

# **Evolution of chevron folds by profile shape changes: comparison between multilayer deformation experiments and folds of the Bendigo-Castlemaine goldfields, Australia**

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## **Abstract**

The Bendigo-Castlemaine goldfields is well-known for the chevron folded Ordovician turbidites of Victoria, Australia. However, through the detailed re-examination of geological map, it is found that there are also other common fold shapes, such as boxfolds and flat-topped folds with subsidiary hinges. These fold shapes are enclosed within chevron folded layers and are traceable on the surface. A series of plasticine multilayer experiments are performed to discover the evolution of profile shape of the folds. In the experiments, it can be observed that chevron folds are evolved from sinusoidal folds and boxfolds via hinge sharpening and hinge migration, respectively. During shortening, the buckling of median segments produces analogous fold styles to those seen in the Bendigo-Castlemaine folds. On the other hand, based on engineering principles, the initiation and development of the symmetric chevron folds are also discussed. By considering the stress state and elasticity of the materials, this theoretical approach provides an insight to build the relationship between the competence of the rock layers and the slenderness of the fold geometry.

**Keywords:** Chevron folds, Box folds, Evolution, Multilayer experiments, Symmetric folds

## **References:**

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