A073 Antioxidant activity of some Turkish medicinal plants

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Turkey has a very rich flora comprising 9.300 plant species, 3.000 of which are endemic. In our search for new classes of biologically active plant metabolites, we have collected many plants some of which are endemic (E) to Turkish flora: *Scrophularia cryptophila* (E), *S. lepidota* (E) (Scrophulariaceae); *Phlomis russeliana* (E), *P. kurdica*, *P. leucophracta*, *Leonurus cardiaca*, *L. persicus*, *L. glaucescens*, *L. quinquelobatus* (Lamiaceae); *Putoria calabrica*, *Asperula nitida subsp. subcapitellata* (E), *Wendlandia ligustroides* (Rubiaceae); *Rhododendron ponticum*, *R. luteum*, *R. sochadzeae*, *R. ungerni*, *R. symirnovi* (E) (Ericaceae) and *Morina persica* (Morinaceae). Most of these plants are used in traditional medicine or are important for public health (e.g. *Rhododendron* species, mad honey) (1). Different available organs (aerial parts, roots, leaves, flowers, fruits) of the collected plants were extracted with MeOH or EtOH. The crude extracts were partitioned by a modified Kupchan partition protocol to yield hexane-, $CHCl_3$- (or CH_2Cl_2-) and H_2O-solubles with a total number of 60. We investigated the potential radical scavenging capacity of all 60 extracts using the 2,2-diphenyl-1-picrylhydrazyl radical (DPPH) (yellow spot on purple background) on silica TLC plates (100 and 200 µg/spot). The highest scavenging activity was obtained with the aqueous extracts of all *Rhododendron* species due to the presence of catechin derivatives and flavonoids as determined by ^{1}H NMR and TLC analyses. Alternatively, the antioxidant potential of the extracts was measured by the Fe^{2+}-catalyzed autoxidation of linoleic acid. Further assays to assess their inhibitory potential on soybean-lipoxygenase or acetylcholinesterase and related serine hydrolases (e.g. chymotrypsin) are in progress.

References: 1. Baytop, T. (1984) Therapy with Medicinal Plants (Past and Present). Istanbul University Publications. Istanbul.

A074 Cyclic peptides from seeds of *Linum usitatissimum*: their immunosuppressive activity and structures

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Cyclolinopeptide A (**1**), a cyclic nonapeptide, which shows a potent immunosuppressive activity (1), has been isolated from linseed oil as one of the first isolated natural cyclic peptides (2). We focused our attention on the isolation of additional cyclic peptides from the seeds of *Linum usitatissimum*. Then, ten new cyclic nona and octapeptides, cyclolinopeptides B (**2**) – K (**11**) were isolated and their structures were elucidated by extensive 2D NMR methods and chemical degradations (3, 4, 5). Further, their immunosuppressive activity is examined by a bio-assay method using mouse lymphocytes.

Structures and Immunosuppressive Effect of Cyclolinopeptides A (**1**) – K (**11**)

Cyclolinopeptides	Structure	IC_{50} (µg/mL)	Cyclolinopeptides	Structure	IC_{50} (µg/mL)
A **1**	cyclo (-Pro-Pro-Phe-Phe-Leu-Ile-Ile-Leu-Val-)	2.5	G **7**	cyclo (-Pro-Phe-Phe-Trp-Ile-Mso-Leu-Mso-)	> 100
B **2**	cyclo (-Pro-Pro-Phe-Phe-Val-Ile-Met-Leu-Ile-)	39.0	H **8**	cyclo (-Pro-Phe-Phe-Trp-Ile-Mso-Leu-Met-)	> 100
C **3**	cyclo (-Pro-Pro-Phe-Phe-Val-Ile-Mso-Leu-Ile-)	> 100	I **9**	cyclo (-Pro-Phe-Phe-Trp-Val-Met-Leu-Mso-)	> 100
D **4**	cyclo (-Pro-Phe-Phe-Trp-Ile-Mso-Leu-Leu-)	> 100	J **10**	cyclo (-Pro-Leu-Phe-Ile-Msn-Leu-Val-Phe-)	28.1
E **5**	cyclo (-Pro-Leu-Phe-Ile-Mso-Leu-Val-Phe-)	43.0	K **11**	cyclo (-Pro-Pro-Phe-Phe-Val-Ile-Msn-Leu-Ile-)	25.2
F **6**	cyclo (-Pro-Phe-Phe-Trp-Val-Mso-Leu-Mso-)	> 100			

Three dimensional structures of **1** and **2** were prepared by X-ray analysis and distance geometry calculations using NOE constrains. Conformation in the solid state of **1** was similar to those in the solution state of **1** and **2**.

References: 1. Wieczorek, Z. et al. (1991) Peptide Res. 4: 275. **2.** Kaufmann, H. P., Tobschirbel, A. (1959) Chem. Ber. 92: 2805. **3.** Morita, H. et al. (1997) Bioorg. Med. Chem. Lett. 7: 1269. **4.** Morita, H. et al. (1999) Tetrahedron 55: 967. **5.** Matsumoto, T. (2001) Phytochemistry 57: 251.