3101-1 (Triterpene)

Name: Thyrsiferol

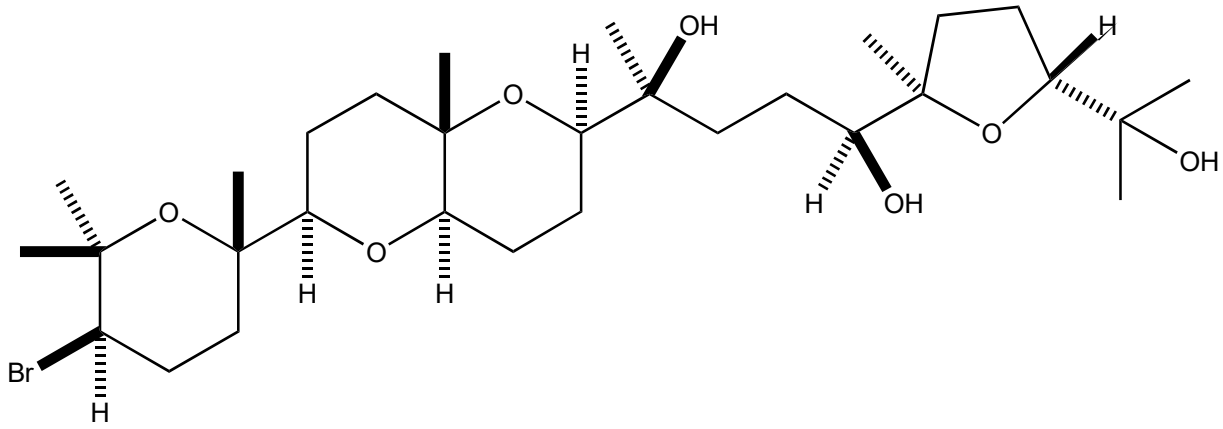
Origin: *Laurencia thyrsifera* (Seal Reef, Kaikoura, New Zealand)[1];
Laurencia saitoi (as *L. obtusa*[3]) (Teuri Island, Hokkaido, Japan)[2,4];
Laurencia venusta (Onna, Okinawa, Japan)[5];
Laurencia saitoi (the coast of Yantai, Shandong Province, China)[6];
Laurencia mariannensis (the coast of Hainan and Weizhou Islands, China)[7];
Laurencia sp. (the village of Thuwal in the Red Sea waters, Saudi Arabia)[8];
Aplysia dactylomela (the coast of Hainan Island, South China Sea, China)[9];

Formula: $C_{30}H_{53}BrO_7$

Mol. Wt.: 605.64

Opt. Rot.: $[\alpha]_{400}$ +89 ($CHCl_3$)[1]; $[\alpha]_D^{20}$ +6.4 ($CHCl_3$)[5]; $[\alpha]_D$ +6.8 ($CHCl_3$)[10];
$[\alpha]_D$ +28 ($CHCl_3$)[9]

Mp.: 133-136[5]; Oil[9]; Non-crystalline solid[10]



References and Notes

(1) Blunt, J. W., Hartshorn, M. P., McLennan, T. J., Munro, M. H. G., Robinson, W. T., and Yorke, S. C. 1978. Tetrahedron Lett., **19**, 69-72. Thyrsiferol: a squalene-derived metabolite of *Laurencia thyrsifera*. (**X-ray crystallographic analysis of thyrsiferyl 18-acetate**)

(2) 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. (together with thrsiferyl 23-acetate, teurilene, thyrsiferol)

(3) *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.

(4) 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.

(5) 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 thyrsiferyl 23-acetate, venustatriol, thyrsiferol)

(Continue to 3101-2)

References and Notes

(Continue from 3101-1)

(6) 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)
(7) Ji, N.-Y., Li, X.-M., Xie, H., Ding, J., Li, K., Ding, L.-P., and Wang, B.-G. 2008. Helv. Chim. Acta, **91**, 1940-1946. Highly oxygenated triterpenoids from the marine red alga *Laurencia mariannensis* (Rhodomelaceae). (**^{13}C-NMR**) (together with laurenmariannol, (21a)-21-hydroxythyrsiferol, thyrsiferol)
(8) 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)
(9) Manzo, E., Gavagnin, M., Bifulco, G., Cimino, P., Micco, S. D., Ciavatta, M. L., Guo, Y. W., and Cimino, G. 2007. Tetrahedron, **63**, 9970-9978. Aplysiols A and B, squqlene-derived polyethers from the mantle of the sea hare *Aplysia dactylomela.* (**^{1}H-NMR**, **^{13}C-NMR**) (together with aplysiol A, aplysiol B, venustatriol, thyrsiferol)
(10) **Transformation from dehydrothyrsiferol**; Gonzalez, A. G., Arteaga, J. M., Fernandez, J. J., Martin, D. J., Norte, M., and Ruano, J. Z. 1984. Tetrahedron, **40**, 2751-2755. Terpenoids of the red alga *Laurencia pinnatifida*. (**IR, ^{1}H-NMR**, **^{13}C-NMR, MS**)
(11) **Synthesis**; (a) Hashimoto, M., Kan, T., Yanagiya, M., Shirahama, H., and Matsumoto, T. 1987. Tetrahedron Lett., **28**, 5665-5668. Synthesis of A-B-C-ring segment of thyrsiferol constraction of a strained tetrahydropyran ring existent as a boat form.; (b) Hashimoto, M., Kan, T., Nozaki, K., Yanagiya, M., Shirahama, H., and Matsumoto, T. 1988. Tetrahedron Lett., **29**, 1143-1144. Total synthesis of (+)-thyrsiferol and (+)-venustatriol.; (c) Hashimoto, M., Kan, T., Nozaki, K., Yanagiya, M., Shirahama, H., and Matsumoto, T. 1990. J. Org. Chem., **55**, 5088-5107. Total syntheses of (+)-thyrsiferol, (+)-thyrsiferyl 23-acetate, and (+)-venustatriol.
(12) **7,11-*epi*-Thyrsiferol**; Nishiguchi, G. A., Graham, J., Bouraoui, A., Jacobs, R. S., and Little, R. D. 2006. J. Org. Chem., **71**, 5936-5941. 7,11-epi-Thyrsiferol: Completion of its synthesis, evaluation of its antimitotic properties, and the further development of an SAR model.