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Legumes as Medicine: Nature Prescribes

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Editorial

This editorial article highlights medicinal significance of leguminous plants as purely natural biopharmaceutics for improving modern and postmodern human health. Exclusive research opportunities are also underlined. Plant therapeutics comprises pharmaceuticals, multi-purpose drugs, functional foods, recombinant proteins and vaccines. These modern products support conventional pharmaceuticals for disease diagnosis and treatment. Research and commercial attention has been increasingly paid to inventing and designing sophisticated biotechnologies and tools to create biopharmaceuticals from legumes. Nevertheless, challenges remain in terms of cost, safety, and global availability [1,2].

Legumes such as lucerne (*Medicago sativa*) are high-yielding. These plants usually contain phytoestrogens, flavonoids, isoflavonoids, coumestans, and lignans. Phytoestrogens as antioxidants could prevent cancer by scavenging free radicals and lowering blood cholesterol. Peas, soybeans, and lucerne may be used to generate inexpensive monoclonal antibodies or plantibodies as therapeutics for human and livestock. Due to the presence of a multiple bioactive chemicals in legumes, future research on nutrigenomics, proteolmics, and metabolomics are needed to specify and delineate those effects on human health parameters. That will express how nature provides pure medicine without any major side effects that would otherwise impair natural cellular metabolism [3].

Legumes contain saponins with anticarcinogenic implications. Saponins have an amphiphilic structure that makes them surface-active. Their anticarcinogenic effects are probably via direct cytotoxicity, immune modulation, bile acid binding, and normalizing cell proliferation. Soybeans are a good source of dietary saponins. Non-dietary sources include lucerne, sunflower and horsechesnut [4]. Lucerne seeds ingestion may increase fecal biliary excretion, indicating that saponins could reduce bile acids conversion to secondary acids by intestinal microflora. Saponins may, thus, help prevent colon cancers. In terms of cardiovascular function and health, proteins of lucerne, fava, gluten, pea, and soy have reduced hypercholesterolemia (rat models) when compared to animal proteins such as casein, lactalbumin, and ovalbumin. This hypocholesterolemic effect has occurred likely and partly through modulations of hepatic low-density lipoproteins receptors [5].

Lucerne as a high-yielding legume has considerable estrogenic effect. Kudzu root, red clover blossom and sprout, mung bean sprout, and lucerne sprout extracts, also, ca elevate cell proliferation above that caused by estradiol. Lucerne is considered a natural laxative, a natural diuretic, an antifungal, a liver detoxifier, a cure for kidney stones and urinary infections. Lucerne is thought as a promoter of pituitary gland function. This resourceful plant is rich in vitamins and minerals. However, Lucerne seeds contain amino acid L-canavanine that might cause pancytopenia and allergy in humans and systemic lupus erythematosus in monkeys [6].

Usually, flavonoids are abundant but isoflavonoids are scarce in plants. Isoflavonoids are prevalent in the Papilonoideae subfamily of Leguminosae, acting as antimicrobial, allelopathic or anti-insect, and induce nodulation genes of symbiotic Rhizobium bacteria. Pterocarpan-type phytoalexins such as medicarpin and constitutive isoflavone malonyl glycosides are typical isoflavonoids. Temporal and spatial correlations exist between phytoalexin accumulation and disease resistance in legumes. Isoflavonoids can naturally make cells resist against diseases. Isoflavonoids originate from flavanones via a rare aryl relocation catalyzed by the cytochrome P450 enzyme CYP93C1 (2-hydroxyisoflavanone synthase or isoflavone synthase). In addition to papilonoid legumes, isoflavonoids exist in Rosaceae, Chenopodiaceae, Apocynaceae, and Pinaceae. Isoflavones have estrogenic, antiangiogenic, antioxidant, and anticancer functions. They are now being accepted as dietary supplements. A major source of isoflavones for human can be found in soybean (daidzein and genistein) and chickpea (biochanin A) seeds. Isoflavones seems most likely to be responsible for the health-promoting properties of soy-enriched diets. Soy isoflavones may be related to reduce risks of breast and prostate cancers. Isoflavones may also help prevent osteoporosis [7,8].

All in all, the near future promises wide applications of tasty plants, vegetables and fruits in natural prevention and treatment of global diseases. The obscure remains to include concerns related to biosafety, dosage uniformity, regulatory guidelines, and any endurance of herbicides and pesticides.

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