using hexane–Me_2CO (4:1). One crystalline compound was isolated mp 165°, M^+ 236 (Found: C, 61.5; H, 5.3. $C_{12}H_{12}O_5$ requires C, 61.0; H, 5.1). IR ν_{max} (cm^{-1}) 1715 (C=O). NMR ($CDCl_3$) 3.81 and 2.03 (two *d*; J = 10 Hz) 3- and 4-H of coumarin, 3.62 (*s*, 6-H); 6 and 6.1 (*s*; 3 OMe). The C_6H_6-induced solvent shifts of OMe groups are seen at 6.2, 6.5 and 6.6, indicating that two OMe groups have suffered a significant upfield shift, suggesting that at least one adjacent position to the two OMe groups is unsubstituted. MS (*m/e*) 236 (100%); 221 (80), M-15; 195 (11), M-41; 194 (93) M-42; 178 (2), M-58; 165 (5) M-71; 150 (11), M-86; 135 (4) M-101; 107 (3) M-129. The compound is therefore 5,7,8-trimethoxycoumarin.

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CHRYSOERIOL 7-*O*-RHAMNOSIDE FROM *SEDUM FORMOSANUM*

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Key Word Index—*Sedum formosanum*; Crassulaceae; sterols; flavonoid; chrysoeriol 7-*o*-rhamnoside.

Sedum formosanum Hay. has been used in folk-medicine for the treatment of diabetes [1]. We have isolated from it campesterol, stigmasterol and sitosterol and a new flavone glycoside, identified as chrysoeriol 7-*o*-rhamnoside. The sugar was identified as rhamnose by co-chromatography with an authentic sample and confirmed by oxidation of the glycoside with periodate [2]. The NMR spectrum of the glycoside showed the characteristic rhamnoside H-1″ proton and rhamnosyl C-Me group [3]. The aglycone was identified as chrysoeriol from UV, NMR [3] and MS data [4] and this was confirmed by its demethylation to give luteolin. The glycoside lost its sugar on acid hydrolysis, indicating that it was an *o*-glycoside. Comparing the NMR spectrum of glycoside and aglycone showed a downfield shift for H-8 and H-6 indicating that the sugar unit was attracted to oxygen at C-7, a fact confirmed by the absence of a UV shift with NaOAc. Thus the compound is chrysoeriol 7-*o*-rhamnoside. Although a number of chrysoeriol glycoside are known, this is the first report of the 7-rhamnoside.

EXPERIMENTAL

Air-dried whole plants of *Sedum formosanum* were obtained from the beach of Yee-Leou (Taiwan) in May, 1973. NMR spectra were recorded in DMSO-d6. GLC was used with 3% SE-30 column. Mp's are uncorrected.

Extraction and isolation. Plants (5.3 kg) were extracted with *n*-hexane and EtOH successively. Evaporation of the *n*-hexane extract left 1 l. of viscous residue, which was then deposited a precipitate at 4°. The supernatant was further concentrated and then subjected to column chromatography on Si gel and eluted with *n*-hexane–Me_2CO (4:1 l.) giving 1.6 g of the sterol mixture. The EtOH extract was concentrated and the syrupy mass was dissolved in 3% HOAc. The filtered acidic soln was extracted with Et_2O, and a brown ppt. formed. This was dissolved in EtOH, filtered, and the filtrate was conc. and dried. The yellow mass was subjected to column chromatography over Si gel and eluted with 25% MeOH in $CHCl_3$, and MeOH, giving the flavone glycoside, eventually as fine yellow needles from MeOH (15 mg). The sterol mixture crystallized from *n*-hexane as needles, mp 139–40°, which gave a positive Liebermann–Burchard test. It was identified as a mixture of campesterol, stigmasterol and sitosterol by GLC comparison with soybean sterols [5]. Chrysoeriol 7-rhamnoside had mp 287–9° (Found: C, 54.82; H, 5.13. $C_{22}H_{22}O_{10}.2H_2O$ requires: C, 54.77; H, 5.43%). It showed a single spot of polyamide plate (EtOH, FeCl, brown–gray), and gave a violet colour with Mg–HCl, UV maxima 350, 268 *sh*, 253; $AlCl_3$ 388, 355, 296 *sh* 276, 261; NaOAc 418, 356, 268 *sh*, 254; NaOAc + H_3BO_3 351, 268 *sh*, 254, EtONa 418, 261. NMR δ:7.5 (2H, *m*,) 6.93 (1H, *d*, *J*, 9 Hz,) 6.75 (1H, *d*, *J* 2 Hz,) 6.38 (1H, *d*, *J* 2 Hz,) 5.18 (1H, *br*,) 1.25 (3H, *m*,). Its identification was carried out by standard procedures [3].

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