

**A SCIENTIFIC REVIEW ON CLOT DISSOLVING ACTIVITY OF CAYENNE PEPPER**

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**ABSTRACT**

The work of fibrinolysis is to break up fibrin clots. The operator of fibrinolysis is plasmin, a glycoprotein with gram atomic weight (GMW) of 90,000. Beneath normal conditions, plasminogen is changed over to plasmin by tissue plasminogen activator (TPA). Actuation happens on the fibrin surface, in this way restricting proteolytic movement to the suitable location. Tissue plasminogen activator, produced by monoclonal methods, has recently been made available for limited therapeutic use. As of now Streptokinase and Urokinase are broadly utilized remedially to enact plasminogen. These specialists cause plasmin to be shaped which is free in the circulation as well as bound to fibrin, coming about in proteolysis of circulating plasminogen and clotting components. Fibrinolytic treatment has demonstrated to be more useful than anticoagulation alone for profound vein thrombi and for aspiratory emboli. Herbs and species are natural foods additives that contribute significantly to the taste and flavor of our food. In some cultures, these herbs and spices have also been used as medicines. Cayenne pepper is one among them which belongs to the family solanaceae. It is a type of *Capsicum annuum*. It is usually a hot chili powder that is used to flavor dishes. The main chemical constituent present in most of the *Capsicum* species is capsaicin (48.6%) which has clot dissolving potential. This present review focuses on providing the information about the Capsaicin.

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**INTRODUCTION**

Cayenne pepper is a type of *Capsicum annuum*. It is usually a moderate hot chili pepper used to flavor dishes. The word cayenne is derived from the old tupi language kynnha which means pepper. Cayenne pepper gets its name from the city of Cayenne in French Guiana.<sup>21</sup> Cayenne pepper is high in vitamin A. It also contains vitamin B, vitamin E, vitamin C, riboflavin, potassium and manganese.<sup>16,17,18</sup>

**Plan Profile**

Cayenne pepper is a naturally occurring plant product<sup>2</sup>. The main active chemical constituent present in it is *Capsaicin* which has an anti-coagulant and anti-inflammatory property<sup>17</sup>. While coming to the synthetic Warfarin, it is an anticoagulant that acts by inhibiting the synthesis of vitamin K-dependent coagulation factors. Warfarin has more side effects than that of Cayenne pepper.<sup>18</sup>

**Synonyms:**<sup>16,18</sup>

- *Capsicum annuum*
- *Capsicum angulosum*
- *Capsicum frutescens*
- *Capsicum minimum*

**Taxonomical classification:**<sup>17</sup>

- Kingdom: Plantae
- Order: Solanales
- Family: Solanaceae
- Genus: *Capsicum*
- Species: *annuum*



Fig No 1 Cayenne pepper

**Therapeutic uses of Cayenne pepper:**<sup>20</sup>

- Boosts metabolism
- Improves Digestive Health
- Lowers Blood Pressure
- Can reduce pain
- Anti-Cancer
- Protects the Heart<sup>8</sup>

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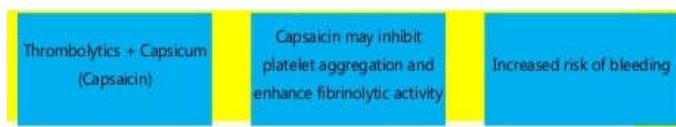
- Clears congestion
- Weight loss
- Helps Detoxify
- Relieves Joint Pains
- Has Anti-microbial properties
- Improves immunity<sup>6</sup>
- Can Heal Toothaches
- Improves Skin And Hair Health

**Folklore uses:** Stimulant, tonic, carminative, pungent, emetic, antiseptic, antispasmodic, rubefacient, condiment and anti-rheumatic.<sup>19</sup>

**Mechanism of Cayenne pepper in dissolving the blood clot**

They are potent blood anticoagulants from the east, used as a cooking necessity.<sup>1</sup> They prevent the platelets from sticking together thereby easing the blood flow.<sup>3</sup> Cayenne pepper contains a compound called Capsaicin which ensures proper blood flow throughout the vessels. It also helps reduce symptoms of poor blood circulation like pain, headaches,<sup>10</sup> numb hands, cold feet and tingling in legs.<sup>9</sup>

**Major drug interaction:<sup>1</sup>**



**CONCLUSION**

Capsaicin, the dynamic rule of hot peppers of the class Capsicum, displays expansive bioactivity. It targets neuronal structures which contain substance P, clinically observed as gastrointestinal and dermatologic disturbance, bronchospasm and fibrinolysis. Capsaicin is an agonist of transient receptor potential vanilloid compose 1 (TRPV1), in which it can go about as a neuronal stimulant and result in nociception. Capsaicin likewise influences an assortment of nonneuronal tissues, in which its instruments of activity are less sure. The fibrinolytic framework is as convoluted and multifaceted as the coagulation course, and is similarly significant thrombotic sickness and dying. Dysregulation of the fibrinolytic framework is related with various and capricious clinical phenotypes going from the coagulopathies of liver sickness<sup>12</sup> and DIC to uncommon inborn draining issue. Likewise, the potential part of the fibrinolytic framework in cell flagging pathways, irritation, and harm stays to be completely investigated. The fibrinolytic framework speaks to a genuine boondocks in understanding the intricate communications of natural frameworks, and, as we pick up a superior comprehension of its part in science, we will have the capacity to enhance the care of patients with assorted medicinal conditions.

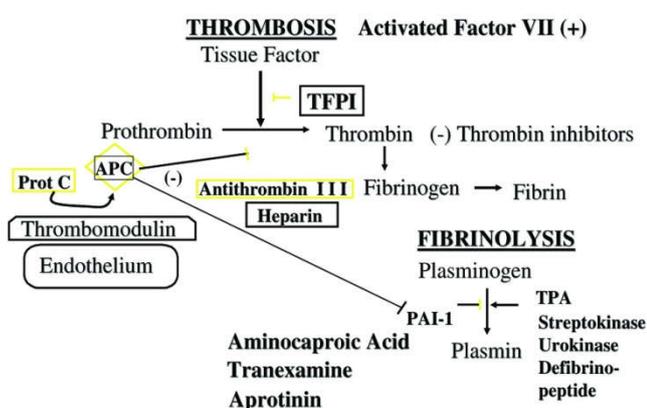


Fig No 2 Mechanism of Fibrinolysis<sup>11,12</sup>

**Human Polymorphisms Associated With Thrombosis**

**Table 1** Some examples of human polymorphisms associated with thrombosis.<sup>14,15</sup>

Polymorphism	Hemostatic phenotype
PAI-1 4G promoter	Increased venous thrombosis risk, slightly increased arterial thrombosis risk, no apparent increase in stroke risk <sup>24</sup>
tPA enhancer 7531 C/T	Increased arterial thrombosis in select populations <sup>25</sup>
TAFI Thr325Ile	Increased circulating TAFI, but no increase in thrombosis <sup>15</sup>
TAFI Ala147Thr	Increased risk for coronary artery disease <sup>14</sup>

Disorders of fibrinolysis can be congenital or acquired in association with numerous medical conditions including malignancy, liver disease<sup>12</sup>, and renal failure<sup>18</sup>. Hypofibrinolysis is more often associated with thrombosis<sup>11</sup>, while hyperfibrinolysis may result in a bleeding tendency<sup>17</sup>. Defects in fibrinolytic components have been associated with non-hematologic manifestations such as ligenous mucositis. Global assays of fibrinolysis developed to predict thrombosis should be validated in larger populations, and further studied for use in bleeding disorder.<sup>16</sup>

**References**

1. Broos K, Feys HB, De Meyer SF, Vanhoorelbeke K, Deckmyn H. Platelets at work in primary hemostasis. *Blood Rev.* 2011; 25(4):155 -67. [PubMed]
2. De Witt SM, Verdoold R, Cosemans JM, Heemskerk JW. Insights into platelet-based control of coagulation. *Thromb Res.* 2014; 133(Suppl 2):S139 - 48. [PubMed]
3. Furie B. Pathogenesis of thrombosis. *Hematology Am Soc Hematol Educ Program.* 2009:255 -8.[PubMed]
4. Bagoly Z, Koncz Z, Hársfalvi J, Muszbek L. Factor XIII, clot structure, thrombosis. *Thromb Res.* 2012; 129(3):382 -7. [PubMed]
5. Hajjar KA. The molecular basis of fibrinolysis. In: Orkin SA, Nathan DG, Ginsburg D, Look AT, Fisher DE, Lux SE, editors. *Nathan and Orkin's Hematology of Infancy and Childhood.* 8. Philadelphia: Saunders/Elsevier; 2014.
6. Wolberg AS. Thrombin generation and fibrin clot structure. *Blood Rev.* 2007;21(3):131 -42. [PubMed]
7. Crowther MA, Roberts J, Roberts R, Johnston M, Stevens P, Skingley P, et al. Fibrinolytic variables in patients with recurrent venous thrombosis: a prospective cohort study. *Thromb Haemost.* 2001;85(3):390 - 4. [PubMed]
8. Folsom AR, Cushman M, Heckbert SR, Rosamond WD, Aleksic N. Prospective study of fibrinolytic markers and venous thromboembolism. *J Clin Epidemiol.* 2003; 56(6):598 -603. [PubMed]
9. Lisman T, de Groot PG, Meijers JC, Rosendaal FR. Reduced plasma fibrinolytic potential is a risk factor for

- venous thrombosis. *Blood*. 2005;105(3):1102 - 5. [PubMed]
10. Hoekstra J, Guimarães AH, Leebeek FW, Darwish Murad S, Malfliet JJ, Plessier A, *et al*. Impaired fibrinolysis as a risk factor for Budd -Chiari syndrome. *Blood*. 2010;115(2):388 -95. [PubMed]
  11. De Wee EM, Klaij K, Eikenboom HC, Van Der Bom JG, Fijnvandraat K, Laros-Van Gorkom BA, *et al*. Effect of fibrinolysis on bleeding phenotype in moderate and severe von Willebrand disease. *Haemophilia*. 2012;18(3):444 -51. [PubMed]
  12. Rijken DC, Kock EL, Guimarães AH, Talens S, Darwish Murad S, Janssen HL, *et al*. Evidence for an enhanced fibrinolytic capacity in cirrhosis as measured with two different global fibrinolysis tests. *J Thromb Haemost*. 2012;10(10):2116 -22. [PubMed]
  13. Sivula M, Pettilä V, Niemi TT, Varpula M, Kuitunen AH. Thromboelastometry in patients with severe sepsis and disseminated intravascular coagulation. *Blood Coagul Fibrinolysis*. 2009;20(6):419 -26.[PubMed]
  14. Ogawa S, Szlam F, Chen EP, Nishimura T, Kim H, Roback JD, *et al*. A comparative evaluation of rotation thromboelastometry and standard coagulation tests in hemodilution-induced coagulation changes after cardiac surgery. *Transfusion*. 2012;52(1):14 -22. [PubMed]
  15. Brazzel C. Thromboelastography-guided transfusion. Therapy in the trauma patient. *AANA J*. 2013;81(2):127 -32. [PubMed]
  16. [https://en.wikipedia.org/wiki/Cayenne\\_pepper#Etymology](https://en.wikipedia.org/wiki/Cayenne_pepper#Etymology)
  17. <http://www.stylecraze.com/articles/top-10-health-benefits-of-cayenne-pepper/#WhatIsCayennePepper?file:///E:/cayenne.pdf>
  18. <http://www.herbalpedia.com/cayenne.pdf>
  19. Nikolopoulos GK, Bagos PG, Tsangaris I, Tsiara CG, Kopterides P, Vaiopoulos A, *et al*. The association between plasminogen activator inhibitor type 1 (PAI-1) levels, PAI-1 4G/5G polymorphism, and myocardial infarction: a Mendelian randomization meta-analysis. *Clin Chem Lab Med*. 2014;52(7):937 - 50. [PubMed]
  20. Jannes J, Hamilton-Bruce MA, Pilotto L, Smith BJ, Mullighan CG, Barty PG, *et al*. Tissue plasminogen activator -7351C/T enhancer polymorphism is a risk factor for lacunar stroke. *Stroke*. 2004;35(5):1090 - 4. [PubMed]

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