

Silurian to Lower Devonian facies evolution and environments in the Cordillera Oriental – Subandino of southern Bolivia

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Thick Silurian–Lower Devonian sequences in southern Bolivia display major facies changes from south to north. Near Tarija in the south, upper Ordovician diamictites are overlain unconformably by ironstones of the Lipeon Formation, of probable Llandovery age, formed as marine bars in a transgressive systems tract. The succeeding Lipeon highstand systems tract was persistently in inshore facies, regressing upwards from sand dominated shoreface environments to prodelta exaerobic sands and silts of distributary bars. Marine fossils are rare, but plant fragments occur throughout, including the land plant *Cooksonia* in the upper Lipeon in beds no older than early Ludlow. Succeeding arenites of the Přídolí to Lochkovian Tarabuco – Santa Rosa formations preserve a marine to non marine transition from tidal channel to tidal flat deposits into delta plain facies. Pragian marine shelf siltstones of the Icla Formation then initiate a new depositional sequence.

To the north, in the Tarabuco region, Silurian transgression over the Ordovician is dated by graptolites as early Ludlow. The typical Lipeon facies of the south, including ironstones, are not developed. Here instead, transgressive and highstand systems tracts of the Kirusilla Formation embrace three members comprising marine shelf fine arenites, mid to deeper shelf anoxic muds and silts, and then silt dominated facies with rare faunas. Fragmentary plants occur throughout. Overlying Tarabuco Formation arenites include levels of soft sediment deformation. Later Silurian to Devonian facies are comparable with the Tarija region. The extensive stratigraphical gap below the Kirusilla Formation indicates a long, Llandovery–Wenlock positive interval in the Tarabuco region.