Isolation of a quinone-rich fraction from Ardisia crispa roots and its attenuating effects on murine skin tumorigenesis

ABSTRACT

Ardisia crispa (Family: Myrsinaceae) is an evergreen, fruiting shrub that has been traditionally used as folklore medicine. Despite a scarcity of research publications, we have succeeded in showing suppressive effects on murine skin papillomagenesis. In extension, the present research was aimed at determining the effect of a quinone-rich fraction (QRF) isolated from the same root hexane extract on both initiation and promotion stages of carcinogenesis, at the selected dose of 30 mg/kg. Mice (groups I-IV) were initiated with a single dose of 7,12-dimethylbenz(a)anthracene (DMBA, 100 εg/100 εl) followed by repeated promotion of croton oil (1%) twice weekly for 20 weeks. In addition, group I (anti-initiation) received QRF 7 days before and after DMBA; group II (anti-promotion) received QRF 30 minutes before each croton oil application; group III (anti-initiation/ promotion) was treated with QRF as a combination of group I and II. A further two groups served as vehicle control (group V) and treated control (group VI). As carcinogen control, group IV showed the highest tumor volume (8.79±5.44) and tumor burden (3.60±1.17). Comparatively, group III revealed only 20% of tumor incidence, tumor burden (3.00±1.00) and tumor volume (2.40±1.12), which were significantly different from group IV. Group II also showed significant reduction of tumor volume (3.11), tumor burden (3.00) and tumor incidence (11.11%), along with prominent increase of latency period of tumor formation (week 12). Group I, nonetheless, demonstrated marked increment of tumor incidence by 40% with prompted latency period of tumor formation (week 7). No tumor formation was observed in groups V and VI. This study provided clear evidence of inhibitory effects of QRF during promotion period which was in agreement with our previous findings. The mechanism(s) underlying such effects have yet to be elucidated.

Keyword: Ardisia crispa; Murine carcinogenesis model; Skin cancer; Tumor initiation; Tumor promotion