Chernoff, Paul R.; Waterhouse, William C.
Local compactness of $\text{Hom}(-, H)$.  (English) [Zbl 0976.22005]

From the paper: A discussion about possible variants of Pontryagin duality led to the following result, which seems to be new.

Theorem. Let $H$ be any topological group. Suppose that, for all locally compact groups $G$, the set $\text{Hom}(G, H)$ in the compact-open topology is locally compact. Then $H$ is a compact Lie group.

Corollary Let $H$ be an abelian topological group such that for all locally compact abelian $G$ the group $\text{Hom}(G, H)$ is locally compact. Then $H$ is the product of a finite group and a finite product of circle groups.

MSC:
22D05 General properties and structure of locally compact groups

Keywords:
abelian topological group; circle groups

Full Text: DOI