C. Costara and T. J. Ransford, **On local irreducibility of the spectrum**, *Proc. Amer. Math. Soc.*, 135 (2007), 2779-i-2784.

Abstract
Let $\mathcal{M}_n$ be the algebra of $n \times n$ complex matrices, and for $x \in \mathcal{M}_n$ denote by $\sigma(x)$ and $\rho(x)$ the spectrum and spectral radius of x respectively. Let D be a domain in $\mathcal{M}_n$ containing 0, and let $F : D \to \mathcal{M}_n$ be a holomorphic map. We prove: (1) if $\sigma(F(x)) \cap \sigma(x) \neq \emptyset$ for $x \in D$, then $\sigma(F(x)) = \sigma(x)$ for $x \in D$; (2) if $\rho(F(x)) = \rho(x)$ for $x \in D$, then again $\sigma(F(x)) = \sigma(x)$ for $x \in D$. Both results are special cases of theorems expressing the irreducibility of the spectrum $\sigma(x)$ near $x = 0$.