Diversity of the Family Leguminosae in Koch Bihar District, West Bengal

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ABSTRACT

Introduction: Legume - a fascinating group of flowering plants belongs to the family Leguminosae or Fabaceae is deserve special attention as they play vital role both in human welfare as well as in ecological aspect. The district of Koch Bihar of West Bengal state has no account about the diversity of leguminous plants and their utilization by the ethnic and local peoples which initiates to undertake the present work.

Methods: Extensive field surveys in different parts of Koch Bihar in different seasons of five consecutive years were conducted to record the legumes of the district and their uses following the standard methods. Voucher specimens were processed and identified by using relevant literature and matching with herbarium specimens.

Result and Discussion: It is evident from the present study that the legumes of Koch Bihar district are represented by 81 species under 36 genera with Desmodium as dominant genus having 9 species. Maximum number of species have been recorded in the subfamily Faboideae (47 species) followed by Caesalpinioideae (18 species) and Mimosoideae (16 species). Among the 81 species of legumes there are 29 species of herbs, 28 species of trees, 16 species of shrubs and 8 species of climbers. It is interesting to note that a good number of legumes are exotic in origin and American elements are more dominant among the alien species. During the field study utilization of legume by the major ethnic communities (viz. Kheria, Oraon, Rabha, Rajbanshi, and Santal) and the local inhabitants of the district have also been recorded. It reveals that 31 species under 24 genera which is about 38% of the legume flora of the district are used in various purposes and several species have more than one kind of use.

Conclusions: Destruction of the habitat and the anthropogenic interferences are identified as the basic causes for the loss of diversity of legumes of the district. Similarly, acculturation is the reason for extinction of traditional knowledge regarding herbal therapy.

Key Words: Mimosoideae, Caesalpinioideae, Faboideae, Ethnic community, Traditional knowledge

INTRODUCTION

The family Leguminosae (Fabaceae) commonly known as legume or bean family is the third largest family among the flowering plants which is represented by 19,500 species under 770 genera and is cosmopolitan in distribution. Human society is benefited by this group of plants as they are not only the source of pulses, fodder, oil seeds, medicines, timber etc but they also increase soil fertility by fixing atmospheric Nitrogen. This family is traditionally divided into three sub-families namely Mimosoideae, Caesalpinioideae and Faboideae (=Papilionoideae). Hutchinso2 had recognized these three sub-families as independent families-Mimosaceae, Caesalpiniaceae and Fabaceae. This view was followed by Cronquist1, Dahlgren4 and others. But the present trend is to consider the above stated three sub-families under broadly circumscribed Leguminosae or Fabaceae. Morphological characters as well as rbcL sequence data support this view5. Takhtajan6, Thorne7 and APGIV8 also recognized the similar treatment. Recently the Legume Phylogeny Working Group9 based on plastid matK gene sequences subdivided Leguminosae into six subfamilies namely Caecalpinioideae (recircumscribed), Cercidoideae, Detarioideae, Dialioideae, Duparquetioideae and Papilionoideae.

Koch Bihar- a district of North eastern part of the state of West Bengal is floristically rich. Though a number of stray publications are existing regarding the flora of the Koch Bihar like Aditya and Ghosh10, Bandyopadhyay11, Bandyopadhyay and Mukherjee12,13,14, Banerjee15 but none of them

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reflect the diversity of leguminous plants of the district. The present work is therefore, undertaken to record the species diversity of the legumes of Koch Bihar district of West Bengal. Not only that an endeavor has also been made to record the local uses of such leguminous plants by the local ethnic and rural peoples of the district which will be helpful to preserve the indigenous knowledge of the ethnic communities of the district.

The district of Koch Bihar is situated under Jalpaiguri division of the state of West Bengal in between 26° 32' 46" to 25° 57' 57" N latitude and 89° 52' 00" to 88° 45' 02" E longitude and covering an area of 3,386 sq Km. The district is surrounded by Alipurduar district of West Bengal in northern and most part of Western side. The Southern boundary of the district is very much indented and is formed by the Rangpur district of Bangladesh. The eastern boundary is formed by the Goalpara district of Assam. The entire district is intersected by six river systems, namely Tista system, Jaldhaka system, Torsha system, Kalzani system, Raidak system and Gadadhar system. The soil of Koch Bihar district is alluvial type of rather recent origin and is mainly sandy loam type. The climate of the district is characterized by high humid atmosphere and abundant rain with the temperature being seldom excessive. The district receives an average rainfall of 320.1 cm. Rajbanshi is the major ethnic community which constitute about 40% population of the district. The other ethnic groups are Kheria, Oraon, Rabha and Santal. Most of them are village dwellers and depend on plant and plant products to maintain their life and livelihood.

**MATERIALS AND METHODS**

The present work is based on screening of herbarium specimens deposited at Central National Herbarium, Howrah and extensive survey conducted in different areas of Koch Bihar district in different seasons of five consecutive years. Plant specimens were collected from the field and preserved following the guidelines of Lawrence16 and Jain & Rao17. Local uses of the plants and vernacular names (if any) were procured from the ethnic medicine men and elderly knowledgeable persons of the villages through interview. The information was collected following Jain18, 19, 20 and Pal & Jain21 with some minor changes wherever required. Correct identity and updated nomenclature of the collected plant specimens were established with the help of published literature and also comparing with the authentic herbarium specimens of Central National Herbarium (CAL).

**RESULTS**

Species diversity in the three sub-families of Leguminosae viz Faboideae (=Papilionoideae), Caesalpinioideae and Mimosoideae are presented in table 1, 2 and 3 respectively. Updated nomenclature of each species along with vernacular name (if any), habit, flowering and fructing periods and their distributional status have been provided in these tables. Uses of plants by the ethnic communities and rural peoples have also been provided in the column ethno botanical uses. The following abbreviations are used in the table:

- rt.-root
- tw.-twig
- lf.-leaf
- fl.-flower
- fr.-fruit
- sd.-seed
- wd.-wood
- pl.-plant
- st. bk. - stem bark

| Name of the species                  | Habit (2) | Flowering & fructing period(3) | Status (4)     | Specimen examined (5) | Ethnobotanical uses                                      |
|--------------------------------------|-----------|---------------------------------|----------------|-----------------------|---------------------------------------------------------|
| Abrus precatorius (Linn. (Kunch–Beng.; Kawet–Sant.).) | Twinner   | Aug.–June.                      | Less Common    | Patlakhawa forest, SB – 3794. | Leucorrhoea (rt.), sore throat (Lf.), colic (Lf.), rheumatic pain (Lf. &fr.) |
| Aeschynomene aspera (Linn. (Shola – Beng.).) | Shrub,    | Aug. – Dec.                     | Common         | Folimari, SB – 3748   |                                                        |
| Aeschynomene indica (Linn.) | Under shrub, | July -Oct.                      | Common         | Setai, SB –3012.      |                                                        |
| Alysicarpus monilifer (Linn.) DC. | Herb      | Sept.–Mar.                      | Less common    | Pundibari, SB – 3537  |                                                        |
| Alysicarpus vaginalis (Linn.) DC. | Herb      | Sept.–March.                    | Less common    | Dewanhat, SB – 3759.  |                                                        |
| Butea monosperma (Lam.) Taub. (Palash – Beng./Sant.) | Tree      | Mar. – May.                     | Less common    | Atiamochar forest, SB – 3372. | Abdominal pain due to worm(Lf.),menorrhagia(Lf, fl bud),edible(fl. bud),dye(fl.) |
Table 1: (Continued)

| Name of the species                     | Habit        | Flowering & fruiting period | Status          | Specimen examined | Ethnobotanical uses                                      |
|----------------------------------------|--------------|-----------------------------|-----------------|-------------------|----------------------------------------------------------|
| *Cajanus cajan* (Linn.) Millsp.        | Shrub        | Nov.– Mar.                  | Commonly cultivated | Sonapur, SB – 3547 | Jaundice (lf.), septic wounds of cattle (lf.); edible(sd.) |
| *Cajanus scarabaeoides* (Linn.) du Petit Thouars | Climber | Sept.– Feb.                  | Less common      | Atiamochar, SB – 3407. |
| *Clitoria ternatea* Linn. (Aparajita – Beng.) | Twiner | More or less throughout the year. | Cultivated in gardens, often found as an escape | Balarampur, SB – 3628. |
| *Crotalaria albida* Heyne ex Roth.     | Herb or under-shrub | Aug.– Apr.                  | Less common      | Atiamochar forest, SB – 3820. |
| *Crotalaria bialata* Schrank.          | Herb or under-Shrub | Aug.– Dec.                  | Less common      | Patlakhawa, SB – 3808. |
| *Crotalaria micans* Link.              | Shrub or under-shrub | Sept.– Jan.                 | Less common      | Megipur, SB – 3053. | Shade plant of tea nursery |
| *Crotalaria pallida* Ait.              | Under shrub  | Jul.– Jan.                  | Common           | Jamalda, SB – 2914. |
| *Crotalaria prostrata* Rottler         | Herb         | Sept.–Dec.                  | Less common      | Saulmari, SB – 3777. |
| *Crotalaria spectabilis* Roth          | Under-shrub  | Nov.– Mar.                  | Commonly planted | Kochbihar, SB – 3510. |
| *Dalbergia sissoo* Roxb. ex DC. (Sissoo – Beng.) | Tree | Mar.– Nov.                  | Common           | Atiamochar, SB–3371; Kochbihar, SB – 3905 | Fodder (young tw); agricultural tools & household articles(wd) |
| 1                                      | Under-shrub  | Jul.– Feb.                  | Common           | Baneswar, SB – 3521. | Catarrhal fever (lf.), swollen glands (lf.). |
| *Desmodium gangeticum* (Linn.) DC.(Salpani–Beng.) | Shrub | Sept.– Feb.                  | Common           | Atiamochar forest, SB – 3402. |
| *Desmodium gyroides* (Roxb. ex Link.) DC. | Shrub | Sept.– Feb.                  | Common           | Kochbihar, SB – 3848. |
| *Desmodium heterocarpon* (Linn.) DC.   | Under-shrub  | Oct.– Feb.                  | Common           | Kochbihar, SB – 3848. |
| *Desmodium heterophyllum* (Willdl.) DC. | Herb         | Sept.– Feb.                  | Rare             | Atiamochar forest, SB – 3131. |
| *Desmodium laxiflorum* DC.             | Under-shrub  | Aug.– Jan.                  | Common           | Kochbihar, SB – 3457. |
| *Desmodium motorium* (Houtt.) Merr.    | Under-shrub  | Aug.– Jan.                  | Less common      | Atiamochar, SB – 3840. |
| *Desmodium pulchellum* (Linn.) Benth.  | Shrub        | Sept.– Feb.                  | Less common      | Patlakhawa forest, SB – 3551. |
| Name of the species                                                                 | Habit       | Flowering & fruiting period | Status       | Specimen examined                  | Ethnobotanical uses                                                                 |
|------------------------------------------------------------------------------------|-------------|-----------------------------|--------------|------------------------------------|-------------------------------------------------------------------------------------|
| **Desmodium triflorum** (Linn.) DC. (Kurali –Rj.).                                | Herb        | Aug – Feb.                  | very common  | Atiamochar, SB –396; Gossanmari, SB – 3329. | Dental carries (tw.), boil & septic wounds(pl.)                                      |
| **Desmodium triquetrum** (Linn.) DC.                                               | Under-shrub | Aug.– Jan.                  | Less common  | Atiamochar forest, SB – 3824.       |                                                                                     |
| **Desmodium triquetrum** (Linn.) DC. ssp. pseudotriquetrum (DC.) Prain             | Under-shrub | Sept. – Feb.                | Less common  | Atiamochar forest, SB – 3841.       |                                                                                     |
| **Erythrina stricta** Roxb.                                                        | Tree        | Mar. – Jun.                 | Common       | Atiamochar, SB – 3386              |                                                                                     |
| **Erythrina variegata** Linn.                                                       | Tree        | Mar. – Jul.                 | Less common  | Tufanganj, SB – 3572.               |                                                                                     |
| **Flemingia macrophylla** (Willd.) Kuntze ex Merr.                                 | Shrub       | Nov. – Mar.                 | Less common  | Patlakhawa forest, SB – 3389.       |                                                                                     |
| **Flemingia strobilifera** (Linn.) Ait. And Ait. f.                                | Shrub       | Dec. – Mar.                 | Less common  | Patlakhawa forest, SB – 3558.       |                                                                                     |
| **Indigofera linifolia** (Linn.f.) Retz.                                            | Herb        | Jul – Oct.                  | Less common  | Haldibari, SB – 3652.               |                                                                                     |
| **Indigofera zollingeriana** Miq.                                                   | Tree        | Jul. – Nov.                 | Less common  | Saulmari, SB – 3775.                | Shade plant of tree garden                                                            |
| **Lathyrus aphaca** Linn.                                                           | Herb        | Dec. – Mar.                 | Less common  | Kochbihar, SB – 3398.               |                                                                                     |
| **Lathyrus sativus** Linn                                                           | Herb        | Nov. – Feb.                 | Common, cultivated | Takuamari, SB – 3468.             |                                                                                     |
| **Lens culinaris** Medik                                                           | Herb        | Nov. – Mar.                 | Common, cultivated | .Ghughumari, SB – 3862             |                                                                                     |
| **Medicago lupulina** Linn.                                                         | Herb        | Jan. – Mar.                 | Common       | Kochbihar, SB – 3898.               |                                                                                     |
| **Melilotus alba** Medik. ex Desr.                                                  | Herb        | Jan. – Apr.                 | Less common  | Ghughumari, SB – 3858.              | Edible (tw.)                                                                         |
| **Melilotus indica** All.                                                           | Herb        | Jan. – Mar.                 | Common       | Atiamochar, SB – 3886.              | Edible (tw.)                                                                         |
| **Mucuna pruriens** (Linn.) DC. (Alkushi-Beng.)                                    | Climber     | Oct.–May.                   | Less common  | Nagurhat, SB – 3617.               | Aphrodisiac(sd.)                                                                    |
| **Pueraria phaseoloides** (Roxb.) Benth. var. subspicata (Benth.) van der Maesen   | Climber     | Sept.– Dec.                 | Less Common  | Atiamochar forest,SB– 3438; Nagurhat, Mukherjee, 4657. |                                                                                     |
| **Sesbania grandiflora** Pers.(Bokphul-Beng.)                                       | Tree        | Jun – Oct.                  | Less common  | Gitaldaha, SB – 3728.               | Dysmenorrhoea(fl.), epilepsy(lf.) ; edible(fl.)                                      |
### Table 1: (Continued)

| Name of the species | Habit   | Flowering & fruiting period | Status    | Specimen examined | Ethnobotanical uses                  |
|---------------------|---------|-----------------------------|-----------|-------------------|--------------------------------------|
| *Bauhinia acuminata* | Shrub   | Apr.– Sept.                 | Less common | Kochbihar, SB – 3306. |                                      |
| *Bauhinia purpurea*  | Tree    | Sept. – Feb.                | Less common | Dinhata, SB – 3703. | Edible(fl.)                          |
| *Bauhinia variegata* | Tree    | Mar.– Feb.                  | Less common | Tufanganj, SB – 3566. |                                      |
| *Caesalpinia bonduc* | Scrambler | Aug. – Apr.               | Common     | Jamalda forest, SB – 2975. | Quick detachment of placenta(Rt.), Vertigo(sd.), burning sensation of body(sd.) |
| *Caesalpinia cucullata* | Scrambler | Dec. – Mar.                | Less common | Ucchalpukri forest, SB – 3495. | Sprain (Rt.)                          |
| *Caesalpinia pulcher-rima* | Shrub   | Almost the year            | Less common | Dinhata, SB – 3711 |                                      |
| *Cassia fistula*     | Tree    | Apr. – Jul.                 | Common     | Mathabhanga, SB – 3097; Tufangunj, SB – 3567. | Swelling of neck of cattle (fr.); Edible (fl.&sd.) |
| *Cassia glauca*      | Tree    | Apr.–Jun.                  | Less common | Kochbihar, SB – 3334. |                                      |
| *Delonix regia*      | Tree    | Apr.– Jun.                 | Common     | Nagurhat, SB 3612; Kochbihar, SB – 3904. |                                      |

### Table 2: Species diversity in the sub-family Caesalpinioideae

| Name of the species | Habit   | Flowering & fruiting period | Status    | Specimen examined | Ethnobotanical uses                  |
|---------------------|---------|-----------------------------|-----------|-------------------|--------------------------------------|
| *Bauhinia acuminata* | Shrub   | Apr.– Sept.                 | Less common | Kochbihar, SB – 3306. |                                      |
| *Bauhinia purpurea*  | Tree    | Sept. – Feb.                | Less common | Dinhata, SB – 3703. | Edible(fl.)                          |
| *Bauhinia variegata* | Tree    | Mar.– Feb.                  | Less common | Tufanganj, SB – 3566. |                                      |
| *Caesalpinia bonduc* | Scrambler | Aug. – Apr.               | Common     | Jamalda forest, SB – 2975. | Quick detachment of placenta(Rt.), Vertigo(sd.), burning sensation of body(sd.) |
| *Caesalpinia cucullata* | Scrambler | Dec. – Mar.                | Less common | Ucchalpukri forest, SB – 3495. | Sprain (Rt.)                          |
| *Caesalpinia pulcher-rima* | Shrub   | Almost the year            | Less common | Dinhata, SB – 3711 |                                      |
| *Cassia fistula*     | Tree    | Apr. – Jul.                 | Common     | Mathabhanga, SB – 3097; Tufangunj, SB – 3567. | Swelling of neck of cattle (fr.); Edible (fl.&sd.) |
| *Cassia glauca*      | Tree    | Apr.–Jun.                  | Less common | Kochbihar, SB – 3334. |                                      |
| *Delonix regia*      | Tree    | Apr.– Jun.                 | Common     | Nagurhat, SB 3612; Kochbihar, SB – 3904. |                                      |
### Table 2: (Continued)

| Name of the species (1) | Habit (2) | Flowering & fruiting period (3) | Status (4) | Specimen examined (5) | Ethnobotanical uses (6) |
|-------------------------|-----------|---------------------------------|------------|-----------------------|------------------------|
| *Peltophorum pterocarpum* (DC.) Baker ex. K. Hyne | Tree | Apr. –Nov. | Common | Kochbihar, SB – 3651. | Dyspepsia(st.bk.), promote conception(st.bk), prevent miscarriage(fl.bud) |
| *Saraca asoca* (Roxb.) de Wilde | Tree | Mar. –Sept. | Less Common, Cult. | Kochbihar, SB – 3573. | Itching(lf.) |
| *Senna alata* (Linn.) Roxb. (Barachakar– Khe.). | Shrub | Jul. – Nov. | Less Common | Atiamochar village, SB – 3126. | |
| 1 | | 3 | 4 | 5 | Dewanhat, SB – 3760. |
| *Senna auriculata* (Linn.) Roxb. | Shrub | May – Dec. | Rare | | 6 |
| *Senna occidentalis* (Linn.) Link. | Under-shrub | Apr. – Sept; often almost the year. | Common | Jamalda, SB– 2928; Nababgunjbalasi, SB – 3281. | Fever(rt.); menorrhagia(rt.); keep off evil spirit(rt.) |
| *Senna siamea* (Lam.) Irwin and Braneby | Tree | Mar. – Nov. | Common | Kochbihar, SB – 3768. | |
| *Senna sophera* (Linn.) Roxb. (Kalkasundar – Beng.; Chakunde – Rj.) | Under-shrub | May – Nov. | Very Common | Jamalda, SB– 2908; Mathabhanga, SB-3096. | Croup (lf.); edible(lf.) |
| *Senna tora* (Linn.) Roxb. (Chakunda –Beng.) | Herb | Jul – Dec. | Very Common | Gitaldaha, SB – 3732. | Edible (lf.& fl.) |
| *Tamarindus indica* Linn. (Tentul – Beng.; Imilidaru – Sant.). | Tree | Apr. – Feb. | Common | Takuamari, SB – 3608. | Dyspepsia (lf.); emetic (fr.); edible (lf &fr.) |

### Table 3: Species diversity in the sub-family Mimosoideae

| Name of the species (1) | Habit (2) | Flowering & fruiting period (3) | Status (4) | Specimen examined (5) | Ethnobotanical uses (6) |
|-------------------------|-----------|---------------------------------|------------|-----------------------|------------------------|
| *Acacia auriculiformis* A. Cunn. exBenth. | Tree | Almost the year. | Common | Maruganj, SB – 3305. | |
| *Acacia catechu* (Linn. f.) Willd. f. (Khair – Beng.). | Tree | Aug. – Dec. | Common | Jamalda forest, SB – 2912. | Fodder(lf.); dye(gum); household article (wd.) |
| *Acacia farnesiana* (Linn.) Willd | Tree | Feb. to Jun. | Less Common | Patlakhawa, SB – 3559 | |
| *Acacia nilotica* (Linn.) Delile, ssp. *cupressiformis* (J. L. Stewart) Ali and Faruqui(Babla – Beng.). | Tree | Aug. – Apr. | Common | Bamanhat, SB – 3752. | Adhesive(gum) |
| *Acacia pennata* (Linn.) Willd | Shrub or small tree | Jun. – Dec. | Less Common | Haldibari, SB – 3663. | |
| *Acacia sinuata* (Lour.) Merr. | Shrub | Apr.-Dec | Less Common | Patlakhawa forest,Banerjee-15299 | |
| *Albizia chinensis* (Osb.) Merr. (Tollisiris – Beng.) | Tree | Apr. –Jan. | Less Common | Ucchalpukuri, SB – 3490. | |
Table 3: (Continued)

| Name of the species (1) | Habit (2) | Flowering & fruiting period (3) | Status (4) | Specimen examined (5) | Ethnobotanical uses (6) |
|------------------------|-----------|---------------------------------|------------|-----------------------|------------------------|
| *Albizia lebbeck* (Linn.) Benth. (Sirish – Beng., Sant.). | Tree | Apr. – Nov. | Common | Mathabhanga, SB – 3090; Dinhata, SB – 3336. | Impotency (sd.); household article (wd.) |
| *Albizia lucidior* (Steud.) Nielsen (Patkasiris – Beng.) | Tree | Apr. – Jan. | Common | Mathabhanga, SB – 3476. |
| *Albizia odoratissima* (Linn. f.) Benth. | Tree | Apr. – Jan. | Less Common | Jamalda, SB – 3640 |
| *Albizia procera* (Roxb.) Benth. (KoroiSiris – Beng.) | Tree | Jun. – Jan. | Common | Mathbhanga, SB – 3680. |
| *Leucaena latissilqua* (Linn.) Gills (Subhabul – Beng.). | Shrub or small tree | May – Jan. | Common | Chilakhana, SB – 3638. | Fodder (tw.); fuel wood |
| *Mimosa pudica* Linn. (Lajja-bati – Beng., Lajnu - Sant.). | Under-shrub | Jul. – Nov. | Very common | Jamalda forests, SB – 2971; Khagratali, SB – 3038. | Parturifacient (rt.), blood dysentery (tender shoot), burn wounds (If.), fever (rt.), body-ache (pl.), snake bite (rt.) |
| *Mimosa rubicaulis* Lam. | Shrub | Jul. – Oct. | Common | Gossanimari, SB – 3331 |
| *Pithecellobium dulce* (Roxb.) Benth. (DhekaniBabla – Beng.; Jilapiphal – Rj.) | Tree | Mar. – Oct. | Less Common | Kochbihar, SB – 3576. | Edible (sd.) |
| *Samanea saman* (Jacq.) Merr., | Tree | Apr. – Nov. | Common | Kochbihar, SB – 3581. |

**DISCUSSION**

The forest vegetation of Koch Bihar district is Tropical moist deciduous type. Presently the district has a total forest cover of 45.31 sq. km and the forests are scattered in few pockets as protected forests. The common trees and shrubs of legumes in forest terrain includes *Acacia catechu*, *Albizia chinensis*, *Butea monosperma*, *Dalbergia sisoo*, *Desmodium pulchellum*, *Erythrina stricta*, *Flemingia macrophylla*, *Flemingia strobilifera* etc. A number of herbaceous species of legumes are also grown in the forest floor. Some of them are *Crotalaria albida*, *Crotalaria bialata*, *Desmodium molibroth*, *Desmodium triflorum*, *Mimosa pudica*, *Senna alata*, *Vicia hirsuta*, *Vicia tetrasperma* etc. The common climbers and twiners found in this forest are *Abrus precatorius*, *Cae- salpinia bonduc*, *Caesalpinia cucullata*, *Cajanus scarabaeoides*, *Macuna pruriens* and *Pueraria phaseoloides*.

Beside the forest terrain, a vast stretches of land in the villages and urbanized area as well as wastelands beside agricultural fields, roadsides, railway tracks, canal banks, harbor a number of leguminous species. Tree legumes are generally planted by the villagers for meeting their needs or planted in afforestation programme by the forest department beside roads and waste places. It has been seen those tree species are sometimes naturalized and running wild. Some of them are *Acacia auriculiformis*, *Acacia farnesiana*, *Acacia nilotica subspecies cupressiformis*, *Albizia lebbeck*, *Albizia lucidior*, *Cassia fistula*, *Dalbergia sisoo*, *Derris indica*, *Erythrina stricta*, *Erythrina variegata*, *Leucaena latissilqua*, *Peltophorium pterocarpum*, *Pithecellobium dulce*, *Samanea saman*, *Senna siamea*, *Sesbania grandiflora*, *Tamarindus indica* and others. The common herbs and undershrubs of those areas are *Alysicarpus monilifer*, *Alysicarpus vaginalis*, *Crotalaria pallida*, *Desmodium gangeticum*, *Desmodium laxisorum*, *Desmodium triflorum*, *Medicago lupulina*, *Mimosa pudica*, *Senna occidentalis*, *Senna sophera*, *Senna tora* and many others.
It has been noted during study that a good number of species are exotic in origin and they became naturalized in Koch Bihar flora. American elements are more dominant among the exotic species, some of them are *Acacia farnesiana*, *Caesalpinia pulcherrima*, *Clitoria ternatea*, *Delonix regia*, *Leucaena latissilqua*, *Mimosa pudica*, *Pithecellobium dulce*, *Samanea saman*, *Senna alata*, *Senna occidentalis*, *Senna sophora*, *Senna tora* and others. Similarly *Lens culinaris*, *Lathyrus aphaca*, *Medicago lupulina*, *Melilotus alba*, *Vicia hirsuta*, *Vicia sativa* etc constitute the European elements of the flora. Legumes of African origin naturalized in this district include *Acacia nilotica*, *Lathyrus sativus*, *Sesbania sesban* and *Tamarindus indica*.

The present study reveals that the legumes of the district of Koch Bihar are represented by 81 species under 36 genera. The proportions of genera to species are 1: 2.25. The numerical representation of genus and species under three subfamilies is presented in Table 4 and Diagram 1. A comparison between Koch Bihar, West Bengal and India regarding diversity of Legumes has been presented in Diagram 2. There are 28 species of trees, 16 species of shrubs, 29 species of herbs and 8 species of climbers recorded during study. The analysis of habits of the species in each sub-family is provided in Table 5 and Diagram 3. Among the legumes *Desmodium* shows maximum species diversity having 9 species followed by *Acacia*, *Crotalaria* and *Senna* with 6 species each. In contrary there are 16 genera having single species each.

### Table 4: Conspectus of the family Leguminosae of Koch Bihar district

| Sub-Families | No. of Genera | No. of Species |
|--------------|---------------|---------------|
| Mimosoideae  | 06            | 16            |
| Caesalpioideae| 08            | 18            |
| Faboideae    | 22            | 47            |
| Total        | 36            | 81            |

### Diagram 1: Distribution of taxa in different sub-families of Leguminosae.

### Diagram 2: Comparison between the Legumes of Koch Bihar, West Bengal and India regarding different taxa.

### Table 5: Numerical analysis of the growth forms of Legumes of Koch Bihar district

| Sub-Families | Tree | Shrub | Herb | Climber |
|--------------|------|-------|------|---------|
| Mimosoideae  | 12   | 03    | 01   | -       |
| Caesalpioideae| 09   | 04    | 03   | 02      |
| Faboideae    | 07   | 09    | 25   | 06      |
| Total        | 28   | 16    | 29   | 08      |

### Diagram 3: Growth forms in different sub-families of Leguminosae.

During the present study uses of leguminous plants by the ethnic communities and rural peoples of the district has also been recorded. The results shows that 31 species of legumes under 24 genera are used for various purposes which are about 38% of the legume flora of the district and several species have more than one kind of uses. The collected information shows that plants and plant parts of 11 species are edible, 20 species have medicinal uses, 2 species are used as fodder, woods of 3 species are used in constructions and making household articles and 6 species have miscellaneous uses. A total of 69 uses have been recorded during the present study and it has been noted that leaves of the legumes are used in maximum occasion (18) followed by stem &twigs (14) and roots &seeds (09).
The present study concludes that the Leguminosae or Fabaceae is the most dominant and diversified family which constitutes about 10% of the total Angiospermic flora of the district. But the rapid urbanization and increase in population causes serious damage to the habitats of these plants. Much damage to the forest vegetation is being done by the cattle grazing. Grazing animals on one hand browse the tree seedlings and on the other hand trampling the soil and seedlings. Therefore, soil become compact and become unsuitable for the growth of the plants. Anthropogenic interference like extraction of “catechu” gum from Acacia catechu, peeling of barks for preparation of medicines and careless and illegal cutting and lopping from the plants for the purpose of fodder and firewood are the causes of the loss of species diversity. Similarly, extensive collection of useful seeds, fruits, roots etc. from plants like Abrus precatorius, Derris indica, Butea monosperma, Mucuna pruriens etc. effects the natural regeneration of population of the species. On the other hand the indigenous knowledge especially the uses of the herbal drugs are in threat due to modernization of the society and loss of interest among the young generation of ethnic and rural peoples about the traditional healing methods. It is, therefore, an urgent need to protect the plants to save the diversity of leguminous flora as well as the ethnic culture of the district.

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