

## CHAPTER II: INVESTIGATION ON NOMENCLATURE OF *FAGOPYRUM DIBOTRYS* (D.DON) HARA AVAILABLE IN DARJEELING AND SIKKIM HIMALAYAS.

### **Introduction:**

Nomenclature study of the plant seems to be an important aspect of the plant identification. To justify the proper names of the species of *Fagopyrum* under consideration, the herbarium sheets deposited by various authors in Central National Herbarium were studied. It has been observed from the literature that a number of authors have utilized different name for the plant under study while some of the reports are available on the same plant having the same name but without any author citation. Moreover a number of information are available for the same plant having the same generic and specific epithets part but they differ in connection with the name of the author.

To avoid the confusion, it is felt necessary to go through the nomenclature investigation of this ethnomedicinal plant, which is known in Darjeeling and Sikkim Himalayas as *Fagopyrum dibotrys* (D. Don) Hara (Bhujel. 1996). This attempt of the study will be helpful for proper utilization of ethnomedicinal knowledge gathered from different communities.

### **Materials**

Specimens of *Fagopyrum dibotrys* (D. Don) Hara collected from different locality in Darjeeling district, West Bengal and Sikkim state, India.

## Methods

### i) Field study.

The area under study has been approached by number of conveyances available (i.e. bus, trucks, jeep, bicycle), though however major part of the exploration in the interior of the forest was covered on foot. Besides Government forest rest houses, Tea estate bungalows, Range Officers and Beat Officer's quaters have been selected as camping.

### ii) Herbarium Study.

Specimens of *Fagopyrum dibotrys* (D. Don) Hara collected during exploration after proper drying, poisoning and mounting on standard herbarium sheet (42 x 29 cm) have been scrutinized following the modern herbarium technique. The herbarium sheets of *Fagopyrum* species and *Polygonum* species that have been kept at the Central National Herbarium, Section, Botanical Survey of India, Howrah, West Bengal have been carefully and critically studied.

Different floras, monographs reversionary work published in different journals and publications have been consulted in the library of Botanical Survey of India, North Bengal University and Calcutta University. Special attention was given to compare the plant specimens collected from Darjeeling district; West Bengal and Sikkim State with those of preserved herbarium sheets available at the Central National Herbarium Section, Howrah.

## Results and Discussion

While searching the literature it has been found that in some books there were no proper author citation in connection with the name of the plants under study (Bamber, 1916; Tanaka 1976; Atkinson, 1980. Kiritikar and Basu, 1975; Gurcharan Singh and Kachroo, 1976). As a result difficulty arises as regards the understanding of the plant. This could be justified with the comment made by Subba (1982) in his book "Agriculture of Sikkim" mentioning the *Fagopyrum cymosum* as the cultivated plants. But during survey in the Sikkim Himalayas, it was found that the cultivated plants

were *Fagopyrum esculentum* Moench and *Fagopyrum tataricum* Gaertn. However, similar confusion was noted when Royle (1970) mentioned that "---- *Fagopyrum esculentum*, and *F tataricum*, cultivated in many part of Europe, and in the hmalayas with *P emarginatum*. The species of *Fagopyrum*, with the exception of *Fagopyrum trigulare*, are found in a cultivated state". He also stated in another instance that--- In the himalayas, *Fagopyrum esculentum* (*Phaphra* and *Kooltoo* of the natives) is also most commonly cultivated, but *F emarginatum* (*Ogla*) coming very near to the *Linean* specimens of *Fagopyrum tataricum* is preferred in higher and drier climates, as in *Kunawur*". It is very difficult to identify *Fagopyrum triangulare* and *F emarginatum* without author citation because the same names were used at different instances (Tanaka, 1976; Hooker, 1886).

From literature, it was noted that there were no proper author's citation in connection with the work on the isolation and characterization of natural products utilizing *Fagopyrum* species (Yao et al, 1989; Liang and Xiao, 1990; Liu et al 1981; Samaiya and Saxena, 1990; Takahashi and Tanaka, 1961; Tsuzuki and Yamamoto, 1989). Thus without proper nomenclature the chemical information about a plant still remains in vague.

The nomenclature of the plant under consideration is of controversy because the plant has been reported by the different Botanists and Chemists with different names at different times (Hooker, 1886; Liu et al, 1981; Liang et al, 1989; Imai and Furuya, 1951; Grierson and Long, 1983; Hara, 1966). During the investigation on nomenclature of the plant much emphasis was given on the consultation of various herbariums sheets related to the plant preserved in the Central National Herbarium Section (CNHS), Howrah, West Bengal. The plants collected and deposited by the different authors with different names are represented in the Table 7.

Table. 7: Representation of the names cited as well as details presented in the herbarium sheets by authors about *Fagopyrum cymosum* and *Fagopyrum dibotrys* (D. Don) Hara

Sl No.	Name cited by authors	Details contained in the herbarium sheets of Central National Herbarium, Howrah.
1	<i>Fagopyrum cymosum</i> Trev	Flora of Nepal . O Polunin , W R Sykes LH J Williams , Ex Herbario Musei Britannici , Herb Near Tarakot ,Bheri River ,Alti 10,000 ft Date 13/7 /1952.
2	<i>Fagopyrum dibotrys</i> ( D Don Hara	Uttar Pradesh, Ex Herb G King M B No 24
3	<i>Fagopyrum cymosum?</i> <i>F trigulare</i>	Coll G King , MB M lurl XIV 144 , Wall
4	<i>Fagopyrum dibotrys</i> ( D Don Hara Syn <i>Fagopyru</i> <i>cymosum</i> (Trev)Meissn	Sikkim , Lachung Valley , Loc Chubondon North of Chungthang ,PL. Rar III 63
5	<i>Fagopyrum cymosum</i> Meissn	Flora of Punjab, Herb.Hort. Bot Calcuttensi Calcutta National Herbarium No 376417,Localit Paugi
6	<i>Fagopyrum cymosum</i> Meissn	Flora of Bashahr ,( Pakistan ) North Wester Himalayas Calcutta National herbarium N 376422 Hab hr Dhuni Alt 9300 No 269 Dat 1 June 1980 , ex Herb J H Lace
7	<i>Fagopyrum cymosum</i> Meissn	Flora of Bhutan, Locality Paro, Altitude 2500m

		Date 19/8/1963. coll. And identified by N. Balakrishan
8	<i>Fagopyrum cymosum</i> Meissn	Hab Nepal . Marshandi River . Legitor Sasuk Nakao.
9	<i>Polygonum fagopyrum?</i>	Nepal Central National Herbarium No 376421 Ham
10	<i>Fagopyrum cymosum</i> Meissn	Same as above
11	<i>Fagopyrum cymosum</i> Meissn	North West Yunnan . China Coll Dr Aug Henry's collection from 1885-1888. Herb sheet No 7688
12	<i>Fagopyrum cymosum</i> Meissn ?	West Shanghai. 1861 . Herb A C Maingaj. MD Herb Sheet No 431 Coll: A C M
13	<i>Fagopyrum cymosum</i>	Dr K Biswas . East Himalaya Place Gangtok. Date 20/10/1952 Altitude 5500ft
14	<i>Polygonum corymbosa</i> = <i>cymosum</i>	Himalayan Herbarium .R Strachey and J. Winterbottom

The specimens which have been collected from the Darjeeling and Sikkim Himalaya have been observed to be similar in all characters. with most of the herbarium specimens of wild species of *Fagopyrum* kept in the Central National Herbarium Section, Howrah, West Bengal. Thus all the specimens excepting *Polygonum fagopyrum* represented in the Table 7 may be considered synonymous with the specimens under study. From literature it has been observed that *Polygonum fagopyrum* L is the synonym of *Fagopyrum esculentum* Moench but the specimen of *Polygonum fagopyrum* kept in the CNHS (Table 7) did not show the authors name. Similarly other specimens were also without the name of the author.

According to the International rule of Botanical Nomenclature, the name of the authors is essential though it is not a part of the name of the plant. To differentiate them, it is customary to indicate the scientific name of the plant by means of an italic typeface. The authors name and date of publication are provided for the purpose of precision and to identify a particular plant name with the description of that plant as published by the author. For the indication of the name ( unitary ,binary or tenary ) of a group to be accurate and complete , and in order the date may be readily verified . It is, therefore, necessary to cite the author who first published the name.

From Table 7 it also appears that *Fagopyrum cymosum* Meissn was written in most of the specimens by the taxonomists but their author citation were not proper. The name of *Fagopyrum cymosum* Meissn was adopted from the nomenclature *Polygonum cymosum* Treviranus (Del Sem Hort. Vrat (1824) nom nud). Thus the correct author citation of the plant should be *Fagopyrum cymosum* (Trev) Meissn as written in Wall PA Asia .Rar .3: 63, 1832 – Fl Brit .Ind 5:55,1886; Fl As 4: 22, 1940; Kitam. In F & Fl NEP Him 115 1955; Vautier in Candollea 15: 226, 1956.

Other published names such as *Polygonum triangulare* (Wall Cat, 1689), *Polygonum acutatum* (Lehm Cat Seem Ort Ham, 1820), *Polygonum emarginatum* (Wall Cat, 1688), *Polygonum voluble* (Tuvea in Bull Soc Imp Nat. Mosq 1840 .77) *Polygonum rogosum* (Herb Ham) are found as

synonyms of *Fagopyrum cymosum* (Trev) Meissn. But in response to the ICBN, the validity has not been given to the nomen nuda, because of that, the priority has been given to valid names which was published after 1 May 1753. So, the nomen nuda have no validity.

After searching the literature, there was Latin diagnosis on *Polygonum dibotrys* by D. Don in Prodr. Fl. Nep. 73, 1825, and which was worked out by Hara to establish its valid name as *Fagopyrum dibotrys* (D. Don) Hara 1:69, 1966; 2:22, 1971; Bhutan, 176, 1973; Murata in Acta Phyt. Geobot. 26: 86, 1974; FPK 86, 1981; EFPN 3:174, 1982; Fl. Bhutan 1(1):171, 1983; Chowdhury and Wadhwa in Fl. Himachal Pradesh 2:609, 1984.

Thus the valid name of the plant under study is *Fagopyrum dibotrys* (D. Don) Hara and this is similar to the observation made by Basu (1997). It is interesting to note that specimen bearing the same valid name is also present in the Central National Herbarium Section, Howrah, West Bengal (Table 7) found in mix with other specimens which were treated as synonyms of *Fagopyrum dibotrys* (D. Don) Hara.

Without proper author citation of the plant nomenclature misguided the Chemists also. During the phytochemical reviews of this plant, it was found that there was no proper author citation after the isolation, characterization and identification. Yao et al., (1989) isolated some of the anti-tumour constituents from the rhizomes of *Fagopyrum cymosum* such as (-) epicatechin, 3-galloyl-(-) epicatechin, procyanidine and 3, 3'-digalloylprocyanidine and 3, 3'-digalloylprocyanidin. Similarly, chlorogenic acid, caffeic acid and ferulic acid isolated from *Fagopyrum cymosum* M. Hence, the plant is of controversy which has been named with the different names by the different Botanists and Chemists (Hooker, 1886; Liu et al., 1981; Liang et al., 1989; Imai and Furuya, 1951; Grierson and Long, 1983; Hara, 1966). Here, this work performed with the help of herbarium sheets observation as well as with the reference to the recent edition of the International Code of Botanical Nomenclature. Tokyo, and shown in the

Table 7 about the collected plants as deposited by the different taxonomists with naming different names.

*Fagopyrum triangulare* (Meissn l .l.c), *Fagopyrum emarginatum*, var *kunawarensis* (Meissn in D C l. c 143), *Fagopyrum cymosum* (Trev) Meissn (Hooker, 1886) *Fagopyrum dibotrys* (D Don) Hara (Hara, 1966; Grierson and Long, 1983) were the plant names used by the different taxonomists in their literature. It is true that some of the plant of genus *Polygonum* has been changed to *Fagopyrum* on the certain characters. even then , the use of both *Fagopyrum cymosum* ( Trev ) Meissn and *Fagopyrum dibotrys* ( D Don ) Hara that have been observed even in the recent works ( Liu et al , 1983 ; Basu, 1997; Pradhan and Basu 1998 ; Liang et al , 1989 ; Liu et al , 1981 ; Ma et al , 1989 ) make a confusion and this investigation would be of helpful for the proper use of ethnomedicine. *Fagopyrum dibotrys* ( D. Don ) Hara of Darjeeling and Sikkim.

**Summary:**

The herbarium sheets deposited by the different authors were examined at Central National Herbarium Section.

The names, which were given by original authors, were enumerated with other information, which were present in the herbarium sheets.

Different literatures were collected for the search valid name for this plant and found that *Fagopyrum dibotrys* (D.Don) Hara is the valid name for this plant.