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A Review on Ayurvedic Bitter Herb-Kiratatikta (*Swertia chirayita* (Roxb) H. Karst)- A Plant of Immense Medicinal Value

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Abstract: ***Kiratatikta (Swertia chirayita (Roxb.) H. Karst.) is a herb with diverse medicinal properties. Name of the plant itself signifies that it is more of bitter taste and this bitterness is due to presence of different active principles like Amarogentin, Swertiamarin and Mangiferin etc. By these active principles it has shown pharmacological activities like Anticancer, and CNS depressant Antiviral activity. Kiratatikta is popularly known for its traditional uses in Jwara, Raktapitta, pidaka and many more. As this herb is now endangered species, another herb called Kalamegha (Androghaphis paniculata) which is having similar properties like Kiratatiktha is being used as substitute. Some authors mention it as adulterant.***
Keywords: Kiratatikta, Swertia chirata, Swertia chirayata, Bhunimba, Kalamegha, Bitter herb

I. INTRODUCTION

Kiratatiktha botanically identified as *Swertia chirayita* (Roxb.) H. Karst belongs to Gentianaceae family. In India, 40 species of *Swertia* are recorded [1]. *S. chirayita* was first described in 1814 by Roxburgh under the name of *Gentiana chyrayta*[2]. This ethnomedicinal herb is known mostly for its bitter taste caused by the presence of different chemical constituents such as amarogentin- most bitter compound isolated till date, swerchirin, swertiamarin, and other bioactive compounds that are directly associated with human health welfare[3]. Its widespread uses in traditional medicine have resulted in over-exploitation from the natural habitat and it is now on the verge of extinction in the wild. So now it is a critically endangered medicinal herb that grows at high altitudes in the sub-temperate regions of the Himalayas between 1200 and 2100 m altitudes from Kashmir to Bhutan [4]

The references about the plant Kiratatikta is found in brihatrayi especially in Ganas and some of therapeutic usage have been mentioned. We can see eloborated more description in many Nighantus. The herb Kiratatikta is popularly familiar with names like Bhunimba. The present article intend to review in detail about Kiratatikta mentioned in ayurvedic classics along with detailed information available in different sources.

II. GENERAL INFORMATION REGARDING KIRATATIKTHA MENTIONED GANAS OF DIFFERENT CLASSICS

Our preceptors classified the drugs based on pharmacodynamics and therapeutic value generally and also by their morphological features and properties. Kiratatikta (*Swertia chirayita* (Roxb.) H. Karst) classified under various such groups is enlisted below.

Table: 1 showing classification according to different Classics [5,6,7,8,9,10,11,12,13,14,15]

1.Charaka Samhita	Stanyashodhana Gana, Trushnanigraha gana, Tikta Skandha Dravyas
2.Sushruta Samhita	Aargvadhadi Gana
3.Ashtang Samgraham	Stanyashudhikarana Gana, Aargvadhadi Gana, Tikta Skandha Dravyas
4.Nighantu Aadarsh	Kiratadi Varga
5.Dhanvantari nighantu	Guduchyadi Varga
6.Bhavprakash nighantu	Haritakiyadi Varga
7.Kaidev nighantu	Aaushdhi Varga
8.Priya nighantu	Shatpushpadi Varga
9.Raj nighantu	Prabhadradi Varga

10.Madanpala nighantu	Abhayadi Varga
11.Shodhala nighantu	Guduchyadi Varga

III. NIRUKTI [16, 17, 18]

The nirukti of the drug –Kiratatikta (*Swertia chirayita* (Roxb.) H. Karst) mentions its taste is purely bitter and its habitat i.e, its available in 'Kirata desha'- which is North east part of India.

1) **'किराततिक्त'- किरातः भूनिम्बस्तदत् तिक्तः | वृक्षविशेषः॥(श.क.द्रु)**

चिराता इति भाषा | तत्पर्यायः | भूनिम्बः, अनार्यतिक्तः ||

2) **किराततिक्तो भूनिम्बोडनार्यतिक्तः - किरातदेशोडस्ति जन्मस्थानमस्य | किरातश्वासौ तिक्तश्च || (अ.को.)**

3) **किराततिक्त – किरातदेश उत्पतिस्थानत्वे नाख्यस्य अच् | (शब्दस्तोम-महानिधि)**

IV. SYNONYMS

Table: 2: Showing synonyms according to different authors. [8,9,10,11,12,13,14,15]

Sl. no	SYNONYMS	Sho. Ni	Dha.Ni	Pri. Ni	Kai. Ni	Ra.Ni	Bha. Ni	Ni. Aa	Ma. Ni
1	Kiratatikta	+	+	+	+	+	+	+	+
2	Kandtikta	+	+	-	+	-	+	+	-
3	Kirataka	+	+	-	+	-	+	+	+
4	Bhunimb	+	+	-	+	+	+	+	+
5	Naditikta	+	-	-	+	-	-	-	+
6	Shleshmaha	+	-	-	-	-	-	-	-
7	Ramsenaka	+	+	-	-	-	+	-	+
8	Shulapaha	+	-	-	-	-	-	-	-
9	Maladhvansi	+	-	-	-	-	-	-	-
10	Krumighno	+	-	-	-	-	-	-	-
11	Balakpriya	+	-	-	-	-	-	-	-
12	Naipal	+	+	-	-	-	+	-	+
13	Sannipatari	+	-	-	-	-	-	-	-
14	Anaryatikta	-	+	-	-	-	+	+	-
15	Kirato	-	+	-	-	-	-	-	+
16	Jvarantaka	-	+	-	-	-	+	-	+
17	Mahatikta	-	+	-	-	-	-	-	-
18	Tikta	-	+	-	-	-	-	-	-
19	Nidrari	-	+	-	-	-	-	-	+
20	Sannipataha	-	+	-	-	-	-	-	+
21	Kairat	-	-	+	-	-	+	-	-
22	Tiktakando	-	-	+	-	-	-	-	-
23	Atitiktaka	-	-	+	-	-	-	-	-
24	Haim	-	+	-	-	-	-	-	-
25	Haimstikta	-	-	-	+	-	-	-	-
26	Ramsena	-	-	-	+	-	-	+	-
27	Katruna	-	-	-	+	-	-	-	-
28	Kairataka	-	-	-	+	-	-	-	-
29	Naryatikta	-	-	-	+	-	-	-	-
30	Ardhatiktaka	-	-	-	+	-	+	-	+

31	Nepalnimba	-	-	-	-	+	-	-	-
32	Katutikta	-	-	-	-	-	+	-	-

V. VERNACULAR NAMES

Table: 3. Showing vernacular names: [19, 20, 21]

Arabic	Qasabuzzarirah
Bengali	Chireta, chirayita
Burmese	Sekhagi
English	Chiretta, chirata
Deccan	Charayatah
Persian	Nenilawandi
Canarese	Nelabevu
Gujarati	Chirayata, chirayita, kariyatu, kariyatun, chirayatah
Hindi	Charayatah, chirayita, nepal nim, chirayata
Oriya	Chireita
Kannada	Nelavebu, chirata kaddi, nelaveppu, kariyathu.
Kashmiri	Lose, chiraita
Assamese	Chirta
Malayalam	Nelaveppu, kirayathu, nilamakanjiram, uttarakiriyattu.
Marathi	Kiraita, kaduchiraita, chirayita.
Persian	Nenilawandi, qasabuzzarirah.
Punjabi	Chiretta, chiraita
Sanskrit	Kiratatikta, kirata, bhunimba, kirataka.
Patna	Cherayta
Tamil	Nilavembu, shirattakuchi, chirattakucchi
Telugu	Nelavemu, nilaveru, nilavembu
Urdu	Chiraita, chirayata
Nepal	Cherata

VI. TAXONOMICAL POSITION[22, 23]

Table no.4 Taxonomic position of Kiratatikta

KINGDOM	Plantae
DIVISION	Magnoliophyta
CLASS	Magnoliopsida
SUBCLASS	Asteridae
ORDER	Gentianales
FAMILY	Gentianaceae
GENUS	Swertia
SPECIES	Chirata

VII. HABITAT and HABIT[19]

1) Global: It is specially grown in Nepal and Bhutan.
2) India: Distributed in temperate Himalayas between 1200 – 3000 m altitude and in Khasi hills in Meghalaya, Arunachal Pradesh and northeast (1200-1500m) covering Himachal Pradesh,Uttaranchal, Uttarpradesh, Sikkim.
3) Habit
4) It is erect, branched, robust, annual herb.
5) Stem: 1m long and 6mm in diameter, glabrous, yellowish-brown to purplish, slightly quadrangular above and cylindrical below, large and continuous.
6) Leaves: opposite, cauline, broad at base, ovate or lanceolate, entire, acuminate, glabrous, usually with 5-7 prominent lateral veins, branching from axils of the leaves which ramify further into paniculate inflorescence.

7) Flowers: small, numerous, greenish yellow, tinged with purple, in profuse panicles, ovoid.
8) Fruit: a capsule with numerous, minute reticulated seed, 0.25- 0.55 mm long and 0.16- 0.45 mm broad irregularly ovoid. Seeds: many smooth, 0.5 mm, polyhedral. Flowering: July – October **Fruiting**: October – December

VIII. CHEMICAL CONSTITUENTS [19, 20]

Mangiferin, Swertiamarin, Swertianin, Chiratanin, Enicoflavine, Gentianine, Gentiocrucine, Chiratin, Amarogentin, Gentiopicrin, Cerolic, Oleic, Leucine, Arginine, Stearic acid,Glutamic acid, Chiratenol, Methionine, Kairatenol, Swertanone, Swertenol, Episwertenol, Ursolic acid, Teraxerol , B sitosterol

IX. RASA PANCHAKA[8,9,10,11,12,13,14,15]

The science of Ayurveda explains Pharmacodynamics of a drug in unique way i.e, in terms of Rasapanchaka i.e, Rasa, Guna, Veerya, Vipaka, Doshakarma. This description we find mainly in lexicons.

Table: 5- Showing Rasa panchaka of Kiratatikta according to different authors

Rasa Panchaka	Dha.Ni	Sho.Ni	Mad.Ni	Kai.Ni	Ra.Ni	Bha.Ni	Ni.Ad	Pri.Ni
GUNA								
LAGHU	+	-	+	+	-	+	+	-
RUKSHA	-	-	+	+	-	+	+	-
SARA	-	-	-	+	-	+	-	-
RASA								
TIKTA	+	-	+	+	+	+	+	+
VIRYA								
SHEETA	-	-	+	+	-	+	+	-
ANUSHNA SHEETA	+	+	-	-	-	-	-	-
VIPAKA								
KATU	-	-	-	-	-	+	-	-
DOSHAGNATA								
VATA ↑↑	-	-	+	+	+	-	+	-
KAPHA ↓↓	+	-	-	+	+	+	+	+
PITTA ↓↓	+	-	+	+	+	+	+	+
KARMA								
JWARAGHNA	+	+	+	+	+	+	+	+
RAKTASHODHAK	+	-	+	+	+	+	+	-
TRISHNA NIGRAHANA	+	-	-	+	+	+	+	-
KASA HARA	+	-	+	+	-	+	+	-
SHOPHAHARA	+	-	-	+	+	+	+	-
KRIMIGHNA	-	+	-	+	-	+	+	+
DAHASHAMAN	-	-	+	+	-	+	+	+
RUCHYA	-	-	-	+	-	-	-	-
SARAK	-	-	-	+	-	+	-	-
KUSHTHGHNA	-	-	-	+	+	+	+	+
KANDUGHNA	-	-	-	-	+	-	+	-
PATHYA	-	-	-	-	+	-	+	-
VRANSAMROPAN	-	-	-	-	+	+	+	+
YOGAVAHI	-	-	-	-	+	-	+	-

DISEASES INDICATED								
	Dh.Ni	Sho.Ni	Bha.Ni	Pri.Ni	Kai.Ni	M.Ni	R.Ni	Ni.ad
JWARA	+	+	+	+	+	+	+	+
TRUSHNA	+	-	+	-	+	-	+	+
KASA	+	-	+	-	+	+	-	+
SHOPHA	+	-	+	-	+	-	+	+
KRIMI ROGA	-	+	+	+	+	-	-	+
SHOOLA	-	+	-	-	-	-	-	+
KUSHTHA	-	-	+	+	+	-	+	+
VRANA	-	-	+	+	-	-	+	+
DAHA	-	-	+	+	+	+	-	+
SHVASA	-	-	+	-	+	+	-	+
MEHA	-	-	-	-	+	-	-	-
ARUCHI	-	-	-	-	+	-	-	-
KANDU	-	-	-	-	-	-	+	-

X. THERAPEUTIC USES [24]

1) Jwara: Hot infusion of Kiratatikta mixed with Dhanyaka leaves alleviates fever immediately. (Siddha.Bhaishajya manimala.4/32)
2) Grahani: Kiratadhya churna (Charaka chikitsa.15/137-140) Bhunimbadhya churna (Charaka chikitsa.15/132-133).
3) Oedema: Paste of Kiratatikta and Shunthi destroys oedema which is chronic and caused by three doshas. (Charak chikitsa.12/42)
4) For purifying breast milk: Decoction of Katuka, Guduchi, Saptaparna bark, Sunthi and Kiratatikta is administered. (Charaka chikitsa30/261-262)
5) Eruptive boils: Bhunimbadi kashaya.(Gada Nigraha.2/ 40-66)
6) Raktapitta (Intrinsic haemorrhage): Kiratatikta mixed with sandal is beneficial in the disease. (Charaka chikitsa.4/74-76)

XI. RESEARCH PROFILE

Amarogenin constituent has shown as Anticancer activity[25] and Antidiabetic activity [26]
Swertiamarin has proven for CNS depressant[27] and Anti diabetic activity[28]
Mangiferin has shown Antiviral activity[29].
S. chirayita extracts showed anti-hepatitis B virus (anti-HBV) activities[30]

XII. PARTS USED[20] And POSOLOGY[20]

Whole plant i.e. Panchanga
Posology:- Powder form: 1 – 3 gm Decoction: 20-30 ml.

XIII. CLASSICAL FORMULATIONS[31, 32, 33]

Table: 6. Showing vishista yogas of Kiratatikta

Sl.no	YOGAS	INDICATIONS	CLASSICAL REFFERANCE
1	Sudarshana churna	Jwara	Sha.Sa.Ch -6 Jwarachikitsa (26-36)
2	Kiratadi kwatha	Vata jwara	B.R. jwara chikitsa(75)

3	Maha tikta ghrit	Kushtha, Raktapitta, Arsha, Visarpa, Pandu, Hridroga, Kamala etc	B.R. kushtharogachikitsa (243-248)
4	Sarvajwarahar lauha	Plihavruddhi, Hridyagravruddhi, Yakruthvruddhi, Jeerna jwara etc	B.R.jwrachikitsa (1170-1174)
5	Jwarantak lauha	All types of jwara, Prameha, Grahani, Kamala, Pandu	B.R. jwarachikitsa (1193-1203)
6	Patrangasava	Shvetpradar, Raktapradar, Jwara, Shotha, Pandu, Mandagni etc	B.R. pradarchikitsa (122-126)
7	Mrutyunjaya rasa	Jwara, Asadhya roga	R.Y.S. Jwaradhikar (3162-3171)
8	Punarnavadi leha	Kamala, Pandu, Kasa, Shvasa, Halimaka, Shvayathu, Swarasada etc	R.Y.S Pandukamalachikitsa (820-829)
9	Raktapittantako rasa	Raktapitta, Rasayan	R.Y.S CH-karadi rasa (158-159)
10	Sarvajwarankusha Vati	All types of Jwara	R.Y.S SH-karadi rasa (1281-1285) B.R. Jwaradhikar
11	Kiratadi taila	Santat jwara, Satata Jwara, Dhatusthit jwara, Kamala, Grahani, Atisara etc	B.R.Jwarachikitsa (1357-1361)
12	Unmadbhanjano rasa	Unmad, Apasmar,Daruna Raktapitta, Karshya	R.Y.S Unmad adhikara (1686)
13	Shodashanga Churna	Sarva jwara	Vanspati chandrodaya Vol – 4
14	Kiratadi mandura	Pandu, Halimaka, Gulma, Prameha, Shotha, Kushtha, Shvitra etc	R.Y.S KA-karadi rasa (1159-1161)
15	Chaturbhadra kwatha	Vata jwara, Pitta jwara	B.R. Jwara chikitsa (269)

XIV. SUBSTITUTES[34] And ADULTERANTS[34]

A. Substitutes

1) Swertia purpurascens Wall.

2) S.decussata Nimmo ex Grah.

3) S.chinensis Franchet.
4) S.paniculata Wall.
5) S.perennis Linn.
6) S.lawii Burkill
7) S.affinis C. B. Clarke.
8) Exacum bicolor Roxb.
9) E.tetragonum Roxb.
10) Erythraea roxburghii G.Don.
11) Enicostemma littorale Blume.

B. Adultrants[34]
1) Swertia angustifolia Buch.Ham.ex D.Don
2) Swertia alata Royle ex.C.B.Clarke
3) Rubia cordifolia Linn
4) Andrographis panniculata Nees.

XV. CONCLUSION

Kiratatikta – a herb with bitter taste, it has got lot of medicinal values. *Swertia chirayata* is now considered as endangered species because of its extensive use. There are many species are taken substite for Kiratatikta, but popularly Kalamegha- (*Andrographis paniculata*) which is having similar properties is being used instead of Kiratikta. In ayurvedic classics the herb has been one of the key ingredient in many preparations used in Jwara, Raktapitta, Shotha etc even used in liver disorders.

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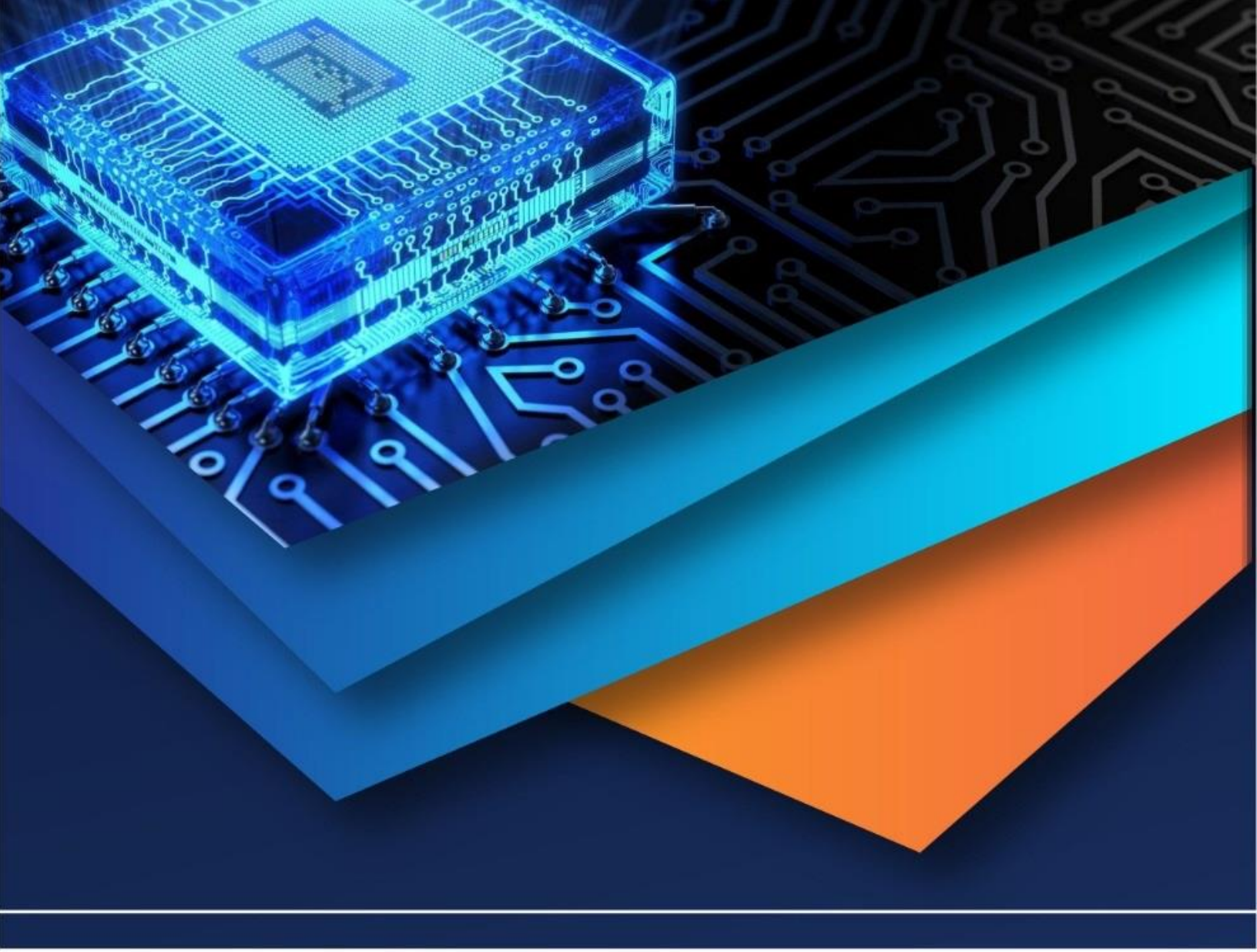
KIRATATIKTHA (*Swertia chirayita* (Roxb.) H. Karst) Images :



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