



Mechanics of anisotropic inclusions applied to mica fish populations

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An analytical solution is derived for the mechanical behaviour of a linear viscous anisotropic elliptical inclusion immersed in a linear viscous isotropic fluid. By assuming that the internal anisotropy deforms passively a system of three differential equations describe the rate of change of ellipse long axis orientation, anisotropy orientation and ellipse aspect ratio. Taking appropriate limits, the model can be adapted to represent the behaviour of mica fish which deform only by glide along the basal plane. Simulation studies indicate that ellipse long axes tend towards a stable orientation of approximately 15 degrees, whereas anisotropy orientations tend to show a fatter and more asymmetric distribution. This is consistent with published natural data.