

– Short Communication

THROMBOLYTIC ACTIVITY OF *CORIANDRUM SATIVUM*

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ABSTRACT

The leaves of *Coriandrum sativum* were subjected to thrombolytic activities. The thrombolytic activities were assessed by using human blood samples and the results were compared with standard streptokinase (SK). In this study, the methanol soluble fraction (MSF) exhibited highest percentage of thrombolytic activity (60.12 ± 1.91). However, significant thrombolytic activity was demonstrated by the crude ethanol extract (CEE) and n-hexane soluble fraction (HSF) of *C. sativum* (45.85 ± 0.69) and (22.22 ± 1.42), respectively.

Key words: *Coriandrum sativum*, Thrombolytic activity, Streptokinase

Coriandrum sativum (Bengali name- Dhania) is a soft, hairless plant growing up to 50 cm (20 in) tall. The leaves are variable in shape, broadly lobed at the base of the plant, and slender and feathery higher on the flowering stems belonging to the family Apiaceae. Traditionally different parts of the plant are used such as local application of coriander seeds alleviates swelling and pains. Externally, powdered green coriander alleviates burning sensation and pain in diseases like inflammation caused by pitta, erysipelas and lymphadenopathy. The seeds were included in a host of prescriptions for fever, diarrhoea, vomiting, indigestion as in stomach and carminative. It cures vertigo, syncope and memory loss. The volatile oil is carminative (MOHFW, 2007). Leaves are aromatic, stimulant, its paste rich in vitamin A, given in watery eyes, mild laxative, useful in skin diseases if taken internally, and applied externally, extract antimicrobial and applied as ulcer. Extract is useful in spleen diseases, sores and carminative. Green leaf is used as a refrigerant. Paste is applied over swellings and boils; also over cervical adenitis. The paste is prepared by pounding green leaves with barley flour. It is also given in biliousness, intestinal irritations, heartburn, thirst and nausea (Kokate *et al.* 2007, Kirtikar and Basu 1999, Lyle and James 2002). Extremely advantageous in deficiencies of vitamin A, B, B2, C and iron. One to two teaspoons of coriander juice, added to refreshing buttermilk, is incredibly beneficial in curing digestive disorders such as indigestion, nausea, dysentery, hepatitis and ulcerative colitis. Such gleaming benefits of coriander are also helpful in remedying typhoid fever (MOHFW 2007).

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As a part of our continuing studies on medicinal plants of Bangladesh (Hossain *et al.* 2012, Shahriar *et al.* 2012a, Shahriar *et al.* 2012b, Shahriar *et al.* 2012c, Shahriar and Kabir 2011, Shahriar 2010), the organic soluble materials of the plant parts of *C. sativum* were evaluated for thrombolytic activities for the first time.

Plant materials: Leaves of *C. sativum* were collected from Mirpur Botanical Garden, Dhaka, Bangladesh, in May, 2011. A voucher specimen (Accession no.36084) for this plant has been maintained in Bangladesh National Herbarium, Dhaka, Bangladesh.

The sun dried and powdered parts (500 gm) of *C. sativum* was macerated in 2.5 l of ethanol for 7 days and then filtered through a cotton plug followed by Whatman filter paper number 1. The extract was concentrated with a rotary evaporator at low temperature (40 - 45°C) and reduced pressure. The concentrated ethanolic extract (EE) was partitioned by modified Kupchan method (Van Wagenen *et al.* 1993) and the resultant partitionates i.e., n-hexen (HSF), and methanol (MSF) soluble fractions were used for the experimental processes.

Streptokinase (SK): Commercially available lyophilized altepase (Streptokinase) vial (Beacon pharmaceutical Ltd.) of 15, 00,000 I.U., was collected and 5 ml sterile distilled water was added and mixed properly. This suspension was used as a stock from which 100 µl (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 1 ml 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 (2006) and slightly modified by Kawsar *et al.* (2011) using streptokinase (SK) as the standard.

Table 1. Thrombolytic activity of different fractions of *C. sativum*.

Sample	Thrombolytic activity (% of lysis)
SK	80.64±1.59
Water	8.64±0.13
CEE	45.85±0.69
MSF	60.12±1.91
HSF	22.22±1.42

SK = Streptokinase, CEE = crude ethanol extract, MSF = methanol soluble fraction and HSF = n-hexane soluble fraction of the whole plant of *C. sativum*.

As a part of discovery of cardio-protective drugs from natural sources the extractives of *C. sativum* were assessed for thrombolytic activity and the results are presented in Table 1. Addition of 100 µl SK, a positive control (30,000 I.U.), to the clots and subsequent incubation for 90 minutes at 37°C, showed 80.64% lysis of clot. At the same

time, distilled water was treated as negative control which exhibited negligible lysis of clot (8.64%). In this study, the methanol soluble fraction (MSF) exhibited highest thrombolytic activity (60.12%). However, significant thrombolytic activity was demonstrated by the crude ethanol extract (CEE) of *C. sativum* (45.85%).

This *in vitro* study demonstrated that folk medicine can be as effective as modern medicine to combat pathogenic microorganisms. The use of these plants in folk medicine suggests that these represent an economic and safe alternative to treat infectious diseases.

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