

Study of Species Diversity on the Family Asteraceae (Compositae) of the Rajshahi Division

¹A.H.M.M. Rahman, ²M.S. Alam, ²M.B. Hossain, ²M.N. Nesa,
¹A.K.M. Rafiul Islam and ³M. Matiur Rahman

¹Department of Botany, University of Rajshahi, Rajshahi-6205, Bangladesh.

²Department of Agronomy and Agricultural Extension, University of Rajshahi. Rajshahi-6205, Bangladesh.

³Bangladesh National Herbarium, Mirpur-1, Dhaka, Bangladesh.

Abstract: Study of species diversity on the family Asteraceae (Compositae) growing throughout the Rajshahi division was carried out. A total of 36 species under 29 genera of the family Asteraceae were collected and identified. Of the total number of species 8 were cultivated and 28 were wild. Of the total number of species diversity, 97.22% were recorded in Rajshahi district; 77.77% in Natore district; 75% in Nawabgonj district; 61.11% in Naogaon district; 72.22% in Bogra district and 66.66% in Joypurhat district in the study area.

Key words: Species diversity, Asteraceae, Rajshahi Division

INTRODUCTION

The family Asteraceae or Compositae (Known as the aster, daisy, or sunflower family) is the largest family of flowering plants, in terms of number of species. The name 'Asteraceae', is derived from the type genus *Aster*, while 'Compositae', an older but still valid name, means Compositae and refers to the characteristic inflorescence, a special type of pseudanthium found in only a few other angiosperm families. The study of this family is known as synanthology.

According to the Royal Botanical Gardens of Kew the family comprises more than 1600 genera and 23,000 species. The largest genera are *Senecio* (1500 species), *Vernonia* (1000 species), *Cousinia* (600 species), *Centaurea* (600 species). The circumscription of the genera is often problematic and some of these have been frequently divided into minor subgroups^[8].

Compositae are the largest family of the flowering plants containing about 950 genera and nearly 20,000 species. The family is divided into 13 tribes. Heliantheae, Astereae, Anthemideae, Arctotideae, Inuleae, Senecioneae, Calenduleae, Eupatorieae, Vernonieae, Cynareae, Mutisieae, Liabeae and Lactuceae (Cichorieae).

Oils are extracted from the seeds of *Helianthus annuus*, *Guizotia oleifera* etc., *Carthamus* and *Guizotia*

oils are used in preparing soaps, colouring materials are obtained from *Carthamus tinctorius* and *Serratula tinctoria*. Rubber is present in the tissues of *Perthenium argentatum*. The leaves of *Lactuca sativa*, tubers of *Helianthus tuberosus* are edible. *Wedelia calendulacea* is used as hair tonic^[17].

MATERIALS AND METHODS

Study of species diversity on the family Asteraceae (Compositae) growing throughout the Rajshahi division was carried out. The study area included six districts of the Rajshahi division and these are Rajshahi, Natore, Nawabgonj, Naogaon, Bogra and Joypurhat. A total of 36 species under 29 genera of the family Asteraceae were collected and identified. Of the total number of species 8 were cultivated and 28 were wild. Plant species were collected as systematically as possible from the study area. The following data were recorded from the herbarium specimen, i.e. current name, local name, occurrence, habit, habitat, flower colour, attractive parts, flowering time, fruiting time, fruit type, pollinating agents, propagation, basic chromosome number, local uses, traditional uses, floral formula, specimens examined, local distribution and geographical distribution.

Publication of Benson^[1], Cronquist^[2], Darlington and Wylie^[3], Heywood^[4], Hooker^[5], Huq^[6,7], Kirtikar and Basu^[9], Khatun^[10], Lawrence^[11], Naik^[12], Pandey^[13], Pasha and Zaman^[14], Prain^[15], Sharma^[16], Sambamurty^[17], and Subrahmanyam^[18] were consulted.

RESULTS AND DISCUSSION

Study of species diversity on the family Asteraceae (Compositae) growing throughout the Rajshahi division was carried out. A total of 36 species under 29 genera of the family Asteraceae were collected and identified. Of the total number of species 8 were cultivated and 28 were wild.

The common species found in the six districts were as follows: *Ageratum conyzoides*, *Blumea lacera*, *Callistephus chinensis*, *Dahlia variabilis*, *Eclipta alba*, *Enhydra fluctuans*, *Grangea maderaspatana*, *Helianthus annuus*, *Launaea asplenifolia*, *Mikania cordata*, *Perthenium hysterophorus*, *Sonchus arvensis*, *Spilanthes paniculata*, *Syndrella nodiflora*, *Tagetes patula*, *Tridax procumbens*, *Vernonia patula*, *Wedelia chinensis* and *Xanthium indicum* (Table 1).

Of total number of species diversity, 97.22% were recorded in Rajshahi district; 77.77% in Natore district; 75% in Nawabgonj district; 61.11% in Naogaon district; 72.22% in Bogra district and 66.66% in Joypurhat district in the study area (Table 2).

Regarding monthly species diversity, of total number of species, 54.28% found in January; 54.28% in February; 77.14% in March; 80% in April; 77.14% in May; 77.14% in June; 77.14% in July; 77.14% in August; 68.57% in September; 48.57% in October; 57.14% in November and 54.28% in December in Rajshahi district (Table 3).

Regarding monthly species diversity, of total number of species, 60.71% found in January; 71.42% in February; 96.42% in March; 96.42% in April; 85.71% in May; 75% in June; 75% in July; 75% in August; 57.14% in September; 64.28% in October; 50% in November and 46.42% in December in Natore district (Table 4).

Regarding monthly species diversity, of total number of species, 55.55% found in January; 55.55% in February; 70.37% in March; 92.59% in April; 92.59% in May; 81.48% in June; 81.48% in July; 81.48% in August; 85.18% in September; 74.07% in October; 62.96% in November and 55.55% in December in Nawabganj district (Table 5).

Regarding monthly species diversity, of total number of species, 54.54% found in January; 59.09% in February; 68.18% in March; 77.27% in April; 81.81% in May; 81.81% in June; 81.81% in July;

Table 1: Distribution of species in the six districts of Rajshahi division.

Name of species	Rajshahi	Natore	Nawabgonj	Naogaon	Bogra	Joypurhat
<i>Ageratum conyzoides</i> Linn.	+	+	+	+	+	+
<i>Blumea lacera</i> (Burm.f.) DC.	+	+	+	+	+	+
<i>Blumea laciniata</i> DC.	+	+	+	+	+	+
<i>Callistephus chinensis</i> Linn.	+	+	+	+	+	+
<i>Calendula officinalis</i> Hook.	+	+	+	-	+	+
<i>Chrysanthemum coronarium</i> Hook.	+	+	-	-	+	-
<i>Cosmos caudatus</i> Cav.	+	+	+	-	+	-
<i>Circium arvense</i> (L.) Scop.	+	+	+	-	-	-
<i>Caesulia axillaris</i> Roxb.	+	-	+	-	+	-
<i>Dahlia variabilis</i> Roez.	+	+	+	+	+	+
<i>Eclipta alba</i> (L.) Hassk.	+	+	+	+	+	+
<i>Enhydra fluctuans</i> Lour.	+	+	+	+	+	+
<i>Eupatorium odoratum</i> Linn.	+	+	+	-	+	-
<i>Gnaphalium polycaulon</i> Pers.	+	-	-	+	-	+
<i>Gnaphalium pulvinatum</i> DC.	+	+	+	-	-	+
<i>Gnaphalium indicum</i> Linn.	+	-	-	+	+	-
<i>Grangea maderaspatana</i> Poir.	+	+	+	+	+	+
<i>Helianthus annuus</i> Linn.	+	+	+	+	+	+
<i>Lactuca sativa</i> Linn.	+	+	-	-	-	+
<i>Launaea asplenifolia</i> Hook.f.	+	+	+	+	+	+
<i>Mikania cordata</i> (Burm.f.) Robinson.	+	+	+	+	+	+
<i>Perthenium hysterophorus</i> Linn.	+	+	+	+	+	+
<i>Sonchus asper</i> (L.) Hill.	+	+	-	-	-	-
<i>Sonchus arvensis</i> Linn.	+	+	+	+	+	+
<i>Sonchus wingianus</i> DC.	-	-	+	-	-	+
<i>Spilanthes paniculata</i> Wall.exDC.	+	+	+	+	+	+
<i>Syndrella nodiflora</i> (L.) Gaertn.	+	+	+	+	+	+
<i>Tagetes patula</i> Linn.	+	+	+	+	+	+
<i>Tridax procumbens</i> Linn.	+	+	+	+	+	+
<i>Vernonia patula</i> (Dryand) Merril.	+	+	+	+	+	+
<i>Vernonia cinerea</i> Less.	+	-	-	-	-	-
<i>Wedelia chinensis</i> (Osbeck) Merr.	+	+	+	+	+	+
<i>Wedelia calendulacea</i> Less.	+	-	-	-	-	-
<i>Xanthium indicum</i> Linn.	+	+	+	+	+	+
<i>Youngia japonica</i> (Linn.) DC.	+	-	-	-	-	-
<i>Zinnia pauciflora</i> Linn.	+	-	-	-	-	-
Total =36	35	28	27	22	26	24

+ = Present, - = Absent

Table 2: Species diversity of the Rajshahi division.

Study area	Number of species	Percentage	Total number of species
Rajshahi	35	97.22%	36
Natore	28	77.77%	36
Nawabgonj	27	75%	36
Naogaon	22	61.11%	36
Bogra	26	72.22%	36
Joypurhat	24	66.66%	36

Table 3: Monthly species diversity of Rajshahi district

Months	Number of species	Percentage	Total number of species
January	19	54.28%	35
February	19	54.28%	35
March	27	77.14%	35
April	28	80%	35
May	27	77.14%	35
June	27	77.14%	35
July	27	77.14%	35
August	27	77.14%	35
September	24	68.57%	35
October	17	48.57%	35
November	20	57.14%	35
December	19	54.28%	35

Table 4: Monthly species diversity of Natore district.

Months	Number of species	Percentage	Total number of species
January	17	60.71%	28
February	20	71.42%	28
March	27	96.42%	28
April	27	96.42%	28
May	24	85.71%	28
June	21	75%	28
July	21	75%	28
August	21	75%	28
September	16	57.14%	28
October	18	64.28%	28
November	14	50%	28
December	13	46.42%	28

Table 5: Monthly species diversity of Nawabgonj district.

Months	Number of species	Percentage	Total number of species
January	15	55.55%	27
February	15	55.55%	27
March	19	70.37%	27
April	25	92.59%	27
May	25	92.59%	27
June	22	81.48%	27
July	22	81.48%	27
August	22	81.48%	27
September	23	85.18%	27
October	20	74.07%	27
November	17	62.96%	27
December	15	55.55%	27

Table 6: Monthly species diversity of Naogaon district.

Months	Number of species	Percentage	Total number of species
January	12	54.54%	22
February	13	59.09%	22
March	15	68.18%	22
April	17	77.27%	22
May	18	81.81%	22
June	18	81.81%	22
July	18	81.81%	22
August	17	77.27%	22
September	15	68.18%	22
October	12	54.54%	22
November	12	54.54%	22
December	12	54.54%	22

Table 7: Monthly species diversity of Bogra district.

Months	Number of species	Percentage	Total number of species
January	15	57.69%	26
February	16	61.53%	26
March	18	69.23%	26
April	23	88.46%	26
May	20	76.92%	26
June	20	76.92%	26
July	20	76.92%	26
August	18	69.23%	26
September	16	61.53%	26
October	16	61.53%	26
November	15	57.69%	26
December	15	57.69%	26

Table 8: Monthly species diversity of Joypurhat district.

Months	Number of species	Percentage	Total number of species
January	13	54.16%	24
February	14	58.33%	24
March	16	66.66%	24
April	23	95.83%	24
May	20	83.33%	24
June	19	79.16%	24
July	19	79.16%	24
August	18	75%	24
September	16	66.66%	24
October	12	50%	24
November	13	54.16%	24
December	13	54.16%	24

77.27% in August; 68.18% in September; 54.54% in October; 54.54% in November and 54.54% in December in Naogaon district (Table 6).

Regarding monthly species diversity, of total number of species, 57.69% found in January; 61.53% in February; 69.23% in March; 88.46% in April; 76.92% in May; 76.92% in June; 76.92% in July; 69.23% in August; 61.53% in September; 61.53% in October; 57.69% in November and 57.69% in December in Bogra district (Table 7).

Regarding monthly species diversity, of total number of species, 54.16% found in January; 58.33% in February; 66.66% in March; 95.83% in April; 83.33% in May; 79.16% in June; 79.16% in July; 75% in August; 66.66% in September; 50% in October; 54.16% in November and 54.16% in December in Joypurhat district (Table 8).

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REFERENCES

1. Benson, L., 1957. *Plant Classification*. Health and Company. Boston. USA.
2. Cronquist, A., 1968. *The Evolution and Classification of Flowering Plants*. Houghton Mifflin, Boston. USA.
3. Darlington, C.D. and A.P. Wylie, 1950. *Chromosome Atlas of Flowering Plants*. George Allen and Unwin Ltd. Ruskin House Museum Street, London, U.K.
4. Heywood, V.H., 1979. *Flowering Plants of the World*. Oxford University Press, New York, USA.
5. Hooker, J.D., 1877. *Flora of British India*. Voi.1-7. L. Reeve and Co. Ltd. London, U.K. pp. 220-419.
6. Huq, A.M., 1986. *Name Changes in Bangladesh Angiosperms*. Bangladesh National Herbarium, BARC, Dhaka, Bangladesh.
7. Huq, A.M., 1986. *Plant Names of Bangladesh*. Bangladesh National Herbarium, B.A.R.C, Dhaka, Bangladesh.
8. Judd, W.S and C.S. Campbell, E. Kellogg, P.F. Stevens, 1999. *Plant Systematics :A Phylogenetic Approach*. Sinauer, Sunderland, Massachusetts, USA.
9. Kirtikar, K.R. and B.D. Basu, 1987. *Indian Medicinal Plants*. Vol. 1-4. Lalit Mohan Basu, Allahabad, Jayyed Press, New Delhi, India., 1313-1449.
10. Khatun, R., 2002. *Plant Taxonomy*. Eureka Book Agency, New Market, Rajshahi, Bangladesh.
11. Lawrence, G.H.M., 1973. *Taxonomy of Vascular Plants*. Oxford and IBM Publishing Co., Rakes Press, New Delhi, India.
12. Naik, V.N., 2003. *Taxonomy of Angiosperms*. Tata McGraw-Hill Publishing Company Limited, New Delhi. India.
13. Pandey, B.P., 1969. *Taxonomy of Angiosperms*. S. Chand and Company Ltd. New Delhi, India.
14. Pasha, M.K and M.B.Zaman, 1988. *Name Changes in Plants of Bangladesh*. Chittagong University Studies, Part-II, Science Vol. 12(1).
15. Prain, D., 1903. *Bengal Plants*. Vol.1-2. Botanical Survey of India. Calcutta, India. pp. 580-630.
16. Sharma, O.P., 2004. *Plant Taxonomy*. Tata McGraw Hill Publishing Co. Ltd. New Delhi, India. pp. 312-318.
17. Sambamurty, A.V.S.S., 2005. *Taxonomy of Angiosperms*. I.K. International Pvt. Ltd. New Delhi. India.
18. Subrahmanyam, N.S., 2004. *Modern Plant Taxonomy*. Vikas Publishing House Pvt. Ltd. New Delhi, India.