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DISTRIBUTION PATTERN OF INVASIVE ALIEN SPECIES IN TARAI REGION OF NAINITAL DISTRICT, KUMAUN HIMALAYA

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Abstract: The present study proves presence of 32 invasive alien species in Haldwani, Uttarakhand, India. Under 30 genera, belonging to 17 families have been recorded from the studied area. Higher Altitude at Ranibagh is recorded as the dominant part of Invasive Alien Flora represented by 19 species. Maximum species were recorded from higher followed by middle altitude halduchaur and lower Altitude Kaladhungi. Lowest species were recorded from Lower altitude Kaladhungi with 14 species. Family Asteraceae was found dominant for the invasive alien flora with 7 species. The taxonomic analysis of IAS reveals dominance of Asteraceae with 7 spp. followed by Malvaceae, Euphorbiaceae, Solanaceae, Amaranthaceae, Asclepiadaceae etc.

Keywords: Invasive alien species; Nativity; Uttarakhand.

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INTRODUCTION

The plants that have been introduced by humans intentionally or accidentally from one region to another are referred as exotic, introduced, foreign, non-indigenous or non-native (Reddy et al. 2008). Invasive alien species (IAS) are those that occur outside their natural range, spread rapidly and cause harm to other species, communities and entire ecosystem. Alien species are non-native or exotic species which introduced either accidentally or deliberately by humans to fulfill their needs. After introduction, they can expand their population and create monospecific thickets. These alien invasive species not only compete for nutrients, moisture and light but for space too. Invasion is usually noticed once the plant has already naturalized (Reddy, 2008). As a result, the introduction of alien species has been recognized as one of the most serious threats to our ecological, social and economic wellbeing (Cox, 2004; Kohli et al., 2004). Convention for Biological Diversity (1992) visualize biological invasion of alien species as the second worst threat after habitat

destruction. Biological invasions may be considered as a form of biological pollution and significant component on human-caused global environmental change and one of the major causes of species extinction. The opportunity of accidental introductions may become more with rapidly increasing global commerce (Mooney and Drake, 1987; Drake et al., 1989; Parihaar et al., 2013; Singh and Kumari, 2017; Rastogi et al., 2018).

EXPERIMENTAL

Present study was carried out in three Altitudinal ranges in Haldwani block of Nainital in Kumaun region of Uttarakhand State, which lies between 1991-2200m elevations. Kaladhungi Lower Altitude (300-400m), Halduchaur Middle Altitude (400-500m), Rani Bagh Higher altitude (500-600m). Extensive field surveys were conducted to record the invasive alien species and their distribution pattern and habitats in the study area i.e. wastelands, roadsides and forests, etc. in Haldwani, Uttarakhand. Plant specimen were identified with the help of different floristic work

like Chandra Sekar, et al., (2012). Naidu, (2012), Hand Book on Weed Identification Directorate of Weed Science Research, Jabalpur, India. During the survey all the 3 sites i.e. Lower altitude – Kaladhungi (between 29°16'12" N latitude and 79°21'6" E longitude) at 300-400 m altitude, Middle altitude-Halduchaur (between 29°6'32" N and 79°32'7" E), at 400-500 m and Higher altitude-Ranibagh (between 29°17'30" N latitude and 79°32'40" E longitude) at altitude 500-600 m, were visited and the ocular observations were taken during

the survey field conditions and ecological conditions were also observed.

RESULT AND DISCUSSION

In the present study 32 invasive alien species under 30 genera, belonging to 17 families have been recorded. All the species collected from study area are listed in table 1. Each species is described with its botanical name, family and their distribution across the world along their nativity.

Table 1: An account of Invasive Species found across altitudinal ranges of study area

S.No.	Invasive Species	Family	Growth Form	Distribution	Nativity
1.	<i>Acalypha indica</i> L.	Euphorbiaceae	Herb	Forest, Wasteland	Tropical Africa
2.	<i>Ageratum conyzoides</i> L.	Asteraceae	Herb	Wasteland, Forest, Roadside	Tropical America
3.	<i>Alternanthera sessilis</i> (L.) DC.	Amaranthaceae	Herb	Wasteland	Tropical America
4.	<i>Barleria cristata</i> L.	Acanthaceae	Herb	Forest	Southeast Asia
5.	<i>Bidens pilosa</i> L.	Asteraceae	Herb	Wasteland, Roadside	Tropical America
6.	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Herb	Forest, Roadside	Tropical Africa
7.	<i>Calotropis gigantea</i> (L.) R.Br.	Asclepiadaceae	Shrub	Forest	Tropical Africa
8.	<i>Calotropis procera</i> (Ait.) R.Br.	Asclepiadaceae	Shrub	Wasteland	Trop. Africa
9.	<i>Celosia argentea</i> L.	Amaranthaceae	Herb	Roadside	Tropical Africa
10.	<i>Cleome viscosa</i> L.	Cleomaceae	Herb	Wasteland	Tropical America
11.	<i>Cyanthillium cinereum</i> (L.) H.Rob.	Asteraceae	Herb	Wasteland	Tropical Africa
12.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Herb	Wasteland	Tropical America
13.	<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	Herb	Wasteland, Forest, Roadside	Tropical America
14.	<i>Ipomoea hederifolia</i> L.	Convolvulaceae	Herb	Roadside, Forest	Tropical America
15.	<i>Lantana camara</i> L.	Verbenaceae	Shrub	Wasteland, Roadside	Tropical America
16.	<i>Ludwigia perennis</i> L.	Onagraceae	Herb	Wasteland	Tropical America
17.	<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae	Shrub	Roadside	Tropical America
18.	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Herb	Roadside	Peru
19.	<i>Parthenium</i>	Asteraceae	Herb	Wasteland,	North America

	<i>hysterophorus L.</i>			Roadside	
20.	<i>Peperomia pellucida (L.) Kunth</i>	Piperaceae	Herb	Wasteland, Roadside	South America
21.	<i>Physalis minima L.</i>	Solanaceae	Herb	Wasteland	Tropical America
22.	<i>Physalis pruinosa L.</i>	Solanaceae	Herb	Roadside	Tropical America
23.	<i>Pilea microphylla (L.) Liebm.</i>	Urticaceae	Herb	Roadside	Southern America
24.	<i>Ricinus communis L.</i>	Euphorbiaceae	Shrub	Roadside	Tropical Africa
25.	<i>Senna occidentalis (L.) Link</i>	Fabaceae	Herb	Forest, Wasteland, Roadside	South America
26.	<i>Sida acuta (Burm. f.)</i>	Malvaceae	Herb	Wasteland, Roadside, Forest	Tropical America
27.	<i>Solanum nigrum L.</i>	Solanaceae	Herb	Roadside	Tropical America
28.	<i>Tridax procumbens L.</i>	Asteraceae	Herb	Wasteland	Tropical America
29.	<i>Triumfetta rhomboidea Jacq.</i>	Tiliaceae	Herb	Roadside	Tropical America
30.	<i>Urena lobata L.</i>	Malvaceae	Shrub	Roadside, Wasteland, Forest	Tropical Africa
31.	<i>Xanthium indicum J. Koenig</i>	Asteraceae	Herb	Roadside	Tropical America
32.	<i>Youngia japonica (L.) DC.</i>	Asteraceae	Herb	Roadside	South America

Higher Altitude at Ranibagh is recorded as the dominant part of Invasive Alien Flora represented by 19 species. Maximum species were recorded from higher followed by middle altitude halduchaur and lower Altitude Kaladhungi. Lowest species were recorded from Lower altitude Kaladhungi with 14 species. Family Asteraceae was found dominant for the invasive alien flora with 7 species. Three different geographic regions in terms of nativity are recorded. Based on their source regions IAS can be broadly categorized into three major group's viz., American, African and Asian. Almost 72% (23 spp.) invasive alien species were introduced from the American continent followed by African continent 25% (8 spp.), Asian 3% (1 spp.). Where Tropical American elements are recorded as the dominant part of IAS flora. Family Asteraceae dominates the invasive alien flora followed by

Malvaceae, Euphorbiaceae, Solanaceae, Amaranthaceae, Asclepiadaceae etc.

CONCLUSION

Across the habitat distribution pattern of the invasive alien species revealed that only five species *Ageratum conyzoides L.*, *Hyptis suaveolens (L.) Poit.*, *Senna occidentalis (L.) Link*, *Sida acuta (Burm. f.)* and *Urena lobata L.* were present in all the habitats. Two species were reported from only one habitat viz. *Barleria cristata L.* and *Calotropis gigantea (L.) W.T. Aiton* was present in forest or wild area only. In recent years, the plant diversity is facing various threats and is reducing very rapidly. The invasion of species in the new regimes became a second highest threat to plant diversity after the habitat loss. The introduction of such species is rising sharply throughout the world due to increased mobility,

trade, travel and tourism and the unprecedented accessibility of goods resulting from globalization. At global scale invasive alien species have become a problem and causing a huge loss in agriculture sectors and decrease the native species diversity.

REFERENCES

- Chandra Sekar K (2012). Invasive Alien Plants of Indian Himalayan Region- Diversity and Implication. *American Journal of Plant Sciences* 3(2):177–184.
- Cox, G.W. (2004). Alien Species and Evolution: The Evolutionary Ecology of Alien Plants, Animals, Microbes and Interacting Native Species. Island Press, Washington, D.C.
- Kohli, R.K.; Dogra, K.S.; Battish, D.R. and Singh, H.P. (2004). Impact of Invasive plants on the structure and composition of natural vegetation of north western Indian Himalayas. *Weed Technol.*, 18: 1296.
- Mooney HA, Drake JA (1987). The Ecology of Biological Invasions. *Environment*; 29(5): 12.
- Parihaar R.S., Kiran Bargali and S.S. Bargali (2013). Ecological Attributes of Some Invasive Plant Species of Jhirna Range in Corbett National Park Ramnagar, Uttarakhand, *Journal of Plant Development Sciences*. 5 (4):447-451.
- Rastogi J, Rawat DS & Chandra S (2015). Diversity of invasive alien species in Pantnagar flora. *Tropical Plant Research* 2(3):282–287.
- Rastogi Jyostna and Rana Sumita (2018). Economic Importance of Some Invasive Alien Species reported in the Tarai Belt of Uttarakhand, India. *Adv. Biores.*, 9(1):67-73.
- Reddy CS (2008). Catalogue of invasive alien flora of India. *Life Sciences Journal* 5:84–89.
- Reddy CS, Bagyanarayana G, Reddy KN & Vatsavaya SR (2008). Invasive Alien flora of India. National Biological Information Infrastructure, USGS, USA.
- Singh, Anupam Pratap and Kumari, Beena (2017). Diversity, Distribution and uses of invasive alien angiosperms of Rampur District (U.P.) India. *International Journal of Applied and Pure Science and Agriculture* 3(6): 33-37

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