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Greco-Arab herbs as a source of anti-diabetic compounds

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Despite the enormous achievements in conventional medicine, diabetes reached epidemic proportions globally. Its highest prevalence is in the Arab world especially in the Gulf region. Several medicinal plants can treat diabetes type II. Based on knowledge obtained from the Greco-Arab and Islamic herbal medicine as well as from our previous studies, this in vitro study aimed to evaluate the action mechanism of distinct herbal extracts, namely: *Abelmoschus esculentus* L. (AE), *Allium cepa* (bulb, AC), *Allium sativum* (bulb, AS), *Asparagus aphyllus* L. (AA), *Atriplex halimus* (AH), *Cinnamomum cassia* (CC), *Crataegus azarolus* L. (CA), *Gundelia tournefortii* (GT), *Nigella sativa* (seeds, NS), *Ocimum Basilicum* (OB), *Olea Europea* (leaves, OE), *Trigonella foenum-graecum* (TF), *Teucrium polium* (TP) and *Urtica dioica* (UD). Water/ethanol, methanol, hexane and dichloromethane extracts were prepared from the above listed plants and the extracts toxicity and efficacy was tested in L6 muscle cells. Cytotoxic and anti-diabetic properties of the extract were evaluated also in vitro using L6-GLUT4myc muscle cells stably expressing myc epitope at the exofacial loop (GLUT4). GLUT4 translocation to the plasma membrane (PM, Fig.1) was elevated by up to 4 and 7 folds (-/+ insulin) after treatment with AA, AH, CV, GT, OB, TF, TP and UD for 20h at none cytotoxic concentrations as measured with MTT and the LDH leakage assay. Sweet basil (OB) extracts were the most efficient in augmenting GLUT4 translocation to the PM. GC/MS phytochemical analysis of GT, OB and TP methanol and hexane extracts revealed tens of compounds (some of them were detected for the first time by our group). These findings indicate that the observed anti diabetic properties of these plants are mediated through one or more of the identified compound and at least partially, through regulating GLUT4 translocation.