[*Phytochemsitry*, **48**, 543-546 (1998)] [Lab. of Pharmacognosy]

Further Monoterpene 5-Methylcoumarins and an Acetophenone Derivative from *Ethulia conyzoides*.

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Re-investigation of the aerial parts of *Ethulia conyzoides* from Egypt afforded two new monoterpne-5-methylcoumarins, named 5'-epi-isoethuliacoumarin B and 5'-epi-isoethuliacoumarin A and a new monoterpene acetophenone derivative, ethuiaconyzophenone, in addition to the five known compounds, ethuliacoumarin, cycloethuliacoumarin, isoethuliacoumain A, isoethuliacoumarin B and 4-hydroxy-5-methylcoumarin-4-O-glucoside.

[*Macromolecules*, **31**, 7988-7991 (1998)] [Lab. of Pharmacognosy]

Anomaous Cyclodimerization of 3-Phenyl-3-(phthalimidomethyl)oxetane *via* Monomer Isomerization and Consecutive Cation Transfer.

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The formations of the cyclic products has been long known, especially at elevated temperatures, and some investigations of the cyclo-oligomerization of unsubstituted and substituted oxetanes have been made. Therein, cyclic oligoethers from trimer to octamer were detected with ther tetramers in the greatest abundance.

[*Biol. Pharm. Bull.*, **21**, 782-783 (1998)] [Lab. of Pharmacognosy]

Phylogenetic Relationship of *Glycyrrhiza* Plants Based on *rbcL* Sequences.

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The nucleotide sequences of the ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit gene (*rbcL*) of *Glycyrrhiza glabra*, *G. uralensis*, *G. inflata*, *G. echinata*, and *G. pallidiflora* have been determined to construct the phylogenetic tree. In the phylogenetic tree based on the *rbcL* sequences, the five *Glycyrrhiza* species were divided into two groups: the three glycyrrhizin-producing species *G. glabra*, *G. uralensis*, and *G. inflata*; and the two glycyrrhizin-nonproducing species *G. echinata* and *G. pallidiflora*. Among the three glycyrrhizin-producing species, only two nucleotide substitutions were observed between the *rbcL* sequences of *G. glabra* and *G. uralensis*, and the sequence of *G. uralensis* was identical to that of *G. inflata*, indicating that the three glycyrrhizin-producing species are closely related.

[*Biol. Pharm. Bull.*, **21**, 782-783 (1998)] [Lab. of Pharmacognosy]

Seasonal Variation of Glycyrrhizin and Isoliquiritigenin Glycosides in the Root of *Glycyrrhiza glabra* L..

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The time courses of the glycyrrhizin and isoliquiritigenin glycoside contents in the thickening roots of licorice, *Glycyrrhiza glabra* L., have been determined. The glycyrrhizin content in 1-year-old roots rapidly increased from October to November, whereas the isoliquiritigenin glycoside content increased up to October. In 3-year-old plants, although the isoliquiritigenin glycoside content rapidly increased from June to July, the glycyrrhizin content did not show any significant increase from May to August. The glycyrrhizin content increased during the senescence of the aerial parts as well as during the early stage of shoot elongation. The incorporation of [^{14}C] mevalonic acid into the glycyrrhizin fraction by the root segments was high in May, June and September, and low in August and winter. These results indicated that the biosynthesis of glycyrrhizin is differently regulated from that of isoliquiritigenin glycoside in the thickening root of *G. glabra*.