

EARLY ORDOVICIAN ASSEMBLAGES AND THEIR POSSIBLE RELATION
TO COMMUNITIES AND BIOFACIES -- WITH AN EXAMPLE FROM THE
NITTANY DOLOMITE OF CENTRAL PENNSYLVANIA

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Historically, six Early Ordovician fossil-bearing facies have been recognized in North America, based on both their lithology and the most abundant types of fossils: the cryptalgal facies, cherty-carbonate - molluscan facies, thrombolite mound facies, sponge-algal mound facies, limestone-brachiopod facies, and graptolitic shale facies. However, complete or representative fossil assemblages characterizing these facies have not yet been defined. Paleogeographic controls on the distribution of these facies are primarily water depth and circulation; much of the North American continent exhibits a progression from dolomite to limestone to shale as one goes from shoreline out across the shelf to deep sea deposits.

Current study shows that the cherty-carbonate - molluscan facies as developed in the Nittany Dolomite of central Pennsylvania contains diverse assemblages consisting of, in decreasing order of abundance, gastropods, cephalopods, pelmatozoans, brachiopods, trilobites, sponges, polyplacophorans, rostroconchs, conodonts, encrusting and burrowing worms, and several types of algal structures. Within the mollusc dominated facies, different assemblages can be recognized which vary in the types of gastropods which predominate and in the abundance of cephalopods. These different assemblages appear limited enough that they approach the concept of fossil communities, although some might prefer to regard them as local biofacies. The assemblages are inferred to be related to current energy, water depth, salinity, and substrate texture. Intriguingly, diversity of the Nittany molluscs is highest where sponges and algal structures occur; comparison with the published literature also suggests a greater-than-expected faunal similarity and geographic proximity between the mollusc dominated facies and the sponge-algal mound facies.