

## *Embelia ribes* ameliorates lipopolysaccharide induced acute respiratory distress syndrome

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**Background:** *Embelia ribes* Burm. F. (Fam. Myrsinaceae) locally known as Vidanga have been used for treating tumors, ascites, bronchitis, jaundice, diseases of the heart and brain in traditional Indian medicine. However, no scientific studies providing new insights in its pharmacological properties with respect to acute respiratory distress syndrome have been investigated.

**Aim:** The present investigation aimed to elucidate the effectiveness of Embelin isolated from *Embelia ribes* seeds on attenuation of LPS- induced acute respiratory distress syndrome in murine models.

**Methods:** Embelin (5, 10 & 20 mg/kg/day, i.p.) and Roflumilast (1 mg/kg/day, p.o.) were administered for four days and prior to LPS in rats (i.t.). Four hour after LPS challenge animals were anesthetized and bronchoalveolar lavage was done with ice-cold phosphate buffer. Assessment of BAL fluid was done for albumin, total protein, total cell and neutrophil count, TNF- $\alpha$  levels, nitrosative stress. Superior lobe of right lung was used for histopathologic evaluation. Inferior lobe of right lung was used to obtain lung edema. Left lung was used for myeloperoxidase estimation. Arterial blood was collected immediately and analysed for pH, pO<sub>2</sub> and pCO<sub>2</sub> were estimated.

**Result:** Pretreatment with embelin (5, 10 & 20 mg/kg, i.p.) decreased lung edema, mononucleated cellular infiltration, nitrate/nitrite, total protein, albumin concentrations, TNF- $\alpha$  in the bronchoalveolar lavage fluid and myeloperoxidase activity in lung homogenate. Embelin markedly prevented pO<sub>2</sub> down-regulation and pCO<sub>2</sub> augmentation. Additionally, it attenuated lung histopathological changes in acute respiratory distress syndrome model.

**Conclusion:** The study demonstrates the effectiveness of *Embelia ribes* Burm. f. (Fam. Myrsinaceae) seeds in acute respiratory distress syndrome possibly related to its anti-inflammatory and protective effect against LPS induced airway inflammation by reducing nitrosative stress, reducing physiological parameters of blood gas change, TNF-  $\alpha$  and mononucleated cellular infiltration indicating it as a potential therapeutic agent for acute respiratory distress syndrome.

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## Stability studies of lysine acetylsalicylate (aspirin derivative): Mechanisms of hydrolysis

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To control the stability of the Lysine Acetylsalicylate Compound (LAS) in aqueous solution, some studies of the hydronium ion-catalyzed, hydroxide ion-catalyzed, and spontaneous reactions of this active ingredient in water solutions have been carried out. The pH-rate profile ( $\log k_{obs} = f(pH)$ ), shows that the hydrolysis reaction of the LAS, is conducted by a catalysis of acid-base mechanism, with multiple reaction pathways. The rate constants  $k_H$ ,  $k_{OH}$  and  $k_0$  of the reaction pathway catalyzed by H<sub>3</sub>O<sup>+</sup> and HO<sup>-</sup> ions and the spontaneous reaction, for the hydrolysis reaction of the reagent LAS, were determined. The results show that the studied compound (LAS) is unstable in basic medium and the hydrolysis reaction catalyzed by HO<sup>-</sup> ions is predominant. For a known acidity (pH 10), studies were conducted for different temperatures of the medium, which clearly indicate, that the experimental rate constant  $k_{obs}$ , depends on the temperature according to the Arrhenius law. The activation parameters like  $E_a$ ,  $\Delta H^\ddagger$  and  $\Delta S^\ddagger$ , for the transition state were determined. The high negative value obtained for the activation parameter  $\Delta S^\ddagger$ , first indicates that in the transition state there is a gain and then in the late state it resembles the product that probably is for the mechanism of the lysine acetylsalicylate hydrolysis reaction which is catalyzed by HO<sup>-</sup> ions, where the rate-determining step is a bimolecular reaction. Finally from all these results, the mechanism for the reaction pathway catalyzed by HO<sup>-</sup> ions has been elucidated.

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