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### *Solanum torvum* Sw. - A Phytopharmacological review

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#### ABSTRACT

*Solanum torvum* is a commonly used herb in traditional medicine. This review supports all updated information on its phytochemical and pharmacological activities and scientific approach. The plant extracts have been widely used for the treatment of a large number of human ailments. The chemical entities of this plant has been used as antihypertensive, antioxidant, cardiovascular, anti-platelet aggregation activities, anti-microbial activity, sedative, digestive, hemostatics and diuretic activities etc. Scientifically proved activities are related with traditional concept. Scientific evidence exists with respect to their major and minor constituents. *Solanum torvum* is one of the most important controversial and effective natural origins that have a tremendous future for research. The novelty and applicability of *Solanum torvum* are hidden. Such things should be overcome through modern scientific concept.

**Key words:** *Solanum torvum*, Pharmacological activities, Scientific.

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#### INTRODUCTION

*Solanum torvum* Sw. [Solanaceae] is a small shrub distributed widely in Thailand and commonly known as 'Turkey berry'. Turkey berry is an erect spiny shrub of about 4m tall evergreen and widely branched. It is native and cultivated in Africa and West Indies [1]. Its edible fruits, commonly available in the market are used as a vegetable and are regarded as an essential ingredient in Thai cuisine. Its fruit and leaves, which are rich in alkaloids can however, be used for Medicinal or ritual purposes. The plant is cultivated in the tropics for its sharp tasting immature fruits. The fruits of *Solanum torvum* are used commonly in traditional medicine as antihypertensive [2]. It has antioxidant [3], Cardiovascular, anti-platelet aggregation activities [4]

anti-microbial activity against human and clinical isolates [5,6] and sedative, digestive, hemostatics and diuretic activities [7].

### CHEMICAL CONSTITUENTS

*Solanum torvum* contains a number steroidal glycosides viz. Torvoside A-L [8, 9,10], among these torvoside A, torvoside B and torvoside E, torvoside F, torvoside G, torvoside H, are considered to be furostanol glycosides [11,12]. Torvoside M and N has antimicrobial activity [10] and show cytotoxic activity with cell lines [13,14]. Non alkaloidal constituents like tetratriacontanoic acid, sitosterol, stigmasterol and campesterol have also been isolated and identified from *S. torvum* leaves [15]. Chlorogenone. {[25R]} - 5a - spirostane - 3,6 dione} and its epimer, neochlorogenone were extracted from unripe fruits of *Solanum torvum* [16]. The 26-O- $\beta$ -glycosidase [torvosidase] [17] present in the young leaves of *Solanum torvum*. It is also present in petioles, but not in fruits and other tissues. Plant  $\beta$  - glycosidase play an important role in many biological processes such as phytohormone activation lignin synthesis cell wall degradation and defense mechanism [18]. It also contains 22- $\beta$ -O-spirostanol Oligoglycoside, C-22 steroidal lactone saponins viz. solanolactosides A, B [10] and 2,3,4 trimethyl triacontane, octacosanyl triacontanoate and 5-hexatriacontane [19].

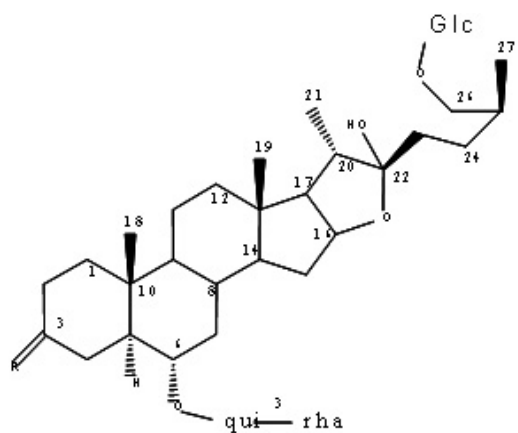


Figure 1: Torvoside A

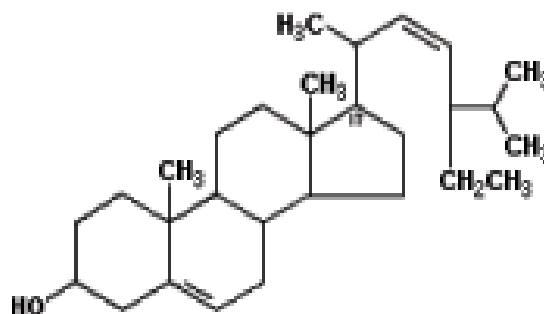
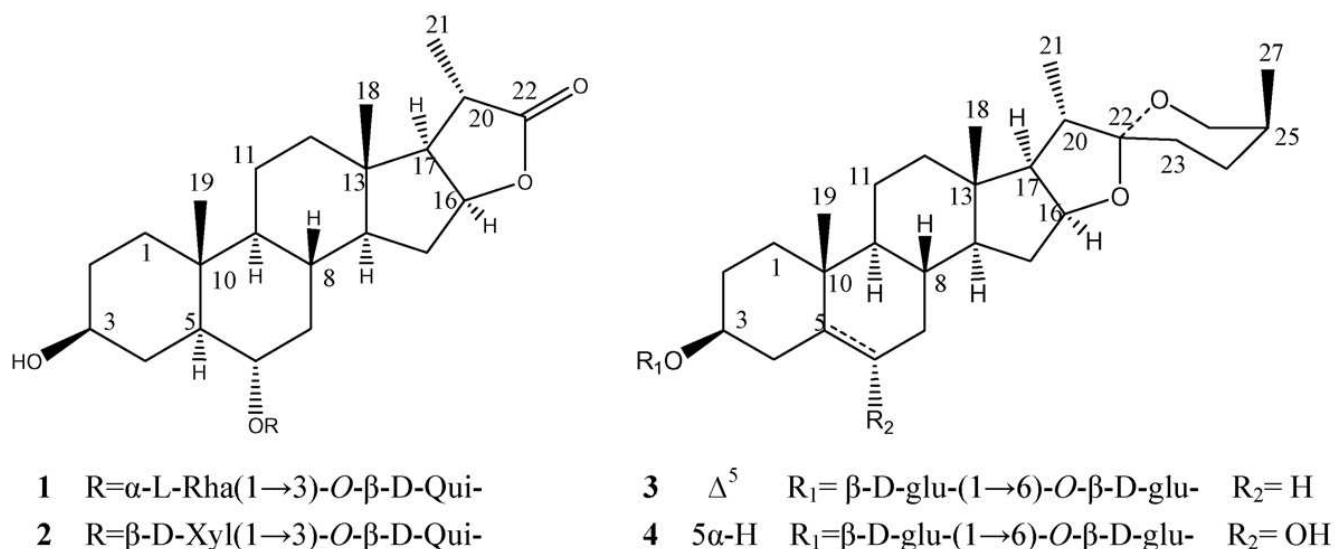


Figure 2: Torvoside B



**Figure: 3:** Solanolactoside A, **2:** Solanolactoside B, **3:** Torvoside M, **4:** Torvoside N

### Pharmacological Activities

#### Hypertensive effect and anti-platelet aggregation activity

Aqueous extract from dried fruits of *Solanum torvum* reduces blood pressure. These effects may result from a reduction in sensitivity of vasorelaxant agent & increase in hypersensitivity to contractile factor. In vitro it also posses potent vasocontractile activity due to activation of both Alpha 1- adrenergic pathway & calcium reflux. *Solanum torvum* may be use in the treatment of severe hypotension as that resulting from autonomic dysfunction that requires administered of vasopressors [20]. The anti-platelet aggregation activity of the aqueous extract of *Solanum torvum* was also evaluated on platelets isolated from rats. Intravenous administration of aqueous and methanolic extract induced a significant reduction in arterial blood pressure. The anti-platelet aggregation effect of *Solanum torvum* may be a benefit for its cardiovascular effect in arterial hypertension and haemostatic ailments [4].

#### Anti- ulcerogenic

*Solanum torvum* revealed the presence of flavanoids, sterols & triterpens which may be responsible for anti-ulcer property. It strength the mucosal barrier through the increase of the mucas and bicarbonate production and reducing the volume of gastric acid secretion or by simply neutralising the gastric activity [21].

#### Anti-viral activity

A new C<sub>4</sub> - sulfated isoflavonoid [torvanol A] and steroidal glycoside [torvoside H] together with torvoside A were isolated from methanolic extract of *Solanum torvum* fruits exhibited anti-viral activity [herpes simple virus type1] [22].

**Analgesic**

The aqueous extract of *Solanum torvum* leaves exhibited peripheral analgesic activity. The pain killing effect of the plant may be due to prostaglandin synthesis inhibition [23].

**Anti-inflammatory**

*S. torvum* extract has anti-inflammatory activity. *Solanum torvum* extract may act by suppressing the later phase of the inflammatory process by inhibition cyclo-oxygenase involved in the formation of prostaglandin [23].

**Antioxidant activity**

*Solanum torvum* possesses significant antioxidant activity in vitro. Due to antioxidant activity *S. torvum* is used for reducing oxidative stress in diabetes [24].

**CONCLUSION**

The extensive literature survey revealed that *Solanum torvum* is an important source of many pharmacologically and medicinally important chemicals such as steroidal glycosides, sitosterol, stigmasterol and campesterol. The plant has also been widely studied for their various pharmacological activities like antihypertensive, antioxidant, cardiovascular, antiplatelet aggregation activity, antimicrobial and antiviral activity etc. More clinical trials should be conducted to support its therapeutic use of *Solanum torvum*. It is also important to recognize that *Solanum torvum* extracts may be effective not only when used singly, but may actually have a modulating effect when given in combination with other herbs or drugs. This review aims to highlight the main medicinal properties of *Solanum torvum* with a view to focus on future studies of this plant.

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