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Study of species diversity on cucurbitaceae family at Rajshahi division, Bangladesh

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Abstract: The present investigation of species diversity on the family Cucurbitaceae growing throughout the Rajshahi division was carried out. A total of 24 species under 13 genera of the family Cucurbitaceae were collected and identified. Out of the total number of species 11 were wild and 13 were cultivated. Of the total number of species diversity, 95.83% were recorded in Rajshahi district, 79.16% in Natore district, 75.00 in Chapai Nawabgonj district, 87.50% in Naogaon district, 91.66% in Bogra district and 83.33% in Joypurhat district in the study area.

Keywords: Species Diversity, Cucurbitaceae, Rajshahi Division, Bangladesh

1. Introduction

Cucurbits are the popular name of the family Cucurbitaceae, commonly known as the gourd family. They are widely distributed in the tropics and warm temperate regions of South, Southeast and East Asia, Africa including Madagascar and central South America. The family is represented by about 110 genera and 560 to 850 species[15].

The Cucurbitaceae or cucurbit family (also commonly referred to as the cucumber, gourd, melon, or pumpkin family) is a medium-sized plant family, primarily found in the warmer regions of the world. It is a major family for economically important species, particularly those with edible fruits. Some of these represent some of the earliest cultivated plants in both the Old and New Worlds. The cultivated species investigated in this study belong to the genera *Benincasa, Citrullus, Cucumis, Cucurbita, Lagenaria, Luffa, Momordica* and *Trichosanthes*. These are used as fruits and vegetables, and most of them have considerable economic value[13].

2. Materials and Methods

Study of species diversity on the family Cucurbitaceae growing throughout the Rajshahi division was carried out. The study area of Rajshahi division includes six districts and these were Rajshahi (including three thanas Boalia, Godagari, Tanore), Nawabgonj (including three thanas Sadar, Nachole, Sibgonj), Naogaon (including two thanas Atrai, Raninagar), Joypurhat (including two thanas Akkelpur, Khetlal), Bogra (including two thanas Adamdighi, Dupchachia) and Natore (including three thanas Sadar, Singra, Lalpur). A total of 24 species under 13 genera of the family Cucurbitaceae were collected and identified.

A survey on the determination of the location of different species was made and a list was prepared to be acquainted with the Cucurbitaceae available in the selected area. All the species were noted and time to time the areas were visited to see when they flowered. For the morphological study, different types of species were examined again and again in order to see if there was any variation or not. They were collected at flowering stages and herbarium specimens were prepared as vouchers. In this practice standard method was followed. In this regard different types of plant species were collected from different habitats. All the collected plant specimens were kept in the Herbarium, Department of Botany, and University of Rajshahi, Bangladesh.

The collected specimens were identified studying related taxonomic books and booklets from the library of Rajshahi University. The major collected materials were identified and described up to species with the help of[5], [12], [3], [8], [1], and[15]. In some cases[9], [4], [14], [2] were consulted. For the current name and up to date nomenclature[6], [7], [10] and[11] were also consulted.

3. Results and Discussion

All the cucurbits species studied were collected from six districts of Rajshahi division of Bangladesh. A total of 24 species under 13 genera of the family Cucurbitaceae were collected and identified in the study area. Most of the cultivated species were grown in all districts of Bangladesh. Some of the species which were sometimes cultivated and sometimes wild were grown in particular area. Most of the species were distributed all over the study area, i.e. *Benincasa hispida, Citrullus lanatus, Coccinia grandis, Cucumis melo, Cucumis sativus, Cucurbita maxima, Cucurbita moschata, Cucurbita pepo, Lagenaria siseraria, Luffa acutangula, Luffa cylindrica, Momordica charantia, Momordica cochinchinensis, Melothria maderaspatana, Trichosanthes anguina, Trichosanthes cucumerina, Trichosanthes bracteata* and *Trichosanthes dioica.*

Melothria maderaspatana and *Trichosanthes bracteata* were much populated and found in sandy roadside area of Rajshahi, Chapai Nawabgonj, Bogra and Joypurhat districts. *Diplocyclos palmatus* was grown in Rajshahi and Chapai Nawabgonj districts climbing on trees. Many *Trichosanthes* spp. species were grown in Joypurhat, Bogra, Naogaon, Rajshahi, Natore and Chapai Nawabgonj districts climbing in trees. *Trichosanthes* spp. was also grown in Rajshahi University Campus. Most of the species were grown in lower elevation of secondary forests and all over the bushes (Table 1).

Table 1. *Distribution of species in the six districts of Rajshahi Division, Bangladesh.*

S/N	Name of species	Rajshahi	Natore	Chapai Nawabganj	Naogaon	Bogra	Joypurhat
1	*Benincasa hispida* (Thunb.) Cogn.	+	+	+	+	+	+
2	*Citrullus lanatus* (Thunb.) Mart. & Nakai.	+	+	+	+	+	+
3	*Coccinia grandis* (L.) Voigt.	+	+	+	+	+	+
4	*Cucumis sativus* L.	+	+	+	+	+	+
5	*Cucumis melo* L.	+	+	+	+	+	+
6	*Cucumis callosus* L.	-	-	-	+	+	+
7	*Cucurbita maxima* Duch.	+	+	+	+	+	+
8	*Cucurbita pepo* L.	+	+	+	+	+	+
9	*Cucurbita moschata* (Duch. ex Lam.) Duch.	+	+	+	+	+	+
10	*Diplocyclos palmatus* (L.) Jeffrey.	+	-	-	-	-	-
11	*Gymnopetalum cochinchinense* (Lour.) Kurj.	+	-	-	+	+	-
12	*Lagenaria siceraria* (Molina) Standl.	+	+	+	+	+	+
13	*Luffa acutangula* (L.) Roxb.	+	+	+	+	+	+
14	*Luffa cylindrica* (L.) Roem.	+	+	+	+	+	+
15	*Melothria maderaspatana* (L.) Cogn.	+	+	+	+	+	+
16	*Momordica cochinchinensis* (Lour.) Spreng.	+	+	+	+	+	+
17	*Momordica charantia* L.	+	+	+	+	+	+
18	*Momordica dioica* Roxb.	+	-	-	-	+	+
19	*Thladiantha cordifolia* (Bl.) Cogn.	+	-	-	-	-	-
20	*Trichosanthes cordata* Roxb.	+	+	-	+	+	-
21	*Trichosanthes dioica* Roxb.	+	+	+	+	+	+
22	*Trichosanthes anguina* L.	+	+	+	+	+	+
23	*Trichosanthes bracteata* (Lamk.) Voigt.	+	+	+	+	+	+
24	*Trichosanthes cucumerina* L.	+	+	+	+	+	+
Total	=24 species	23	19	18	21	22	20

+ = Present, - = Absent

Out of the total number of species diversity, 95.83% were recorded in Rajshahi district, 79.16% in Natore district, 75.00 in Chapai Nawabgonj district, 87.50% in Naogaon district, 91.66% in Bogra district and 83.33% in Joypurhat district in the study area (Table 2).

Regarding monthly species diversity, of total number of species, 95.65 % found in January, 95.65 % in February, 91.30 % in March, 86.95% in April, 100.00% in May, 100.00% in June, 82.60% in July, 91.30% in August, 91.30% in September, 91.30% in October, 95.65% in November and 95.65% in December in Rajshahi district (Table 3).

Regarding monthly species diversity, of total number of species, 84.21% found in January, 89.47% in February, 94.73% in March, 94.73% in April, 100.00% in May, 100.00% in June, 89.47% in July, 89.47% in August, 84.21% in September, 84.21% in October, 94.73% in November and 89.73% in December in Natore district (Table 4).

Regarding monthly species diversity, of total number of species, 94.44% found in January, 94.44% in February, 94.44% in March, 88.88% in April, 88.88% in May, 83.33% in June,100.00 % in July, 100.00% in August, 94.44% in September, 88.88% in October, 100.00% in November and 88.88% in December in Chapai Nawabgonj district (Table 5).

Regarding monthly species diversity, of total number of species, 100.00% found in January, 100.00% in February, 90.47% in March, 90.47% in April, 85.71% in May, 80.95% in June, 90.47% in July, 95.23% in August, 95.23% in September, 95.23% in October, 100.00% in November and 95.23% in December in Naogaon district (Table 6).

Regarding monthly species diversity, of total number of species, 90.90% found in January, 90.90% in February, 95.45% in March, 95.45% in April, 100.00% in May, 100.00% in June, 100.00% in July, 95.45% in August, 95.45% in September, 90.90% in October, 86.36% in November and 86.36% in December in Bogra district (Table 7).

Regarding monthly species diversity, of total number of species, 95.00 % found in January, 85.00 % in February, 90.00 % in March, 80.00 % in April, 90.00 % in May, 75.00 % in June, 95.00 % in July, 85.00 % in August, 95.00 % in September, 90.00 % in October, 80.00 % in November and 90.00 % in December in Joypurhat district (Table 8).

Table 2. *Species diversity of Rajshahi Division.*

Study area	Number of species	Percentage (%)	Total number of species
Rajshahi	23	95.83	24
Natore	19	79.16	24
Chapai Nawabgonj	18	75.00	24
Naogaon	21	87.50	24
Bogra	22	91.66	24
Joypurhat	20	83.33	24

Table 3. *Monthly species diversity of Rajshahi district.*

Months	Number of species	Percentage (%)	Total number of species
January	22	95.65	23
February	22	95.65	23
March	21	91.30	23
April	20	86.95	23
May	23	100.00	23
June	23	100.00	23
July	19	82.60	23
August	21	91.30	23
September	21	91.30	23
October	21	91.30	23
November	22	95.65	23
December	22	95.65	23

Table 4. *Monthly species diversity of Natore district.*

Months	Number of species	Percentage (%)	Total number of species
January	16	84.21	19
February	17	89.47	19
March	18	94.73	19
April	18	94.73	19
May	19	100.00	19
June	19	100.00	19
July	17	89.47	19
August	17	89.47	19
September	16	84.21	19
October	16	84.21	19
November	18	94.73	19
December	17	89.47	19

Table 5. *Monthly species diversity of Chapai Nawabgonj district.*

Months	Number of species	Percentage (%)	Total number of species
January	17	94.44	18
February	17	94.44	18
March	17	94.44	18
April	16	88.88	18
May	16	88.88	18
June	15	83.33	18
July	18	100.00	18
August	18	100.00	18
September	17	94.44	18
October	16	88.88	18
November	18	100.00	18
December	16	88.88	18

Table 6. *Monthly species diversity of Naogaon district.*

Months	Number of species	Percentage (%)	Total number of species
January	21	100.00	21
February	21	100.00	21
March	19	90.47	21
April	19	90.47	21
May	18	85.71	21
June	17	80.95	21
July	19	90.47	21
August	20	95.23	21
September	20	95.23	21
October	20	95.23	21
November	21	100.00	21
December	20	95.23	21

Table 7. *Monthly species diversity of Bogra district.*

Months	Number of species	Percentage (%)	Total number of species
January	20	90.90	22
February	20	90.90	22
March	21	95.45	22
April	21	95.45	22
May	22	100.00	22
June	22	100.00	22
July	22	100.00	22
August	21	95.45	22
September	21	95.45	22
October	20	90.90	22
November	19	86.36	22
December	19	86.36	22

Table 8. *Monthly species diversity of Joypurhat district.*

Months	Number of species	Percentage (%)	Total number of species
January	19	95.00	20
February	17	85.00	20
March	18	90.00	20
April	16	80.00	20
May	18	90.00	20
June	15	75.00	20
July	19	95.00	20
August	17	85.00	20
September	19	95.00	20
October	18	90.00	20
November	16	80.00	20
December	18	90.00	20

4. Conclusion

Species diversity on the family Cucurbitaceae was recorded. Totally, 24 species under 13 genera of the family

Cucurbitaceae were collected and recorded their species diversity in six districts of Rajshahi division were documented. Out of the total number of species diversity, 95.83% were recorded in Rajshahi district, 79.16% in Natore district, 75.00 in Chapai Nawabgonj district, 87.50% in Naogaon district, 91.66% in Bogra district and 83.33% in Joypurhat district in the study area.

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