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## Identity and exploration of Rasna (*Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata*) a controversial traditional drug used in Ayurveda

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### Abstract

Rasna is an ayurvedic drug used in other system of traditional medicines viz. Homoeopathy, Unani, Siddha against which is represented by *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata*, in different part of the Country and abroad. In Eastern Indian markets in the name of Rasna, roots of *Acampe praemorsa* and *Vanda tessellata* is being used whereas, in Central and Northern India *Pluchea lanceolata* is used and in Southern India *A. galanga* is in use. The plants of *Acampe praemorsa*, *Alpinia galanga* and *Vanda tessellata* are distributed in Assam, West Bengal, and Southern coastal areas in India whereas *Pluchea lanceolata* is distributed in Central India particularly in Gwalior and Moraina districts of Madhya Pradesh. The paper emphasizes to treat *Pluchea lanceolata* in the name of Rasna.

**Keywords:** Exploration, Rasna, *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata*, *Vanda tessellata*

### Introduction

Rasna is an ayurvedic drug used in other system of traditional medicines viz. Homoeopathy, Unani, Siddha against which is represented by *Acampe praemorsa* (Roxb.) Blott. & McCann, *Alpinia galanga* (L.) Willd, *Pluchea lanceolata* (DC.) C.B. Clarke and *Vanda tessellata* (Roxb.) Hook. ex G. Don, in different part of the Country and abroad. In Eastern Indian markets in the name of Rasna, roots of *Acampe praemorsa* and *Vanda tessellata* are being used whereas, in Central and Northern India *Pluchea lanceolata* is used and in Southern India *A. galanga* is in use. Cultivation of *A. galanga* is in practice in the name of Kulanjan and Ghorvach.

North Eastern India covering the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim, having richest source of biodiversity and highly occupied by orchids to which *Acampe praemorsa* and *Vanda tessellata* belongs and being traded in entire Eastern Indian Crude drug markets. is having the distribution of *Acampe praemorsa*, *Alpinia galanga* and *Vanda tessellata* and the South and western India covering the states of Andhra Pradesh, Tamil Nadu, Karnataka, Goa, Kerala Telangana and Maharashtra, *Alpinia galanga* and *Vanda tessellata* is having its occurrence and distribution whereas *Pluchea lanceolata* is confined to only Chambal valley of Madhya Pradesh and adjoining part of Rajasthan and Uttar Pradesh.

It has wider use in in Ayurvedic formulations and even in perfumeries and incense. Root and rhizome is used for famous Ayurvedic formulations like Rasnadi quath, Leaves of *Alpinia galanga* and *Vanda tessellata* are also useful in traditional healing practices in the cure of joint pains, cough and digestive complaints. All the plants available in the name of Rasna are having crude drug commercial market value and having good scope for commercial cultivation as demanded by pharmaceuticals and perfumeries gradually depleting from its Natural habitat due to unscientific exploitation by removing from their habitats. Though the plants belonging to different systemic positioning and chemical constituents even then they all serve the common purpose for herbal formulations. Rhizomes of *Alpinia galanga* belonging to family Zingiberaceae contains essential oil helpful in respiratory complaints in children, *Acampe praemorsa* and *Vanda tessellata* being the members of Orchidaceae, *Acampe praemorsa* contains alkaloids, bitter resin useful in rheumatism, and whole plant of *Vanda tessellata*

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contains alkaloid responsible for stimulating entire body organs removing pain and renovation of body system. *Pluchea lanceolata* belonging to family Asteraceae also contains essential oil useful in same disorders. Authors through repeated explorations in Northeast Indian states, Uttar Pradesh and Madhya Pradesh had confined to the occurrence and potential distribution of all the plants used as Rasna useful in various ailments developing commonly in modern period like body pain, respiratory disorders and digestive complaints and found the occurrence and distribution in following patterns. The plant *Vanda tessellata* has an alkaloid, a glucoside, tannins,  $\beta$ -sitosterol,  $\gamma$ -sitosterol and a long chain aliphatic compound, fatty oils, resins and colouring matters. Roots contain tetracosyl ferrulate and  $\beta$ -sitosterol-D-glucoside [1, 4]. Heptacosane ( $C_{27}H_{56}$ ) containing traces of the higher homologue ( $C_{29}H_{60}$ ) and octacosanol ( $C_{28}H_{58}O$ ) containing traces of higher homologue ( $C_{30}H_{62}O$ ), ( $C_{32}H_{66}O$ ) were identified.

### Objective of Research

This type of study of Rasna (*Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata*) the four plants belonging to three different taxonomic families are used in the same name and similar formulations. Population of different plants except *Vanda tessellata* are limited to very limited areas and the drug Rasna is of high valued formulation in the systems which need is gradually increasing. Accordingly, first attempt has been made to assess the distributional potential in the field and acquiring the information about the cultivation status. Further, mode of propagation with its limitations in propagation was kept in mind to fulfil the need of time when human population is turning towards herbal treatment.

### Literary

Orchid plants like *Acampe praemorsa* and *Vanda tessellata* being epiphyte needs more attention towards selection of plants as support as well as terrestrial adaptation of the plants. Medicinal uses of plants described under Rasna have been described [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]. Pharmaceutical properties and microbial action of orchids of Bangladesh have been made [11, 12]. Found aphrodisiac compound in orchid's plants. The antimalarial action of *Pluchea lanceolata* [13], Antibacterial properties of orchids were studied [14]. Anti inflammatory effects of *P. lanceolata* were studied [15]. Antioxidant studies and immunoregulatory role of orchids were studied [16]. Distribution of orchids covering *Acampe praemorsa* and *Vanda tessellata* has been described [17, 18], whereas conservation and *in vitro* studies of orchids covering medicinal orchids were made [19, 20, 21] for the callus formation in *Pluchea lanceolata*. Seeking out the difficulties in procuring the medicinal plants from natural habitat description was the causes using pratinidh dravya (substitute drugs) [22].

### Experimental

#### Summary of the research work

Plants of Rasna i.e. *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata* is having acute pressure for exploitation from Natural habitat due to being pharmaceutically important drug and may get extinction from Nature and to fulfil the need of Pharmaceuticals and safety from extinction from the natural habitat it has been the need of time to develop method of conservation and cultivation of these species as the root is the major part of drug which is also the propagules for cultivation and the traders are

collection the drugs without any precaution for further generation. To acquire the areas of occurrence, source of propagules for regeneration and mass cultivation, authors have taken attempt for exploring the areas of occurrence mode of propagation and conservation in the natural habitat. Accordingly, all possible efforts have been made to study GPS information of plants in the areas of occurrence in different forests having richest biodiversity in the Country. Accordingly, quantitative status of the plants used as Rasna i.e. *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata* in field provides the clear picture for the need of harvest without care means having sufficient quantity for use or taking initiative towards conservation and cultivation. The field survey of medicinal plants in different forest areas of the Region expressed the clear picture of the distribution of plant in field and occurrence of all the plants under Rasna in very waste areas but with less population in the areas of occurrence i.e. in an area of 10 m<sup>2</sup> and it inspired for taking initiative towards quantitative assessment and need for conservation and cultivation. Accordingly, various attempts for quantitative assessment and mode of propagation were studied in different parts of the North eastern India.

### Methodology

Study is based on exhaustive survey of the North eastern India, sub Himalayan plains and Vindhyan as well as Bundelkhand part of Uttar Pradesh first and then study of population density in the areas of occurrence followed by method of conservation and cultivation in the North-eastern states. Side by side population density with associated weeds was studied in field of occurrence of plants with the status of longitude, latitude and altitude by using GPS where the plant is naturally growing. Different study size of quadrat sizing 1 m<sup>2</sup> for terrestrial plant *Pluchea lanceolata* in Chambal Valley and adjoining part of Madhya Pradesh and number of trees where the epiphytic plants of *Acampe praemorsa* and *Vanda tessellata* are occurring in Arunachal Pradesh, Assam, Meghalaya, Mizoram and Nagaland, where ever, bigger area of occurrence was observed. Seeking out very little number of *A. praemorsa* plants distributions only in limited areas and moderate number of plants of *V. tessellata* there has been need of natural conservation and cultivation. Accordingly, observation was made for young seedlings in proportion to the flowering and fruiting of the plant. Studies for the cultivation of *Alpinia galanga* was made through planting bulbils attached with rhizomes in beds and extension was made from time to time during rainy seasons. Attempt for cultivation of *Pluchea lanceolata* was made through seed germination and root stocks. Only rootstocks could be found suitable for propagation. Attempt were made both for seed germination and vegetative propagation by collecting seeds from the field and bulbils of *Alpinia galanga* and only rootstocks of orchid plants were selected. Observations were made after certain time interval of 15 days. The bulbils could only survive in giving rise to new plants whereas seed germination was failed. Rhizome bulbils were sown in sandy soil and the orchids were sown in pots and survived.

### Results

#### Distribution

Plants of *Acampe praemorsa* being native of North-eastern India is distributed in Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. It is found on tree trunks as epiphyte. *Alpinia galanga* is also distributed in North-eastern Region of India as well as in

Western and South Indian states. Plants of *Vanda tessellata* is distributed in almost all part of Country in humid places on tree trunk as epiphyte. *Pluchea lanceolata* is distributed in Chambal Valley of Uttar Pradesh and Madhya Pradesh and salt marshy places According to the distribution of the plant these plants are used in various formulations in the name of

Rasna and by other names in other part of the Country as *Pluchea lanceolata* confined to the part of occurrence in Chambal and adjoining parts. GPS status of plants used as Rasna i.e. *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata* with its population density per unit area has been given in Table 1.

**Table 1: GPS Status of different plant species used as Rasna in India**

Area	Longitude	Latitude	Altitude	Maximum population per tree
<b>Vanda tessellata</b>				
<b>Arunachal Pradesh</b>				
East Kameng district,	27 <sup>o</sup> 21.856	093 <sup>o</sup> 02.243	350	20
Riga Camp to Pakye,	27 <sup>o</sup> 30.357	093 <sup>o</sup> 00.534	280	10
	27 <sup>o</sup> 31.674	092 <sup>o</sup> 59.038	290	16
Lamkak-Yarpin, EK	27 <sup>o</sup> 20.793	093 <sup>o</sup> 02.846	360	14
West Kameng	27 <sup>o</sup> 06.738	093 <sup>o</sup> 49.054		50
Papumpare	27 <sup>o</sup> 06.738	93 <sup>o</sup> 49.054	350	25
<b>Assam</b>				
<b>Gwalpara</b>				
Dudhnoi- Guwahati Road	25 <sup>o</sup> 50.384	90 <sup>o</sup> 57.494	56	76
	25 <sup>o</sup> 56.736	90 <sup>o</sup> 10.312	57	12
Kachadol	25 <sup>o</sup> 58.057	90 <sup>o</sup> 54.667	58	28
Krishnoi -	26 <sup>o</sup> 02.151	90 <sup>o</sup> 39.711	58	14
<b>Kamrup</b>				
Boko Market	26 <sup>o</sup> 06.876	92 <sup>o</sup> 20.281	57	16
	26 <sup>o</sup> 07.505	92 <sup>o</sup> 14.496	31	25
	26 <sup>o</sup> 07.404	92 <sup>o</sup> 15.730	57	65
	26 <sup>o</sup> 09.469	91 <sup>o</sup> 90.643	132	45
	26 <sup>o</sup> 11.890	092 <sup>o</sup> 24.509	57	36
	26 <sup>o</sup> 11.896	92 <sup>o</sup> 24.509	58	42
<b>Nagaon</b>				
Jagi Road- Misa	26 <sup>o</sup> 18.892	92 <sup>o</sup> 42.569	57	15
	26 <sup>o</sup> 26.020	92 <sup>o</sup> 51.666	65	22
	26 <sup>o</sup> 30.086	92 <sup>o</sup> 57.180	62	19
	26 <sup>o</sup> 31.473	92 <sup>o</sup> 57.109	75	23
Misa	26 <sup>o</sup> 31.810	92 <sup>o</sup> 56.717	64	10
Koleabari	26 <sup>o</sup> 32.384	92 <sup>o</sup> 55.132	64	13
<b>Sonitpur</b>				
Chetia- Bishwanath Chariali	26 <sup>o</sup> 49.575	92 <sup>o</sup> 48.535	75	18
	26 <sup>o</sup> 48.291	92 <sup>o</sup> 54.078	73	16
	26 <sup>o</sup> 43.814	92 <sup>o</sup> 58.687	58	12
	25 <sup>o</sup> 49.739	93 <sup>o</sup> 18.605	72	16
	26 <sup>o</sup> 49.759	93 <sup>o</sup> 16.788	77	13
	26 <sup>o</sup> 50.174	93 <sup>o</sup> 17.012	77	28
<b>Meghalaya</b>				
<b>West Garo Hill</b>				
Milam Road	27 <sup>o</sup> 06.116	093 <sup>o</sup> 38.909	125	1
Dalu Baghmara Road	25 <sup>o</sup> 13.981	09 <sup>o</sup> 14.265	138	13
Dalu Baghmera road	25 <sup>o</sup> 18.083	090 <sup>o</sup> 12.025	270	8
Jorpara	25 <sup>o</sup> 18.831	090 <sup>o</sup> 12.026	134	24
Morebge	25 <sup>o</sup> 20.528	090 <sup>o</sup> 10.053	85	12
Milam	25 <sup>o</sup> 33.093	090 <sup>o</sup> 05.722	120	15
Garobandha- Manikachhar	25 <sup>o</sup> 34.766	090 <sup>o</sup> 01.836	100	14
Tura Rangram	25 <sup>o</sup> 34.771	090 <sup>o</sup> 17.464	65	21
Bandanggre	25 <sup>o</sup> 49.256	090 <sup>o</sup> 03.099	90	8
<b>East Garo Hill</b>				
Wagaisai	25 <sup>o</sup> 48.245	090 <sup>o</sup> 47.818	85	9
<b>East Khasi Hill</b>				
Rihun	25 <sup>o</sup> 57.906	091 <sup>o</sup> 51.459	254	12
Nangram	25 <sup>o</sup> 58.263	091 <sup>o</sup> 51.072	284	11
<b>Nagaland</b>				
Dimapur- Meziphemaa	25 <sup>o</sup> 52.929	093 <sup>o</sup> 45.488		
Dimapur Golaghat	25 <sup>o</sup> 06.236	093 <sup>o</sup> 43.844		67
Dimapur- Angami	25 <sup>o</sup> 45.269	093 <sup>o</sup> 53.352		69
<b>Manipur</b>				
Senapat	25 <sup>o</sup> 02.049N	093 <sup>o</sup> 55.550E		54
Senapati- Imphal	25 <sup>o</sup> 18.593N	094 <sup>o</sup> 02.632E		38
	25 <sup>o</sup> 02.793N	093 <sup>o</sup> 85.650E		29

Uttar Pradesh				
Sitasaran (Gonda)	27 <sup>0</sup> 40.709N	081 <sup>0</sup> 46.718E		7
Mahuli (SK Nagar)	N26 <sup>0</sup> 39.601	083 <sup>0</sup> 06.347		8
Jugail (Sonbhadra)	N24 <sup>0</sup> 33.129	E 083 <sup>0</sup> 06.347		7
NorthNaugarh (Chandauli)	24 <sup>0</sup> 51.701N	083 <sup>0</sup> 16.913		8
Chhattisgarh				
Raigarh	22 <sup>0</sup> 00.375N	083 <sup>0</sup> 30.444		11
<i>Acampe praemorsa</i> in Assam and Nagaland (Number per host tree)				
Dimapur- Golaghat (Assam)	25 <sup>0</sup> 54.243	093 <sup>0</sup> 40.859		13
Dimapur- Angami (Nagaland)	25 <sup>0</sup> 45.269	093 <sup>0</sup> 53.352		12
Dimapur- Angami (Nagaland)	25 <sup>0</sup> 45.420	093 <sup>0</sup> 42.274		14
<i>Alpinia galanga</i> in Nagaland (Number per m <sup>2</sup> )				
Mariyani- Mokochung	26 <sup>0</sup> 24.382E	094 <sup>0</sup> 25.318N		8
<i>Pluchea lanceolata</i> in Chambal and Sindh Valley (Number per m <sup>2</sup> )				
Bhind	026 <sup>0</sup> 23.344E	076 <sup>0</sup> 37.376N		19
	026 <sup>0</sup> 15.095E	078 <sup>0</sup> 41.369N		15
	026 <sup>0</sup> 15.106E	078 <sup>0</sup> 41.881N		17
	026 <sup>0</sup> 15.099E	078 <sup>0</sup> 41.886N		18
	026 <sup>0</sup> 15.099E	078 <sup>0</sup> 41.386N		24

### Cultivation

Cultivation of *Acampe praemorsa* and *Vanda tessellata* has not been made in field. Only young plants are transplanted on tree trunk and get sprouted over the same tree trunk by absorbing moisture and nutrients from the host plants or planted in the pots filled with humus rich soil. Plants kept over tree trunks grow faster than that of potted plants. In nature mature seeds attached with the tree trunk having multiple branches get germinated and give rise to new plant. In Nature, mature seeds left on the rough barks having dust and moisture contents absorbed by the bark supports the seed germination through which Plants of *Alpinia galanga* are cultivated in field through rhizome pieces which are planted in the field by maintaining a distance of 1 meter from plant to plant and row to row both. Young bulbils are initiated within a month and after passing one year the young sprouting plants become ready for harvesting. Harvesting can be made by digging the mature rhizomes and new bulbils are left in the soil for future crop. Cultivation of *Acampe praemorsa* and *Vanda tessellata* takes place through seed germination on the tree trunk by absorbing moisture and soil by the bark especially on points of branching. Cultivation of *Pluchea lanceolata* takes place through root cuttings.

### Uses

The plant *Alpinia galanga* is used by homeopaths and herbalists for its medicinal uses in the name of Galangal. Consuming galangal regularly can aid the digestion process, and reduce constipation and vomiting. It has been found effective as a remedy for ulcers and inflammation of the stomach. Galangal has been known to improve blood circulation, especially in the hands and feet, thereby improving oxygen supply and nutrient supply to these parts. It can also aid respiratory problems like congestion and helps regulate breathing rate. The galangal herb is used extensively throughout the East as a snuff for nasal infections. A mixture of galangal and lime juice is used as a tonic for cough and cold. Additionally, galangal powder is used against bad breath as a mouth freshener. However, excessive use may cause side effect as joint pain and vomiting. *Acampe praemorsa* is used as bitter tonic and in rheumatism, *Pluchea lanceolata* is used

for the inflammations and bronchitis, psoriasis, cough and piles. It is also used as antipyretic, analgesic, laxative and nervine tonic. The decoction of plant is used to prevent the swellings of joint in arthritis, rheumatism and neurological diseases. The roots are antipyretic, bitter, laxative and thermogenic and are used for allaying the pain caused by the sting of scorpions. Plant extract is used as a cooling agent in summer. The leaves are aperient and used as a laxative, analgesic and antipyretic.

### Discussion

Plant of *Acampe praemorsa* and *Vanda tessellata* are distributed all over the country ascending 500 masl. But to a limited number where dry rocky and in Northeast Region it is confined to only certain areas in Arunachal Pradesh, Assam, Manipur, Meghalaya Mizoram, Nagaland and West Bengal (only the adjoining part of Sikkim) [22, 23, 24]. So far no population density and GPS status of distribution of plant has been studied for the plants of *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata*, and *Vanda tessellata*. The present study is newer for the plant and in respect to conservation and cultivation aspect only little has been reported through seed germination and vegetative propagation measure [25, 26]. Seed germination takes place under Net Lon sheds or shady places but does not takes place in Nature due blowing winds carries the dispersed seeds to long distance in the dry or watery places as seed dispersal takes place during December to January the complete dry season for the region. Vegetative propagation does not take place due to non initiation of rooting in the stem cuttings. Accordingly, seed germination under controlled condition under shade is only measure for mass cultivation. Present study is highly accessible for the farmers interested in cultivation of *Alpinia galanga* and *Pluchea lanceolata* a highly valuable rare medicinal plant in North Eastern India. Genetic behaviour and pharmacological investigations for various isolated compounds can be undertaken for further studies. Side by side there is need of genetic behaviour for isolates and varietal improvement studies under *in vitro* studies as several studies on effect of *In vitro* propagation through cell differentiation needs to be undertaken for further studies.



**Fig 1:** *Vanda tessellata*



**Fig 2:** *Pluchea lanceolata*

### Conclusion

Plants of *Alpinia galanga* and *Pluchea lanceolata* having a high demand for pharmaceuticals used in various formulations are distributed in North-eastern part of India whose cultivation through seed germination is very accessible method of propagation through rhizome bulbils is accessible method for farmers interested in cultivation of *Alpinia galanga*. Studies on tissue culture, genetic behavioural studies and effect of chemical constituents on different physiological disorders like enhancement of hormones and body fluid, secretion or effects on causal organisms and is yet to be studied. Organized farming by farmers is also the need of time to fulfil the requirements of pharmaceuticals to avoid extraction from wild sources. Plant is looking very attractive and needs to be adapted as ornamental plant also which will also serve the purpose of fulfilling the need of pharmaceuticals.

### Research highlights

The research work is carried out to study the distribution of the plants of *Acampe praemorsa*, *Alpinia galanga*, *Pluchea lanceolata* and *Vanda tessellata* which is reducing its population from Natural habitat due to acute pressure in different ways.

In Nature the seed germination is poor due to seeds being winged and dispersed away from the vicinity of plant which needs first experimental cultivation i.e. raising planting material and then transplantation in the field.

Cultivation of *Pluchea lanceolata*, a threatened plant is possible through seed germination. Public and government should take under mass cultivation.

### Limitations

The study is to the extent of field survey and experimental cultivation. Commonly the new seedlings are developed in the vicinity of the plant which make the possibility of reoccupation of the same plant if older on exploits however, in this case new seedlings were not found in the vicinity. Since the plant is reported as highly threatened medicinal plant its conservation and cultivation is the need of time.

### Recommendations

Plants of *Alpinia praemorsa*, *Alpinia galanga* are confined to North eastern states of India either wild or cultivated and *Vanda tessellata* is distributed in the tropical forests of all parts of India, whereas *Pluchea lanceolata* is confined only in the Chambal and Sindh in vallies of Madhya Pradesh, Yamuna valley of Mathua and adjoining part of Rajasthan in agriculture fields and being used in the name of Rasna in Ayurvedic formulations in different parts of the Country and

is under highly demanded and exploited from wild sources only except *Alpinia galanga*, medicinal plants needs to be cultivated in mass for safety from extinction as well as to fulfill the Pharmaceutical demand for health management. Government sector specially Forest Department should concentrate over enriching population of orchid Rasna in the forest areas by conservation in the natural field of occurrence and allow for systemic collection of drug material till the population achieves its normal position. *A. galangal* is already in cultivation

Public involvement in the conservation of medicinal plants is needed and the unutilized land in the villages as well as community land is to be used for extensive cultivation of *Pluchea lanceolata* in agricultural and waste land for income generation.

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### References

1. Kirtikar KR, Basu BD. Indian Medicinal Plants, International Book Distributor, Dehradun. 1975;2:1344-1345.
2. Chopra RN, Nayar SL, Chopra IC. Glossary of Indian Medicinal Plants. CSIR, New Delhi, 1956.
3. Khare CP. Indian Medicinal Plants: An Illustrated Dictionary. Springer-Verlag Berlin/ Heidelberg, 2007, 500.
4. Vidal J. Les Plantes Utiles de Laos. J Agric Trop Bot Appl. 1960;7:417-46.
5. Farnsworth NR, Bunyaphatsara N. Thai Medicinal Plants. Prachachon Co: Bangkok, 1992, 200.
6. Dourness J. Deuxime Contribution a l'Ethnobotanique Indochinoise. J Agric Trop Bot Appl. 1995;14:64-86.
7. Nadkarni AK. Indian Materia Medica, Popular Prakashan, Bombay, 1976, 242.
8. Panda Ashok, Mandal Debasis. Folklore medicinal orchids of Sikkim Ancient Sci. Life. 2013;33(2):92-96.
9. Behera D, Rath CC, Mohapatra U. Medicinal Orchids in India and their Conservation: A Review. Floriculture and Ornamental Biotechnology; Global Science Books, 2013, 53-59.
10. Rahman M, Husen A. Orchids an important group of plants of traditional system of medicine in India. The Indian Forester. 2003;129(5):651-653.
11. Haque MM, Khaleda L, Al-Forkan, M. Evaluation of pharmaceutical properties on microbial activities of some

- important medicinal orchids of Bangladesh. *Journal of Pharmacognosy and Phytochemistry*. 2016;5(2):265-269.
12. Subramoniam A, Gangaprasad A, Sureshkumar PK, Radhika J, Arun BK. A novel aphrodisiac compound from an orchid that activates nitric oxide synthases. *International Journal of Impotence Research*. 2013;25:212-216.
  13. Kaushik P, Ghanaksha A. Antibacterial effect of *Aerides multiflora* Roxb. A study *in vitro*. *J Orchid Soc India*. 1999;13(1-2):65-68.
  14. Mohanty Shilpa, Srivastava Pooja, Maurya, Anil Kumar, Cheema Harveer Singh, Shankar Karuna, *et al.* Antimalarial and safety evaluation of *Pluchea lanceolata* (DC.) Oliv. & Hiern: *In vitro* and *in vivo* study. *J. Ethnopharmacology* 2013: 1-6.
  15. Sharma SK, Goyal N. Biological Studies of the Plants from Genus *Pluchea*. *Annals of Biological Research*. 2011;2(3):25-34.
  16. Abhishek C, Paulomi P, Deepa N, Mrinal KB. Antimicrobial efficacy of Orchid extracts as potential inhibitors of antibiotic resistant strains of *Escherichia coli*. *Asian J Pharma Clin Res*. 2013;6(3):108-11.
  17. Deorani SC, Naithani HB. In *Orchids of Nagaland*, Oriental Express Dehra Dun, India, 1995, 364.
  18. Chowdhery HJ. *Orchid flora of Arunachal Pradesh*, Bishen Singh Mahacandra Pal Singh, Dehra, Dun, India, 1998, 824.
  19. Pradhan UC. *Conserving Indian Orchids*. Amer, Orchid Soc. 1977;46:117-21.
  20. Kumar S, Narula A, Sharma MP, Srivastava PS. *In vitro* Propagation of *Pluchea lanceolata*, a Medicinal Plant, and Effect of Heavy Metals and Different Aminopurines on Quercetin Content *in vitro* Cellular & Developmental Biology. *Plant*. 2004;40(2):171-176.
  21. Verma A, Jain N. Callus production under different culture medium in *Pluchea lanceolata*: A perennial medicinal plant *Annals of Biological Research*. 2011;2(5):191-195.
  22. Joshi Pravin R, Patel BR, Shukla VJ. An overview of the causes of current practices in Pratinidhi Dravyas (substitution of drugs) in Ayurveda including newer techniques for their evaluation AYU. 2012;33(4):81-485.
  23. Sinha SC. *Medicinal Plants of Manipur*. Imphal, 1986.
  24. Shankar R, Rawat MS. *Medico-ethnobotany of Arunachal Pradesh (Papumpare, Lower and Upper Subansiri districts)* Himalayan Publishers, New Delhi, Itanagar, 2008.
  25. Anonymous. *The Ayurvedic Pharmacopoeia of India*, Ministry of Health and Family Welfare, Department of Health, Govt. of India, New Delhi, 1989, 3.
  26. Shankar R, Rawat MS. *Medicinal Plants of Arunachal Pradesh*. International Book, Distributors, Dehradun, 2013.