Let $(X, x)$ be a pointed space and $\Omega^n(X, x)$ be the $n$-th loop space of $(X, x)$ with the compact-open topology. The $n$-th quasitopological homotopy group $\pi_{qtop}^n(X, x)$ of $(X, x)$ is the homotopy group $\pi_n(X, x)$ endowed with the natural quotient topology inherited from the space $\Omega^n(X, x)$. It is known that $\pi_{qtop}^n(X, x)$ is a quasitopological group. In this paper, the authors prove that: for all $n \geq 1$ and $1 \leq k \leq n-1$, $\pi_{qtop}^n(X, x) \cong \pi_{qtop}^{n-k}(\Omega^k(X, x), e_x)$, where $e_x$ is a constant $k$-loop in $X$ at $x$. By using this fact, some results about quasitopological homotopy groups are obtained. With the help of the long exact sequence of a based pair and a fibration in qTop introduced by J. Brazas [Topology Appl. 160, No. 1, 170–188 (2013; Zbl 1264.57001)], the authors also obtain some further results in this field.

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MSC:
55Q99 Homotopy groups
54H11 Topological groups (topological aspects)
22A05 Structure of general topological groups

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References:

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