities developed by very quick adaptive radiation of immigrant species.

A different situation was in deeper parts of the basin which were ventilated only temporary by surface currents. The currents provided not only ventilation of the deeper parts of the basin but also transport of larvae and cephalopods. Here, during low stands of the sea level when currents were reaching the sea bottom, developed the cephalopod limestone biofacies with the Bivalvia dominated *Cardiola* Community Group (KRIZ 1993a MS). This group is composed of the recurring *Cardiola* dominated analogous and homologous communities. They are developed in several horizons which indicate low stands of the sea level stratigraphically. The communities are formed by cosmopolitan species with relatively long larval life which is favourable for long transport and which are known from many other basins within the reach of the South Tropical Current (Wilde, Berry and Quiby-Hunt 1991) - e.g. Morocco, Spain, Montagne Noire, Massif Armoricaire, Welsh Borderland, Scania, Carnic Alps, Moesian Platform, Serbia, Sardinia, Australia, Caucasus and Tajmyr.

First major change in facies and fauna was in the middle Ludfordian (upper Ludlow) caused by high stand or transgression of the sea which influenced the whole basin, even the shallowest parts of it. In the basin developed new shallow water communities while old shallow water communities characterized by encrinurid trilobites extincted. There was no time and conditions for the deeper water communities to recover.

Shallowing of the basin during the higher Ludlow caused development of similar conditions in the basin which existed here before the middle Ludfordian. In the shallow parts of the basin, in the regions of former volcanic centres, brachiopod and trilobite dominated communities composed mainly from endemic species flourished. The deeper parts of the basin ventilated by currents were characterized by the Bivalvia dominated communities in which the majority of the species was cosmopolitan.

¹ Czech Geological Survey, P.O. Box 85, Praha 011, 118 21 Czech Republic

A second major facial and faunal change was at the Ludlow - Prídolí boundary caused by another transgression of the sea. High stand of the sea-level killed all the Ludlow benthic communities and just few species survived. The new Bivalvia dominated communities composed mainly of infaunal and cosmopolitan species distributed as larvae together with cephalopods by surface currents developed in deeper water under somewhat restricted bottom conditions (mostly only little and temporary ventilated). These communities are known also from other regions (e.g. Morocco, Montagne Noire, Poland, Moesian Platform, Carnic Alps, Sardinia, Serbia). In the shallow bottom which persisted in the regions of former volcanic centres flourished the brachiopod dominated communities with a majority of endemic species. Parts of these shallow flats were protected against high energy by barriers of crinoid sand composed mainly of *Scyphocrinites* disarticulated stem plates and numerous loboliths.

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Autor(en)/Author(s): Kriz Jiri

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