Antibacterial and cytotoxic xanthones from *Cratoxylum cochinchinense*

Mahabusarakam W., **Rattanaburi S.**, Phongpaichit S., Kanjana-Opas A. (2008) Phytochemistry Letters, 1 (4), pp. 211-214.

มีการอ้างอิงในช่วง 1 ต.ค. 68- 28 ก.พ. 69 จำนวน 1 บทความ

NATURAL PRODUCT RESEARCH
2026, VOL. 40, NO. 1, 172–180
https://doi.org/10.1080/14786419.2024.2397044

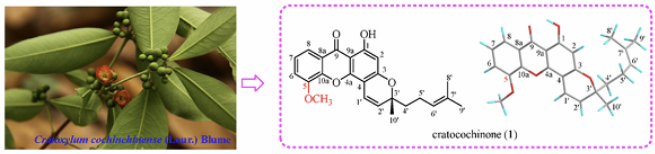
Polyprenylated xanthones with potential anti-inflammatory and anti-HIV effects from the stems and leaves of *Cratoxylum cochinchinense* (Lour.) Blume

Yong Zhang[a,b], You-Di Rao[a,b], Jing-Su Yu[a,b], Jia-Yi Hu[a,b], Wen-Hui Hu[a,b], Shu-Ri Li[a,b], Hui Yang[a,b], Yan-Ping Liu[a,c,d,e] and Yan-Hui Fu[a,b,c,d,e]

[a]Key Laboratory of Tropical Medicinal Resource Chemistry of Ministry of Education, Hainan Normal University, Haikou, P. R. China; [b]Engineering Research Center for Industrialization of Southern Medicinal Plants Resources of Hainan Province, Hainan Normal University, Haikou, P. R. China; [c]Key Laboratory of Research and Development of Tropical Fruit and Vegetable of Haikou City, Hainan Normal University, Haikou, P. R. China; [d]Key Laboratory of Southern Medicinal Plants Resources of Haikou City, Hainan Normal University, Haikou, P. R. China; [e]Key Laboratory of Tropical Medicinal Plant Chemistry of Hainan Province, Hainan Normal University, Haikou, P. R. China

ABSTRACT

A phytochemical study on the stems and leaves of *Cratoxylum cochinchinense* (Lour.) Blume resulted in the isolation and characterisation of a new polyprenylated xanthone, cratocochinone (**1**), as well as seven known analogues, fuscaxanthone K (**2**), pruniflorone Q (**3**), 1,3,5,8-tetrahy-droxy- 2-(3-methybut-2-enyl)-4-(3,7-dimethylocta-2,6-dienyl) xanthone (**4**), cochinensoxanthone (**5**), cratoxylum-xanthone B (**6**), cochinchinone I (**7**) and cochinchinone K (**8**). The chemical structure of **1** was determined by comprehensive spectral analyses. The known compounds **2**–**8** were identified by comparing their experimental spectroscopic data with those reported data in the literature. The anti-inflammatory and anti-HIV effects of all isolates **1**–**8** were evaluated. As a result, compounds **1**–**8** showed remarkable inhibitory effects against nitric oxide (NO) production induced by lipopolysaccharide in mouse macrophage RAW 264.7 cells showing IC_{50} values ranging from 0.68 ± 0.06 to 10.27 ± 0.18 μM. Meanwhile, compounds **1**–**8** displayed notable anti-HIV-1 reverse transcriptase (RT) effects with EC_{50} values ranging from 0.19 to 10.72 μM.



ARTICLE HISTORY
Received 12 February 2024
Accepted 21 August 2024

KEYWORDS
C. cochinchinense (Lour.) Blume; polyprenylated xanthones; cratocochinone; anti-inflammatory effects; anti-HIV-1 activities

References

Bennett GJ, Harrison LJ, Sia GL, Sim KY. 1993. Triterpenoids, tocotrienols and xanthones from the bark of *Cratoxylum cochinchinense*. Phytochemistry. 32(5):1245–1251. doi:10.1016/S0031-9422(00)95100-8.

Boonnak N, Karalai C, Chantrapromma S, Ponglimanont C, Fun H-K, Kanjana-Opas A, Chantrapromma K, Kato S. 2009. Anti-pseudomonas aeruginosa xanthones from the resin and green fruits of *Cratoxylum cochinchinense*. Tetrahedron. 65(15):3003–3013. doi:10.1016/j.tet.2009.01.083.

Boonnak N, Karalai C, Chantrapromma S, Ponglimanont C, Fun HK, Kanjana-Opas A, Laphookhieo S. 2006. Bioactive prenylated xanthones and anthraquinones from *Cratoxylum formosum* ssp. *pruniflorum*. Tetrahedron. 62(37):8850–8859. doi:10.1016/j.tet.2006.06.003.

Duan YH, Dai Y, Wang GH, Chen LY, Chen HF, Zeng DQ, Li YL, Yao XS. 2015. Bioactive prenylated xanthones from the stems of *Cratoxylum cochinchinense*. J Asian Nat Prod Res. 17(5):519–531. doi:10.1080/10286020.2015.1043902.

Duan YH, Dai Y, Wang GH, Zhang X, Chen HF, Chen JB, Yao XS, Zhang XK. 2010. Bioactive xanthones from the stems of *Cratoxylum formosum* ssp. *pruniflorum*. J Nat Prod. 73(7):1283–1287. doi:10.1021/np1001797.

Editorial Committee of Flora of China. 1990. Chinese flora. Vol. 50. Beijing: Science Press; p. 75–79.

Fouotsa H, Lannang AM, Dzoyem JP, Tatsimo SJ, Neumann B, Mbazoa CD, Razakarivony AA, Nkengfack AE, Eloff JN, Sewald N. 2015. Antibacterial and antioxidant xanthones and benzophenone from *Garcinia smeathmannii*. Planta Med. 81(7):594–599. doi:10.1055/s-0035-1545841.

Kaewpiboon C, Boonnak N, Yawut N, Kaowinn S, Chung YH. 2019. Caged-xanthone from *Cratoxylum formosum* ssp. *pruniflorum* inhibits malignant cancer phenotypes in multidrug-resistant human A549 lung cancer cells through down-regulation of NF-κB. Bioorg Med Chem. 27(12):2368–2375. doi:10.1016/j.bmc.2018.12.042.

Kukongviriyapan U, Luangaram S, Leekhaosoong K, Kukongviriyapan V, Preeprame S. 2007. Antioxidant and vascular protective activities of *Cratoxylum formosum*, *Syzygium gratum* and *Limnophila aromatica*. Biol Pharm Bull. 30(4):661–666. doi:10.1248/bpb.30.661.

Laphookhieo S, Maneerat W, Koysomboon S. 2009. Antimalarial and cytotoxic phenolic compounds from *Cratoxylum maingayi* and *Cratoxylum cochinchinense*. Molecules. 14(4):1389–1395. doi:10.3390/molecules14041389.

Laphookhieo S, Syers JK, Kiattansakul R, Chantrapromma K. 2006. Cytotoxic and antimalarial prenylated xanthones from *Cratoxylum cochinchinense*. Chem Pharm Bull. 54(5):745–747. doi:10.1248/cpb.54.745.

Li ZP, Lee HH, Uddin Z, Song YH, Park KH. 2018. Caged xanthones displaying protein tyrosine phosphatase 1B (PTP1B) inhibition from *Cratoxylum cochinchinense*. Bioorg Chem. 78:39–45. doi:10.1016/j.bioorg.2018.02.026.

Liu YP, Liu QL, Zhang XL, Niu HY, Guan CY, Sun FK, Xu W, Fu YH. 2019. Bioactive monoterpene indole alkaloids from *Nauclea officinalis*. Bioorg Chem. 83:1–5. doi:10.1016/j.bioorg.2018.10.013.

Liu YP, Zhao WH, Feng XY, Zhang ZJ, Zong K, Sun ZG, Zheng YT, Fu YH. 2018. Novel tetrahydrofuran derivatives from *Trigonostemon howii* with their potential anti-HIV-1 activities. Bioorg Chem. 79:111–114. doi:10.1016/j.bioorg.2018.04.023.

Mahabusarakam W, Rattanaburi S, Phongpaichit S, Kanjana-Opas A. 2008. Antibacterial and cytotoxic xanthones from *Cratoxylum cochinchinense*. Phytochem Lett. 1(4):211–214. doi:10.1016/j.phytol.2008.09.012.

Nguyen NK, Truong XA, Bui TQ, Bui DN, Nguyen HX, Tran PT, Nguyen LD. 2017. α-Glucosidase inhibitory xanthones from the roots of *Garcinia fusca*. Chem Biodivers. 14:e1700232.

Raksat A, Phukhatmuen P, Yang J, Maneerat W, Charoensup R, Andersen RJ, Wang YA, Pyne SG, Laphookhieo S. 2020. Phloroglucinol benzophenones and xanthones from the leaves of *Garcinia cowa* and their nitric oxide production and α-glucosidase inhibitory activities. J Nat Prod. 83(1):164–168. doi:10.1021/acs.jnatprod.9b00849.

CrossMark

Document is current

Any future updates will be listed below

Polyprenylated xanthones with potential anti-inflammatory and anti-HIV effects from the stems and leaves of Cratoxylum cochinchinense (Lour.) Blume

Crossref DOI link: https://doi.org/10.1080/14786419.2024.2397044

Published Online: 2024-09-04

Published Print: 2026-01-02

Update policy: https://doi.org/10.1080/tandf_crossmark_01

Authors

Funding

More Information