

## Sedimentary Processes in the Cambrian - Ordovician mudrocks, Famatina Range, northwestern Argentina

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Fine-grained sedimentary rocks occur in the Lower Member of the Volcancito Formation (Latest Cambrian-Early Ordovician) of the Famatina Range, northwest Argentina. These deposits are characterized by their finely laminated structure and their dark color (dark grey to black). This member is 160 m thick and includes shales and marls interbedded with numerous storm layers deposited in a shelf environment. The presence of only a few unequivocal hummocky cross-stratified beds and dominance of shales and marls indicates that most of the Lower part of the succession (Latest Cambrian) was deposited below, storm wave base.

Shales are characterized by alternating light and dark very fine, parallel, ungraded laminae. Laminae are generally less than 0.5 mm thick. The light layers are thinner, usually quartz-rich, with scarce clay and organic matter. These laminae occasionally are undulated or thin laterally. Grain-size of quartz ranges from very fine- to fine-grained silt. Dark colored laminae are thicker than light colored laminae. Clay and organic-matter occur as continuous deposits of dark brown color.

Marls are formed by parallel to wavy, 0.5 to 1 mm thick, light and dark laminae. Small scale cross-lamination has been observed in the marly interval. Light layers are composed of silt-grade carbonate and quartz. Small fossil fragments are preserved within laminae. The dark colored laminae contain abundant organic-rich micrite material and minor proportions of very fine-grained silt.

Lamination type, and fabric features have been used to interpret the dominant depositional processes. Thin, non-graded and parallel laminated layers record suspension fall-out. Episodic sedimentation, perhaps storm generated, is indicated by the presence of fine to thick laminae in association with small scale cross-lamination (marly interval) or bottom scour features (shaly interval). Wavy lamination locally observed in the marly interval may have resulted from microbial mat development.