



E-ISSN: 2278-4136  
 P-ISSN: 2349-8234  
 JPP 2017; 6(6): 587-589  
 Received: 25-09-2017  
 Accepted: 27-10-2017

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## Study on medicinal uses of *Persicaria* and *Rumex* species of polygonaceae family

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### Abstract

Plants contain bioactive molecules and thus can provide lead structures for the development of alternative medicines to available toxic commercial drugs with better effectivity and increased safety. Flowering plants have always been a great source of biologically active compounds. Although a very small portion has been investigated, it has been found that only 9 species of flowering plants contain about 120 therapeutic lead molecules. Some of the useful plant drugs include Vinblastine, vincristine, taxol, podophyllotoxin, camptothecin, digitoxigenin, gitoxigenin, digoxigenin, tubocurarine, morphine, codeine, aspirin, atropine, pilocarpine, capscicine, allicin, curcumin, artemesinin and ephedrine are some of the important drug molecules that can be found from traditional medicinal plants. For this purpose, two important flowering species named *Persicaria* and *Rumex* from Polygonaceae family has been studied in this review paper to discover the potential therapeutical applications of them. It has been found that both of the species have various important medicinal uses and have been used for many years in different parts of the world.

**Keywords:** *Persicaria* Species, *Rumex* Species, Polygonaceae Family

### Introduction

The evolution of mankind has happened along with their surrounding herbs and medicinal plants from ancient period of time. Approximately 270,000 plant species have been discovered by human, while there is a possible of existence of close to 400,000 species in mother earth<sup>[1]</sup>. No synthetic substitute is currently available for about 121 major plant based drug molecules, comprising 45 from tropical and 76 from subtropical areas. Treatment of life threatening diseases like Cancer has been possible due to identification and isolation of important anticancer drug molecules from plant sources. This situation necessitates both developed and developing countries to intensify scientific research on medicinal plants and documenting data related to traditional medicines. A recent study by World Health Organization claimed 80% dependency of world population on ethnomedicines in some extent<sup>[2]</sup>. *Persicaria* species and *Rumex* species both are the members of Polygonaceae family, which have various important medicinal properties.

### Polygonaceae Family

The Polygonaceae commonly known as the knotwood or smartweed family, are a family of flowering plants and comprise about 1200 species containing 50 genera. Among which largest ones are *Eriogonum* (2410 species), *Rumex* (200 species), *Cocoloba* (120 species) and *Persicaria* (100 species) etc. This family is widely distributed in North Temperature Zone although can be found worldwide. Various medicinal uses have been attributed to this family, like for asthma, bronchitis, cough, diarrhea, dysentery, eczema, earache, inflammatory conditions, jaundice, kidney disease, leprosy, paralysis, toothache, ulcerative colitis, intestinal parasites and others<sup>[3]</sup>.

### *Persicaria* Species

Among the genres of Polygonaceae family, the species of *Persicaria* plays a vital role as alternative medicines, since they have been used for long time to treat colic pain, skin conditions such as scabies, boils, abscesses, ringworms, diuretic, inflammatory conditions like pain, knee pain, rheumatic pain, gout, menstrual pain and amenorrhoea, etc. They are also used as traditional medicines in conditions like diarrhea, dyspepsia, itchy skin and hemorrhoids. Various phytochemical constituents such as flavonoids, terpenoids, anthraquinones, apianen lactones have been found and isolated from *Persicaria* species. These active biochemical ingredients have enriched the species with anticancer, antioxidant, analgesic, antileukemic, antimicrobial and tyrosinase inhibiting properties<sup>[4]</sup>.

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Seeds of *Persicaria barbata* (L). seeds are called to possess antiemetic, purgative, stimulant properties and can be used to relieve colic pain. Shoots extracts can be used for washing ulcer wounds. The plant juice is used as anthelmintic, diuretic, carminative and also can be used for itchininess [5]. Infusion of *Persicaria orientalis* (L.) is a good tonic and can be used in ulcerative colitis and remedy of Fever [6].

*Persicaria hydropiper* L. can be called the most widely used plant which has huge array of medicinal uses. First of all, it has diuretic and tonic properties. The plant is used in different symptoms and chronic diseases like hepatomegaly, headache, intestinal parasites, toothache, gastric ulcer, dysentery, premature abortion, hemorrhage, stomach pain. The plant is known to have antipyretic, astringent, laxative, styptic, antibacterial properties. *Persicaria hydropiper* contains flavonoids and chalcones which show powerful antioxidant effects and can be used to reverse oxidative stress-causing pathologic conditions, for example arteriosclerosis and cancer [7]. Sesquiterpenes present in the plant exhibit important biological activities like aldose reductase inhibitory, antitumor and antifungal properties [8]. Study on this plant also reported tyrosine kinase inhibitory, analgesic, antimutagenic and oestrogenic effects. Investigation has proved that *Persicaria hydropiper* contains potent cytostatic compounds, including flavonoids and sesquiterpenes which has marked preferential antiproliferative properties on Hela cells [9].

#### Rumex Species

Rumex, a genus of polygonaceae family, is very prevalent worldwide. There are about 200 species of this genus, many of which are beneficial and used traditionally for medicinal purposes [10]. Root, seed, leaf, fresh plant juice, aerial parts etc. are the parts generally used.

Different species of rumex genus contain various types of pharmacological activities e.g. anti-inflammatory, antioxidant, cytotoxic, antifertility, antibacterial, purgative, anti-diarrhoeal, antifungal, antipyretic, antiviral activities [11-16].

Traditionally one species of rumex genus named Rumex abyssinicus, has been used for hypertension and pain relief. This plant also possesses antibacterial and diuretic properties [13].

Leaf, roots, stem etc. are the parts used of *Rumex hastatus* D. Don species. The methanolic extract of this species of rumex has many biological effects including antioxidant, antinociceptive, anti-diarrhoeal, and cytotoxic potential [17, 18]. Important chemical constituents of rumex include anthraquinones, naphthalenes, tannins, flavonoids, phenolic acids, stilbenoids, triterpenes, carotenoids, etc. *Rumex hymenosepalus* contains Leucodelphinidin and Leucopelargonidin which are antitumorous substituents. Neopodin, a substance found in *Rumex japonicas* has inhibitory effect of osteoclast [19].

*Rumex nepalensis* Spreng. is another species that is widely used for various actions like antifungal, antibacterial, purgative. This species has moderate cytotoxicity and high phytochemical activity [20].

*Rumex dentatus*, *Rumex acetosa*, *Rumex crispus*, *Rumex patientia* and *Rumex obtusifolius* are some of the plants highly used for various pharmacological actions [21].

#### Conclusion

From the above discussion it can be said that these genus (*Persicaria* and *rumex*) of Polygonaceae family has promising potential in terms of different therapeutic properties. Various species of them possesses many important bioactivities. They

can be studied more systemically for further uses

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