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## A NEW SESQUITERPENE FROM THE ANDAMAN SPONGE *DYSIDEA HERBACEA*<sup>1</sup>

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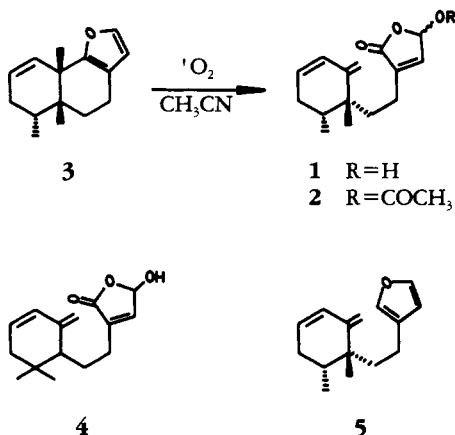
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**ABSTRACT.**—A new sesquiterpene [**1**] has been isolated and characterized from the sponge, *Dysidea herbacea*, collected from the Andaman and Nicobar Islands, India.

During the course of our ongoing research program to isolate biologically active compounds from marine organisms, we have investigated a sponge, *Dysidea herbacea* (Keller, family Aplysillidae) collected from the Andaman and Nicobar Islands during March 1992. *Dysidea herbacea* is a widely available sponge occurring in various tropical seas. The sponge genus *Dysidea* has been shown to contain structurally interesting (1) and closely related sesquiterpenes (2–4).

A CH<sub>2</sub>Cl<sub>2</sub>–MeOH (1:1) extract of the sponge, *D. herbacea*, afforded the furanosesquiterpene, herbacin [**3**] (5,6) and a new sesquiterpene hydroxybutenolide [**1**]. Compound **1** was obtained as an oil, [ $\alpha$ ]<sub>D</sub><sup>25</sup> –22.5° ( $c$ =0.2, CHCl<sub>3</sub>) and had ms and nmr data consistent with the elemental composition C<sub>15</sub>H<sub>20</sub>O<sub>3</sub>. The peaks in the ir spectrum at 3380 and 1755 cm<sup>–1</sup> indicated the presence of hydroxyl and  $\gamma$ -lactone groups. Compound **1** formed a monoacetate upon acetylation with Ac<sub>2</sub>O/pyridine.

The <sup>1</sup>H-nmr spectrum of compound **1** showed signals for two methyls at  $\delta$  0.85 (3H, d,  $J$ =7.5 Hz) and 1.0 (3H, s). Furthermore, the <sup>1</sup>H-nmr spectrum of **1** indicated the presence of a terminal methylene at  $\delta$  4.85 (2H, s), conjugated with a double bond at  $\delta$  5.65 (1H, dd,  $J$ =10 and 4 Hz), and  $\delta$  6.05 (1H, d,  $J$ =10 Hz). In the low-field region of the <sup>1</sup>H-nmr spectrum occurred two broad



singlets at  $\delta$  6.1 (CHOH) and 6.8 (O=C=CH), which could be assigned to an  $\alpha$ -substituted- $\gamma$ -hydroxy- $\alpha,\beta$ -butenolide (2) in agreement with ir and <sup>13</sup>C-nmr ( $\delta$  172.5 s, 148.7 s, 143.5 d, and 97.3 d) data and with the formation of a monoacetate [**2**] [<sup>1</sup>H nmr,  $\delta$  6.78 (2H, br s) and 2.15 (3H, s, CH<sub>3</sub>CO)]. Compound **1** is closely related to pallescensin-3 [**4**] previously isolated from *D. pallescens* (2).

The structure and relative stereochemistry of compound **1** was further confirmed by converting **3** to **1**, which was accomplished with quantitative yield, upon reacting singlet oxygen with herbacin [**3**] in the presence of light (7). Furthermore, we have searched for possible precursors such as **5**, related to pallescensin-2 (2), but without success, suggesting that the compound **1** may be an artifact.

### EXPERIMENTAL

GENERAL EXPERIMENTAL PROCEDURES.—Op-

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