

ECOLOGICAL STUDIES OF FAMILY ASTERACEAE OF EASTERN UTTAR PRADESH, INDIA

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The systematic identification of 106 species belonging to 65 genera, occurring in Eastern Uttar Pradesh, followed by their general ecology *i.e.* habit, habitat and phenology has been recorded.

Keywords : Asteraceae, Eastern Uttar Pradesh, Ecology.

Introduction

The eastern part of Uttar Pradesh has been considered as a structural entity on the basis of topography, climate, soil, geography and socio-cultural profile. The area is surrounded by Bihar in the east, Madhya Pradesh in the south, Banda, Fatehpur, Raibareli, Barabanki, Bahraich, and Sravasti district of Uttar Pradesh in the west and Nepal in the north. It lies between about 23° 52' N to 27° N latitude and about 82° E to 84° 39' E longitude. The area is spread over 79,042 sq. km which comprises 25 districts viz. Sonbhadra, Mirzapur, Kausambi, Allahabad, Sant Ravi Das Nagar, Jaunpur, Chandauli, Varanasi, Pratapgarh, Azamgarh, Ghazipur, Ballia, Sultanpur, Basti, Faizabad, Ambedkarnagar, Gonda, Siddarthnagar, Maharajganj,

Kusinagar, Deoria, Sant Kabirnagar, Gorakhpur, Mau, Balrampur are the eastern part of Uttar Pradesh. The area has been broadly categorized into three major zones: Terai region, Gangetic plains and Vindhyan region. The forest and vegetation of eastern Uttar Pradesh has been broadly classified and categorized into three types depending upon the three major zones: Tropical moist deciduous type, Tropical dry deciduous type and Tropical mixed dry deciduous forest. These forests provide sufficient vegetational diversity and rich environmental condition for the growth of Asteraceous flora.

Family Asteraceae is one of the largest family of flowering plants comprising about 25,000 species and 1600 genera^{1,2}. In India, the family is represented by about

Flowering and Fruiting

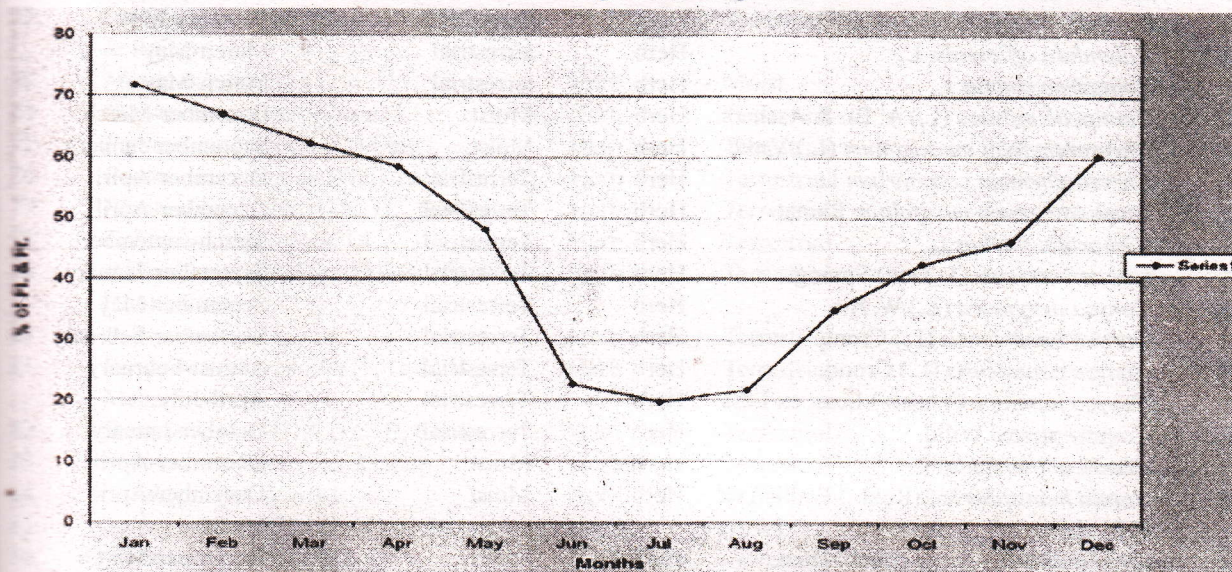


Fig 1. Graph showing flowering and fruiting (Phenology) of Asteraceae plant species.

Table 1. Showing habit, habitat and phenology of Asteraceae plant species.

S.No.	Name of species	Habit	Habitat	Phenology
1.	<i>Acanthospermum hispidum</i> DC.	Herb	Terrestrial	November-April
2.	<i>Adenostema lavenia</i> (L.) O.Kuntze	Herb	Aquatic	October-January
3	<i>Ageratum conyzoides</i> L.	Herb	Terrestrial	Throughtout year
4	<i>Ageratum haustonianum</i> Mill.	Herb	Terrestrial	Throughtout year
5	<i>Amberboa ramosa</i> (Roxb.) Jafri	Herb	Terrestrial	January-April
6	<i>Anthemis cotula</i> L.	Herb	Terrestrial	April-June
7	<i>Artemisia japonica</i> Thunb.	Herb	Terrestrial	July-January
8	<i>Bidens bipinnata</i> L.	Herb	Terrestrial	August-January
9	<i>Bidens pilosa</i> L.	Herb	Terrestrial	November-January
10	<i>Bidens sulphurea</i> (Cav.) Sch-Bip.	Herb	Terrestrial	October-January
11	<i>Blainvillea acmella</i> (L.) Philipson	Herb	Terrestrial	September-January
12	<i>Blumea bifoliata</i> (L.) DC.	Herb	Terrestrial	December-May
13	<i>Blumea eriantha</i> DC.	Herb	Terrestrial	October-April
14	<i>Blumea fistulosa</i> (Roxb.) Kurz	Herb	Terrestrial	December-May
15	<i>Blumea laciniata</i> (Roxb.) DC.	Herb	Terrestrial	March-January
16	<i>Blumea lacera</i> (Burm. f.) DC.	Herb	Terrestrial	February-June
17	<i>Blumea membranacea</i> DC.	Herb	Terrestrial	January-May
18	<i>Blumea mollis</i> (D.Don) Merr.	Herb	Terrestrial	January-November
19	<i>Blumea obliqua</i> (L.) Druce	Herb	Terrestrial	February-May
20	<i>Blumea oxyodonta</i> DC.	Herb	Terrestrial	October-May
21	<i>Blumea sonbhadrensis</i> Narain <i>et al.</i>	Herb	Terrestrial	February-October
22	<i>Brachycome iberidifolia</i> Benth.	Herb	Terrestrial	January-February
23	<i>Breca arvensis</i> (L.) Less.	Herb	Terrestrial	January-May
24	<i>Caesulia axillaris</i> Roxb.	Herb	Moist	July-January
25	<i>Carthamus tinctorius</i> L.	Herb	Terrestrial	February-April
26	<i>Carthamus oxyacantha</i> M. Bieb.	Herb	Terrestrial	February-May
27	<i>Calendula officinalis</i> L.	Herb	terrestrial	March-May
28	<i>Centaurea cyanus</i> L.	Herb	terrestrial	March-May
29	<i>Centipeda minima</i> (L.) A. Br. & Aschers.	Herb	Moist	December-March
30	<i>Chrysanthellum americanum</i> (L.) Vatke	Herb	Moist	September-January
31	<i>Chrysanthemum coronarium</i> L.	Herb	Terrestrial	December-April
32	<i>Chrysanthemum morifolium</i> Ramat.	Herb	Terrestrial	December-April
33	<i>Cichorium intybus</i> L.	Herb	Terrestrial	March-september
34	<i>Cirsium verutum</i> (D.Don) Spreng.	Herb	Terrestrial	September-January
35	<i>Conyza aegyptica</i> (L.) W. Ait.	Herb	Terrestrial	September-May
36	<i>Conyza bonariensis</i> (L.) Cronq.	Herb	Terrestrial	September-February
37	<i>Conyza canadensis</i> (L.) Cronq.	Herb	Terrestrial	August-February
38	<i>Conyza japonica</i> (Thunb.) Less. ex Less	Herb	Terrestrial	April-July
39	<i>Conyza stricta</i> Willd.	Herb	Terrestrial	October-January
40	<i>Cotula anthemoides</i> L.	Herb	Moist	December-April
41	<i>Cotula hemispherica</i> (Roxb.) Wallich ex C.B. clarke	Herb	Moist	December-April
42	<i>Cyathocline purpurea</i> (Buch.-Ham. ex D. Don) O. Kuntze	Herb	Moist	December-March
43	<i>Dahlia pinnata</i> Cav.	Herb	Terrestrial	December-March
44	<i>Echinops echinatus</i> Roxb.	Herb	Terrestrial	January-April

45	<i>Eclipta prostrata</i> (L.) L.	Herb	Moist	Throughout year
46	<i>Elephantopus scaber</i> L.	Herb	Terrestrial	September-November
47	<i>Emilia sonchifolia</i> (L.) DC.	Herb	Terrestrial	July-October
48	<i>Enhydra fluctuans</i> Lour.	Herb	Aquatic	January-April
49	<i>Erigeron sublyratus</i> DC.	Herb	Terrestrial	April-July
50	<i>Eupatorium adenophorum</i> Spreng.	Herb	Terrestrial	January-June
51	<i>Eupatorium riparium</i> Regel	Herb	Terrestrial	January-May
52	<i>Gaillardia pulchella</i> Foug.	Herb	Terrestrial	September-February
53	<i>Galinsoga parviflora</i> Cav.	Herb	Terrestrial	September-January
54	<i>Galinsoga quadriradiata</i> Ruiz & Pavon	Herb	Terrestrial	December-May
55	<i>Gerbera gossypina</i> (Royle) P. Beauv.	Herb	Terrestrial	September-March
56	<i>Glossocardia bosvallea</i> (L. f.) DC.	Herb	Terrestrial	August-October
57	<i>Glossogyne bidens</i> (Retz.) Alston	Herb	Terrestrial	September-November
58	<i>Gnaphalium luteo-album</i> L. subsp. <i>affine</i> (D. Don) Koster	Herb	Moist	January-May
59	<i>Gnaphalium luteo-album</i> L. subsp. <i>luteoalbum</i> Ssensu	Herb	Moist	January-May
60	<i>Gnaphalium pensylvanicum</i> Willd.	Herb	Moist	December-May
61	<i>Gnaphalium polycaulon</i> Pers.	Herb	Moist	November-February
62	<i>Gnaphalium pulvinatum</i> Delile	Herb	Moist	December-May
63	<i>Grangea maderaspatana</i> (L.) Poir.	Herb	Moist	December-May
64	<i>Guizotia abyssinica</i> (L. f.) Cass.	Herb	Terrestrial	November-December
65	<i>Helianthus annuus</i> L.	Herb	Terrestrial	November-June
66	<i>Helianthus cucumerifolius</i> Torr. & Gray	Herb	Terrestrial	December-June
67	<i>Klenia grandiflora</i> (Wall. ex DC.) N. Rani	Herb	Terrestrial	April-august
68	<i>Lactuca sativa</i> L.	Herb	Terrestrial	February-May
69	<i>Lagascea mollis</i> Cav.	Herb	Terrestrial	October-February
70	<i>Launaea asplenifolia</i> (Willd.) Hook.f.	Herb	Terrestrial	March-October
71	<i>Launaea procumbens</i> (Roxb.) Ramayya & Rajagopal	Herb	Terrestrial	March-September
72	<i>Matricaria recutita</i> L.	Herb	Moist	August-September
73	<i>Parthenium hysterophorus</i> L.	Herb	Terrestrial	May-March
74	<i>Pentanema indicum</i> (L.) Ling	Herb	Terrestrial	November-March
75	<i>Pentanema vestitum</i> (Wall. ex DC.) Ling	Herb	Terrestrial	January-May
76	<i>Pluchea lanceolata</i> (DC.) C. B. Clarke	Herb	Terrestrial	February-June
77	<i>Pulicaria angustifolia</i> DC.	Herb	Terrestrial	November-May
78	<i>Pulicaria crispa</i> (Forsskal) Benth. & Hook. f.	Herb	Terrestrial	November-May
79	<i>Pulicaria foliolosa</i> DC.	Herb	Terrestrial	February-May
80	<i>Saussurea heteromella</i> (F. Don) Hand.-Mazz.	Herb	Terrestrial	February-May
81	<i>Senecio linifolia</i> (DC.) C. B. Clarke	Herb	Terrestrial	January-July
82	<i>Silybum marianum</i> (L.) Gaertn.	Herb	Terrestrial	May-September
83	<i>Solidago canadensis</i> L.	Herb	Terrestrial	October-January
84	<i>Soliva anthemifolia</i> (Juss.) R. Br.	Herb	Moist	December- April
85	<i>Sonchus asper</i> (L.) Hill.	Herb	Terrestrial	October-February
86	<i>Sonchus brachyotus</i> DC.	Herb	Terrestrial	October-February
87	<i>Sonchus oleraceus</i> L.	Herb	Terrestrial	October-February
88	<i>Sphaeranthus senegalensis</i> DC.	Herb	Moist	December-April
89	<i>Spilanthes ciliata</i> H.B.K.	Herb	Moist	October-March

91	<i>Spilanthes oleracea</i> L.	Herb	Moist	October-February
92	<i>Spilanthes paniculata</i> Wallich ex DC.	Herb	Moist	September-February
93	<i>Spilanthes radicans</i> Jacq.	Herb	Moist	October-January
94	<i>Synedrella vialis</i> (Less.) A. Gray	Herb	Moist	August-December
95	<i>Tagetes erecta</i> L.	Herb	Terrestrial	September-April
96	<i>Tagetes minuta</i> L.	Herb	Terrestrial	September-December
97	<i>Tagetes patula</i> L.	Herb	Terrestrial	September-December
98	<i>Tridax procumbens</i> L.	Herb	Moist	Throughout year
99	<i>Vernonia cinerea</i> (L.) Less.	Herb	Terrestrial	July-February
100	<i>Vernonia divergens</i> (Roxb.) Benth.	Shrub	Terrestrial	December-January
101	<i>Vernonia elliptica</i> DC.	Climber	Terrestrial	January-April
102	<i>Wedelia chinensis</i> (Osbeck.) Merr.	Herb	Moist	December-April
103	<i>Wedelia trilobata</i> (L.) A. S. Hitchc.	Herb	Moist	September-February
104	<i>Xanthium indicum</i> Koenig in Roxb	Herb	Terrestrial	March-May
105	<i>Youngia japonica</i> (L.) DC.	Herb	Terrestrial	February-May
106	<i>Zinnia elegans</i> Jacq.	Herb	Terrestrial	March-September

Table 2. Showing habit and habitat of plants of Asteraceae family.

S.No.	Habit	No. of Species	Total
1.	Terrestrial	78	104
	Moist	24	
	Aquatic	2	
2.	Shrub	1	1
3.	Climber	1	1

1052 species under 161 genera³. In Uttar Pradesh the family Asteraceae was studied by a number of workers⁴⁻¹⁷.

Results and Discussion

During the study on family Asteraceae of Eastern Uttar Pradesh, 106 species belonging to 65 genera were identified with information like their habit, habitat and its phenology was recorded (Table 1). Out of these *Vernonia divergens* and *Vernonia elliptica* are only shrub and climber respectively while 104 species are herbs. Among herbaceous plants 78 species (75%) are terrestrial and 24 species (23.08%) are grown on moist condition while *Enhydra fluctuans* and *Adenostemma lavenia* (1.92%) are aquatic (Table 2).

The phenology shows maximum flowering and fruiting in January with 71.69% followed by the month of February with 66.98% and December with 60.37%. There is a gradual decrease in the flowering and fruiting from the month of February up to the month of July. Thus minimum flowering and fruiting occur during the month of July with 19.81%. There is gradual increase in the

flowering and fruiting from August up to January. January is the peak month of flowering and fruiting while the month of July shows least flowering and fruiting (Fig.1). The plant species which show flowering and fruiting throughout year are *Ageratum conyzoides*, *Ageratum haustonianum*, *Eclipta prostrata* and *Tridax procumbens*.

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