Title of dissertation			
Biological Activity Screening of Sudanese Medicinal Plants and Chemical Analysis of Active Extracts of Guiera senegalensis J.F. Gmel. and Blepharis linariifolia Pers.			
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Solvents used during extraction process are reported to have an influence on the nature and the amount of secondary metabolites extracted from medicinal plants. Thus, the choice of proper extraction solvent is necessary for the desired pharmacological activity of these extracts. In the present study, six medicinal plants grown in Sudan, namely, *Blepharis linariifolia*, *Cyperus rotundus*, *Guiera senegalensis*, *Maerua pseudopetalosa*, *Tinospora bakis*, and *Dicoma tomentosa* were extracted with six solvents of different polarity, i.e. water, 50% ethanol (EtOH), 70% EtOH, 95% EtOH, acetone and dichloromethane to obtain total 36 extracts. Quantitative estimation of total phenolic and flavonoid contents was performed. These extracts were further evaluated for their free radical scavenging activities and α-glucosidase, pancreatic lipase and tyrosinase inhibitory activities. 50% EtOH and 70% EtOH extracts of *G. senegalensis* showed the highest content of phenolic compounds in comparison to other extracts. For total flavonoid contents, higher content was found in acetone extracts of *G. senegalensis* followed by *B. linariifolia* and *M. pseudopetalosa*. Polar extracts showed higher free radical scavenging activity in comparison to dichloromethane extracts, with 70% EtOH and 50% EtOH extracts of *G. senegalensis* being the most active ones. The 50% EtOH and 70% EtOH extracts *G. senegalensis* also showed potent inhibitory activity against α-glucosidase. In contrast, acetone and dichloromethane extracts showed potent pancreatic lipase inhibitory activity. Potent tyrosinase inhibitory activity was shown by acetone extract of *G. senegalensis*. In conclusion, 50% EtOH, 70% EtOH and acetone were found to be the best solvents of choice for the extraction of phenolic compound rich extracts with free radical scavenging and enzyme inhibitory activities. Based on these results, *G. senegalensis* and *B. linariifolia* were selected for further detailed study for chemical analysis.

G. senegalensis J.F. Gmel. (Family: Combretaceae) is commonly used as a traditional medicine in Africa. The detailed chemical analysis of 70% EtOH extract of the leaves afforded 8 phenolic compounds namely; myricetin (**1**), myricitrin (**2**), quercetin (**3**), (-)-gallocatechin (**4**), 1,3,4,5-tetra-*O*-galloylquinic acid (**5**), gallic acid (**6**), methyl gallate (**7**) and ethyl gallate (**8**). Among them, 1,3,4,5-tetra-*O*-galloylquinic acid (**5**) (IC_{50}= 7.21 ± 0.21 μM), quercetin (**3**) (IC_{50} = 7.71 ± 0.17 μM), and myricitrin (**2**) (0.25 ± 0.03 μM) showed the most potent free radical scavenging, α-glucosidase and pancreatic lipase inhibitory activities, respectively.

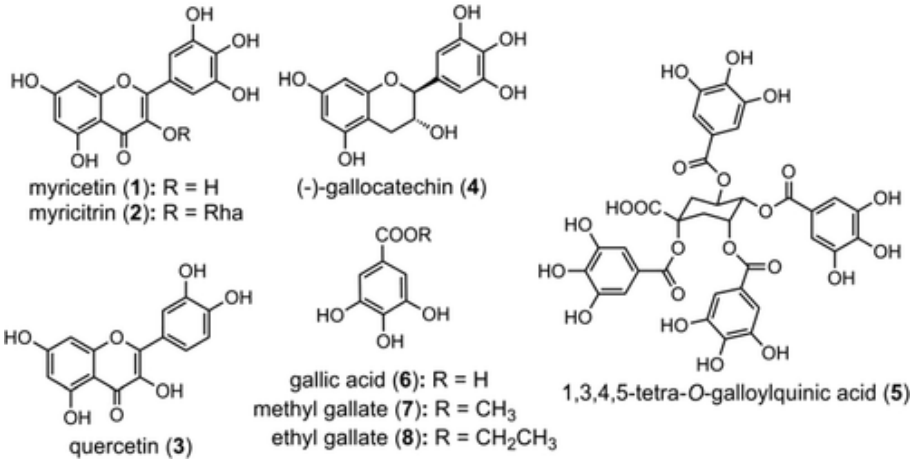

Figure 1. Structures of compounds isolated from *G. senegalensis*

B. linariifolia Pers. (Family: Acanthaceae) is used in traditional medicines as a general tonic and for the treatment of various health problems. From the detailed chemical analysis, verbascoside (**9**), vanillic acid (**10**), apigenin (**11**) and 6″-*O*-*p*-coumaroylprunin (**12**) were isolated and their chemical structures were identified on the basis of their NMR spectral data. Among the isolated compounds, verbascoside (**9**) showed the most potent free radical scavenging activity (IC_{50}= 22.03± 0.04 μM). Apigenin (**11**) and 6″-*O*-*p*-coumaroylprunin (**12**) showed promising inhibitory activities against all tested enzymes. Apigenin (**11**) showed the most potent inhibitory activity against α-glucosidase and tyrosinase (IC_{50}= 34.73 ± 1.78 μM and 23.14 ± 1.83 μM, respectively), whereas 6″-*O*-*p*-coumaroylprunin (**12**) showed potent inhibition for pancreatic lipase (IC_{50}= 2.25 ± 0.17 μM). All compounds showed good DPPH free radical scavenging activities with verbascoside (**9**) being the most potent. Apigenin (**11**) was the most active as α-glucosidase and mushroom tyrosinase inhibitor, while 6″-*O*-*p*-coumaroylprunin (**12**) showed potent inhibitory activity for pancreatic lipase.

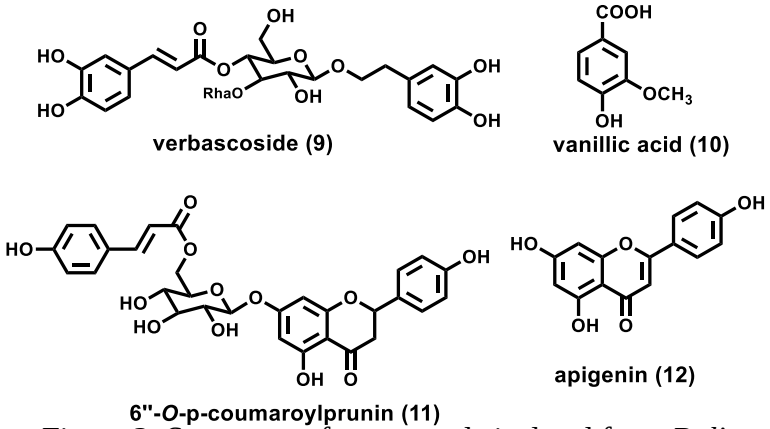

Figure 2. Structures of compounds isolated from *B. linariifolia*

Photos

During experiment

Participation in a conference