

Plant Genetic Resources in Lam Dong province - Vietnam : *Brief in medicine plants and wild orchids situation*

Nguyen Van Ket^{1*} and Joon-Hyeong Cho²

¹Agriculture and Forestry Faculty, The Dalat University, 01 Phu Dong Thien Vuong St. Lam Dong Province, Dalat City, Viet Nam

²Department of Plant Biotechnology, Dongguk University, Korea 26 Pil-dong 3-ga, Jung-gu, Seoul, 100-750, Korea

Abstract - Lam Dong Province of Vietnam has an exceptional diversity of orchids and herbs. At least 920 herb species are widely mentioned in Vietnamese traditional medicinal literature and over 239 Lam Dong wild orchid species are used for attention under the Conservation Vietnamese wild orchids projects. In collaboration with Department of Plant Biotechnology, Dongguk University – South Korea working under supported ODA funds from Korea government (MIFAFF), we will consider how to collecting and preserving these plants in situ or conservating in vitro as a genetic resource.

Key words - Vietnam, wild orchids, herbs

Viet Nam geography and climate

Viet Nam is approximately 331,688 km² in area with the perimeter of the country running along its international boundaries is 4,639 km. Vietnam's geographical location is in the tropical monsoon belt characterized by two seasons - rainy summers and dry winters. Vietnam, stretching over 7° longitudes (102°10' E - 109° 30' E) is sandwiched between the Annamite mountain chains and the South China Sea and has a long coastline of 3000 km. Its northsouth elongation (1600 km) over 15° of latitudes (8° 30' N – 23° 22'N) is a factor for gradual decrease of temperature towards the north setting in sub-tropical situation. It is the high altitude that brings in a zone of temperate climate on the peaks of mountains rising more than 1000 metres above the mean seal level. During the winter or dry season, extending roughly from November to April, and the rainy or summer season with monsoon winds picking up considerable moisture. The average annual temperature is generally higher in the plains than in the mountains and plateaus. Temperatures in the southern between 21 and 28°C over the course of a year, meanwhile in the north are much more dramatic.

Topography and climate together with geology have brought in changes in the soil conditions; and their combined influence is well evident on the vegetation types and floristic composition. Further and more complexity is manifested in the Vietnam's flora as a result of southward extension of the flora of the South China and the Himalayas (Fisher, 1969). The common forest types, mixed evergreen and semi-deciduous broadleaved forest.

Vietnam's forests cover to about 41 per cent by 1943 to 24% recently. The depletion of forest resources mainly due to over-exploitation, Vietnam's urbanization, wild fires, pollution, lack of funding for environmental programs, over-population growth, and many other factors

Orchid and medicinal plant resources

Vietnam possesses more than 10,836 plant species. Among them, there are over 3,100 species of medicinal plants (Vo-Van-Chi. 1997). Of which, 920 species are widely mentioned in Vietnamese traditional medicinal literature. A list of 356 rare medicinal plants, as recorded in Vietnamese Red Book, is classified into: rare (159 species), threatened (83), vulner-

*Corresponding author. E-mail : ketnv@dlu.edu.vn

able (61), known indefinitely (29) and endangered (24) species (Do Huy Bich et al. 2003).

However, deforestation and forest degradation has resulted in the significant loss of biodiversity in general and medicinal plant resources in particular. This loss has led to the erosion of valuable traditional knowledge and practice of the ethnic minorities in using these medicinal plant resources for disease treatment.

On the otherside, the orchid flora in Vietnam was considered a typical spectrum of the largest orchid genera in tropical Asia (Averyanov, 2003). Unfortunately, the current excellent governmental program for protection of primary forests cannot effectively prevent the extinction orchids and other plants that are in high demand in the market-place because of their widespread selective collecting for sale by local people and for international trade. Vietnam is currently hastening in industrial development and utilization of its natural resources so that the deforestation is in proceeding and some of the orchids are becoming rare and has changed dramatically. The complete extinction in Vietnam of most of the native orchids is quite possible in the very near future (Averyanov, 2003).

In the context of market economy, urbanization, demographic growth and expansion of agricultural land, medicinal

plants and wild orchid grown in the family gardens have got dwindled; in several instances wild medicinal plants have been so much ruthlessly exploited as to face the threat of extinction.

Present status of medicinal plant and wild orchid resource in Lam Dong

Lam Dong is the third largest province on the plateau on the Central Highlands is approximately 10,137 sq km in area. It is also the highest province lying on a plain the average height of which is about 1,500 meters above sea level. Lam Dong is a forest province with forest coverage accounting for 70 per cent of the total area. The annual average temperature is 18°C. Dalat is a provincial capital which offers an average temperature of about 10°C in winter time and 20°C in summer. Thanks to the warm weather the whole city of Dalat is a great many kinds of flowers and plants growing including orchid and medicine plants.

According to currently available data, at least 249 medicinal plant species being reserved in Lam Dong herbal plant center (Table 1), and in a some households have a small part in their gardens for planting medicinal plants for family needs.

On the field of wild orchids, according to Averyanov L.V,

Table 1. List of Herb plants from Lam Dong – Vietnam

NNo.	Species	Family
1	<i>Prunus cerasoides</i> D. Don	Rosaceae
2	<i>Cynara scolymus</i> L.	Asteraceae
3	<i>Rauvolfia cambodiana</i> Pierre ex Pit.	Apocynaceae
4	<i>Rauvolfia vomitoria</i> Afzel ex Spreng.	Apocynaceae
5	<i>Rauvolfia tetraphylla</i> L.	Apocynaceae
6	<i>Rauvolfia yunnanensis</i> Tsiang	Apocynaceae
7	<i>Rauvolfia verticillata</i> (Lour.) Baill.	Apocynaceae
8	<i>Pimpinella diversifolia</i> DC.	Apiaceae
9	<i>Mentha arvensis</i> L.	Lamiaceae
10	<i>Mentha arvensis</i> L. var 1.	Lamiaceae
11	<i>Mentha arvensis</i> L. var 2.	Lamiaceae
12	<i>Mentha arvensis</i> L. var 3.	Lamiaceae
13	<i>Angelica dahurica</i> (Fisch. ex Hoffm) Benth. et Hook.f.	Apiaceae
14	<i>Eucalyptus citriodora</i> Hook.	Myrtaceae
15	<i>Eucalyptus globulus</i> Labill.	Myrtaceae
16	<i>Calocedrus macrolepis</i> Kurz.	Cupressaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
17	<i>Typhonium trilobatum</i> (L.) Schott.	Araceae
18	<i>Stephania rotunda</i> Lour.	Menispermaceae
19	<i>Stephania pierrei</i> Diels.	Menispermaceae
20	<i>Buddleija asiatica</i> Lour.	Buddleijaceae
21	<i>Taraxacum officinale</i> (L.) Weber.	Asteraceae
22	<i>Lactuca indica</i> L.	Asteraceae
23	<i>Gleditsia fera</i> (Lour.) Merr.	Fabaceae
24	<i>Persea americana</i> Miller	Lauraceae
25	<i>Litsea glutinosa</i> (Lour.) C.B.Rob.	Lauraceae
26	<i>Solanum xanthocarpum</i> Schrad et Wendl.	Solanaceae
27	<i>Lycium chinense</i> Mill.	Solanaceae
28	<i>Alongsia virgata</i> Juss.	Verbenaceae
29	<i>Schefflera</i> sp1.	Araliaceae
30	<i>Schefflera</i> sp2.	Araliaceae
31	<i>Schefflera</i> sp3.	Araliaceae
32	<i>Schefflera</i> sp4.	Araliaceae
33	<i>Schefflera</i> sp5.	Araliaceae
34	<i>Schefflera</i> sp6.	Araliaceae
35	<i>Schefflera</i> sp7.	Araliaceae
36	<i>Schefflera</i> sp8.	Araliaceae
37	<i>Schefflera farinosa</i> (Bl.) Merr.	Araliaceae
38	<i>Schefflera</i> sp.	Araliaceae
39	<i>Symphytum officinale</i> L.	Boraginaceae
40	<i>Polygonum cuspidatum</i> Sieb. et Zucc.	Polygonaceae
41	<i>Drynaria fortunei</i> (Kurz.) J. Sm.	Polypodiaceae
42	<i>Eclipta prostrata</i> L.	Asteraceae
43	<i>Stevia rebaudiana</i> (Bert.) Hemsl.	Asteraceae
44	<i>Achyranthes aspera</i> L.	Amaranthaceae
45	<i>Croton oblongifolius</i> Roxb.	Euphorbiaceae
46	<i>Elephantopus mollis</i> H.B. K.	Asteraceae
47	<i>Silybum marianum</i> (L.) Gaerth.	Asteraceae
48	<i>Pluchea indica</i> (L.) Less	Asteraceae
49	<i>Morus alba</i> L.	Moraceae
50	<i>Tinospora crispa</i> Miers.	Menispermaceae
51	<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae
52	<i>Catharanthus roseus</i> (L.) G. Don.	Apocynaceae
53	<i>Matricaria chamomilla</i> L. (<i>Matricaria recutita</i> L.)	Asteraceae
54	<i>Agave americana</i> L. var <i>marginata</i> Bail.	Agavaceae
55	<i>Keteleeria evelyniana</i> Mast.	Pinaceae
56	<i>Ficus elastica</i> Roxb. ex Horn	Moraceae
57	<i>Plumeria rubra</i> L. var <i>acutifolia</i> (Poir.) Bail.	Apocynaceae
58	<i>Prunus persica</i> (L.) Batsch.	Rosaceae
59	<i>Codonopsis javanica</i> (Blume) Hook.f.	Campanulaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
60	<i>Kaempferia galanga</i> L.	Zingiberaceae
61	<i>Polycias fruticosa</i> (L.) Harms.	Araliaceae
62	<i>Polycias</i> sp.	Araliaceae
63	<i>Polycias balfouriana</i> Bail.	Araliaceae
64	<i>Polyscias guilfoylei</i> Baill	Araliaceae
65	<i>Cephalotaxus mannii</i> Hook.f.	Cephalotaxaceae
66	<i>Rhododendron simsii</i> Planch	Ericaceae
67	<i>Eucommia ulmoides</i> Oliv.	Eucommiaceae
68	<i>Angelica pubescens</i> Maxim.f.	Apiaceae
69	<i>Ixora coccinea</i> L.	Rubiaceae
70	<i>Trevesia palmata</i> (Roxb.) Vis.	Araliaceae
71	<i>Stachytarpheta jamaicensis</i> (L.) Vahl.	Verbenaceae
72	<i>Plumbago zeylanica</i> L.	Plumbaginaceae
73	<i>Angelica acutibola</i> (Sieb. et Zucc.) Kiatawa	Apiaceae
74	<i>Angelica urchiriana</i> (L.) Kurz.	Apiaceae
75	<i>Boehmeria nivea</i> (L.) Gaud.	Urticaceae
76	<i>Curculigo</i> sp.	Hypocidaceae
77	<i>Polygonum multiflorum</i> Thunb.	Polygonaceae
78	<i>Phaius tankervilleae</i> Blume	Orchidaceae
79	<i>Hemerocallis fulva</i> L.	Hemerocallidaceae
80	<i>Rosa chinensis</i> Jacq.	Rosaceae
81	<i>Pogostemon cablin</i> (Blanco) Benth.	Lamiaceae
82	<i>Diospyros kali</i> L.f.	Ebenaceae
83	<i>Rhodoleia championi</i> Hook.f.	Rhodoleiaceae
84	<i>Dioscorea</i> sp.	Dioscoreaceae
85	<i>Dacrydium elatum</i> (Roxb.) Wall. ex Hook.	Podocarpaceae
86	<i>Berberis nepaulensis</i> (D.C.) Spreng	Berberidaceae
87	<i>Sophora japonica</i> L.	Fabaceae
88	<i>Dianella ensifolia</i> (L.) DC.	Phormiaceae
89	<i>Ocimum sanctum</i> L.	Lamiaceae
90	<i>Ocimum gratissimum</i> L.	Lamiaceae
91	<i>Plectranthus amboinicus</i> (Lour.) Spreng	Lamiaceae
92	<i>Scrophularia ningpoensis</i> Hemsl.	Scrophulariaceae
93	<i>Cordilyne fruticosa</i> (L.) A. Cheval.	Asteliaceae
94	<i>Siegesbekia orientalis</i> L.	Asteraceae
95	<i>Leonurus heterophyllus</i> Sweet.	Lamiaceae
96	<i>Milletia reticulata</i> Benth.	Fabaceae
97	<i>Urena lobata</i> L.	Malvaceae
98	<i>Rhinacanthus nasutus</i> (L.) Kurz.	Acanthaceae
99	<i>Smilax</i> sp.	Smilacaceae
100	<i>Chrysanthemum indicum</i> L.	Asteraceae
101	<i>Nageia fleuryi</i> (Hick.) de Labenf.	Podocarpaceae
102	<i>Lonicera japonica</i> Thunb.	Caprifoliaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
103	<i>Solanum verbascifolium</i> L.	Solanaceae
104	<i>Raphidophora decursiva</i> Schoot.	Araceae
105	<i>Ludisia discolor</i> (Ker Gawl.) A. Rich	Orchidaceae
106	<i>Calanthe triplicata</i> (Willem.) Ames	Orchidaceae
107	<i>Geranium nepalense</i> Sweet var. thunbergii	Geraniaceae
108	<i>Dicliptera chinensis</i> (L.) Nees.	Acanthaceae
109	<i>Piper lolot</i> L.	Piperaceae
110	<i>Callistemon citrinus</i> (Curtis) Skeels	Myrtaceae
111	<i>Cinnamomum camphora</i> (L.) Presl.	Lauraceae
112	<i>Stephania longa</i> Lour.	Menispermaceae
113	<i>Aloe vera</i> L. var chinensis Berger.	Asphodelaceae
114	<i>Punica granatum</i> L.	Punicaceae
115	<i>Sansevieria zeylanica</i> L.	Dranacaceae
116	<i>Sansevieria trifasciata</i> Hort. Ex Brain var laurentii (De Willd.) N.E. Brown.	Dranacaceae
117	<i>Ophiopogon japonicus</i> (L.f.) Ker. Gawl.	Convallariaceae
118	<i>Plantago major</i> L.	Plantaginaceae
119	<i>Plantago asiatica</i> L.	Plantaginaceae
120	<i>Plantago lanceolata</i> L.	Plantaginaceae
121	<i>Origanum majorana</i> L.	Lamiaceae
122	<i>Costus speciosus</i> (Koenig) Sm.	Costaceae
123	<i>Bauhinia</i> sp	Fabaceae
124	<i>Rhus chinensis</i> Mill.	Anacardiaceae
125	<i>Crimum defixum</i> Ker Gawl.	Amaryllidaceae
126	<i>Crimum asiaticum</i> L.	Amaryllidaceae
127	<i>Curcuma zedoaria</i> (Berg.) Roscoe	Zingiberaceae
128	<i>Sansevieria cylindrica</i> Boijer.	Dranacaceae
129	<i>Artemisia vulgaris</i> L.	Asteraceae
130	<i>Curcuma longa</i> L.	Zingiberaceae
131	<i>Curcuma xanthorriza</i> Roxb.	Zingiberaceae
132	<i>Achyranthes bidentata</i> Blume.	Amaranthaceae
133	<i>Schefflera eliptica</i> L.	Araliaceae
134	<i>Acanthopanax gracilistylus</i> W.W.Sm.	Araliaceae
135	<i>Acanthopanax trifoliatum</i> (L.) Merr.	Araliaceae
136	<i>Codiaeum variegatum</i> (L.) Blume.	Euphorbiaceae
137	<i>Vitex negundo</i> L.	Verbenaceae
138	<i>Oroxylum indicum</i> (L.) Kurz.	Bignoniaceae
139	<i>Citrus medica</i> L. var. sarcodactylis (Noot.) Swingle.	Rutaceae
140	<i>Hibiscus mutabilis</i> L.	Malvaceae
141	<i>Fokienia hodginsii</i> (Dunn.) A. Henry et Thomas	Cupressaceae
142	<i>Cinchona ledgeriana</i> Moens.	Rubiaceae
143	<i>Belamcanda chinensis</i> (L.) DC.	Iridaceae
144	<i>Alpinia officinarum</i> Hance.	Zingiberaceae
145	<i>Rosemarinus officinalis</i> L.	Lamiaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
146	<i>Amomum villosum</i> Lour.	Zingiberaceae
147	<i>Salvia officinalis</i> L.	Lamiaceae
148	<i>Eleutherine bulbosa</i> (Mill.) Urb.	Iridaceae
149	<i>Pueraria thomsonii</i> Benth.	Fabaceae
150	<i>Wedelia chinensis</i> (Osbeck.) Merr.	Asteraceae
151	<i>Wedelia</i> sp.	Asteraceae
152	<i>Cymbopogon citratus</i> (D.C.) Stapf.	Poaceae
153	<i>Cymbopogon nardus</i> (L.) Rendle.	Poaceae
154	<i>Tropaeolum majus</i> L.	Tropaeolaceae
155	<i>Disporum</i> sp.	Disporaceae
156	<i>Chloranthus japonicus</i> Sieb.	Chloranthaceae
157	<i>Ficus</i> sp.	Moraceae
158	<i>Ficus variolosa</i> Lind. ex Benth.	Moraceae
159	<i>Starlianthus thorellii</i> Garnep.	Zingiberaceae
160	<i>Acalypha wilkesiana</i> Muell.-Arg.	Euphorbiaceae
161	<i>Ricinus communis</i> L.	Euphorbiaceae
162	<i>Huperzia serrata</i> (Thunb.) trevis.	Lycopodiaceae
163	<i>Acorus taitarinowii</i> Schott.	Araceae
164	<i>Commelina communis</i> L.	Commelinaceae
165	<i>Artemisia annua</i> L.	Asteraceae
166	<i>Justicia gendarussa</i> L.f. (Gendarussa vulgaris Nees.)	Acanthaceae
167	<i>Citrus medica</i> L.	Rutaceae
168	<i>Cassia tora</i> L.	Fabaceae
169	<i>Acer campbellii</i> Hook. & Thoms. ex Hiern. var <i>campbellii</i>	Aceraceae
170	<i>Asparagus filicinus</i> Buch. –Han. ex D. Don	Asparagaceae
171	<i>Homalomena occulta</i> (Lour.) Schott.	Araceae
172	<i>Cycas micholitzii</i> Dyer.	Cycadaceae
173	<i>Smilax glabra</i> Roxb.	Smilacaceae
174	<i>Talium patens</i> (Gaertn.) Willd.	Portulacaceae
175	<i>Polygonum chinense</i> L.	Polygonaceae
176	<i>Taxus wallichiana</i> Zucc.	Taxaceae
177	<i>Pinus kesiya</i> Royle ex Gordon	Pinaceae
178	<i>Dacrycarpus imbricatus</i> (Blume) Laubenf.	Podocarpaceae
179	<i>Pinus dalatensis</i> Fereø	Pinaceae
180	<i>Podocarpus neriifolius</i> D. Don.	Podocarpaceae
181	<i>Kalanchoe pinnata</i> (Lour.) Pers.	Crassulaceae
182	<i>Euphorbia atoto</i> Forst. f.	Euphorbiaceae
183	<i>Acorus calamus</i> L.	Araceae
184	<i>Thymus vulgaris</i> L.	Lamiaceae
185	<i>Foeniculum vulgare</i> Mill.	Apiaceae
186	<i>Eupetorium fortunei</i> Turcz.	Asteraceae
187	<i>Aquilaria crassna</i> Pierre ex Lecomte	Thymelaeaceae
188	<i>Melaleuca alternifolia</i> Cheel.	Myrtaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
189	<i>Crimum latifolium</i> L.	Amaryllidaceae
190	<i>Dipsacus japonicus</i> Miq.	Dipsacaceae
191	<i>Ruta graveolens</i> L.	Rutaceae
192	<i>Erythrina variegata</i> L.	Fabaceae
193	<i>Cinnamomum parthenoxylum</i> (Jack) Meisn.	Lauraceae
194	<i>Cinnamomum</i> sp.	Lauraceae
195	<i>Ligusticum wallichii</i> Franch.	Apiaceae
196	<i>Rubia cordifolia</i> L.	Rubiaceae
197	<i>Coix lachryma – jobi</i> L.	Poaceae
198	<i>Hibiscus safdariffa</i>	Malvaceae
199	<i>Solanum torvum</i> Swartz	Solanaceae
200	<i>Melia azedarach</i> L.	Meliaceae
201	<i>Aralia armata</i> (Wall.) Seem	Araliaceae
202	<i>Streptocaulon juvenas</i> Merr.	Asclepiadaceae
203	<i>Flemingia macrophylla</i> (Willd.) Merr.(Moghania macrophylla(Willd.) Kuntze	Fabaceae
204	<i>Bougainvillea brassiliensis</i> Raeusch (B. spectabilis Willd.)	Nyctaginaceae
205	<i>Viola odorata</i> L.	Violaceae
206	<i>Coptis chinensis</i> Franch.	Ranunculaceae
207	<i>Polygonum kingianum</i> Coll. Et Hemsl.	Convallariaceae
208	<i>Illicium verum</i> Hook. f. et Thoms	Illiciaceae
209	<i>Mentha aquatica</i> L.	Lamiaceae
210	<i>Dracaena cambodiana</i> Pierre ex Gagnep	Dracaenaceae
211	<i>Rosmarinus officinalis</i> L.	Lamiaceae
212	<i>Tithonia diversifolia</i> (Hemsl.)A. Gray	Asteraceae
213	<i>Sida rhombifolia</i> L.	Malvaceae
214	<i>Tradescantia discolor</i> L'Heur(Rhoeo discolor(L'Heur.) Hance	Commelinaceae
215	<i>Solanum nigrum</i> L.	Solanaceae
216	<i>Litsea cubeba</i> (Lour.) Pers	Lauraceae
217	<i>Mimosa pudica</i> L.	Fabaceae
218	<i>Asparagus officinalis</i> L.	Asparagaceae
219	<i>Rubus alceaefolius</i> Poir. (<i>R. moluccanus</i> L.)	Rosaceae
220	<i>Saccharum officinarum</i> L.	Poaceae
221	<i>Artocarpus heterophyllus</i> Lam.	Moraceae
222	<i>Caesalpinia bonduc</i> (L.) Roxb. (<i>C. bonducella</i> (L.)Flem.	Fabaceae
223	<i>Basella rubra</i> L. (<i>B. alba</i> L.)	Basellaceae
224	<i>Paederia lamuginosa</i> Wall.	Rubiaceae
225	<i>Melastoma candidum</i> D. Don.	Melastomataceae
226	<i>Holarrhena curtisii</i> King et Gamble(<i>H. crassifolia</i> Pierre ex Spire)	Apocynaceae
227	<i>Polygonum hydropiper</i> L.	Polygonaceae
228	<i>Acanthopanax gracilistylis</i> W.W. Sm	Araliaceae
229	<i>Gomphrena celosoides</i> Mart.	Amaranthaceae
230	<i>Platynerium grande</i> A. Cunn. Ex J. Sm	Polypodiaceae
231	<i>Acanthus ilicifolius</i> L.	Acanthaceae

Table 1. List of Herb plants from Lam Dong – Vietnam (Continued)

NNo.	Species	Family
232	<i>Epiphyllum oxypetalum</i> (DC.) Haw.(<i>Cereus oxypetalus</i> DC.)	Cactaceae
233	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae
234	<i>Gynura crepidioides</i> Benth.	Asteraceae
235	<i>Emilia sonchifolia</i> (L.)DC	Asteraceae
236	<i>Centella asiatica</i> (L.) Urb.	Apiaceae
237	<i>Gnaphalium affine</i> D. Don(<i>G.multiceps</i> Wall.)	Asteraceae
238	<i>Sonchus oleraceus</i> L.	Asteraceae
239	<i>Sarcandra glabra</i> (Thunb.)Nakai(<i>Chloranthes glabra</i> Thunb.)	Chloranthaceae
240	<i>Ficus benjamina</i> L.	Moraceae
241	<i>Curculigo capitulata</i> (Lour.)Kuntze(<i>Leucojum capitulatum</i> Lour.)	Hypoxidaceae
242	<i>Wedelia prostrata</i> (Hook. et Arn.) Hemsl.	Asteraceae
243	<i>Melaleuca quinquinervia</i>	Myrtaceae
244	<i>Stahlianthus thorellii</i> Gagnep	Zingiberaceae
245	<i>Lycopodium complanatum</i> L.	Lycopodiaceae
246	<i>Lycopodiella cernua</i> (L.)Pic.-Serm(<i>Lycopodium cernuum</i> L.)	Lycopodiaceae
247	<i>Platycladus orientalis</i> (L.) Franco(<i>Thuja orientalis</i> L. , <i>Biota orientalis</i> (L.) Endl.	Cupressaceae
248	<i>Paederia scandens</i> (Lour.) Merr	Rubiaceae
249	<i>Houtuynia cordata</i> Thumb	Saururaceae

Table 2. List of Wild Orchids from Lam Dong – Vietnam

No.	Scientific name	Notes
1	<i>Acmpe bidoupense</i> (Tixier..) Aver.	Endemic
2	<i>Acanthephippium stratum</i> Lindl.	
3	<i>Acriopsis india</i> Wight	
4	<i>Arachnis annamensis</i> (Rolfe) J.J.Sm.	Endemic
5	<i>Arachnis labrosa</i> (Lindl. et Pxt.) Reichb. f.	Use value
6	<i>Aerides falcata</i> Lindl.	Use value
7	<i>Aerides rusbescens</i> Schlechter.	Endemic
8	<i>Aerides odorata</i> Lour.	Use value
9	<i>Appendicula cornuta</i> Blume.	
10	<i>Appendicula hexandra</i> J.J.Sm.	
11	<i>Agrostophyllum planicaule</i> (Lindl.) Rolfe.	
12	<i>Arundina graminifolia</i> (D.Don) Hochr.	Use value
13	<i>Bulbophyllum putidum</i> (Teijsm. et Bin..)J.J.Sm.	Use value
14	<i>Bulbophyllum spadiciflorum</i> Tixier.	Endemic
15	<i>Bulbophyllum oreogenes</i> (W.W. Smith) Seidenf.	
16	<i>Bulbophyllum refractum</i> Reichb.f.	Use value
17	<i>Bulbophyllum frostii</i> Summer..	Endemic
18	<i>Bulbophyllum affine</i> Lindl.	
19	<i>Bulbophyllum eberhardtii</i> (Gagn.) Seidenf.	
20	<i>Bulbophyllum retusiusculum</i> Reichb.f.	Use value
21	<i>Bulbophyllum umbelatum</i> Lindl.	
22	<i>Bulbophyllum luanii</i> Tixier.	

Table 2. List of Wild Orchids from Lam Dong – Vietnam (Continued)

No.	Scientific name	Notes
23	<i>Bulbophyllum nigrescen</i> Rolfe.	
24	<i>Bulbophyllum stenobubon</i> Rar & Reichb.f.	
25	<i>Bulbophyllum apodum</i> Hook. f.	
26	<i>Bulbophyllum ebulbum</i> King & Pantl.	
27	<i>Bulbophyllum khasyanum</i> Griff.	
28	<i>Bulbophyllum devangiriense</i> Bllakr..	
29	<i>Bulbophyllum elassonotum</i> Summer.	
30	<i>Bulbophyllum sigaldiae</i> Guill.	Endemic
31	<i>Bulbophyllum odoratissimum</i> (J.E. Sm.) Lindl.	Use value
32	<i>Calanthe rubens</i> Ridl.	Use value
33	<i>Calanthe triplicata</i> (Will) Ames.	Use value
34	<i>Calanthe pachystalix</i> Reichb. f.	Use value
35	<i>Calanthe duyana</i> Aver.	New species
36	<i>Ceratostylis radiata</i> J.J. Sm..	
37	<i>Ceratostylis subulata</i> Blume.	
38	<i>Callostylis rigida</i> Blume.	
39	<i>Ceratostylis subulata</i> Blume.	
40	<i>Cleisostoma inflatum</i> (Rolfe.) Garay	Endemic
41	<i>Cleisotomopsis eberhardtii</i> Seidenf.	Endemic
42	<i>Cleisostoma williamsonii</i> (Reichb. f.) Garay.	
43	<i>Cleisocentron klossii</i> (Ridl.) Garay.	Endemic
44	<i>Cleisotoma arietinum</i> Garay.	
45	<i>Coelogyne calcilola</i> Kerr.	Use value
46	<i>Coelogyne assamica</i> Lindl. et Reichb.f.	Use value
47	<i>Coelogyne bachyptea</i> Reichb.f.	Use value
48	<i>Coelogyne filipeda</i> Gagn..	Endemic
49	<i>Coelogyne fimbriata</i> Lindl.	Use value
50	<i>Coelogyne lawrenceana</i> Rolfe.	Endemic
51	<i>Coelogyne mooreana</i> Sander ex Rolfe.	Endemic
52	<i>Coelogyne vicosa</i> Reichb. f.	Use value
53	<i>Coelogyne Sanderæ</i> Kraenzl.	Use value
54	<i>Coelogyne rigida</i> Par.	Use value
55	<i>Corybas annamesis</i> Aver.	New species
56	<i>Cymbidium cyperifolium</i> Wall & Lindl.	Use value
57	<i>Cymbidium dayanum</i> Reichb. f.	Use value
58	<i>Cymbidium devonianum</i> Paxt.	Use value
59	<i>Cymbidium erythrostylum</i> Rolfe.	Endemic
60	<i>Cymbidium lancifolium</i> Hook.	Use value
61	<i>Cymbidium lowianum</i> Reichb. f.	Use value
62	<i>Cymbidium aloifolium</i> (L.) Sw.	Use value
63	<i>Dendrobium fimbriatum</i> Hook. f.	Use value
64	<i>Dendrobium secundum</i> (Blume.) Lindl.	Use value
65	<i>Dendrobium sociale</i> J.J. Sm..	Use value

Table 2. List of Wild Orchids from Lam Dong – Vietnam (Continued)

No.	Scientific name	Notes
66	<i>Dendrobium aphyllum</i> C.E.C. Fischer.	Use value
67	<i>Dendrobium bellatulum</i> Rolfe.	Use value
68	<i>Dendrobium cariniferum</i> Reichb. f.	Use value
69	<i>Dendrobium dantaniense</i> Guill..	Use value
70	<i>Dendrobium chrysanthum</i> Lindl.	Use value
71	<i>Dendrobium chrysotoUse valueum</i> Lindl.	Use value
72	<i>Dendrobium delacourii</i> Guill..	
73	<i>Dendrobium crepidatum</i> Lindl. & Paxt.	Use value
74	<i>Dendrobium aloifolium</i> (Blume.) Reichb. f.	
75	<i>Dendrobium crumenatum</i> Sw.	
76	<i>Dendrobium crystallinum</i> Reichb. f.	Use value
77	<i>Dendrobium cumulatum</i> Lindl.	
78	<i>Dendrobium dentatum</i> Seidenf.	
79	<i>Dendrobium cretaceum</i> Lindl.	Use value
80	<i>Dendrobium dracornis</i> Reichb. f.	Use value
81	<i>Dendrobium exile</i> Schlechter.	
82	<i>Dendrobium ellipsophyllum</i> Tang et Wang.	Use value
83	<i>Dendrobium farmeri</i> PaUse valuet.	Endemic
84	<i>Dendrobium harveyanum</i> Hook. f.	Endemic
85	<i>Dendrobium thyrsoflorum</i> Reichb. f.	Endemic
86	<i>Dendrobium parcum</i> Reichb. f.	Endemic
87	<i>Dendrobium nobile</i> Lindl.	Quý hiếm
88	<i>Dendrobium lindleyi</i> Steud.	Use value
89	<i>Dendrobium hercoglossum</i> Reichb. f.	Use value
90	<i>Dendrobium heterocarpum</i> Lindl.	Use value
91	<i>Dendrobium parciflorum</i> Reichb. f. ex Lindl.	
92	<i>Dendrobium aduncum</i> Wall. ex Lindl.	Use value
93	<i>Dendrobium tortile</i> Lindl.	Use value
94	<i>Dendrobium devonianum</i> Paxt.	Use value
95	<i>Dendrobium salaccense</i> (Blume.) Lindl.	Use value
96	<i>Dendrobium anosmum</i> Lindl.	Use value
97	<i>Dendrobium oligophyllum</i> Gagn.	
98	<i>Dendrobium hemimelanoglossum</i> Guill..	Endemic
99	<i>Dendrobium gratiosissimum</i> Reichb. f.	Use value
100	<i>Dendrobium wattii</i> (Hook.) Reichb. f.	Use value
101	<i>Dendrobium hercoglossum</i> Reichb. f.	Use value
102	<i>Dendrobium ochraceum</i> De Wild...	Endemic
103	<i>Dendrobium heterocarpum</i> Lindl.	Use value
104	<i>Dendrobium aduncum</i> Wall. ex Lindl.	Use value
105	<i>Dendrobium primulinum</i> Lindl.	Use value
106	<i>Epigeneium amplum</i> (Lindl.) Summer.	Use value
107	<i>Epigeneium cacuminis</i> Summer.	Endemic
108	<i>Eria acervata</i> Lindl.	

Table 2. List of Wild Orchids from Lam Dong – Vietnam (Continued)

No.	Scientific name	Notes
109	<i>Eria amica</i> Reichb.f.	Use value
110	<i>Eria apertiflora</i> Summer.	
111	<i>Eria longipes</i> Gagn..	
112	<i>Eria paniculata</i> Lindl.	
113	<i>Eria pulverulenta</i> Guill..	
114	<i>Eria pusila</i> (Griff.) Lindl.	
115	<i>Eria siamensis</i> Schlech..	
116	<i>Eria sutepensis</i> Rolfe & Downie.	
117	<i>Eria pannea</i> Lindl.	
118	<i>Eria corneri</i> Reichb. f.	
119	<i>Eria globifera</i> Rolfe.	
120	<i>Eria tomentosa</i> Hook. f.	Use value
121	<i>Eria dacrydium</i> Gagn.	Endemic
122	<i>Eria floribunda</i> Lindl.	
123	<i>Eriodes barbata</i> (Lindl.) Rolfe.	Use value
124	<i>Eulophia andamanesis</i> Reichb. f.	
125	<i>Eulophia spectabilis</i> (Dennst.) Surech.	Use value
126	<i>Flickengeria albopurpurea</i> Seidenf.	
127	<i>Flickengeria vietnamensis</i> Seidenf.	Endemic
128	<i>Gastrochilus calceolari</i> (J.E. Sm.) D. Don	
129	<i>Gastrochilus calceolari</i> D. Don.	
130	<i>Holcoglossum subulifolium</i> Christ..	Use value
131	<i>Hygrochilus parishii</i> Pfitz.	Use value
132	<i>Liparis mannii</i> Reichb. f.	
133	<i>Liparis viridiflora</i> Blume.	
134	<i>Liparis compressa</i> (Blume.) Lindl.	
135	<i>Liparis flava</i> (Aver.) Aver.	
136	<i>Luisia zollingeri</i> Reichb.f.	
137	<i>Ludisia discolor</i> (Ker Gawl.) A. Rich..	Use value
138	<i>Luisia psyche</i> Reichb.f.	
139	<i>Macropodanthus alotus</i> (Holt.) Seidenf. & Garay	
140	<i>Malaxis acuminata</i> D.Don.	
141	<i>Monomeria dichroma</i> Schltr.	Endemic
142	<i>Ornithochilus difformis</i> (Wall.ex Lindl.) Schlech...	
143	<i>Otochilus fuscus</i> Lindl.	
144	<i>Panisia alobiflora</i> Seidenf.	Use value
145	<i>Paphiopedilum dalatense</i> Aver.	Endemic
146	<i>Paphiopedilum purpuratum</i> Lindl.	Rare
147	<i>Paphiopedilum delenatii</i> Guill..	Endemic
148	<i>Paphiopedilum appletonianum</i> (Gower) Rolfe.	Rare
149	<i>Paphiopedilum villosum</i> (Lindl.) Stein.	Rare
150	<i>Paphiopedilum callosum</i> (Reichb. f.) Stein.	Rare
151	<i>Papilionanthe pedunculata</i> (Kerr.) Garay.	Endemic

Table 2. List of Wild Orchids from Lam Dong – Vietnam (Continued)

No.	Scientific name	Notes
152	<i>Phalaenopsis manii</i> Reichb. f.	Use value
153	<i>Phajus longicornu</i> Guill.	Use value
154	<i>Phajus mishmensis</i> Reichb. f.	Use value
155	<i>Phajus tankervilleae</i> Blume.	Use value
156	<i>Phajus flavus</i> (Blume) Lindl.	Use value
157	<i>Pholidota guibertiae</i> Fin.	
158	<i>Pholidota rubra</i> Lindl.	
159	<i>Pholidota convallariae</i> (Reichb. f.) Hook. f.	
160	<i>Pholidota recurva</i> Lindl.	
161	<i>Pholidota chinensis</i> Lindl.	
162	<i>Pholidota bracteata</i> (D. Don) Seidenf.	
163	<i>Peroceras teres</i> (Blume.) Holtt.	
164	<i>Peroceras elobe</i> Seidenf.	
165	<i>Pteroceras semiteretifolium</i> Pedersen.	Endemic
166	<i>Platanthera epihitica</i> Aver. et Efimov.	New species
167	<i>Podochilus microphyllus</i> Lindl.	
168	<i>Plocglottis bokorensis</i> Seidenf.	
179	<i>Renanthera imschootiana</i> Rolfe.	Endemic
170	<i>Robiqueta spathulata</i> (Blume.) J.J. Sm.	
171	<i>Rhynchotylis retusa</i> Blume.	
172	<i>Schoenorchis gemmata</i> J.J. Sm.	
173	<i>Sunipia annamensis</i> (Ridl.) P.F. Hunt	
174	<i>Stauorchilus fasciatus</i> (Reichb.f) Ridl. ex. Pfitz.	Use value
175	<i>Stereochilus dalatensis</i> (Guill.) Garay.	Endemic
201	<i>Eria</i> sp.	
202	<i>Eria</i> sp.	
203	<i>Pholidota</i> sp.	
204	<i>Pholidota</i> sp.	
205	<i>Liparis</i> sp.	
206	<i>Liparis</i> sp.	
207	<i>Vanilla</i> sp.	
208	<i>Zeuxine</i> sp.	
209	<i>Zeuxine</i> sp.	

1994, Lam Dong Province of Vietnam has an exceptional diversity of orchids with approximately 410 species representing 104 genera (which of the entire the country 51,25% and 78,7%, respectively). Of these, over 239 Lam Dong wild orchid species are used for attention under the Conservation Vietnamese wild orchids projects. Among of 239 species of Lam Dong collection, 209 species (Table 2) belong to 69 genus scientific name oriented (VietNamNet. 2006).

Many herbs and wild orchid are becoming alarming. In collaboration with Department of Plant Biotechnology, Dongguk University – South Korea working under supported ODA funds from Korea government (MIFAFF) to exchange students for study, publication, the informations relating on natural and biological resources for developing bio-researches as well as other fields, we will consider how to collecting and preserving these plants in situ (or plantation) or conservating



Fig. 1. *Anoectochilus formosanus* Hayata conserved *in vitro* (left) and *in ex vitro* (right).

in vitro as a genetic resource. Plant tissue culture and micro-propagation techniques play an important role in conservation programme and management of botanical collection. The micropropagation unit will set up at Agriculture and Forestry department of DaLat University to propagate plants that are endangered or difficult to grow conventionally (Fig. 1). The techniques used include *in vitro* laboratory propagation from vegetative material and germination of seeds. We believe that the techniques used include *in vitro* laboratory propagation from vegetative material and germination of seeds will be successful.

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