In vitro and in vivo Anti-plasmodial Activities of Gynura procumbens

Abstract

Gynura procumbens, locally known in Malaysia as Sambung Nyawa is a medicinal plant belonging to the Asteraceae (Compositae) family. G. procumbens have been traditionally used by the local and indigenous populations to treat an array of ailments ranging from skin conditions and fever to kidney disease, inflammation and diabetes. In the present investigation, aqueous and ethanol extracts of G. procumbens were evaluated for anti-plasmodial activities in vitro and in vivo. Survival of two chloroquine-sensitive strains of malarial parasites; rodent Plasmodium berghei NK65 and human Plasmodium falciparum 3D7 was determined following incubations in vitro with extracts. Based on parasite lactate dehydrogenase (pLDH) assay, both extracts were shown to inhibit parasite proliferation to varying degrees. The aqueous extract was more potent than the ethanol extract at suppressing growth of both parasites in vitro; each displaying IC50 values of 12.40 ± 6.02 and 14.38 ± 7.53 µg/mL towards P. berghei NK65; and 25.69 ± 4.34 and 42.23 ± 7.19 µg/mL towards P. falciparum 3D7, respectively. The aqueous extract was found to be selective for P. falciparum (Selectivity Index 64.30). Four-day suppressive tests in ICR mice showed dose-dependent chemo-suppressive activities of both plant extracts tested towards P. berghei NK65. Daily intra-peritoneal injections of the aqueous extract of G. procumbens at 25, 50 or 100 mg/kg for four consecutive days showed chemo-suppression of 50.42 ± 3.17, 65.95 ± 5.48 and 81.92 ± 3.07%, respectively. At the same dosages, the ethanol plant extract resulted in 44.97 ± 3.44, 55.21 ± 3.87 and 64.44 ± 4.05% chemo-suppression respectively. At 250 mg/kg/day, only the aqueous plant extract gave >90% chemo-suppression (93.06 ± 5.46%). Treatment of P. berghei-infected mice with extracts improved the median survival time compared with non-treated infected mice. This represents the first report showing anti-plasmodial activity of G. procumbens.