Molecular basis of the beneficial effects of *Salicornia* spp. consumption on algerian mouse *Mus spretus* global health

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Classical laboratory mouse stocks have a serious drawback when compared with human populations since they exhibit a poor variety of natural genetic polymorphisms. In contrast, wild-derived inbred strains established from progenitors of different subspecies and species, such as *M. spretus*, provide a reservoir of additional phenotypic variation, which makes them a valuable complement to laboratory strains for studying the genetics of complex diseases, as is the case of obesity, the modern global epidemic that have replaced undernutrition and infectious diseases as the most significant contributor to ill health. Genetics, environmental and diet are involved in the development of obesity and the progression of its life threatening complications, i.e., insulin resistance (type 2 diabetes mellitus) and cardiovascular diseases, through modulation of various fundamental metabolic pathways i.e. food intake, lipid metabolism (hyperlipidemia), oxidative stress and immune system (inflammation).

Treatment of obesity involves diet control, exercise and pharmaceutical therapy. Plants represent a source of biologically active substances which can become new therapeutic anti-obesity agents with fewer toxic side effects than synthetic drugs. The halophyte *Salicornia* spp is an abundant plant growing on salt marshes and muddy seashores along the south-western coastal areas of Spain. Salicornia has been traditionally used in popular medicine and as a seasoned herb in several countries. Some recent studies have proposed that its extract and components possess antioxidative, antiinflamatory, antihyperglycemic, antihyperlipidemic and anti-adipogenic activities.

Fifteen-month-old male and female mice were fed a normal or a *Salicornia*-enriched diet for 4 week. Body weight was 38% lower in mice fed the *Salicornia*-enriched diet already, while it was the same (males) or even increased (females) in control mice. In *Salicornia*-fed animals, circulating glucose, triglycerides and cholesterol levels were reduced, especially in males. Transcriptomic analysis by real-time qRT-PCR in the liver of these *Salicornia*-fed mice revealed a substantial increase in the levels of antioxidative enzymes (GPX3) and anti-xenobiotics and anti-stress sulfotranserases (SULT1D1) mRNAs, whereas the transcript levels corresponding to enzymes involved in lipid metabolism, especially in cholesterol biosynthesis (HMGCR, IDI1), and to the protease inhibitor A2M, implicated in Alzheimer's disease, atherosclerosis, and other age-related diseases, decreased markedly. Further studies are being carried out to elucidate the molecular basis of beneficial effects of *Salicornia* consumption over health.

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