Mast cell stabilization property of *Coleus aromaticus* leaf extract in rat peritoneal mast cells

*Coleus aromaticus* Benth., (Lamiaceae), syn. *Coleus amboinicus* (Lour.) Spreng. or *Plectranthus amboinicus* Lour., is commonly known as Indian / country borage. It is a large succulent herb with aromatic leaves, found abundantly in India. The leaves of this plant are traditionally used for the treatment of severe bronchitis, asthma, diarrhea, epilepsy, renal and vesicle calculi and fever.[1] *C. aromaticus* has been reported to exhibit antilithic,[2] chemopreventive,[3] antiepileptic[4] and antioxidant[5] properties. The present study was undertaken to evaluate the mast cell stabilization property of the leaf extract in rat mesentery.

The aerial part of *C. aromaticus* consisting of the leaves were obtained from M/S. Arya Vaidya Sala, Kottakal and authenticated by the Department of Pharmacognosy of this institute. The leaves were washed properly and cut into small pieces before being subjected to cold maceration for seven days. The solvents used for aqueous and hydroalcoholic extraction were distilled water and 50% v/v ethanol in distilled water respectively. After seven days, the aqueous and hydroalcoholic macerates were filtered through muslin cloth and concentrated using a rotary evaporator. The concentrated extracts were freeze-dried to provide dry aqueous (1.2% w/w) and hydroalcoholic (0.9% w/w) extracts. Approval was obtained from IAEC before conducting the studies.

Three to four overnight-fasted male Wistar rats (200-250 g) were sacrificed with an overdose of anesthetic ether. The abdomen was cut open to expose the intestine. Pieces of mesentery with connecting lobes of fat and blood vessels were rapidly dissected out and small pieces of the mesentery were cut and placed in beakers for 30 ± 1 min. These beakers contained Ringer Locke (in mM: NaCl 154, KCl 5.6, CaCl₂ 2.2, NaHCO₃ 6.0 and dextrose 5.5) solution with different concentrations of *C. aromaticus* extracts. Later, the tissues were exposed to Compound 48/80 (C 48/80 at 0.8 µg/ml to promote mast cell degranulation)⁶ and the tissues were incubated further for 30 ± 1 min. The pieces of mesentery were then removed and placed on clean slides. Excess fatty layers and adhering small intestine tissues were carefully removed. The trimmed tissue was dipped in 4% formaldehyde solution containing 0.1% toluidine blue for 20-30 min and the tissue was then washed in acetone and then xylene (2 changes each) for 5 ± 1 min each wash.

Three pieces of mesentery were used for each concentration of the test substance (leaf extract). Values were expressed as mean ± SE. The values were statistically analyzed using One-Way Analysis of Variance (ANOVA) followed by Tukey’s multiple comparison test. P values < 0.5 were considered to be statistically significant. The analysis was carried out using GraphPad Prism software V.4.

C 48/80, a known mast cell degranulating agent, produced a significant (P < 0.001) reduction in intact rat mesenteric mast cells. 14.7 ± 2.2, when compared to the mesentery exposed to the vehicle, Ringer Locke’s solution, alone, 81.5 ± 3.4. Concentrations of 10 and 100 µg/ml of both the aqueous and hydroalcoholic extracts of *C. aromaticus* produced dose-dependent and significant (P < 0.001) increases in the numbers of intact mast cells when compared to C 48/80-treated tissues [Figure 1]. Based on these results, it could be suggested that *Coleus aromaticus* stabilizes mast cells in the rat mesenteric tissue. As mast cells play a major role in Type I hypersensitivity-mediated diseases like allergic asthma and rhinitis,[6] studies are under way to evaluate the efficacy of *Coleus aromaticus* due to its mast stabilization property in these animal allergic models.

A. Kumar, K. Elango*, S. Markanday*, C.V. Undhad*, A.V. Kotadiya*, B.M. Savaaliya*, D.N. Vyasa*, D. Datta*
TIFAC CORE in Herbal Drugs, *Department of Pharmacology, JSS College of Pharmacy, Ootacamund - 643 001, India.
E-mail: aktifac@yahoo.com

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Figure 1: Effect of aqueous extract (ACA) and hydroalcoholic extract (HCA) of *Coleus aromaticus* (µg/ml) in C 48/80 induced mast cell degranulation of rat mesentry. *P<0.001 vs. control; *P<0.001 vs.C 48/80; One-Way ANOVA followed by Tukey’s multiple comparison test (F=69.2; df=53; P<0.001). DSCG-dissodium cromoglycate

Six pieces of mesentery were used for each concentration of the test substance (leaf extract). Values were expressed as mean ± SE. The values were statistically analyzed using One-Way Analysis of Variance (ANOVA) followed by Tukey’s multiple comparison test. P values < 0.5 were considered to be statistically significant. The analysis was carried out using GraphPad Prism software V.4.

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TIFAC CORE in Herbal Drugs, *Department of Pharmacology, JSS College of Pharmacy, Ootacamund - 643 001, India.
E-mail: aktifac@yahoo.com
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References