

IN VITRO THROMBOLYTIC ACTIVITY OF *ERYTHRINA VARIEGATE* BARK

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ABSTRACT

In this present study, the bark extracts of *Erythrina variegata* were subjected to evaluate of the thrombolytic activity, which was assessed by using human erythrocyte and the results were compared with standard streptokinase (SK). The methanol extract showed 72.14 ± 3.77 % clot lysis as compared to 78.42 ± 1.6 % clot lysis produced by standard streptokinase.

KEYWORDS: *Erythrina variegata*, methanol extract, thrombolytic activity, human erythrocyte, streptokinase.

INTRODUCTION

Medicinal plants are widely used in the traditional system for the treatment of several diseases that contain chemical compounds which act as precursor for the synthesis of useful drugs.^[1] Many plants have been listed in the ancient literatures for their medicinal values and their formulation has been found to be effective for the treatment of various diseases. Different parts of the plants are used in the traditional treatment system without any scientific validation. They play significant role in providing primary health care services to rural people as the synthetic drugs are costly and sometimes they are unavailable. Besides their role as therapeutic agents, they also act as a major source of income by exporting medicinal plants to other countries.^[2]

Erythrina variegata belongs to the Fabaceae family and *Erythrina* genus which includes about 110 species of trees and shrubs. The plants under the *Erythrina* genus are collectively known as "coral tree". These plants are native to the Old World tropics, especially from India to Malaysia, but are native of ancient west ward to Zanzibar and eastward to eastern Polynesia (the Marquesas). It is typically found on sandy soil in littoral forest, and sometimes in coastal

forest up to 250m (800ft) in elevation. The coral tree is cultivated particularly as an ornamental tree and as a shade and also as a soil improvement tree (it fixes nitrogen) for other tree crops such as coffee and cacao.^[3]

The plants parts from *Erythrina variegata* are widely used for the treatment of different diseases and complications. The leaves are used for their stomachic, anthelmintic, laxative, diuretic, galactagogue and emmenagogue properties; sometimes also applied externally for dispersing venereal buboes, relieve pain of the joints and inflammations; juice is poured in to the ear to relief earache and is used as an anodyne in toothache. The bark is astringent, febrifuge anti-bilious and anthelmintic; useful in dysentery and as a collyrium in ophthalmia. The roots are emmenagogue.^[4]

The objective of the present study was to explore the thrombolytic activity of the bark extract of *Erythrina variegata*.

MATERIALS AND METHOD

Collection, identification and processing of plant sample

The bark extracts of *Erythrina variegata* was collected from Botanical garden, Curzon Hall at the University of Dhaka in June 2014 and was taxonomically identified with the help of the National Herbarium of Bangladesh, Mirpur-1, Dhaka (DACB; Accession Number- 36148). Bark was sun dried for seven days. The dried bark were then ground in coarse powder using high capacity grinding machine, which was then stored in air-tight container with necessary markings for identification and kept in cool, dark and dry place for the investigation.

Extraction procedure

The powdered plant parts (22 gm) were successively extracted in a soxhlet extractor at elevated temperature using 250 ml of distilled methanol (40-60)°C which was followed by ethanol, and then chloroform. After extraction all extracts kept in refrigerator at 4°C for future investigation with their necessary markings for identification.

Streptokinase (SK)

Commercially available lyophilized Altepase (Streptokinase) vial (Trade name-S-Kinase from Popular Pharmaceutical Ltd.) of 15, 00,000 I.U., was collected and 5 ml 0.9% NaCl was added and mixed properly. This suspension was used as a stock from which 100µl (30,000 I.U) was used for *in vitro* thrombolysis.

Blood sample

Blood (n=6) was drawn from healthy human volunteers without a history of oral contraceptive or anticoagulant therapy and 500 micro liter of blood was transferred to the previously weighed micro centrifuge tubes and was allowed to form clots.

Thrombolytic activity

The thrombolytic activity of all extracts was evaluated by the method developed by Daginawala *et al.*, (2006)^[5] and slightly modified by Kawsar *et al.*, (2011)^[6] using streptokinase (SK) as the standard.

RESULT AND DISCUSSION

Thrombolytic activity

As a part of discovery of cardio-protective drugs from natural sources the extractives of *Erythrina variegata* were assessed for thrombolytic activity and the results are presented in table 1. Addition of 100 µl Streptokinase (30,000 I.U.), standard to the clots along with 90 minutes of incubation at 37°C, showed 78.42% clot lysis. Clots when treated with 100 µl sterile distilled water (control) showed only negligible clot lysis (3.21%). In this study, the methanol extract of *Erythrina variegata* revealed highest thrombolytic activity 72.14%, whereas ethanol and chloroform extracts of *Erythrina variegata* (60.08% and 55.82 % respectively) displayed moderate thrombolytic activities.

Table 1: % Clot lysis by different extracts of *Erythrina variegata*

Samples	% of Clot Lysis
Methanolic Extract	72.14 ± 3.77
Ethanolic Extract	60.08 ± 2.07
Chloroform Extract	55.82 ± 2.48
Control	3.21 ± 0.51
Streptokinase (Std.)	78.42 ± 1.6

Values are expressed as mean ± S.D. (n=6)

CONCLUSION

In the light of the result of the present study, it can be concluded that the plant extract of *E. variegata* possesses moderate thrombolytic activity. This finding justifies the use of *E. variegata* in folk medicine to treat inflammation. However, chemical studies are required to isolate the bioactive compounds and elucidate the precise molecular mechanisms responsible for the pharmacological activities of the plant.

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