

## Folk Medicine, Pharmacological and Biological Activities

Elephant garlic has a much milder flavor than garlic (*Allium sativum* L.) and is used for domestic cooking (Morita *et al.*, 1988). *Allium ampeloprasum* (garlic) extracts have been reported as hepatoprotectants and health foods for prevention and treatment of liver diseases from hepatitis virus, stress, alcohol, immunity disorder, and drug toxicity (Uchida and Sakurai, 2005).

Both foam powder and freeze-dried powder of jumbo leek decreased the induction of hepatocyte necrosis in D-galactosamine hydrochloride-induced acute liver disorders and prevented the occurrence of ethanol-induced chronic liver disorders in rats by inhibiting the absorption of alcohol from the stomach (Uchida *et al.*, 2009b).

The elevation of blood sugar level in oral glucose tolerance tests (OGTT) in rats was suppressed by feeding 8.3 g odorless jumbo leek with an inulin content of 60% (PSII) (5 g inulin)/kg per day. Among the biochemical markers, total cholesterol and triglyceride levels rose in streptozotocin (STZ)-treated rats compared with control rats. PSII fed to STZ-treated rats lowered these two marker levels below those of the control rats. The activities of blood aspartate transaminase (AST) and alanine transaminase (ALT) as well as the hepatopathological examination of liver confirmed that PSII (2 g/kg per day) protected rats from liver damage before acetaminophen treatment (Uchida *et al.*, 2008). Jumbo leek foam powder at 100 mg/kg p.o. significantly lowered blood sugar level, BUN and AST activity in STZ treated rats (Uchida and Sakurai, 2008). However, *Allium ampeloprasum* subsp. *iranicum* did not show valuable inhibitory activity on  $\alpha$ -amylase (a carbohydrate hydrolyzing enzyme useful as oral hypoglycemic drug) (Nickavar and Youefian, 2009). Yayoisoaponins A-C and aginoside isolated from the plant exhibited *in vitro* cytotoxicity against P388 cells at 2.1 mg/ml, and antifungal activity against *Mortierella ramanniana* at 10  $\mu$ g/disk (Sata *et al.*, 1998). Methods and therapeutic compositions comprising plant extracts (including *Allium ampeloprasum*) for treatment of cancer have been reported. The compositions can be used in treatment of, and, methods of inhibiting tumor growth, tumor metastasis, and/or tumor-induced angiogenesis using the therapeutic compositions alone or in combination with an anticancer agent are, therefore, also provided (Cyr, 2006).

The findings of Nguansangiam *et al.* (2003) suggested that *Allium ampeloprasum* volatile oil, both in pre- and post-treatment could protect trichothecene toxin-induced epidermal damage in a mouse footpad.

*Allium ampeloprasum* and *Allium sativum* clove homogenates showed greater antibacterial and antifungal activities than a number of onion types (*Allium cepa* L.) (Hughes and Lawson, 1991). Goren *et al.* (2002) reported antiviral composition which contains dehydrated particulate derived *Allium* species such as *Allium ampeloprasum* L. (leek), *Allium cepa* L. (onion), *Allium cepa* var. *ancasti*, Southporth white glove, *Allium fistulosum* (Japanese bunching onion, scallion, Welsh onion) and *Allium schoenoprasum* (chives). The composition has antiviral activity, antimicrobial activity (antibacterial, antifungal), immunomodulating activity, immunostimulating activity, T-cell function and/or T-cell

proliferation and/or T-cell differentiation enhancing activity, and weight gain promoting activity. The composition can be used for treating retroviral infections such as AIDS, herpes (genital, rectal, oral), distemper, papillomavirus, flu associated influenza viruses, parvoviruses, rhabdoviruses, Epstein Barr virus, CMV, hepatitis virus, RSV, rhinoviruses, and foot and mouth disease virus; HIV-positive, HIV-1, HIV-2, microbial infection, e.g. fungal, yeast or Candidiasis infection such as pneumonia caused by *Pneumocystis carinii*, urinary infection and mycosis. It can also be used to reduce clinical symptoms associated with HIV positive or AIDS patients such as paresthesia, wasting syndrome, intestinal colic, diarrhea and polyadenopathy. The composition is also used to treat animal microbial infections, especially viral infections such as distemper or parvovirus or bacterial infections such as psittacosis (Goren *et al.*, 2002). The antioxidant activity of the plant was reported (Lu *et al.*, 2011).

The toxicity of the alkaloidal extract of the Egyptian garlic (*Allium ampeloprasum*) was studied by Kamel (1966). Toxic symptoms in rats injected with different doses were colic, severe diarrhea, vomiting, incoordination, and a reddish coloured urine. Anemia and leukocytosis were common in animals injected with the LD<sub>50</sub> of the alkaloidal extract. The presence of a garlic odour, inflammation of the internal organs, and pallor of the mucous membranes were postmortem features. Rise of temperature and relative humidity greatly affect the mortality rate in rats dosed with the LD<sub>50</sub> of the drug (Kamel, 1966). Composition comprises extracts of a plant of *Allium* genus (*Allium ampeloprasum*, *Allium ascalonicum* (shallot), *Allium bakeri*, *Allium cepa*, *Allium fistulosum* (Welch onion), *Allium niponicum* (nobiru), *Allium sativum*, *Allium schoenoprasum* (chive), *Allium ursinum* (wild garlic, ransoms), *Allium tricoccum* (ramp, wild leek), *Allium triquetrum* (three-cornered leek), *Allium vineale* (wild garlic, ransoms) and *Allium wakegi* (wakegi) is applied to an exposed surface of a substrate including plants, living animals, manufactured subjects for repelling animals (Lipman, 2003).

6.1.2. *Allium artemisiatorum* Eig & Feinburn, Pal. J. Bot., Jerusalem ser., 3: 18 (1943); Boulos, Fl. Egypt 4: 75 (2005).

Nothing has been reported about the constituents and/or biological activities of this species.

6.1.3. *Allium aschersonianum* Barbey in C. & W. Barbey, Herb. Lavant 163, t. 4 (1882); Boulos, Fl. Egypt 4: 79 (2005).

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Three main flavonoids were isolated from flowers of *Allium aschersonianum*: tricetin, 5,7,4'-trihydroxy-6,3,3'-trimethoxyflavone and its 4'-glycoside. Two cyanidin glycosides were also isolated and identified as cyanidin 3-glucoside and an acylated derivative of cyanidin 3-glucoside (Hilal *et al.*, 1985).

6.1.4. *Allium barthianum* Asch. & Schweinf., Bull. Herb. Boiss. 1 (9): 670 (1893); Boulos, Fl. Egypt 4: 75 (2005).

Nothing has been reported about the constituents and/or biological activities of this species.