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## A review on pharmacognostical and phytochemical evaluation of *Pyrus pashia* Buch-Ham ex D. Don

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### Abstract

*Pyrus pashia* Buch-Ham. Ex D. Don is distributed in Himalayan region with higher ethnic uses and it comprising of approximately 38 species in temperate regions of the North hemisphere. *Pyrus Pashia* is a important medicinal plant, belongs to the family Rosaceae. It is a medium size deciduous tree commonly known as wild pear. The plant has various nutritional and therapeutic importance. The leaves of *Pyrus Pashia* have been known to have various physiological activities and have many useful polyphenolic therapeutic constituents such as chlorogenic acids flavan-3-ols, arbutin etc. this study comprises macroscopical, microscopical and pharmacogostic evaluations of the plant. Phytochemical and pharmacognostical investigation of Plant revealed the presence of primary and secondary metabolites like alkaloids, glycosides, flavonoids, steroids, saponins and tannins. This review will give the scientific information in a brief manner to the scientific community.

**Keywords:** *Pyrus pashia*, macroscopy, phytochemical and pharmacognostic

### 1. Introduction

*Pyrus pashia* Buch-Ham ex D. Don, belongs to Rosaceae family, subfamily Maloideae is a medium size fruiting tree, known locally as Indian pear, Himalayan pear and Mehal comprising of approximately 38 species in temperate regions of the North hemisphere (except North America). The leaves of Plant have been known to have various physiological activities and have many useful polyphenol therapeutic constituents such as chlorogenic acids flavan-3-ols, arbutin etc <sup>[1]</sup>.

The leaf extract is used as a tonic for hair loss and woods are used as a major fuel source in the central Himalayan region, and consumed as tea beverages by many monpa community of twang, Arunachal Pradesh (India) <sup>[2]</sup>. Twings of the tree are used in tooth ache problems by the indigenous people of Jammu Kashmir and Laddhak divisions of India <sup>[3]</sup>. *Pyrus pashia* fruits is used for the treatment of dehydration, GI disorder, fever, headache, hysteria and epilepsy <sup>[4]</sup>. Edible flowers is used in Cardiovascular disease and certain cancers, these properties is attributed by the presence of phenolic compounds <sup>[5]</sup>.



Fig 1: Morphology of leaves fruits and flowers of *Pyrus pashia* Buch-Ham ex D. Don.

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**1.1 Distribution:** This Plant is Distributed in Afganistan, China, India, Iran, Bhutan, Myanmar and Nepal at altitude of 700-750m <sup>[6]</sup>.

## 1.2 Species Information [7]

Species	Geographic distribution- site of origin
<i>Pyrus communis</i> Linn	All Europe
<i>Pyrus domestica</i> (L.) Sm.	Algeria, Cyprus, Eastern Europe Central West and Meridional
<i>Pyrus pashia</i> buch ham ex d. don	South Asia, India and china
<i>Pyrus elaeagrifolia</i> Pall.	Turkey, Albanta and bulgaria
<i>Pyrus communis</i> Var.	UK, Spain, France
<i>Pyrus caucastica</i> Fed.	Eastern Europe and Central Europe
<i>Pyrus crataegifolia</i> Savi	Turkey, Italy and Macedonia
<i>Pyrus Germanica</i> (L.)	Middle East, Eastern Europe, Central, Southern and Northern Asia

## 2. Pharmacognostic profile

### 2.1 Taxonomical Classification [8]

Table 1: Taxonomical Classification

Scientific Name	<i>Pyrus pashia</i>
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Rosales
Family	Rosaceae
Subfamily	Maloideae
Genus	<i>Pyrus</i>
Species	<i>P. pashia</i>

### 2.2 Local Name [9]

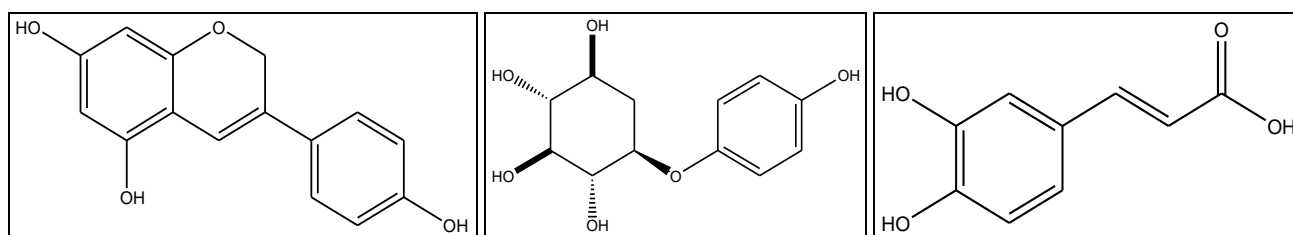
Table 2

Language	Synonyms	Language	Synonyms
Hindi	Mahal Mol, Kainath	Panjabi	Kainth, Shegal
Nepali	Passi, Mayal	Kashmiri	Tangi
Kumaoni	Mehal Mol	Urdu	Batangi

Table 3: Phytochemical compounds in Plant of *Pyrus pashia* Buch-Ham ex D. Don [12-13].

Type of Nucleus	Name of Compound	Part used
Sterols	$\beta$ - sitosterols, $\beta$ - sitosterol-3-D glucoside	Fruit
Phenolic glycoside	4-o-Z- coumaroyl arbutin and arbutin (hydroquinone- $\beta$ -D- glucopyranoside)	Flower
Alkaloids	Caffeic acid, and Genistein	Leaves and fruit
Triterpines	Lupeol	Fruit
Flavonoids	quercetin 3-o- $\beta$ -D-glucopyranoside phloridzin and kaempferol-3- $\beta$ -D-(6-o-cis-p- coumaroyl) glucopyranoside	Leaves

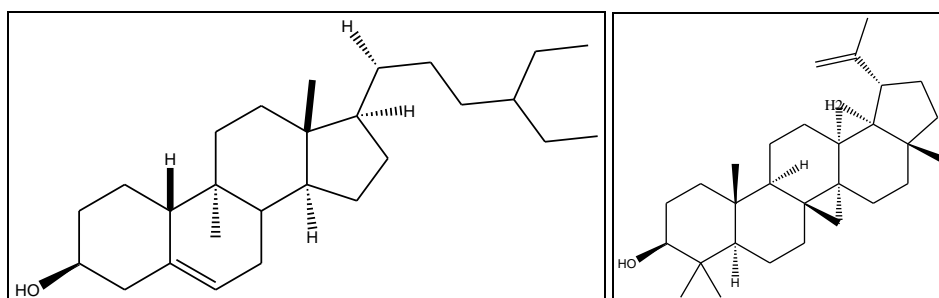
### 3.1 Chemical Structure of Compounds



Genistein

arbutin

caffeic acid



$\beta$  - sitosterols

Lupeol

#### 4. Pharmacological activity

**Table 4:** Pharmacological activity of Plant of *Pyrus pashia* Buch-Ham ex D. Don.

S. No.	Therapeutic activity	Plant part Used	Solvents	Author/ Year
1.	<i>In vivo</i> Anti inflammatory activity <sup>[14]</sup> .	Leaves	Methanol.	Singh A. <i>et al.</i> /2017
2.	Hepatoprotective <sup>[15]</sup> .	Areal parts	Aqueous.	Bawari M. <i>et al.</i> /2017
3.	Anti depressant activity <sup>[16]</sup> .	Leaves	Methanol.	Pandey N. <i>et al.</i> /2017
4.	Disinfectant <sup>[17]</sup> .	Leaves	Water.	Malik S.K. <i>et al</i> /2017
5.	<i>In- vivo</i> anti inflammatory activity <sup>[18]</sup> .	Fruit	Methanol.	Chandra S. <i>et al.</i> / 2016
6.	Spasmolytic, bronchodilator and vasoconstrictive activities <sup>[5]</sup> .	Fruit	aqueous ethanol.	Janbaz K.H. <i>et al.</i> /2015
7.	Antioxidant and anti proliferative <sup>[19]</sup> .	Fruit	Methanol & acetone.	Saini R. <i>et al.</i> /2012
8.	Antioxidant activity <sup>[2]</sup> .	Leaves	Chloroform.	Tsering J. <i>et al.</i> /2012
9.	Antimicrobial activity <sup>[20]</sup> .	Bark & fruit	Ethanol	Saklani S. <i>et al.</i> /2012

#### 5. General Uses of Plant *Pyrus pashia* Buch-Ham ex D. Don.

- The *Pyrus* Species contains of pectin which lower down the LDL, triglyceride and VLDL. Thereby reducing risk of high cholesterol.
- The leaves contain arbutin which decreased the melanin in the skin and act as a natural skin whitening agents.<sup>[21]</sup>
- Fruit juice is astringent and diuretic, manage dysentery, eye problems and anemia.
- Bark is used as astringent, laxative, anthelmintics, fever and in peptic ulcer, gastric ulcer and typhoid fever.
- Fresh leaves are used as astringent, febrifuge, laxative and sedative.
- Leaf extract is used as a tonic for hair loss.
- Fruits used for dehydration, digestive ailments.
- The plant has a no. of medicinal used, it is used in GI disorder, fever headache and sweating of body, hysteria and epilepsy <sup>[22]</sup>.
- Paste of young twigs and fresh leaves used for fungal infection of toe <sup>[23]</sup>.

#### 6. Conclusion and discussion

*Pyrus pashia* is a plant of choice for many health related disorders. There are many primary and secondary metabolites reported from this plant. The extract and phytoconstituents isolated from this plant has shown to produce different pharmacological activities, includes anti inflammatory, antioxidant and hepatoprotective effect. This review article have revealed given pharmacognostical and phytochemical information regarding the Indian wild pear that can help researchers to investigates more on account of its described important properties.

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