Cytotoxicity and structure-activity relationships of xanthone derivatives from Mesua beccariana, Mesua ferrea and Mesua congestiflora towards nine human cancer cell lines.

Abstract

The cytotoxic structure-activity relationships among a series of xanthone derivatives from Mesua beccariana, Mesua ferrea and Mesua congestiflora were studied. Eleven xanthone derivatives identified as mesuarianone (1), mesuasinone (2), mesuaferrin A (3), mesuaferrin B (4), mesuaferrin C (5), 6-deoxyjacareubin (6), caloxanthone C (7), macluraxanthone (8), 1,5-dihydroxyxanthone (9), tovopyrifolin C (10) and α-mangostin (11) were isolated from the three Mesua species. The human cancer cell lines tested were Raji, SNU-1, K562, LS-174T, SK-MEL-28, IMR-32, HeLa, Hep G2 and NCI-H23. Mesuaferrin A (3), macluraxanthone (8) and α-mangostin (11) showed strong cytotoxicities as they possess significant inhibitory effects against all the cell lines. The structure-activity relationship (SAR) study revealed that the diprenyl, dipyrano and prenylated pyrano substituent groups of the xanthone derivatives contributed towards the cytotoxicities.

Keyword: Cytotoxicity; Mesua beccariana; Mesua congestiflora; Mesua ferrea; Structure-activity relationship; Xanthones.