Management of thrombocytopenia is by drugs and blood products, both of which are costly. Conversely, Sri Lankan traditional medicine use mature leaf concentrate of Carica papaya to treat this condition. This claim was scientifically validated. Adult Wistar rats (N=6/group) with *Hydroxyurea-induced thryombocytopenia* (model established for the first time), were orally administered, once daily on 3 consecutive days with three doses of fresh mature leaf concentrate of C papaya (0.18, 0.36 and 0.72 ml/100g), while controls received water. Standard protocols were used to establish their platelet, WBC and RBC counts. Effects of mature leaf concentrate of C papaya on carrageenan induced oedema in rats, on rat erythrocyte membrane stabilization, and on acetic acid-induced vascular permeability in mice, as well as acute toxicity studies were conducted using standard methodology. High dose of mature leaf concentrate of *C. papaya in thrombocytopenic rats* significantly *(P<0.05)* increased platelets by 76.5%, WBC by 30.51% and RBCs by 9.08%, when compared with controls. High dose of mature leaf concentrate of C papaya also significantly *(P<0.5)* inhibited caregenan induced rat paw oedema and impaired in vivo vascular permeability in mice (by 82%), while *inducing maximum (10.11%) membrane stabilizing activity* of rat RBCs at 8mg/ml of mature leaf concentrate of C papaya, suggestive of effective anti-inflammatory activity. Administration of high dose of mature leaf concentrate of *C papaya on 3 consecutive days* neither provoked overt signs of toxicity nor stress, where hepatotoxicity, renotoxicity, hematotoxicity and neurotoxicity were also ruled out. Thus freshly prepared mature leaf concentrate of *C papaya is orally active, effectively increases rat platelet, WBC and RBC counts with no acute toxicity, and possesses potent anti-inflammatory activity, that overly justify claims of traditional medicine.*