silica-alumina 113 (in hexane and eluted with hexane 3% EtOAc). Crystallized from EtOAc; m.p. 253°; $[\alpha]_D^{20}$ +13 ($CHCl_3$). The IR spectrum was identical to that of the sample obtained by HCl reaction on ursolic acid [3]. *Unsaturated ursolic acid lactone.* Separated from the same column and isolated as its acetate crystallized from EtOAc in microcrystals; m.p. 252°; $[\alpha]_D^{20}$ +46° ($CHCl_3$). IR and NMR spectra showed that the natural lactone was identical to the lactone obtained by $LiAlH_4$ reduction of 3-acetoxy-11-keto-ursolic acid [4]. It was thus proved to be 3β-acetoxy-ursa-11,12-ene-oic-13,(28)-lactone. *Sitosterol.* Found only in the first residue from the branches: m.p. 137–138; $[\alpha]_D^{20}$ −36° ($CHCl_3$). Identified by co-TLC, IR and NMR spectra.

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ISOLATION OF PHORBOL FROM *EUPHORBIA FRANCKIANA*

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Key Word Index—*Euphorbia franckiana*; Euphorbiaceae; Diterpene; phorbol.

Plant material. Euphorbia franckiana is a succulent species indigenous to Southern Africa, which produces copious latex on incision of the leaves. During biological screening tests involving the mice ear irritant assay [1] we were able to show that the latex had a short term irritant effect reaching a maximum within four hours. This is in contrast to several other ingenol and phorbol ester containing *Euphorbia* and *Croton* species which have a maximum irritant activity only after 24 hr.

Present work. E. franckiana latex was collected from Kew Gardens into alcohol and immediately dried below 40°. The acetone extract of two samples of latex had ID50's on mice of 70 μg/5 μl and were non-irritant after 24 hr. Extraction of the polar extract with *n*-hexane removed the lipid and triterpenoid compounds and the irritants were extracted with CH_2Cl_2. The biologically active fraction was hydrolysed with KOH in MeOH to produce a resin a component of which (M^+ $C_{20}H_{28}O_6$) was acetylated [2] and purified by TLC [3]. The recovered solid was recrystallized from MeOH m.p. 120–1° and was chromatographically pure by TLC [2] and GLC [4]. The high resolution MS gave parent ion *m/e* 490 (M^+ $C_{26}H_{34}O_9$); fragment ions at *m/e* 430 (M-60); 388 (M-60 + 42); 387; 370 (M-120); 352 (M-120 + 18); 328; 310 (M-180); 292 (M-180 + 18); 282; 267; 227; 215; 199; 173;159; 145; 133; 125; 121; 109; 95; 93; 91; 83 (base peak). The NMR spectrum (60 MHz), $CDCl_3$ (TMS $\delta = 0{\cdot}00$) exhibited resonances at δ 0·93 (3Hd-18); 1·22 (2Me-16, 17); 1·76 (3Hd-19); 2·05 (3MeCO-12, 13, 20); 2·45 (2Hm-5); 2·72 (1 OH deuterium exchange); 3·22 (2H broad-8 and 10); 4·43 (2H-20); 5·27 (Hd-12); 5·45 (1OH deuterium exchange); 5·70 (Hd-7); 7·54 (Hm-1)ppm: C.D.(MeOH); 204 nm [8] = −27291; 229 nm = +53295; 270 nm = −5181; 340 nm = −3984, confirming the presence of phorbol, isolated as its triacetate. This compound has been isolated from *Croton tiglium* seed oil [5], but from our own unpublished results of screening approximately 60 *Euphorbia* species the common diterpene of this genus is ingenol [3]. It occurs in the latex together with one or more of ingol [6], 16-hydroxy-ingenol [7] or 5-deoxyingenol [8]. Phorbol has

been reported from *E. tirucalli* [9] but a sample available to us was only found to contain 4-deoxy-4α-phorbol [4]. The presence of phorbol in *E. franckiana* is therefore of chemotaxonomic interest. Phorbol was estimated to be 0·52% w/w of the acetone dried latex by means of GLC [4].

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C-GLYCOSYLFLAVONES IN THE BULBS OF SQUILL*

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Key Word Index—*Urginea maritima*; Liliaceae; squill; bulb; glycoflavones.

Plant. Urginea maritima Baker (Liliaceae). Source. Collected in Iberian Peninsula and Balearic Islands. Voucher specimen in Herb. of this University.

Previous work. Anthocyanins[1] and several flavonols and dihydro-flavonols-*O*-glucosides[2].

Present work. Six *C*-glycosylflavones were isolated from the EtOAc extract by PC; five of which were identified as vitexin, isovitexin, orientin, isoorientin, scoparin, by the usual degradative[3], chromatographic and spectrophotometric[4] methods, and further comparison with authentic samples (Fluka). A possible isovitexin-*O*-xyloside has also been isolated, but its structure is not yet definitive. Vicenin-2 was isolated from the ethanolic extract, after precipitating sinistrins with MeOH–EtOAc (1:3), and separating cardiac glycosides on a celite column eluted with $CHCl_3$ and $CHCl_3$/MeOH. Further elution with aqueous MeOH afforded the flavonoid fraction; vicenin-2, was separated by PC and identified as above by comparison with an authentic sample.

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