**ABSTRACT**

*Cucumis sativus.* L (Cucurbitaceae) is distributed in temperate and tropical regions, it is commonly known as melon or gourd or cucurbit. It is a popular plant with numerous beneficial effects on human health and diseases. In recent years this plant has occupied a prominent place in the therapeutic and cosmetic field. It is a woman friend when they are on a diet and also for their external and internal beauty. The leaves, fruits and seeds are extensively used for a variety of skin disorders such as wrinkles, chink, freckles, suntan/sunburn, puffiness beneath the eyes and hyperpigmentation. The different parts of cucumber are being used to treat conditions like jaundice, hemorrhage, fever, insomnia, bronchitis, burning sensation, thermoplegia (heat stroke or sunstroke) and hyperdipsis (intense thirst), and as an antioxidant, anti-hyaluronidase, anti-elastase, anti-microbial, anti-inflammatory, anti-proliferative, analgesic, antidiabetic and anti-cancer agents. Cucumber is extensively used along with the juicy material/peel as a softening and cleansing agent by the traditional healers and as well as the beauticians to remove plasma clot, bad skin and for conditioning acne and other facial wounds. Proteolytic activity is presumed to be one of the significant contributors for the observed beneficial properties. The fresh, juicy material, the sap from the cucumber fruit which is generally removed before consumption due to its bitter taste has not been studied for the proteolytic activity. In the present study the fruit sap extract (CSE) is studied for the proteolytic activity. The activity staining using different substrates such as casein, gelatin, BSA and hemoglobin revealed a plethora of activity bonds and the pattern of activity bands varied greatly with different substrates used. Different protease inhibitors and metal ions inhibited the activity of CSE to a varied extent. Further, the proteolytic activity showed the varied extent of stability for organic solvents and for the detergents. The activity staining revealed a varied pattern of inhibition of activity bands by protease inhibitors and as well as the stability to organic solvents and detergents.
CSE decreased the plasma re-calcification time and prothrombin time (PT) and showed factor VII (pro-converting) like activity and it readily hydrolyzed the plasma clot and azocasein and inhibited the agonists collagen, ADP and epinephrine induced platelet aggregation in PRP in the order epinephrine > collagen > ADP. Further, CSE augmented wound healing process, including the scar removal in a mouse model. The SOD, CAT, GSH activities and hydroxyproline, hexosamine and hexuronic acid contents were increased while, NO, LPO and MPO activities were decreased compared to control values. Histological study revealed accelerated wound healing involving epithelialisation and re-formation of skin following CSE treatment compared to Neosporin. CSE contain metallo-, serine and cysteine proteases, and are appear to interfere in clot formation, platelet function, and clot dissolution. CSE is non hemorrhagic and non toxic in nature. Thus, the present study validate or provide a scientific basis for the use of cucumber in traditional medicine and cosmetic industries as a wound healing, cleansing and softening agent without causing damage to the skin.