FORMULA 3.623.1

$$\int_0^{\pi/2} \tan^{\mu-1} x \cos^{2\nu-2} x \, dx = \int_0^{\pi/2} \cot^{\mu-1} x \sin^{2\nu-2} x \, dx = \frac{1}{2} B\left(\frac{\mu}{2}, \nu - \frac{\mu}{2}\right)$$

The integral representation

$$B(a,b) = \frac{1}{2} \int_0^{\pi/2} \sin^{2a-1} x \cos^{2b-1} x \, dx$$

and the identity

$$\tan^{\mu-1} x \cos^{2\nu-2} x = \sin^{\mu-1} x \cos^{2\nu-\mu-1} x$$

give the first formula. The second comes from the first via the change of variables $x \mapsto \frac{\pi}{2} - x$.