

Studies on structure and metamorphism within the SW-Irish Variscides: A profile from Bantry to Killarney.

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Detailed structural mapping, strain analysis and studies on metamorphism were carried out along a straight N7°E striking profile in the Variscides of SW Ireland, in order to provide of consistent data set for the nature of the outer Variscan tectonic regime in this area and the implication for a tectonic model of the Irish Variscides (thin-skinned versus thick-skinned). Small scale and large scale D1 fold axes of periclinal folds with boxlike to tight geometry mainly plunge shallowly towards the WSW. The intense pressure solution cleavage mainly dips steep to the SSE. The Muckross fault (of at least 4km displacement) divides Upper Devonian Old Red Sandstone from Lower Carboniferous limestones near Killarney. In the footwall of this fault zone polyphase deformation occurs on Ross- and Muckross Peninsula. Along the whole profile shear indicators such as calcrite nodules, cherty clasts and sc'-fabrics indicate mainly dextral reverse shear with a resultant displacement vector up to the NW along the cleavage planes. Dextral reverse kink bands with subvertical kink planes deform both bedding and cleavage. Minimal 2D-strain ratios (R_{xz}) range from 1.5 up to 2.6 with an average value of 1.97 using the Fry-method. The metamorphic grade of the Old Red Sandstone succession in the western part of the Middle- to Upper Devonian Munster basin is epizonal, whereas the the Upper Devonian to Lower Carboniferous marine siliclastics of the South Munster basin and the northern Munster shelf are in general anchizonal. Illite and chlorite crystallinity data indicate a generally weak relation to the stratigraphic position, which can be interpreted as a pre-deformational metamorphic event. Comparison with 2-d strain (R_{xz}) shows a relation between strain and illite crystallinity. This supports the idea that illite crystallinity is influenced by and increased during advanced deformation. All observations and structural data imply thick skinned tectonics and dextral shear in this part of the Irish Variscides and exclude a 'Variscan Front' along the Killarney-Mallow fault.
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