

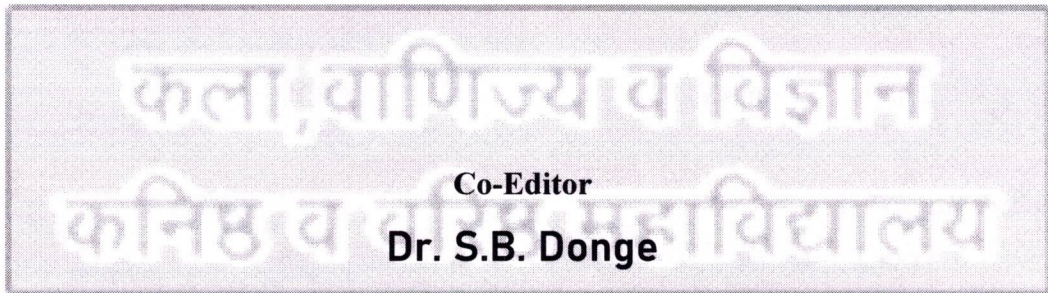
Trends in Commerce, Economics & Life Sciencess



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CONTENTS

Sr. No.	Content
01	Black Money and its Disastrous Influence on Indian Economy
02	Obstacles and the Importance of Commerce Education
03	To Study the Leaf Extract of Some Medicinal Wild Plants on Growth of Macrophomina Phaseolina (Tassigoid) Causing Root Rot Disease of Sarpagandha
04	A Review of New Challenges in Internet Banking and Its Benefit
05	Studies on Growth of Macrophomina phaseolina isolated from infected roots of Sarpagandha on Selected Media
06	Applications and Challenges of Nanotechnology
07	राष्ट्रीय शैक्षणिक धोरण-२०२०: उच्च शिक्षणाची दशा आणि दिशा
08	Studies on root rot of Rauwolfia serpentina L. Benth ex Kurz caused by Macrophomina Phaseolina (Tassi) Goid
09	डॉ.बाबासाहेब आंबेडकर यांचे कामगार विषयक विचार
10	Commerce Education: Challenges and Solutions
11	Studies on Rauwolfia tetraphylla Benth. Ex. Kurz. (Sarpagandha)

कला, वाणिज्य व विज्ञान
कनिष्ठ व वरिष्ठ महाविद्यालय

Studies on Rauwolfia tetraphylla Benth. Ex. Kurz. **(Sarpagandha)**

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Abstract: *Rauwolfia tetraphylla* Benth Ex Kurz. is an important medicinal plant. Root contains reserpine viz. used a drug, since pre- Vedic period in India. It is used for the treatment of snake bite, mental illness, and hypertension and reduces blood pressure. The present studies deals with the enormous different aspects of this plant in the areas i.e. morphology, chemical constituents, root yield, income and medicinal uses.

Key words – *Rauwolfia tetraphylla*, snake bite, reserpine.

Introduction:

Rauwolfia tetraphylla Benth Ex Kurz is commonly known as Sarpagandha, viz. an important medicinal plant. It is widely used as medicine both in the Modern Western Medical system and also in Ayurveda, Unani and Folk medicine. It helps to reduce blood pressure depresses activity of central nervous system and act as hypnotic. Hindus used this plant from centuries as a febrifuge and as an antidote to the bites of poisonous snakes. This plant generally grows in the region with annual rainfall 200-250 cm. and up to an altitude of 1000 m. The deep fertile soil rich in organic matter is favorable for the growth of this plant. Due to low seed germination, over exploitation and loss of habitat are the major causes of decline of this species from natural habit. It is found in India, Bangladesh, Bhutan, China, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Shrilanka, Thailand and Vietnam (Dey and De, 2010)

Common names of Sarpagandha in different languages:

Sanskrit:	Naqkuli, Chandrica, Chandramarah
Bengali:	Chandra
Hindi:	Chota-chand
Tamil:	Chivan-amalpodi, Covannamiloori
Kannada:	Sutranabhu, Patalagaruda, Sutranabhi
Oriya:	Dhannena or Dhan-barua
Gujrati:	Amelpodee
Telgu:	Phlalaganni or Phtala-gandi, Sarpagandhi
Malayalam:	Amalpori, Cuvanna Amalpori
Marathi:	Harkaya, Harki, Hadaki/Adakai, Chandra
Arunachal pradeash:	Bhungmaraja
Chinese:	Lu fu mu

Habitat:

It grows in India, Pakistan, Sri Lanka, Burma and Thailand. In India, it is widely distributed in the Himalayan tract from Punjab to Nepal and Bhutan. It is also found in

the lower hills of plains, Eastern and Western Ghats and Andaman. It is mostly found in moist deciduous forests altitudes ranging from sea level to an altitude of 1,200m high. In Deccan, it is associated with bamboo forest. It is also growing wildly in Kankan, Vidherbha and other region of Maharashtra. (Dey and De, 2010).



Fig 1: *Rauwolfia tetraphylla*

Morphology of the plant:

It is an evergreen, perennial and erect shrub. It grows up to a height of 60 cm. Its roots are tuberous with pale brown cork. Leaves are arranged in whorls of three, elliptical, lanceolate or obovate, bright green above, pale green below, tip acute or acuminate, base taper and slender. Petioles are long. Inflorescences are corymbs cymes. Flowers are many, white, often has violet colored tinge and irregular or zygomorphic. Pedicels are stout. Calyx is glabrous, bright red and apex lanceolate. Corolla is longer than calyx, tube slender, swollen a little above the middle, lobes elliptic and oblong. Disc is cup shaped. Drupes are slightly connate, obliquely ovoid, 0.5 to 0.7 cm across and purplish black in color. Santapu, (1956), Bhattacharyya and Sarkar, (1998). It has reported phyllotaxial morphotypes. It has been reported the revision of Rauwolfia (Apocynaceae) in Malaysia. It has diploid autological and ploidal leaf epidermal characters with emphasis to ecophysiological adaptability. Variation of chemo-botanical characters in the indigenous collection of this plant. (Kattel 1987, Hendrian, 1999, Baruah and Nath, 2000, Sethi et al, 1991).



Fig II: *Rauwolfia tetraphylla*

Chemical Constituents:

The major alkaloid present in root, stem and leaves of the plant is Reserpine. It is most important alkaloid. It varies from 1.7 to 3.0 %. The root barks has more than 90% of the total alkaloids in roots. Siddiqui and Shiddiqui,(1931, 1932, 1935,1939). The percentage of the alkaloids depends on the geographical places from where the plant is growing and also the season of collection (Wakhloo, 1963). Chemotypic studies of natural populations from certain areas of Karnataka, India (Mital et al, 1980). Generally samples from Assam have a high percentage of alkaloids (2.57%) than the other parts of country. December is the suitable month for the collection to obtain more percentage of alkaloids. There is no effect on the percentage of alkaloid content up to the age of four years. The minor alkaloids present in the plant are ajmalicine, ajmaline, isoajmaline, ajmalinine, chandrine, rauwolfinine, renoxidine, rescin-namine, reserpiline, reserpin, reserpinine, sarpagine, serpentine, serpentinine, tetraphyllicine, yohimbine, 3-epi-a-yohimbine. These alkaloids are identified from samples collected from India (Bose, 1954).



Fig. III: Roots of *Rauwolfia tetraphylla*

Root Yield and Income:

The root yield is varying from 15 to 25 of dry weight under irrigation depending upon soil fertility, crop stand and management. Some cultivators reported that the average dried root yield is 270 to 300 kg/ha and 8 to 10 kg/ha seeds. Sarpaghandha plants are collected from the forests for the purpose of pharmacology by a disappearing fast due to over exploitation and loss of habitat are the major causes of decline of this plant. Therefore this plant is reported as an endangered plant. (Dey and De, 2010).

Medicinal Uses:

Rauwolfia tetraphylla plant was first mentioned by Sushruta in 600 BC. This plant root has been used since the pre-Vedic period as a drug in India, known at that time as the Sarpaghandha root to treat against snake bites and fever. The root was used continuously during the subsequent vedic and ayurvedic periods. The plant is mentioned in ancient literature including the works of Charaka (1000-800 BC) where it was said to be used against snake bites and insect stings (Pandey, 1984). *Rauwolfia* can be regarded as a typical drug of Ayurvedic medicine. It belongs to a small group of plants. Deserving attention as a traditional medicinal plant since 300 years (Ruppert et al, 2005b). The ayurvedic preparations of *Rauwolfia tetraphylla* are Sarpaghandha ghanvati, Sarpaghandha yoga, Sarpaghandha churna and maheshvari vati, among others (Vaidya, 2006). Its roots are used as a valuable remedy for high blood pressure, insomnia anxiety, excitement, schizophrenia, insanity, epilepsy, hypochondria and other disorders of the central nervous system (Monachino, 1954, Kirtikar and Basu, 1993). Alkaloids of this plant have a great medicinal importance to treat cardiovascular diseases (Anitha and Kumari, 2006), high blood pressure (Vakil, 1955), hypertension (Von Poser et al, 1990), arrhythmia (Kirillova et al, 2001), mental disorders (Noce et al, 1954), Breast cancer (Stanford et al, 1986), human promyelocytic leukemia (Itoh et al, 2005) like diseases. The unani formulation, pitkriya capsule contains arsol (Shamsi et al, 2006). It acts as musk in wo-munawwim (sedative and hypnotic), (Diuretic), muskkin-e Asab (Nervine sedative) and mkhaddir (Anesthetic).

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