ABSTRACT: Experimental reports showed carcinogenic effects of artificial food colors and additives (AFCAs) on many organs, including the head and neck region. We aimed to investigate the effect of AFCAs on laryngeal histomorphology and immunohistochemical expression in maternally exposed rats. "No observable adverse effect levels" of commonly used AFCAs as a mixture were given to female rats before and during gestation. Histopathological and immunohistochemical findings were evaluated in their offspring. Significant decreasing in goblet cell count and cilia loss were observed with AFCAs in maternally exposed rats (p < 0.05). Immunohistochemically, the Ki67 index was significantly increased and villin expression was significantly reduced in laryngeal epithelium in the study group (p < 0.05), whereas expression of cyclooxygenase type 2, Muc-2, Muc-5AC, p53, and epidermal growth factor receptors did not differ between the groups. This study demonstrated that maternal exposure of AFCAs plays a role in the mucosal defense system and possibly in carcinogenesis.