

TRANSPARENT EXOPOLYMER PARTICLES (TEP)
AS A COMPONENT OF HYDROTHERMAL PLUME
PARTICLE DYNAMICS

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ABSTRACT

This is the first report of TEP concentrations in a hydrothermal plume environment. Transparent exopolymer particles (TEP) have recently been recognized as a class of sticky particles that often stimulate macroaggregate formation. Until now, studies looking at TEP were focused on surface waters, particularly in association with diatom blooms. The occurrence of TEP in deep water demonstrates its existence in an environment that is devoid of phytoplankton, the organisms that have been regarded as its primary source. The main objective of this study was to investigate the presence and potential abundance of TEP within hydrothermal plumes over the Juan de Fuca Ridge. Samples for TEP and bacteria were collected from CTD-rosette casts through hydrothermal plumes over the Juan de Fuca Ridge during the summers of 1999 and 2000. Concentrations of TEP and bacteria within the hydrothermal plumes were significantly greater than in background seawater. TEP number and volume concentrations reported here are low compared to reported values for shallow environments, but are substantially higher than published reports of TEP in deep water.

Ratios of TEP anomalies to temperature anomalies (a conservative hydrothermal tracer) increased with distance from the apparent plume source, suggesting that TEP are produced within the aging hydrothermal plumes. Potential TEP sources associated with hydrothermal plumes are discussed. TEP in hydrothermal plumes could stimulate *in situ* aggregate formation, support populations of attached bacteria, and serve as a potential food source to zooplankton.