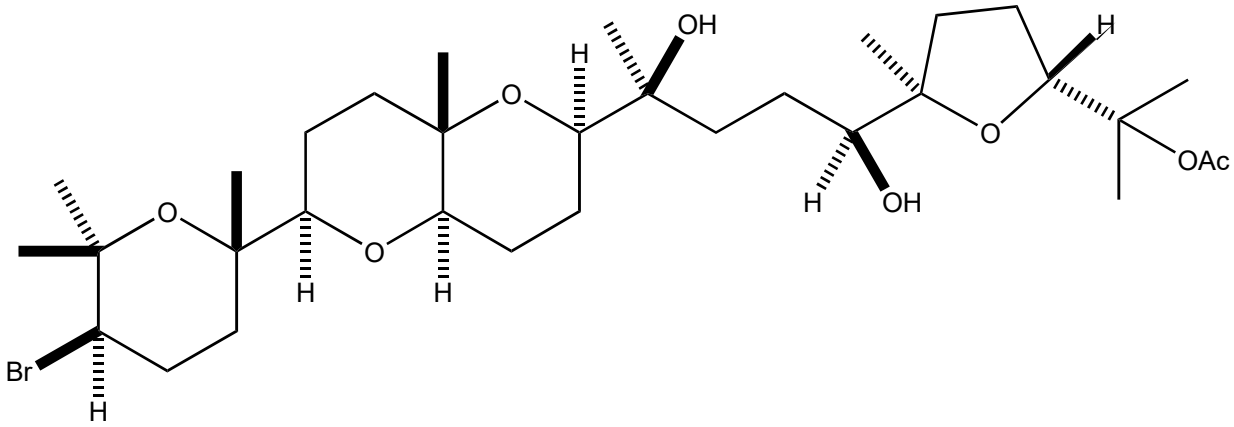
3102-1 (Triterpene)

Name: Thyrsiferyl 23-acetate
Origin: *Laurencia saitoi* (as *L. obtusa*[2]) (Teuri Island, Hokkaido, Japan)[1,3];
Laurencia venusta (Onna, Okinawa Prefecture, Japan)[4];
Laurencia saitoi (the coast of Yantai, Shandong Province, China)[5];
Laurencia sp. (the village of Thuwal in the Red Sea waters, Saudi Arabia)[6];
Formula: $C_{32}H_{55}BrO_8$
Mol. Wt.: 647.68
Opt. Rot.: $[\alpha]_D^{29}$ +1.99 ($CHCl_3$)[1]; $[\alpha]_D^{20}$ +2.64 ($CHCl_3$)[4]
Mp.: 118-119[1]; 115-116[4]



References and Notes

(1) Suzuki, T., Suzuki, M., Furusaki, A., Matsumoto, T., Kurosawa, E., Kato, A., and Imanaka, Y. 1985. Tetrahedron Lett., **26**, 1329-1332. Teurilene and thrsiferyl 23-acetate, *meso* and remarkably cytotoxic compounds from the marine red alga *Laurencia obtusa* (Hudson) Lamouroux. (**IR, ^{1}H-NMR**, **^{13}C-NMR**) (together with thrsiferyl 23-acetate, teurilene)

(2) *Laurencia saitoi* Perestenko was confused with *Laurencia obtusa* (Hudson) Lamouroux; Masuda. M. and Abe, T. 1993. Jpn. J. Phycol., **41**, 7-18. The occurrence of *Laurencia saitoi* Perestenko (*L. obtusa* auct. japon.) (Ceramiales, Rhodophyta) in Japan.

(3) Suzuki, T., Takeda, S., Suzuki, M., Kurosawa, E., Kato, A., and Imanaka, Y. 1987. Chem. Lett., **16**, 361-364. Cytotoxic squalene-derived polyethers from the marine red alga *Laurencia obtusa* (Hudson) Lamouroux.

(4) Sakemi, S., Higa, T., Jefford, C. W., and Bernardinelli, G. 1986. Tetrahedron Lett., **27**, 4287-4290. Venustatriol, a new, anti-viral, triterpene tetracyclic ether from *Laurencia venusta*. (together with thyrsiferol, thyrthyferyl 23-acetate, venustatriol)

(5) Ji, N.-Y., Li, X.-M., and Wang, B.-G. 2008. Molecules, **13**, 2894-2899. Halogenated terpenes and a C_{15}-acetogenin from the marine red alga *Laurencia saitoi*. (**^{13}C-NMR**) (together with parguerane diterpenes, thyrsiferol, thyrthyferyl 23-acetate, neolaurallene)

(6) Koutsaviti, A., Daskalaki, M. G., Agusti, S., Kampranis, S. C., Tsatsanis, C., Duarte, C. M., Roussis, V., and Ioannou, E. 2019. Mar. Drugs, 17(11), 644. Thuwalallenes A-E and Thuwalenynes A-C: New C_{15} acetogenins with anti-inflammatory activity from a Saudi Arabian Red Sea *Laurencia* sp. (together with thuwalallenes A-E, thuwalenynes A-C, *cis*-maneonene D, thyrsiferol, thyrsiferyl 23-acetate)

(Continue to 3102-2)

References and Notes

(Continue from 3102-1)

(6) **Synthesis**; (a) Kan, T., Hashimoto, M., Yanagiya, M., and Shirahama, H. 1988. Tetrahedron Lett., **29**, 5417-5418. Effective deprotection of 2-(trimethylsilylethoxy)methylated alcohols (SEM ethers). Synthesis of thyrsiferyl 23-acetate.; (b) Hashimoto, M., Kan, T., Nozaki, K., Yanagiya, M., Shirahama, H., and Matsumoto, T. 1990. J. Org. Chem., **55**, 5088-5107. Total synthesis of (+)-thyrsiferol, (+)-thyrsiferyl 23-acetate, and (+)-venustatriol.; (c) Gonzalez, I. C. and Forsyth, C. J. 2000. J. Am. Chem. Soc., **122**, 9099-9108. Total synthesis of thyrsiferyl 23-acetate, a specific inhibitor of protein phosphatase 2A and anti-leukemia inducer of apotosis.

(7) **Biological activity**; (a); Matsuzawa, S., Suzuki, T., Suzuki, M., Matsuda, A., Kawamura, T., Mizuno, Y., and Kikuchi, K. 1994. FEBS Lett., **356**, 272-274. Thyrsiferyl 23-acetate is a novel specific inhibitor of protein phosphatase PP2A.; (b) ; Matsuzawa, S., Kawamura, T., Mitsuhashi, S., Suzuki, T., Matsuo, Y., Suzuki, M., Mizuno, Y., and Kikuchi, K. 1999. Bioorg. Med. Chem., **7**, 381-387. Thyrsiferyl 23-acetate and its derivatives induce apoptosis in various T- and B-leukemia cells.; (c) Kikuchi, K., Shima, H., Mitsuhashi, S., Suzuki, M., and Oikawa, H. 1999. Int. J. Mol. Med., **4**, 395-401. The apoptosis-inducing activity of the two protein phosphatase inhibitors, tautomycin and thyrsiferyl 23-acetate, is not due to the inhibition of protein phosphatase PP1 and PP2A (review).