

TRITERPENES IN LEAVES OF *OLEA EUROPAEA*

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(Received 28 October 1974)

**Key Word Index**—*Olea europaea*; Oleaceae; maslinic acid;  $\beta$ -amyrin.

**Plant and source.** Leaves of *O. europaea* cultivated in the Botanical Garden of Simes S.p.A., Tuscolano, Italy.

**Previous work.** Maslinic acid from olive oil [1] and from olive husks [2, 3].

**Present work.** Fresh leaves of *O. europaea*, collected in February, after degreasing with light petrol, were extracted with  $\text{CHCl}_3$ , followed by EtOAc.  $\text{CHCl}_3$  conc. after purification by adsorption chromatography over Si gel yielded  $\beta$ -amyrin (ca 0.001%) (eluent:  $\text{CHCl}_3$ ; TLC eluent  $\text{CHCl}_3$ -EtOAc = 7:3) besides sitosterol [4], eritrodiol and oleanolic acid [5]. EtOAc extract was chromatographed on a Si gel column with  $\text{CHCl}_3$ -EtOAc as eluent with increasing EtOAc concentration giving in order oleanolic and maslinic acid ( $\text{CHCl}_3$ -EtOAc = 8:2 as eluent). Etheral  $\text{CH}_2\text{N}_2$  treatment of the latter afforded methyl maslinate (ca 0.05%): mp  $230^\circ$  (from MeOH),  $[\alpha]_D + 59^\circ \pm 1 c = 1$  in  $\text{CHCl}_3$ .

**Comment.** The occurrence of maslinic acid in fresh leaves of *Olea europaea* strongly supports it is a true metabolite of the plant. Recently it has been reported that maslinic acid is produced, during the ageing of olive husks, possibly through microbial  $\alpha$ -hydroxylation of oleanolic acid [3]. Furthermore, to our knowledge, this appears to be the first record of isolation of  $\beta$ -amyrin in *O. europaea*.

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QUERCETAGETIN AND OTHER FLAVONES FROM *GMELENA ARBOREA* AND *G. ASIATICA*

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(Received 6 November 1974)

**Key Word Index**—*Gmelina arborea*; *G. asiatica*; Verbenaceae; quercetagenin; glycosides of kaempferol, apigenin and luteolin.

**Plant.** *G. arborea* L. (voucher specimen No. 1/74 deposited at JIPMER). **Uses.** Medicinal [1,2]. **Previous work.** On leaves [3,4] and heartwood [5].

**Present work.** Dry leaves extracted with hot EtOH and the residue fractionated using solvents of increasing polarity. The benzene extract yielded

sitosterol; the Et<sub>2</sub>O concentrate gave quercetageitin (a flavanol of rare occurrence often misidentified) [6] (identified by  $R_f$ ,  $\lambda_{\max}$ , colour reactions, specific test with NaOAc and confirmed by direct comparison with an authentic compound), kaempferol, apigenin and luteolin ( $\lambda_{\max}$ , U.V. fluorescence and co-PC with authentic samples). EtOAc extract yielded 4 flavone glycosides (separated by adsorption over Si gel and elution with moist EtOAc and EtOAc-MeOH mix.) identified as kaempferol-3-rutinoside, apigenin-7-rutinoside, apigenin-7-glucuronide and luteolin-7-glucuronide ( $\lambda_{\max}$ , products of hydrolysis and co- $R_f$  with authentic samples).

*Plant.* *Gmelina asiatica* L. (voucher specimen No. 2/74 deposited at JIPMER). *Uses.* Medicinal [1,2]. *Previous work.* Sitosterol and a yellowish orange colouring matter from seed oil [1].

*Present work.* On the flavones of leaves, flowers and fruits. Examination of the leaves, flowers and fruits of *G. asiatica* on similar lines as *G. arborea* revealed the same flavonoid pattern except for the overall low concentration of the pigments. The yellow colour of flowers and ripe fruits was mainly due to carotenoids. The presence of quercetageitin was confirmed in this case as above; the yellow-

orange pigment (reported earlier [1]) was non-phenolic in nature and could not be identified.

*Comment.* The presence of the 6-hydroxyflavanol, quercetageitin, in *G. arborea* and *G. asiatica* of the Verbenaceae is significant from the point of molecular taxonomy since it is of rare occurrence, being confined mainly to the Compositae [6] and to a lesser extent in the Leguminosae [7]. However, the methyl ethers of quercetageitin (casticin and artemetin) have been reported in *Vitex* sp. of the Verbenaceae [8,9].

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## 6-HYDROXYKYNURENIC ACID FROM *THAPSIA VILLOSA*

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(Received 29 October 1974)

**Key Word Index**—*Thapsia villosa*; Umbelliferae; quinoline; 6-hydroxykynurenic acid.

*Plant.* *Thapsia villosa* L. Voucher sample No. 4779 Department of Botany Herbarium, University of Salamanca, Spain. *Source.* Umbels and fruits from Ortigueira and Muros (Coruña), respectively. *Previous work.* Flavonoids in leaves [1] and fruits [2]. Absence of myristicin in two *Thapsia* spp [3].

During an examination of *T. villosa* for coumarins, we isolated a compound showing a pink

fluorescence in UV light, changing to yellow when fumed with NH<sub>3</sub>. The compound proved not to be the coumarin cichoriin, which exhibits similar fluorescence, and was identified as 6-hydroxykynurenic acid, which was first found in higher plants in 1968 [4].

The occurrence of this quinoline derivative in the Umbelliferae, an evolved family, accords with the findings of a small-scale survey showing a pre-