$$C(r\bar{g} \to r\bar{g}) = \tfrac{1}{4}\left(\lambda^1_{21}\lambda^1_{12} + \lambda^2_{21}\lambda^2_{12}\right)$$

$$= \tfrac{1}{4}\left(1 \times 1 + (i) \times (-i)\right)$$

$$= \tfrac{1}{4}(2)$$

$$= \tfrac{1}{2}$$

$$C(r\bar{r} \to g\bar{g}) = \tfrac{1}{4}\left(\lambda^3_{11}\lambda^3_{22} + \lambda^8_{11}\lambda^8_{22}\right)$$

$$= \tfrac{1}{4}\left(1 \times (-1) + \tfrac{1}{\sqrt{3}} \times \tfrac{1}{\sqrt{3}}\right)$$

$$= \tfrac{1}{4}\left(-1 + \tfrac{1}{3}\right)$$

$$= \tfrac{1}{4}\left(-\tfrac{2}{3}\right)$$

$$= -\tfrac{1}{6}$$