
Oikocrysts in the gold districts of the Meguma Group, central Nova Scotia

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Oikocrysts are one of the most enigmatic features of the Meguma Gold districts. They are ovoid aggregates of quartz, carbonate, and sheet silicates, locally associated with sulphide, that commonly define a prominent down-dip lineation on the limbs of gold-bearing anticlines in the central part of the Meguma Group. Regional mapping of the Oldham and Montague gold districts, and sampling at Mooseland and Caribou, has shown that oikocrysts are confined to the gold districts. A detailed mineralogical and textural investigation of oikocrysts from these areas has been undertaken in an attempt to determine their origin and their link to the gold districts.

Oikocrysts occur mainly in slate horizons interlayered with quartzo-feldspathic metasiltstones and metasandstones of the Goldenville Formation. Field observations confirm that the long axes of the elongated oikocrysts define down-dip lineations on cleavage planes perpendicular to anticlinal fold hinges. Although in hand sample they resemble deformed porphyroblasts, internal mineralogy and texture are not consistent with this interpretation. Instead, their internal features resemble the mineralogy and texture of interlayered metasiltstones. In some cases, an apparent progression from cusps of deformed metasiltstone layers at slate boundaries to isolated oikocrysts in the adjacent slate can be observed. The oikocrysts are generally rimmed by biotite-chlorite intergrowths, which are coarser grained and less deformed than sheet silicates defining cleavage in the surrounding slate. Similar biotite-chlorite intergrowths are present within some metasiltstone layers. These features point to the possibility that oikocrysts are isolated fragments of highly deformed metasiltstone layers. Oikocryst aspect ratios (4:1 to 12:1) reflect the amount of strain in the slate, which is interpreted to reflect folding.

The relative age of oikocryst formation can be constrained by cross-cutting relationships. The quartz-rich aggregates pre-date or are synchronous with at least one stage of cleavage formation, although it is likely that the biotite-chlorite rims formed later. The oikocrysts and their rims pre-date at least one generation of quartz veins and in the Mooseland district they appear to pre-date contact metamorphism. Although these observations suggest that oikocrysts formed relatively early in the structural and metamorphic history, our data so far do not provide an explanation for their association with gold districts.