



## **Structural controls on listwaenite genesis in the Semail Ophiolite, Northern Oman**

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Listwaenite, a carbonated and/or silicified serpentinite, is common in the Semail Ophiolite of northern Oman. However, the tectonic setting behind its formation is enigmatic. Previous workers have proposed that listwaenite in northern Oman formed at the leading edge of the mantle wedge in the basal thrust zone of the Semail ophiolite during its Late Cretaceous obduction or is related to postobductional extension. In the former case, listwaenite should be penetratively deformed and folded. We present evidence from three locations demonstrating that unfolded listwaenite is intimately associated with a series of Cenozoic extensional faults.

Near Buwah, north of the Jabal Nakhl Culmination, two generations of E-W-striking normal faults separate the metamorphic sole from underlying Jurassic carbonates, and bound relatively thin (<30m), planar bodies of listwaenite. The older suite of faults dips 25 to 35° N and is characterized by semi-ductile deformation. At some locations, the metamorphic sole is cut out by these faults, and mantle peridotite forms a serpentinitized mélangé with abundant top-to-the north extensional sense-of-shear indicators. High-angle (~60 to 70° N) younger brittle faults cut all other structures. Listwaenite occurs as isolated, tabular bodies in fault slices and extensional duplexes. Near Fanja, listwaenite occurs in the damage zone of a top-to-the NE extensional fault that places Late Cretaceous (post-obduction) sediments on peridotite and rocks of the metamorphic sole. Listwaenite occurs upwards from the fault as injections into sedimentary rocks of the Campanian to Maastrichtian Al-Khod Formation. Southwest of Bidbid, on the southwestern flank of the Saih Hatat Dome, listwaenite occurs as a series of NW-striking tabular bodies associated with a suite of top-to-the southwest extensional faults with a sinistral slip component.

Field data from northern Oman indicate that listwaenite is localized in brittle fault zones associated with extensional deformation and mid-Cenozoic unroofing of the Jebal Akhdar/Nakhl and Saih Hatat domes. Fault processes facilitated fluid movement and the metasomatic alteration of peridotite-derived serpentinite.