

## ФЛОРИСТИЧЕСКИЕ НАХОДКИ

УДК 582.594(597)

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### RARE SPECIES OF ORCHIDS (ORCHIDACEAE) IN THE FLORA OF VIETNAM

### РЕДКИЕ ВИДЫ ОРХИДНЫХ (ORCHIDACEAE) ВО ФЛОРЕ ВЬЕТНАМА

New localities of 178 orchid species (Orchidaceae), which belong to 72 genera, are reported in the paper. All discoveries are mainly based on herbarium materials collected on the territory of Vietnam during field works of 2004–2006 years as well as on few herbarium and living samples that were found in Herbaria and private collections in Vietnam. Among reported orchids, 1 genus (*Esmeralda*) and 13 species (*Aphyllorchis pallida*, *Bulbophyllum polliculosum*, *Cymbidium erythraeum*, *C. iridioides*, *C. longifolium*, *Esmeralda clarkei*, *Gastrochilus bellinus*, *Hetaeria alta*, *Liparis ferruginea*, *Luisia ramosii*, *Pomatocalpa angustifolia*, *Thrixspermum amplexicaule*, *Zeuxine grandis*) were found in Vietnam at first. They represent new additions to the orchid flora of the country. Two nomenclature combinations in rank of variety (*Habenaria dentata* var. *parageniculata*) and form (*Paphiopedilum appletonianum* f. *tridentatum*) are proposed.

The paper continues our publications of new localities of rare orchid species collected by the author and his colleagues in remote mountain areas of Vietnam (Averyanov, 1988 a,b, 1989, 1998, 1999, 2000 a,b; Averyanov, Averyanova, 2000, 2003, 2005; Averyanov, Vu Ngok Long, 1989; Averyanov, Duong Duc Huyen, 1989, 1993). Field exploration works, results of which are presented in this publication, were supported mainly from investigation programs of **Henry Luce Foundation** (project 2004–2006 "Vietnam Botanical Conservation Program"), **Basic Research program in Life Sciences of Viet Nam, # 611001** "Threatened conifers and cycads of Vietnam," 2002–2006, **Fauna & Flora International (Vietnam Program) & Counterpart International**. "Preliminary survey of Orchids (Orchidaceae) in Phong Nha – Ke Bang National Park", 2005, **WWF Indochina Programme. Green Corridor Project in Thua Thien – Hue province, VN085301**. "Lowland flora and vegetation. Preliminary survey", 2005.

Field studies of the flora and vegetation according to mentioned investigation programs were connected with extensive collection of herbarium materials, which

represent voucher materials for all published reports of species localities. Duplicate sets of collected voucher herbarium samples are housed mainly at Herbaria of the Institute of Ecology and Biological Resources of Academy of Sciences and Technology of Vietnam (HN) and Komarov Botanical Institute of the Russian Academy of Sciences (LE).

The orchid names in the list are arranged in alphabetic order. Abbreviated and unified text of herbarium labels are reported for each collecting numbers. In the text the following standard abbreviations are used: prov. (Province), distr. (District), mun. (Municipality), vic. (vicinity, vicinities), elev. (elevation, elevations), mt. (mountain, mountains), N.P. (National Park). The names of orchid species and genera reported for Vietnam at first are marked with asterisk (\*). Prefixes at the collecting numbers represent next abbreviations:

**HAL** – Dr. Nguyen Tien Hiep, Prof. L. Averyanov, Prof. Phan Ke Loc (collections in collaborative explorations of these persons),

**HLF** – Henry Luce Foundation, collections of different collectors according to Vietnam Botanical Conservation Program supported from Henry Luce Foundation,

**NTH** – Dr. Nguyen Tien Hiep (collections in expeditions with this person as Principal Investigator),

**P** – Prof. Phan Ke Loc (collections in expeditions with this person as Principal Investigator),

Few other occasional herbarium collections of different collectors housed in Herbaria of the Institute of Ecology and Biological Resources (HN) were also included in the paper.

### **New data on distribution of rare orchid species in Vietnam**

#### 1. *Acampe* Lindley

##### 1.1. *A. bidoupense* (Tixier & Guillaumin) Aver.

**Lam Dong** prov., **Dalat** city area, around point 11°59'N, 108°22'E, at elev. 1400–1500 m a.s.l., epiphyte, flowers odorless, sepals and petals dull yellowish with few dull dirty-purple marks at the base, lip white, column and anther pale yellow, ovary dull pale purple-brown, rare, 14 November 2005, *L. Averyanov, P.K. Loc, HAL 8625*.

#### 2. *Acriopsis* Reinw. ex Blume

##### 2.2. *A. liliifolia* (J. Koenig) Ormerod

**Thua Thien** – **Hue** prov., **Nam Dong** distr., **Huong Son** mun., around point 16°09'52"N, 107°36'22"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale at elev. 300–450 m a.s.l., epiphyte on high trees, occasional, 24 March 2005, *L. Averyanov, N.T. Hiep, P.K. Loc et al., HAL 6819*. **Thua Thien** – **Hue** prov., **A Luoi** distr., **Huong Nguyen** mun., around point 16°16'08"N, 107°26'29"E, at elev. about 125 m a.s.l., secondary closed evergreen broad-leaved forest on hill slopes composed with shale, epiphyte on tall trees, tepals white with purple-violet median stripe, lip white with light violet tint, common, 6 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 7927*.

3. *Anoectochilus* Blume3.3. *A. lylei* Rolfe

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes along main ridge of Ta Dung mt at elev. 1700–1985 m a.s.l., around point of highest peak at 11°51'30"N, 108°02'08"E, primary broad-leaved evergreen closed wet mossy cloudy forest on crystalline highly metamorphosed sandstone, creeping terrestrial herb, leaves dark velvety-green with yellowish or pinkish venation, common, 8 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5656.

4. *Anthogonium* Wall. ex Lindley4.4. *A. gracile* Wall. ex Lindley

**Lam Dong** prov., **Dalat** city, Trai Mat mun., secondary open coniferous forest with *Pinus kesiya*, ephemeroïd terrestrial tuberiferous herb, flowers dull yellow-pink-violet, rare, 13 October 2005, P.K. Loc, L. Averyanov, T.V. Thao, HLF 5191a.

5. *Aphyllorchis* Blume5.5. *A. annamensis* Aver.

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes along main ridge of Ta Dung mt at elev. 1700–1985 m a.s.l., around point of highest peak at 11°51'30"N, 108°02'08"E, primary broad-leaved evergreen closed wet mossy cloudy forest on crystalline highly metamorphosed sandstone, terrestrial achlorophyllous light brownish saprophyte (stem with indistinct dirty violet marks) up to 1.4 m tall, common, 9 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5617.

5.6. *A. pallida* Blume\* (Plate 1, a)

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, terrestrial achlorophyllous whitish saprophyte on shady mossy slope, stem, ovary and tepals silvery-whitish with dirty violet marks, very rare, 20 October 2005, T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5328a; HLF 5344. **Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., NE slopes of Chu Yang Sin mt at elev. 800–1000 m a.s.l., primary mixed broad-leaved and coniferous forest with *Pinus krempfii*, *Dacrycarpus imbricatus* and *Dacrydium elatum* along ridge edge, achlorophyllous yellowish ground saprophyte in shady places, very rare, 28 October 2005, L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5423.

6. *Apostasia* Blume6.7. *A. wallichii* R. Br.

**Thua Thien – Hue** prov., **A Luoi** distr., A Roang mun., around point 16°04'38"N, 107°29'10"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale and granite at elev. 700–800 m a.s.l., terrestrial herb 5–10 cm tall, flowers yellow, rare, 20 April 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HAL 7175.

7. *Appendicula* Blume7.8. *A. cornuta* Blume

**Quang Binh** prov., **Quang Ninh** distr., Truong Son mun., Phong Nha – Ke Bang N.P., around point 17°26'50"N, 106°23'41"E, at elev. about 600 m a.s.l., primary closed broad-leaved evergreen forest on steep slopes of mt composed with shale and sandstone along stream canyon, lithophyte in shady place, flowers including lip white, locally common, 1 February 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6315.*

7.9. *A. gracilis* Aver.

**Lam Dong** prov., **Dalat** city area, around point 11°59'N, 108°22'E, at elev. 1400–1500 m a.s.l., epiphyte with long pendent shoots, flowers odorless, tepals white, lip with purple-violet apex, column and anther purple, rare, 14 November 2005, *L. Averyanov, P.K. Loc, HAL 8623.*

7.10. *A. hexandra* (Koenig) J.J. Smith

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°23'32"N, 106°12'46"E, primary closed coniferous forest (with *Calocedrus rupestris*) on steep slopes and on tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 750–900 m a.s.l., lithophyte and epiphyte, very common, 25 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6134.* **Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'52"N, 107°36'22"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale at elev. 300–450 m a.s.l., epiphyte on mossy trees along stream, very common, 26 March 2005, *L. Averyanov, N.T. Hiep, P.K. Loc et al., HAL 6914.* **Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'50"N, 107°36'29"E, mt and hill slopes composed with shale at elev. 200–250 m a.s.l., primary and secondary closed evergreen broad-leaved forest on steep stream slopes, epiphyte and lithophyte along rocky stream valley, flowers white, locally abundant, 14 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8252.*

8. *Arachnis* Blume8.11. *Arachnis labrosa* (Lindley & Paxt.) Reichenb. fil.

**Lam Dong** prov., **Dalat** city area, around point 11°59'N, 108°22'E, at elev. 1400–1500 m a.s.l., epiphyte with pendent ascending shoots, flowers odorless, tepals yellowish with dull purple-violet marks, lip light yellow with reddish-brown keels, column and anther white to light yellowish, rare, 20 October 2005, *L. Averyanov, P.K. Loc, HAL 8622.* **Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep hill slopes at elev. 700–750 m a.s.l., around point 11°51'47"N, 107°56'59"E, secondary open broad-leaved evergreen forest with bamboo and *Pinus kesiya*, epiphyte on tall trees in shady place, rare, 4 November 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5522.*

9. *Arundina* Blume9.12. *Arundina chinensis* Blume

**Thua Thien – Hue** prov., **A Luoi** distr., Huong Nguyen mun., around point

16°15'16"N, 107°26'57"E, at elev. about 80 m a.s.l., open riparian shrubs along rocky Tra Ve river valley on sandstone and granite outcrops, lithophytic herb up to 0.4 m tall in crevices of wet rocky waterfall cliffs, flowers purple, lip with white center, very rare, 6 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 7953.

10. *Bulbophyllum* Thouars

10.13. *B. ambrosia* (Hance) Schlechter

**Ha Giang** prov., **Yen Minh** distr., Du Gia mun., around point 22°05'51"N, 105°10'24"E, at elev. 1000–1200 m a.s.l., primary broad-leaved submontane forests on limestone and shale, 30 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al.*, WP 822. **Quang Binh** prov., **Minh Hoa** distr., Thuong Hoa mun., Phong Nha – Ke Bang N.P., around point 17°40'21"N, 105°58'00"E, primary closed evergreen broad-leaved lowland forest on steep slopes and on tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 500–620 m a.s.l., creeping epiphyte, very common, 22 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al.*, HAL 5994; HAL 6027.

10.14. *B. andersonii* (Hook. fil.) J.J. Smith

**Ha Giang** prov., **Meo Vac** distr., Sung Tra mun., around point 23°10'12"N, 105°17'39"E, at elev. 1100–1150 m a.s.l., remnants of primary coniferous forest with *Pseudotsuga sinensis* on tops of high rocky remnant ridge composed with highly eroded marble-like limestone, creeping lithophyte on very steep mossy rocky slope, flowers purple speckled, very common, 10 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8468.

10.15. *B. capillipes* Par. et Reichenb. fil.

**Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., NE slopes of Chu Yang Sin mt at elev. 600–700 m a.s.l., around point 12°28'21"N, 108°20'33"E, primary and secondary broad-leaved closed evergreen forest on steep stream slopes, epiphyte along shady wet rocky stream valley, tepals yellowish with purple-brownish stripes, lip purple-brownish with violet center, not common, 29 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh*, HLF 5466.

10.16. *B. clandestinum* Lindley

**Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'50"N, 107°36'29"E, mt and hill slopes composed with shale at elev. 200–250 m a.s.l., primary and secondary closed evergreen broad-leaved forest on steep stream slopes, canopy epiphyte on mossy trees along rocky stream valley, flowers white, not common, 14 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8251.

10.17. *B. emarginatum* (Finet) J.J. Smith

**Ha Giang** prov., **Meo Vac** distr., Pa Vi mun., around point 23°11'05"N, 105°24'04"E, at elev. about 1450 m a.s.l., remnants of coniferous forest with *Pseudotsuga sinensis* on very steep rocky slopes and along tops of rocky remnant ridges composed with highly eroded marble-like limestone, creeping lithophyte and epiphyte on very steep rocky mossy slope, flowers white, purple striped, very common, 13 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8575.

10.18. *B. emarginatum* (Finet) J.J. Smith

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. 1400 m a.s.l., coniferous (with *Pseudotsuga sinensis*) submontane limestone forest, 26 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 706.*

10.19. *B. evrardii* Gagnep.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, creeping epiphyte, flowers light yellow, apex of sepals and petals bright yellow, lip yellow, not common, 18 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5308*; 20 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5327.*

10.20. *B. flabellovenenis* (Koenig) Seidenf. et Ormerod ex Aver.

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°10'22"N, 107°36'24"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. about 300 m a.s.l., epiphyte on tall tree along rocky stream valley, sepals dull yellowish with purple-violet punctuation, not common, 29 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 7065.* **Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'58"N, 107°36'07"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. 300–400 m a.s.l., 31 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 7163a.* **Thua Thien – Hue** prov., **A Luoi** distr., Huong Nguyen mun., around point 16°15'27"N, 107°26'15"E, at elev. 80–100 m a.s.l., secondary closed evergreen broad-leaved forest on steep hill and mt slopes composed with shale, epiphyte on tall tree along rocky stream valley, lateral sepals yellowish marked with brown-purple, median sepal and petals deep brown-purple, lip yellow-orange, not common, 5 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 7899.* **Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'50"N, 107°36'29"E, mt and hill slopes composed with shale at elev. 200–250 m a.s.l., primary and secondary closed evergreen broad-leaved forest on steep stream slopes, epiphyte on mossy trees along rocky stream valley, flowers dull yellowish-orange, common, 14 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8259.*

10.21. *B. kanburiense* Seidenf.

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., along rocky river valley of Dak Bo river, around point 12°16'17"N, 107°11'30"E, at elev. 320–350 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, creeping epiphyte on tall trees, flowers orange, rare, 8 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4932a.*

10.22. *B. penicillium* Par. & Reichenb. fil.

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest along rocky streamlet valley at the base of steep slopes of mt composed with solid highly eroded crystalline and

partially shale limestone at elev. about 900 m a.s.l., creeping epiphyte on tall tree, flower buds greenish, sepals with brownish nerves, rare, 6 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6564.*

10.23. *B. pinicolum* Gagnep.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°08'31"N, 108°39'01"E, at elev. 1400–1500 m a.s.l., open grassy woodlands with *Pinus kesiya* on hill slopes, epiphyte on *P. kesiya*, flowers white to light yellowish, lip white with dirty purple speckles at center and yellow apex, locally very common, 23 October 2005, *L. Averyanov, N.T. Vinh, HLF 5368.*

10.24. *B. polliculosum* Seidenf.\* (Plate 1, b).

**Dak Nong** prov., **Dak Glong** distr., Dak Som mun., steep hill slopes at elev. 800–900 m a.s.l., around point 11°52'27"N, 107°55'33"E, secondary broad-leaved open evergreen and mixed forest with *P. kesiya* and bamboo, creeping epiphyte on tall tree in shady slope, rare, 3 November 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5505.*

10.25. *B. retusiusculum* Reichenb. fil.

**Thua Thien Hue** prov., **Phu Loc** distr., Bach Ma mt, at elev. 850–1112 m a.s.l., around point 16°11'19"N, 107°50'94"E, epiphyte, 10 September 2005, *N.T. Hiep, T.V. Thao, N.S. Khang et al., CFH-324A*; 10 October 2005, *N.T. Hiep, T.V. Thao, N. Sinh. et al., CFH-325; CFH-326; CFH-326A; CFH-326B.* **Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, epiphyte, flowers dirty purple-violet, not rare, 18 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5307.* **Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., vic. of Sa Mui pass, around point 16°46'49"N, 106°35'28"E, at elev. 650–750 m a.s.l., primary broad-leaved evergreen submontane forest along rocky river valley on shale rocks, creeping epiphyte on tall trees, tepals violet, lateral sepals violet-purple, not rare, 1 April 2006, *N.T. Hiep, L. Averyanov, P.K. Loc et al., HLF 6533.*

10.26. *B. sanitii* Seidenf.

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., along rocky river valley of Dak Bo river, around point 12°16'17"N, 107°11'30"E, at elev. 320–350 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, creeping epiphyte on tall trees, flowers orange, rare, 8 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4932b.*

10.27. *B. taeniophyllum* Par. et Reichenb. fil.

**Bac Kan** prov., **Cho Don** distr., Ban Thi mun., around point 22°17'31"N, 105°31'51"E, at elev. 800–900 m a.s.l., primary broad-leaved evergreen closed forest on very steep slopes and cliffs near tops of rocky ridge composed with solid marble-like stratified limestone, epiphyte, leaves below with light purple-violet tint, flowers yellow-green, not common, 24 May 2004, *L. Averyanov, N.T. Hiep, P.V. The et al., HAL 4859a.* **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. about 1500 m a.s.l., lithophyte, in wet places of

primary evergreen submontane limestone coniferous forest (with *Tsuga chinensis*), flowers pink, 25 November 2004, S.K. Wu, L.K. Phan, X. Gong et al., WP 618.

11. *Calanthe* R. Br.

11.28. *C. angusta* Lindley

**Thua Thien** – Hue prov., A Luoi distr., A Roang mun., around point 16°04'38"N, 107°29'10"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale and granite at elev. 700–800 m a.s.l., terrestrial herb along shady wet stream slopes, flowers white, lip white with central yellow callus, occasional, 20 April 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HAL 7238.

12. *Cephalantheropsis* Guillaumin

12.29. *C. obcordata* (Lindley) Ormerod

**Ha Giang** prov., Yen Minh distr., Du Gia mun., around point 22°56'51"N, 105°10'24"E, at elev. 1000–1200 m a.s.l., primary broad-leaved submontane forest on limestone and shale, terrestrial herb, flowers yellowish, 29 November 2004, S.K. Wu, L.K. Phan, X. Gong et al., WP 812.

13. *Ceratostylis* Blume

13.30. *C. evrardii* Gagnep.

**Lam Dong** prov., Lac Duong distr., Da Chais mun., around point 12°06'44"N, 108°39'27"E, at elev. 1800–2000 m a.s.l., along main ridge and on W slope of Bi Doup mt, primary broad-leaved closed wet forest, epiphyte on tall trees, flowers white, very common, 15 October 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5237c.

13.31. *C. siamensis* Rolfe ex Downie

**Thua Thien Hue** prov., Phu Loc distr., Bach Ma mt, Do Quyen water fall, around point 16°11'19"N, 107°50'94"E, epiphyte, 10 October 2005, N.T. Hiep, T.V. Thao, N. Sinh et al., CFH-321. **Lam Dong** prov., Lac Duong distr., Da Chais mun., around point 12°06'44"N, 108°39'27"E, at elev. 1800–2000 m a.s.l., along main ridge and on W slope of Bi Doup mt, primary broad-leaved closed wet forest, epiphyte on tall trees, flowers white, sepals and petals with purple stripes, lip white with fleshy brightly yellow epichile, common, 15 October 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5237b.

14. *Cheirostylis* Blume

14.32. *Ch. chinensis* Rolfe

**Quang Binh** prov., Minh Hoa distr., Thuong Hoa mun., around point 17°40'21"N, 105°58'00"E, primary and secondary closed evergreen broad-leaved forest and scrub on rocky ridge composed with solid and stratified marble-like highly eroded crystalline limestone at elev. 550–650 m a.s.l., terrestrial herb on shady steep slope, leaves with whitish broad central stripe, not common, 18 January 2005, L. Averyanov, P.K. Loc, P.V. The et al., HAL 5869. **Quang Binh** prov., Bo Trach distr., Tan Trach mun., around point 17°23'22"N, 106°12'47"E, primary closed evergreen coniferous forest



(with *Calocedrus rupestris*) on steep slopes and tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 800–900 m a.s.l., terrestrial and lithophytic creeping herb, leaves uniform dull gray-green, flowers white, lip with two green spots at mesochile, common, 24 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6056*. **Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., around point 17°23'32"N, 106°12'46"E, primary closed coniferous forest (with *Calocedrus rupestris*) on steep slopes and on tops of rocky ridge composed with solid marble-like highly eroded solid crystalline limestone at elev. 750–850 m a.s.l., terrestrial and lithophytic herb, leaves dull green, flowers white, lip with two green spots on mesochile, common, 25 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6114a*; 26 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6196*. **Quang Binh** prov., **Bo Trach** distr., Son Trach mun., around point 17°30'32"N, 106°17'45"E, at elev. 300–400 m a.s.l., secondary closed broad-leaved evergreen forest and scrub on rocky steep slopes of remnant mt composed with solid highly eroded crystalline deep gray limestone, creeping lithophyte on steep rocky slope near top of mt, leaves deep dull green, flowers white, common, 2 February 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6352*.

14.33. *Ch. latipetala* Aver.

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, lithophyte on shady mossy slope, flowers white, lip with two greenish spots at the center, rare, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8381*. **Ha Giang** prov., **Meo Vac** distr., Sung Tra mun., around point 23°10'12"N, 105°21'46"E, at elev. about 1100–1150 m a.s.l., remnants of primary coniferous forest with *Pseudotsuga sinensis* on tops of high rocky remnant ridge composed with highly eroded marble-like limestone, lithophyte on mossy boulders on very steep mossy rocky slope, flowers white with light green spot at the center of epichile, not common, 10 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8478*. **Ha Giang** prov., **Meo Vac** distr., Pai Lung mun., around point 23°15'06"N, 105°22'02"E, at elev. about 1300 m a.s.l., remnants of coniferous forest with *Pseudotsuga sinensis* and *Tsuga chinensis* on very steep rocky slopes and along tops of rocky remnant ridges composed with highly eroded marble-like limestone, terrestrial and lithophytic creeping herb on very steep rocky mossy slope, flowers white, lip with two light green spots at the center, not rare, 12 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8526*.

14.34. *Ch. takeoi* (Hayata) Schlechter

**Lang Son** prov., **Bac Son** distr., Tan Tri mun., primary and secondary broad-leaved evergreen forest on very steep slopes and tops of ridge composed with solid highly eroded crystalline gray marble-like limestone at elev. about 500–600 m a.s.l., creeping lithophyte on open mossy rocks, leaves dull green-silver-brownish, sepals green-brown, petals white, occasional, 14 March 2005, *L. Averyanov, N.T. Hiep, P.V. The et al., HAL 6708*.

14.35. *Ch. yunnanensis* Rolfe

**Lang Son** prov., **Bac Son** distr., Tan Tri mun., primary and secondary broad-leaved evergreen forest on very steep slopes and along tops of ridge composed with solid highly eroded crystalline gray marble-like limestone at elev. 500–600 m a.s.l., creeping lithophyte on open mossy rocks, leaves dull green-silver-brownish, sepals green-brown, petals white, lip with greenish central spot, locally very common, 14 March 2005, *L. Averyanov, N.T. Hiep, P.V. The et al., HAL 6709.*

15. *Cleisostoma* Blume15.36. *C. crochettii* (Guillaumin) Garay

**Bac Kan** prov., **Na Ri** distr., Liem Thuy mun., around point 21°56'44"N, 106°05'09"E, at elev. 300–700 m a.s.l., primary broad-leaved evergreen closed wet forest on very steep slopes and cliffs of rocky ridges and mesae composed with white solid marble-like crystalline limestone, epiphyte, occasional, sepals and petals white with pink-violet tint, lip and spur purple-violet, apex of mid-lobe whitish, 27 May 2004, *L. Averyanov, N.T. Hiep, P.V. The et al., HAL 4928a.*

15.37. *C. duplicilobum* (J.J. Smith) Garay

**Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., NE slopes of Chu Yang Sin mt at elev. 1000–1400 m a.s.l., around point 12°27'55"N, 108°19'00"E, primary mixed broad-leaved and coniferous forest with *Pinus latteri* and *P. krempfii* along ridge edge, epiphytic herb, tepals yellowish with deep purple-brown stripes (sepals with two, petals with one), lip white with pink-violet base, locally common, 28 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5437.*

15.38. *C. paniculatum* (Ker-Gawl.) Garay

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest on slopes and tops of mt composed with solid highly eroded crystalline limestone at elev. 900–1150 m a.s.l., epiphyte on tall trees, occasional, 7 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6587.*

16. *Coelogyne* Lindley16.39. *C. filipeda* Gagnep.

**Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers odorless, tepals white to yellowish-white, lip with brown margin and deep brown keels, common, 25 October 2005, *L. Averyanov, P.K. Loc, HAL 8633.*

16.40. *C. fimbriata* Lindley

**Ha Giang** prov., **Quan Ba** distr., around point 23°05'49"N, 105°01'00"E, at elev. about 1150 m a.s.l., primary coniferous forest with *Calocedrus rupestris*, *Cal-litropsis vietnamensis* and *Pseudotsuga sinensis* on rocky highly eroded marble-like limestone remnant mt, creeping lithophytic herb on very steep rocky mossy slope, flowers light yellowish, lip with deep brown center, very common, co-dominant of lithophytic herb communities, 6 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8358.* **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N,

105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, lithophyte and epiphyte on shady mossy slope, flowers light dull yellowish, lip with brown center, very common, co-dominant of lithophytic herb communities, 7 December 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8378.

16.41. *C. malipoensis* Tsi

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. 1200–1400 m a.s.l., broad-leaved submontane forest of limestone slope, flowers pink, 26 November 2004, S.K. Wu, L.K. Phan, X. Gong et al., WP 677.

16.42. *C. mooreana* Rolfe

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°06'44"N, 108°39'27"E, at elev. 1800–2000 m a.s.l., along main ridge and on W slope of Bi Doup mt, primary broad-leaved closed wet forest, epiphyte on tall mossy trees, flowers white, lip with yellow to yellow-orange center, very common, 15 October 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5245. **Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes along main ridge of Ta Dung mt at elev. 1700–1985 m a.s.l., around point of highest peak at 11°51'30"N, 108°02'08"E, primary broad-leaved evergreen closed wet mossy cloudy forest on crystalline highly metamorphosed sandstone, epiphyte and lithophyte, flowers white pleasantly fragrant, lip with yellow center, very common, 9 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5629.

16.43. *C. nitida* (Wall. ex D. Don) Lindley

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, white, lip with large yellow spot at the center and on side-lobes, epiphyte and lithophyte, very common, 24 November 2005, L. Averyanov, P.K. Loc, HAL 8309.

16.44. *C. ovalis* Lindley

**Dak Nong** prov., **Dak Glong** distr., Dak Som mun., steep hill slopes at elev. 800–900 m a.s.l., around point 11°52'50"N, 107°55'35"E, primary broad-leaved evergreen dry forest along ridge edge, epiphyte on tall trees, sepals light green, petals white, lip white with brown keels and chestnut base, not rare, 5 November 2005, L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5542. **Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers odorless, tepals light dull yellowish, lip with light brown at the sides of the base of epichile, light brown keels and dark brown base of the lip, very common, 14 November 2005, L. Averyanov, P.K. Loc, HAL 8634.

16.45. *C. virescens* Rolfe

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., around point 12°16'17"N, 107°11'30"E, at elev. 300–350 m a.s.l., primary and secondary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, epiphyte, tepals and lip light green, lip with brown marks, very common, locally abundant, co-dominant in epiphytic communities in the area, 5 April 2005, P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4810.

17. *Collabium* Blume17.46. *C. assamicum* (Hook. fil.) Seidenf.

**Quang Binh** prov., **Bo Trach** distr., Hung Trach mun., Phong Nha – Ke Bang N.P., around point 17°27'24"N, 106°23'14"E, at elev. 600–700 m a.s.l., primary closed broad-leaved evergreen forest on slopes of mt composed with shale, sandstone and occasionally granite, terrestrial and lithophytic herb on shady slope of stream valley along stream, locally common, 30 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6268.*

17.47. *C. chinense* (Rolfe) Tang et F.T. Wang

**Quang Binh** prov., **Bo Trach** distr., Xuan Trach mun., Phong Nha – Ke Bang N.P., around point 17°39'24"N, 106°05'66"E, at elev. 460 m a.s.l., on stream banks, in primary and secondary closed broad-leaved lowland forest on shale, terrestrial herb, flowers white, 8 December 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 981.*

18. *Cymbidium* Sw.18.48. *C. atropurpureum* (Lindley) Rolfe

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, 20 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5344a.*

18.49. *C. eburneum* Lindley

**Lam Dong** prov., Dalat city., mt forest in Dalat city area, flowers white, tepals outside along midvein with pink tint, lip white with brightly yellow keel, column light dull pink, anther light yellowish, not common, 25 October 2005, *L. Averyanov, P.K. Loc, HAL 8629.* **Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, sepals and petals white, sometime with light pink tint to the base, lip white, sometime with pink tint to the base, at the center with yellow spot and yellow keels, column at front light pink, anther white, epiphyte and lithophyte, common, 25 November 2005, *L. Averyanov, P.K. Loc, HAL 8317.* **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, epiphyte on tall mossy tree, flowers white (rarely with purple tint), lip with yellow center and yellow keels, not common, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8402.*

18.50. *C. erythraeum* Lindley\* (Plate 2, c).

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, sepals and petals olive-green with brown stripes, lip white, with purple marks on epichile and purple stripes on side-lobes, epiphyte and lithophyte, very common, 24 November 2005, *L. Averyanov, P.K. Loc, HAL 8310.*

18.51. *C. iridioides* D. Don\* (Plate 2, d).

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, sepals and petals deep olive-green with brown stripes, lip yellow

with, purple marks on epichile and purple stripes on side-lobes, epiphyte and lithophyte, not common, 24 November 2005, *L. Averyanov, P.K. Loc, HAL 8316*.

18.52. *C. longifolium* D. Don (*C. elegans* Lindley)\* (Plate 1, e).

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, paniculate, white to light dull yellowish, rare, 25 November 2005, *L. Averyanov, P.K. Loc, HAL 8318*.

19. *Dendrobium* Sw.

19.53. *D. acerosum* Lindley

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°16'17"N, 107°11'30"E, at elev. 300–350 m a.s.l., primary and secondary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, tiny canopy epiphyte on tall trees, not common, 5 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4814*.

19.54. *D. amabile* (Lour.) O'Brien

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'52"N, 107°36'22"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale at elev. about 300–450 m a.s.l., epiphyte on tall tree, sepals and petals white, tips with pink-violet tint, lip yellow, not common, 27 March 2005, *L. Averyanov, N.T. Hiep, P.K. Loc et al., HAL 6974*. **Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°10'22"N, 107°36'24"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. about 300 m a.s.l., epiphyte on mossy tall trees along rocky stream valley, flowers odorless, tepals white with light violet tint, lip bright yellow with white or very light violet apex, occasional, 30 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 7090*.

19.55. *D. brymerianum* Reichenb. fil.

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers bright pure yellow, rare, 25 November 2005, *L. Averyanov, P.K. Loc, HAL 8319*.

19.56. *D. crumenatum* Sw.

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°05'12"N, 107°09'26"E, at elev. about 200 m a.s.l., dry secondary evergreen broad-leaved forest and open woodlands on basalt soils, epiphyte on tall trees, locally very common, flowers white, very fragrant, lip white with yellow center, 13 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 5083*.

19.57. *D. cumulatum* Lindley

**Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers light violet, column and anther pure white to yellow, not common, 25 October 2005, *L. Averyanov, P.K. Loc, HAL 8631*.

19.58. *D. leonis* (Lindley) Reichenb. fil.

**Tay Ninh** prov., **Tan Bien** distr., Tan Binh mun., around point 11°35'15"N, 105°53'19"E, at elev. about 15 m a.s.l., closed evergreen broad-leaved dry forest on

alluvial ferralite soils, epiphyte, not common, 8 October 2005, *P.K. Loc, L. Averyanov, D.V. Son et al.*, *HLF 5174*.

19.59. *D. ochraceum* De Wild.

**Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°13'20"N, 107°34'23"E, SW slopes of Mang Chan ridge at elev. 600–800 m a.s.l., primary closed evergreen broad-leaved forest along tops of ridge composed with rocky quartzite outcrops, epiphyte on tall tree, flowers white, later yellowish, lip with brightly red stripes, not rare, 10 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, *HAL 8056*.

19.60. *D. pachyglossum* Par. & Reichenb. fil. (*D. parcum* Reichenb.f.)

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep hill slopes at elev. 700–750 m a.s.l., around point 11°51'47"N, 107°56'59"E, secondary open broad-leaved evergreen forest with bamboo and *Pinus kesiya*, epiphyte on tall trees, occasional, 4 November 2005, *L. Averyanov, T.V. Thao, N.T. Vinh*, *HLF 5516*.

19.61. *D. phi* E. Christenson

**Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°48'36"N, 106°34'44"E, at elev. about 1200–1300 m a.s.l., primary broad-leaved evergreen submontane forest on very steep rocky shale southern slopes of Sa Mui mt, epiphyte on tall trees, tepals light yellowish, lip with brightly orange-red to red center, common, 29 March 2006, *N.T. Hiep, L. Averyanov, P.K. Loc et al.*, *HLF 6298*.

19.62. *D. pseudotenellum* Guillaumin

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, epiphyte on mossy trees, flowers white, very common, 20 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh*, *HLF 5326*.

19.63. *D. tortile* Lindley

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°10'22"N, 107°36'24"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. about 300 m a.s.l., epiphyte on mossy tall trees along rocky stream valley, flowers with light sweet fragrance, tepals light olive-yellow, tips light violet, lip deep purple-violet with yellow base and light olive-yellow apex, not common, 30 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al.*, *HAL 7091*.

19.64. *D. uniflorum* Griff.

**Thua Thien – Hue** prov., **ALuoi** distr., ARoang mun., around point 16°04'41"N, 107°29'06"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale, sandstone and granite at elev. 700–800 m a.s.l., epiphyte on tall trees, tepals light green-brownish, lip dull olive-brown with three deep brown median longitudinal stripes, occasional, 22 April 2005, *L. Averyanov, P.K. Loc, J. Regalado et al.*, *HAL 7307*.

19.65. *D. virgineum* Reichenb. fil.

**Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers pure white, lip with bright red spot on the disk, column and anther pure white, very rare, 25 October 2005, *L. Averyanov, P.K. Loc*, *HAL 8632*.

19.66. *D. wattii* (Hook. fil.) Reichenb. fil.

**Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers pure white, lip white with brightly yellow to yellow-orange keels on the disc, occasional, 25 October 2005, L. Averyanov, P.K. Loc, HAL 8630.

20. *Didymoplexiella* Garay

20.67. *D. siamensis* (Rolfe) Seidenf.

**Quang Tri** prov., **Da Krong** distr., Huc Nghi mun., around point 16°29'16"N, 107°00'32"E, at elev. about 414 m a.s.l., secondary broad-leaved evergreen lowland forest on mt hills composed with shale, achlorophyllous terrestrial saprophyte on very steep shady wet slope, flower white, very rare, 26 March 2006, L. Averyanov, P.K. Loc, P.V. The et al., HLF 6216. **Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°47'42"N, 106°35'50"E, at elev. about 1000 m a.s.l., secondary broad-leaved evergreen submontane forest on shale, terrestrial achlorophyllous olive-brownish to nearly black saprophyte on rocky shady stream slope with bamboo, flowers white, lip light blue-violet, not common, 28 March 2006, L. Averyanov, P.K. Loc, P.V. The, HLF 6263.

21. *Didymoplexiopsis* Seidenf.

21.68. *D. khiriwongensis* Seidenf.

**Thua Thien – Hue** prov., **A Luoi** distr., A Roang mun., around point 16°04'38"N, 107°29'10"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale and granite at elev. 700–800 m a.s.l., terrestrial achlorophyllous saprophyte, flowers white, lip white with gray spotted callus above, yellow-brown spot below, occasional, 20 April 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HAL 7246. **Thua Thien – Hue** prov., **A Luoi** distr., Huong Nguyen mun., around point 16°15'27"N, 107°26'15"E, at elev. 150–250 m a.s.l., secondary closed evergreen broad-leaved forest on steep hill and mt slopes composed with shale, achlorophyllous terrestrial herb on hill slopes near the top of ridge, flowers white, lip with yellow central spot below and gray spotted callus above, not common, 5 May 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 7890.

22. *Diplomeris* D. Don

22.69. *D. pulchella* D. Don

**Ha Giang** prov., **Yen Minh** distr., Du Gia mun., Lung Dam village, broad-leaved forest, on mt slope, on rock at stream bank at elev. about 750 m a.s.l., flowers white, 15 November 2004, Ching-I. Peng, N.T. Hiep, P.V. The et al., Ching-I. Peng – 20202.

23. *Epigeneium* Gagnep.

23.70. *E. amplum* (Lindley) Summerh.

**Ha Giang** prov., **Yen Minh** distr., Du Gia mun., around point 22°56'51"N, 105°10'24"E, at elev. 1000–1200 m a.s.l., primary broad-leaved submontane forests on limestone and shale, 30 November 2004, S.K. Wu, L.K. Phan, X. Gong et al., WP 819.



23.71. *E. chapaense* Gagnep.

**Ha Giang** prov., **Quan Ba** distr., epiphyte, tepals brown-red, 13 October 2004, *N.T. Hiep, NTH 5938*. **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around 23°06'30"N, 105°04'32"E, at elev. 1380–1450 m a.s.l., primary evergreen submontane limestone coniferous forest (with *Tsuga chinensis*), epiphyte, flowers brownish, 25 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 617*. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, creeping epiphyte on tall mossy trees, very common, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8386*.

23.72. *E. labuanum* (Lindley) Summerh.

**Ha Giang** prov., **Dong Van** distr., Sinh Lung mun., around point 23°12'17"N, 105°17'07"E, 1246 m a.s.l., on limestone, common, 6 October 2005, *N.T. Hiep, N.S. Khang, T.V. Thao, NTH 6087*.

24. *Epipactis* Zinn24.73. *E. atromarginata* Seidenf.

**Quang Tri** prov., **Da Krong** distr., Huc Nghi mun., around point 16°27'50"N, 107°00'41"E, at elev. about 428 m a.s.l., secondary broad-leaved evergreen lowland forest on mt hills composed with shale, lithophytic herb up to 1 m tall in open wet stream rocks, flowers yellow, tepals with deep purple margins, lip yellow with deep purple striation, column light green, pollinia bright yellow, occasional, but sometimes in large colonies, 25 March 2006, *L. Averyanov, P.K. Loc, P.V. The et al., HLF 6181*.

25. *Eria* Lindley25.74. *E. acervata* Lindley

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest along rocky streamlet valley at the base of steep slopes of mt composed with solid highly eroded crystalline and partially shale limestone at elev. about 900 m a.s.l., epiphyte on tall trees, not common, 6 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6529*.

25.75. *E. boniana* (Gagnep.) Tang & F.T.Wang

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest on slopes of remnant mt composed with solid highly eroded crystalline and partially shale limestone at elev. about 1200 m a.s.l., creeping epiphyte, flowers light yellowish-green, lip with violet tint, rare, 4 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6458*; 5 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6474*.

25.76. *E. bractescens* Lindley

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., steep hill slopes along Dak Huit river valley, around point 12°16'11"N, 107°09'25"E, at elev. 350–400 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and



open woodlands on basalt and shale mother rocks, epiphyte on tall trees, flowers white, lip white, center with two reddish keels, common, 9 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al.*, *HLF* 4982.

25.77. *E. carinata* Lindley

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, rare, lip bright brown, 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH* 5951.

25.78. *E. coronaria* (Lindley) Reichenb. fil.

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, very common, lip with violet line inside, 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH* 5948.

25.79. *E. pusilla* (Griff.) Lindley

**Quang Binh** prov., **Minh Hoa** distr., Thuong Hoa mun., around point 17°40'21"N, 105°58'00"E, Ca Xach mt, primary closed evergreen broad-leaved gnarled stunted forest along rocky ridge composed with solid marble-like highly eroded crystalline limestone at elev. 600–800 m a.s.l., epiphyte in shady place, flowers white, common, 20 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al.*, *HAL* 5970. **Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., along rocky river valley of Dak Bo river, around point 12°16'17"N, 107°11'30"E, at elev. 320–350 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, creeping epiphyte on tall trees, rare, 8 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al.*, *HLF* 4941. **Thua Thien – Hue** prov., **A Luoi** distr., Hong Kim mun., around point 16°17'54"N, 107°12'41"E near A Nor waterfall at elev. 700–800 m a.s.l., wet closed secondary broad-leaved forest on very steep slopes of A Nor stream composed with shale and granite, creeping lithophyte on open rocky cliffs of waterfall, not common, 26 April 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, *HAL* 7539. **Thua Thien – Hue** prov., **A Luoi** distr., Hong Van mun., around point 16°21'52"N, 107°09'36"E, at elev. 1000–1100 m a.s.l., secondary wet closed broad-leaved forest on very steep mt slopes composed with shale and granite along shady stream canyon, creeping lithophyte on open waterfall cliffs, occasional, 30 April 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, *HAL* 7671.

25.80. *E. siamensis* Schlechter

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. 1200–1400 m a.s.l., broad-leaved submontane forest of limestone slope, 26 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al.*, *WP* 675. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH* 5945.

25.81. *E. stricta* Lindley

**Ha Giang** prov., **Quan Ba** distr., around point 23°05'49"N, 105°01'00"E, at elev. about 1150 m a.s.l., primary coniferous forest with *Calocedrus rupestris*, *Calitropsis vietnamensis* and *Pseudotsuga sinensis* on rocky highly eroded marble-like limestone remnant mt, epiphyte on mossy trees on shady wet rocky mossy slope, flowers

yellowish, lip white with purple marks, very common, 6 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8348*. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, epiphyte on mossy tree, flowers white, margin of sepals purple, very common, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8366*.

25.82. *E. thao* Gagnep.

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°24'24"N, 106°13'08"E, at elev. 850 m a.s.l., pristine closed coniferous submontane forest (with *Calocedrus rupestris*), epiphyte, common, 13 December 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 1108*.

25.83. *E. tomentosa* (Koenig) Hook. fil.

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., steep hill slopes along Dak Huit river valley, around point 12°16'11"N, 107°09'25"E, at elev. 350–400 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on basalt and shale mother rocks, creeping epiphytic vine on tall trees, tepals olive-green, lip white with brightly red apex, anther yellow, not common, 9 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4988*.

26. *Eriodes* Rolfe

26.84. *Eriodes barbata* (Lindley) Rolfe

**Lam Dong** prov., **Dalat** city area, around point 11°59'N, 108°22'E, at elev. about 1400–1500 m a.s.l., terrestrial orchid, flowers odorless, tepals and lip yellowish, with purple-brown stripes, column reddish, at the apex white, rare, 14 November 2005, *L. Averyanov, P.K. Loc, HAL 8624*.

27. *Erythrodes* Blume

27.85. *E. hirsuta* (Griff.) Ormerod

**Ha Tinh** prov., **Huong Son** distr., Son Hong mun., around point 18°34'06"N, 105°11'40"E, primary broad-leaved evergreen forest on steep mt slopes composed with granite along Khe Van stream at elev. 400–450 m a.s.l., terrestrial creeping herb on shady rocky stream slope, leaves uniform deep green, locally common, 8 May 2004, *P.K. Loc, L. Averyanov, P.V. The et al., HAL 5215*.

28. *Esmeralda* Reichenb. fil.\*

28.86. *E. clarkei* Reichenb. fil.\* (Plate 1, f).

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., epiphyte with pendulous ascending shoots 25–40 cm long, flowers odorless, sepals and petals light yellowish with purple-brown transversal stripes, lip white with purple-brown longitudinal stripes and brown margin, column white, rare, 24 November 2005, *L. Averyanov, P.K. Loc, HAL 8311*.

29. *Eulophia* R. Br. ex Lindley

29.87. *E. andamanensis* Reichenb. fil.

**Ninh Thuan** prov., **Ninh Hai** distr., Vinh Hai mun., Nui Chua N.P., around point 11°43'38"N, 109°11'25"E, at elev. about 50 m a.s.l., open secondary forest and shrubs on dry rocky slopes of low hills composed with granite along stream, ephemeroid terrestrial herb in sandy place among semi desert xerophytic shrubs, rare, 20 March 2004, P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 3197.

29.88. *E. graminea* Lindley

**Quang Tri** prov., **Da Krong** distr., Ta Long mun., around point 16°36'30"N, 106°52'52"E, at elev. 170–200 m a.s.l., primary broad-leaved evergreen lowland forest on highly eroded solid marble like limestone, terrestrial ephemeroid herb on shady slope. Sepals and petals greenish, lip white with violet center, not common, 27 March 2006, L. Averyanov, P.K. Loc, P.V. The, HLF 6257.

29.89. *E. macrobulbon* (Par. et Reichenb. fil.) Hook. fil.

**Thua Thien – Hue** prov., **ALuoi** distr., Hong Van mun., around point 16°21'52"N, 107°09'36"E, at elev. 1000–1100 m a.s.l., secondary wet closed broad-leaved forest and open secondary shrubs on very steep mt slopes composed with shale, terrestrial herb in open grassy place along trail, flowers light brown, rare, 30 April 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 7696.

30. *Gastrochilus* D. Don

30.90. *G. bellinus* (Reichenb. fil.) Kuentze\* (Plate 2, a).

**Thanh Hoa** prov., **Muong Lat** distr. at elev. 600–800 m a.s.l., broad-leaved evergreen lowland forest on slopes of remnant mt composed with solid highly eroded crystalline limestone, epiphyte, flowers with unpleasant smell of decaying protein, sepals and petals dark olive-green with numerous deep purple-brown spots; lip white, hypochile with brown-purple spots; operculum very light yellow heavily brown-purple spotted at the base; ovary deep green with purple-brown tint, purple-brown spotted at the base, very rare, 23 February 2005, L. Averyanov, P.K. Loc, HAL 6387.

30.91. *G. calceolaris* (Buch.-Ham. ex Sm.) D. Don

**Nghe An** prov., **Con Cuong** distr., Binh Chuan mun., Pu Huong nature reserve, Pu Pha Cau limestone mt, 19°18'13.3"N, 104°53'50.2"E, at elev. 1100–1250 m a.s.l., epiphyte in forest with *Calocedrus rupestris*, flowers yellow with red traces, 26 February 2004, V.M. Son, N.T. Vinh, HLF 3138. **Cao Bang** prov., **Trung Khanh** distr., Ngoc Khe mun., around point 22°54'59"N, 106°31'44"E, at elev. 800–850 m a.s.l., remnants of primary evergreen broad-leaved forest along tops of rocky ridges and mesae composed with light gray solid marble-like highly eroded crystalline limestone, epiphyte, occasional, 10 June 2004, L. Averyanov, P.K. Loc, P.V. The et al., HAL 5555.

30.92. *G. pseudodistichus* (King et Pantl.) Schlechter

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, creeping ascending lithophytic vine up to 0.5

m long, leaves dirty purple-violet spotted, rare, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8385*. **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°05'55"N, 105°04'10"E, at elev. about 1500 m a.s.l., primary mossy coniferous forest with *Tsuga sinensis* and *Pinus kwangtungensis* on tops of high rocky ridge composed with highly eroded marble-like limestone, small erect lithophytic vine on shady mossy rocks along rocky mossy ridge edge, tepals light dull yellowish, indistinctly reddish-brown spotted, lip light dull yellowish, epichile white with indistinct small reddish-purple spots, leaves deep green, dirty violet spotted, occasional, 9 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8441*.

31. *Goodyera* R. Br.

31.93. *G. foliosa* (Lindley) Clarke

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. about 1250 m a.s.l., around point 11°52'30"N, 108°01'12"E, primary broad-leaved evergreen closed wet forest on SW slopes composed with crystalline highly metamorphosed sandstone, terrestrial and lithophytic creeping herb along shady rocky stream valley, leaves uniform dark green, sepals pinkish, sepals and lip white, rare, 9 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5611*.

31.94. *G. schlechtendaliana* Reichenb. fil.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°05'27"N, 108°39'43"E, at elev. 2100–2300 m a.s.l., along main ridge of Bi Doup mt, primary mossy wet coniferous forest with *Fokienia hodginsii* along main ridge, creeping terrestrial, lithophytic and epiphytic herb, flowers white, petals with green central stripe, leaves with white tessellation, very common, 15 October 2005, *L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5257*.

32. *Habenaria* Willd.

32.95. *H. dentata* (Sw.) Schlechter

**Lam Dong** prov., **Dalat** city, Trai Mat mun., open short tall grasslands on road cut along secondary coniferous woodland with *Pinus kesiya*, ephemeroid terrestrial tuberiferous herb up to 40 cm tall, flowers pure white, odorless, very rare, 14 October 2005, *L. Averyanov, P.K. Loc, HLF 8627*.

32.96. *H. dentata* (Sw.) Schlechter **var. parageniculata** (Tang et F.T. Wang) Aver., **comb. nov.** – *H. parageniculata* Tang & F.T. Wang, 1936, Bull. Fan Mem. Inst. Biol. 7: 137.<sup>1</sup>

**Lam Dong** prov., **Dalat** city, Trai Mat mun., open short tall grasslands on road

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<sup>1</sup> Plants described from Myanmar under the name *Habenaria parageniculata* Tang et F.T. Wang (Tang, Wang, 1936) strikingly differs from typical *H. dentata* in simple narrowly cuneate lip without distinct side-lobes or with very small low side-lobes. Meanwhile, these samples probably lie within natural variation of the widespread very polymorphic *H. dentata* and represent its marginal derivative (Seidenfaden, 1977). Before special studies of more material, I prefer regard this taxon in the rank of variety.

cut along secondary coniferous woodland with *Pinus kesiya*, ephemeroïd terrestrial tuberiferous herb up to 40 cm tall, flowers pure white, odorless, very rare, 14 October 2005, L. Averyanov, P.K. Loc, HAL 8628.

32.97. *H. rostellifera* Reichenb. fil.

**Tay Ninh** prov., **Tan Bien** distr., Tan Binh mun., around point 11°38'27"N, 105°51'23"E, at elev. about 15 m a.s.l., dry secondary dipterocarp woodlands and grasslands on alluvial swampy ferralite soils, terrestrial tuberiferous herb up to 0.5 m tall in open wet places, flowers white to very light yellowish-pink, lateral sepals with big brown spot, occasional, 4 October 2005, P.K. Loc, L. Averyanov, D.V. Son et al., HLF 5109.

32.98. *H. rumphii* (Brongn.) Lindley

**Tay Ninh** prov., **Tan Bien** distr., Tan Binh mun., around point 11°38'27"N, 105°51'23"E, at elev. about 15 m a.s.l., dry secondary dipterocarp woodlands and grasslands on alluvial swampy ferralite soils, terrestrial tuberiferous herb up to 0.5 m tall in open place, flowers odorless, pure white, occasional, 4 October 2005, P.K. Loc, L. Averyanov, D.V. Son et al., HLF 5107.

33. *Herminium* L.

33.99. *H. lanceum* (Thunb. ex Sw.) Vuijk

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°07'39"N, 108°39'17"E, at elev. 1600–1800 m a.s.l., W slope of Bi Doup mt, grassy secondary woodlands with *Pinus kesiya* on steep mt slopes, terrestrial tuberiferous ephemeroïd herb 0.2–1.2 m tall, flowers light green, occasional, 15 October 2005, L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5201. **Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°08'31"N, 108°39'01"E, at elev. about 1400 m a.s.l., open secondary grassy coniferous woodland on tops of hills, terrestrial tuberiferous ephemeroïd herb, flowers light green, occasional, 17 October 2005, L. Averyanov, N.T. Vinh, HLF 5282.

34. *Hetaeria* Blume

34.100. *H. affinis* (Griff.) Seidenf. & Ormerod

**Quang Tri** prov., **Da Krong** distr., Ta Long mun., around point 16°36'30"N, 106°52'52"E, at elev. 170–200 m a.s.l., primary broad-leaved evergreen lowland forest on highly eroded solid marble like limestone, terrestrial creeping herb on shady slope, sepals dull yellow-pinkish, petals white, not common, 27 March 2006, L. Averyanov, P.K. Loc, P.V. The, HLF 6256. **Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. about 1250 m a.s.l., around point 11°52'30"N, 108°01'12"E, primary broad-leaved evergreen closed wet forest on SW slopes composed with crystalline highly metamorphosed sandstone, creeping terrestrial herb along shady rocky stream valley, sepals olive-green, petals and lip white, leaves uniform green, locally common, 9 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5608.

34.101. *H. alta* Ridl.\* (Plate 2, b).

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point

16°09'58"N, 107°36'07"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. 300–400 m a.s.l., terrestrial creeping herb on very steep shady rocky stream slope, leaves uniform green, sepals dull light brownish, petals white, rare, 31 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 7156.*

34.102. *H. anomala* (Lindley) Hook. fil.

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., around point 17°23'22"N, 106°12'47"E, Phong Nha – Ke Bang N.P., primary closed evergreen coniferous forest (with *Calocedrus rupestris*) on steep slopes and tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 800–900 m a.s.l., terrestrial and lithophytic creeping herb, leaves uniform green, sepals whitish with brown-reddish spots, lip white, locally common, 24 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6060.*

34.103. *H. nitida* Ridl.

**Quang Tri** prov., **Da Krong** distr., Ta Long mun., around point 16°36'30"N, 106°52'52"E, at elev. 170–200 m a.s.l., primary broad-leaved evergreen lowland forest on highly eroded solid marble like limestone, terrestrial creeping herb in shady slope, sepals dull pinkish, petals white, lip yellow, not common, 27 March 2006, *L. Averyanov, P.K. Loc, P.V. The, HLF 6255.*

35. *Holcoglossum* Schlechter

35.104. *H. amesianum* (Reichenb. fil.) E. Christenson

**Lai Chau** prov., **Muong Te** distr. at elev. 800–1000 m a.s.l., broad-leaved evergreen submontane forest on slopes of remnant mt composed with solid highly eroded crystalline limestone, epiphyte, flowers odorless, sepals white, petals white with pink-violet tint; lip pink, purple-violet at the center; column pink-violet; operculum white, with yellowish tint; ovary white or light yellowish-green; later all flower white, leaves thick, succulent, rare, 23 February 2005, *L. Averyanov, P.K. Loc, HAL 6388.*

35.105. *H. lingulatum* (Aver.) Aver.

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. about 1500 m a.s.l., epiphyte, primary evergreen submontane limestone coniferous forest (with *Tsuga chinensis*), flowers white, 25 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 621.*

35.106. *H. wangii* E. Christenson

**Bac Kan** prov., **Na Ri** distr., Kim Hy mun., Kim Hy nature reserve, 22°15'36"N, 106°03'12"E, at elev. about 600 m a.s.l., primary closed broad-leaved lowland forest on slope of limestone mt, epiphyte, rare, 22 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 548.*

36. *Hygrochilus* Pfitzer

36.107. *H. parishii* (Veitch et Reichenb. fil.) Pfitzer

**Thanh Hoa** prov., **Thach Thanh** distr., Thanh Yen mun., around point 20°17'36"N, 105°35'54"E, remnants of primary evergreen seasonal broad-leaved lowland dry forest

on steep rocky slope of limestone hills at elev. 300–350 m a.s.l., lithophyte and epiphyte on open cliff near the top of hill, very common, 9 January 2003, *L. Averyanov, P.K. Loc, N.H. Quang et al., HAL 2882a.*

37. *Kingidium* P. Hunt

37.108. *K. deliciosum* (Reichenb. fil.) Sweet

**Ha Tinh** prov., **Huong Son** distr., Son Hong mun., around point 18°34'06"N, 105°11'40"E, primary broad-leaved evergreen dry forest on steep mt slopes composed with shale at elev. 250–350 m a.s.l., along Song Con river valley, epiphyte on shady slope, locally common, 10 May 2004, *P.K. Loc, L. Averyanov, P.V. The et al., HAL 5299.*

38. *Liparis* Rich.

38.109. *L. balansae* Gagnep.

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest on slopes of remnant mt composed with solid highly eroded crystalline and partially shale limestone at elev. 1000–1200 m a.s.l., lithophytic creeping herb, flowers dull light yellowish to yellowish-green, not rare, 5 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6484.*

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, lithophytic herb on shady rocky slope, flowers green, common, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8392.*

38.110. *L. bootanensis* Griff.

**Quang Binh** prov., **Bo Trach** distr., Hung Trach mun., Phong Nha – Ke Bang N.P., around point 17°27'51"N, 106°22'46"E, at elev. 900–1000 m a.s.l., primary closed broad-leaved evergreen forest on slopes of mt composed with shale and sandstone, lithophyte along streamlet, flowers dull orange, not rare, 29 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6214.* **Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest along rocky streamlet valley at the base of steep slopes of mt composed with solid highly eroded crystalline and partially shale limestone at elev. about 900 m a.s.l., epiphyte in shady place on mossy trees, flowers dull light yellow-brown, very common, 6 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6557.* **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'20"N, 105°04'25"E, at elev. about 1450 m a.s.l., primary mossy coniferous forest with *Tsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone, lithophyte on mossy rocks along rocky mossy ridge edge, flowers dull olive-yellow, common, 9 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8413.*

38.111. *L. ferruginea* Lindley\* (Plate 2, c).

**Dak Nong** prov., **Dak Glong** distr., Dak Som mun., around point 11°53'06"N, 107°55'15"E, at elev. about 800 m a.s.l., open shrubby and grassy swamp along stream in depression between low hills composed with basalt, terrestrial tuberiferous herb,

sepals brown-purple, lateral sepals with yellow-brown median stripe, lip deep purple-brown, column white, locally common, 10 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5726.*

38.112. *L. latilabris* Rolfe

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°23'22"N, 106°12'47"E, primary closed evergreen coniferous forest (with *Calocedrus rupestris*) on steep slopes and tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 800–900 m a.s.l., lithophyte, flowers light dull orange, common, 24 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6070.* **Ha Giang** prov., **Bac Me** distr., Phiang Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest along rocky streamlet valley at the base of steep slopes of mt composed with solid highly eroded crystalline and partially shale limestone at elev. about 900 m a.s.l., epiphyte in shady place on mossy trees, flowers olive-green, common, 6 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6558.*

38.113. *L. stricklandiana* Reichenb. fil.

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, very common, lip green, December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH 5946.*

38.114. *L. viridiflora* (Blume) Lindley

**Quang Binh** prov., **Bo Trach** distr., Xuan Trach mun., Phong Nha – Ke Bang N.P., around point 17°39'24"N, 106°05'66"E, at elev. 460 m a.s.l., primary and secondary closed broad-leaved lowland forest on shale, lithophyte, flowers yellowish, 8 December 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 946.* **Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., vic. of Krong Kmar river, NE slopes of Chu Yang Sin mt at elev. 600–700 m a.s.l., around point 12°28'21"N, 108°20'33"E, primary and secondary broad-leaved closed evergreen forest on steep stream slopes, lithophytic herb on wet shady granite rocks and boulders along stream, flowers light greenish, very common, 29 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5464.* **Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. 1000–1250 m a.s.l., around point 11°52'30"N, 108°01'12"E, primary broad-leaved evergreen closed wet forest on SW slopes composed with crystalline highly metamorphosed sandstone, epiphyte on tall mossy tree, flowers light green, not common, 9 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5561.*

39. *Ludisia* A. Rich.

39.115. *L. discolor* (Ker-Gawl.) A. Rich.

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°23'32"N, 106°12'46"E, primary closed evergreen broad-leaves forest on steep slopes of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 650–750 m a.s.l., creeping lithophyte, leaves deep green with white nerves, flowers white, operculum yellow, not rare, 24 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6078.* **Quang Binh** prov., **Bo**



**Trach** distr., Son Trach mun., Phong Nha – Ke Bang N.P., around point 17°30'32"N, 106°17'45"E, at elev. 300–400 m a.s.l., secondary closed broad-leaved evergreen forest and scrub on rocky steep slopes of remnant mt composed with solid highly eroded crystalline deep gray limestone, creeping lithophyte on steep rocky slope near top of mt, flowers white, anther yellow, common, leaves deep green-brown with three pink longitudinal nerves, 2 February 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6350.*

40. *Luisia* Gaudich.

40.116. *L. ramosii* Ames\* (Plate 2, d).

**Thua Thien – Hue** prov., **A Luoi** distr., Hong Kim mun., around point 16°19'05"N, 107°12'42"E, near ANor waterfall at elev. about 1000 m a.s.l., secondary closed broad-leaved forest along mt ridge composed with shale and granite, canopy epiphyte on tall trees, tepals light greenish, lip deep purple-violet, occasional, 27 April 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 7558.*

40.117. *L. tristis* (G. Forst.) Hook. fil.

**Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°47'42"N, 106°35'50"E, at elev. about 1000 m a.s.l., secondary broad-leaved evergreen submontane forest on shale mt, epiphyte on tall tree, flowers brownish-green, lip dull yellow with irregular reddish-brown marks, not common, 28 March 2006, *L. Averyanov, P.K. Loc, P.V. The, HLF 6262.*

41. *Micropera* Lindley

41.118. *M. pallida* (Roxb.) Lindley

**Tay Ninh** prov., **Tan Bien** distr., Tan Binh mun., around point 11°35'15"N, 105°53'19"E, at elev. about 15 m a.s.l., closed evergreen broad-leaved dry forest on alluvial ferralite soils, epiphyte, flowers light dull yellow, locally common, 8 October 2005, *P.K. Loc, L. Averyanov, D.V. Son et al., HLF 5180.*

42. *Microsaccus* Blume

42.119. *M. griffithii* (Par. et Reichenb. fil.) Seidenf.

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°16'17"N, 107°11'30"E, at elev. 300–350 m a.s.l., primary and secondary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, epiphyte, rare, 6 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4819.*

43. *Monomeria* Lindley

43.120. *M. barbata* Lindley

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, at elev. 1400 m a.s.l., in limestone coniferous submontane forest (with *Pseudotsuga sinensis*), flowers yellow, 26 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al., WP 704.*

44. *Nephelaphyllum* Blume44.121. *N. tenuiflorum* Blume

**Thua Thien Hue** prov., **Phu Loc** distr., Bach Ma mt at elev. about 1100 m a.s.l., terrestrial and lithophytic herb, along stream, 9 October 2005, *N.T. Hiep, T.V. Thao, N.S. Khang et al., CFH-302B*.

45. *Nervilia* Comm. ex Gaudich.45.122. *N. plicata* (Andr.) Schlechter

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., along rocky river valley of Dak Bo river, around point 12°16'17"N, 107°11'30"E, at elev. 320–350 m a.s.l., primary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, ephemeroïd terrestrial herb in open bamboo forest along river valley, tepals very light olive-green, lip white with light purple nerves and yellow central keel, rare, 8 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4940*.

46. *Neuwiedia* Blume46.123. *N. balansae* Baill. ex Gagnep.

**Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., E slopes of Chu Yang Sin mt at elev. 600–850 m a.s.l., around point 12°30'27"N, 108°22'50"E, secondary broad-leaved evergreen forest with bamboo on steep rocky mt slopes, terrestrial herb up to 0.4 m tall, fruits white, juicy, sweet, locally very common, 30 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5479*.

47. *Oberonia* Lindley47.124. *O. acaulis* Griff.

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, red-orange, epiphyte, not rare, 24 November 2005, *L. Averyanov, P.K. Loc, HAL 8313*.

47.125. *O. falcata* King et Pantl.

**Thua Thien Hue** prov., **Phu Loc** distr., Bach Ma mt at elev. 1000–1098 m a.s.l., around point 16°11'19"N, 107°50'94"E, epiphyte, petals brown-red, 11 October 2005, *N.T. Hiep, T.V. Thao, N.S. Khang et al., CFH-334A*. **Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°06'44"N, 108°39'27"E, at elev. 1800–2000 m a.s.l., along main ridge and on W slope of Bi Doup mt, primary broad-leaved closed wet forest, epiphyte on mossy trees, flowers light yellowish to orange, occasional, 15 October 2005, *L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5210*. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., about 3 km to NWW of Quan Ba town, around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, canopy epiphyte, occasional, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8397a*.

47.126. *O. falconeri* Hook. fil.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, epiphyte, flowers dull yellowish, not common, 18 October 2005, T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5306; 20 October 2005, T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5328.

47.127. *O. kwangsiensis* Seidenf.

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest on slopes and tops of mt composed with solid highly eroded crystalline limestone at elev. 900–1150 m a.s.l., canopy epiphyte, rare, 7 March 2005, L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6572.

47.128. *O. longibracteata* Lindley

**Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., E slopes of Chu Yang Sin mt at elev. 600–850 m a.s.l., around point 12°30'27"N, 108°22'50"E, secondary broad-leaved evergreen forest with bamboo on steep rocky mt slopes, lithophytic herb on large shady mossy boulders, flowers red, occasional, 30 October 2005, L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5486.

47.129. *O. rufilabris* Lindley

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. 900–1000 m a.s.l., around point 11°52'30"N, 108°01'12"E, primary broad-leaved evergreen closed wet forest on SW slopes composed with crystalline highly metamorphosed sandstone, epiphyte on tall tree, flowers dark red, very common, 9 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5584.

48. *Odontochilus* Blume

48.130. *O. saprophiticus* (Aver.) Ormerod

**Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'55"N, 107°35'35"E, SW slopes of Mang Chan ridge at elev. about 450 m a.s.l., primary closed evergreen broad-leaved forest along steep slopes composed with shale with quartzite, sepals olive-brown, lip white, very rare, 13 May 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8194.

48.131. *O. umbrosus* (Aver.) Ormerod

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. about 1250 m a.s.l., around point 11°52'30"N, 108°01'12"E, primary broad-leaved evergreen closed wet forest on SW slopes composed with crystalline highly metamorphosed sandstone, terrestrial and lithophytic creeping herb along shady rocky stream valley, leaves uniform dark green, sepals pinkish-brown, sepals and lip white, rare, 9 November 2005, L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5611a.

49. *Otochilus* Lindley

49.132. *O. porrectus* Lindley

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32"E, around point 1500 m a.s.l., lithophyte, in submontane limestone coniferous

forest (with *Tsuga chinensis*), flowers white, 25 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al.*, WP 620. **Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, sepals and petals white, lip white with pinkish base and light greenish apex of side-lobes, column and anther pink-brown, epiphyte, not rare, 24 November 2005, *L. Averyanov, P.K. Loc*, HAL 8315. **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'20"N, 105°04'25"E, at elev. about 1450 m a.s.l., primary mossy coniferous forest with *Tsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone, epiphyte and lithophyte on steep rocky slope, flowers white, column and anther pink-brownish, occasional, 9 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8403.

50. *Panisea* (Lindley) Lindley

50.133. *P. tricalosa* Rolfe

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, very common, lip bright brown with violet line inside, 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao*, NTH 5949. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1200 m a.s.l., primary mossy cloudy coniferous forest with *Pseudotsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone along left side of Mien river, epiphyte on mossy tree on shady rocky slope, flowers light dull yellow, lip with three yellow-brownish spot at the center and light yellowish-brown apex, rare, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8401.

50.134. *P. uniflora* (Lindley) Lindley

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°23'32"N, 106°12'46"E, primary closed coniferous forest (with *Calocedrus rupestris*) on steep slopes and on tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 750–900 m a.s.l., lithophytic herb on shady vertical cliffs and occasional epiphyte on *Calocedrus*, flowers light dull yellow, lip dull orange, common, 25 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al.*, HAL 6114.

50.135. *P. yunnanensis* S.C. Chen et Tsi

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°00'4'32"E, at elev. 1400–1520 m a.s.l., epiphyte, in primary evergreen wet broad-leaved and coniferous submontane limestone forests (with *Tsuga chinensis*), flowers white, common, 25 November 2004, *S.K. Wu, L.K. Phan, X. Gong et al.*, WP 602. **Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, pure white, epiphyte, not common, 24 November 2005, *L. Averyanov, P.K. Loc*, HAL 8314. **Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'20"N, 105°04'25"E, at elev. about 1450 m a.s.l., primary mossy coniferous forest with *Tsuga sinensis* on tops of high rocky ridge composed with highly eroded marble-like limestone, epiphyte on mossy trees along rocky mossy ridge edge, flowers white, very common, 9 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8422.

51. *Paphiopedilum* Pfitzer

51.136. *P. appletonianum* (Gower) Rolfe f. *tridentatum* (S.C. Chen et Z.J. Liu) Aver., **comb. nov.** – *P. tridentatum* S.C. Chen et Z.J. Liu, 2001, Acta Phytotax. Sin., 39, 5 : 455.<sup>2</sup>

**Thua Thien Hue** prov., **Phu Loc** distr., Bach Ma N.P., Bach Ma mt, Hai Vong Dai peak, around point 16°11'46"N 107°51'45"E, at elev. 1300–1350 m a.s.l., mixed and broad-leaved evergreen primary closed mt forest on steep granite slopes, terrestrial herb on very steep shady slope along road, locally common, 18 April 2003, V.X. *Phuong*, L. *Averyanov*, N.X. *Tam et al.*, HLF 959; around point 16°11'65"N 107°51'53"E, at elev. 1150–1300 m a.s.l., mixed and broad-leaved evergreen secondary closed wet mt forest on steep shale slopes, terrestrial and lithophytic herb on shady steep slope along stream, leaves tessellated with deep and light green, locally very common, 19 April 2003, N.T. *Hiep*, L. *Averyanov*, N.T. *Vinh et al.*, HLF 1049. **Thua Thien – Hue** prov., **A Luoi** distr., Hong Van mun., around point 16°21'52"N, 107°09'36"E, at elev. 800–1000 m a.s.l., secondary wet broad-leaved closed forest on steep mt slopes composed with shale and granite, terrestrial and lithophytic herb along shady wet stream, flowers of typical coloration, leaves deep green – light green tessellated, rare, 29 April 2005, L. *Averyanov*, P.K. *Loc*, T.V. *Thao et al.*, HAL 7607. **Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°48'36"N 106°34'44"E at elevation about 1200–1300 m a.s.l., primary broad-leaved evergreen submontane forest on very steep rocky shale southern slopes of Sa Mui mt, terrestrial and lithophytic rosulate herb, flowers of typical coloration, leaves green/light green tessellated, locally common, 29 March 2006, N.T. *Hiep*, L. *Averyanov*, P.K. *Loc et al.*, HLF 5800.

51.137. *P. callosum* (Reichenb. fil.) Stein

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes of Ta Dung mt at elev. 600–800 m a.s.l., around point 11°52'14"N, 107°59'34"E, secondary dense broad-leaved evergreen wet forest with bamboo on steep rocky W faced stream slopes composed with crystalline highly metamorphosed sandstone, terrestrial and lithophytic rosulate herb in shady places and rocky cliffs, leaves dark-light green tessellated, locally common, 9 November 2005, L. *Averyanov*, P.K. *Loc*, T.V. *Thao et al.*, HLF 5575.

51.138. *P. villosum* (Lindley) Stein

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes along main ridge of Ta Dung mt at elev. 1700–1985 m a.s.l., around point of highest peak at 11°51'30"N, 108°02'08"E, primary broad-leaved evergreen closed wet mossy cloudy forest on crystalline highly metamorphosed sandstone, epiphytic and lithophytic rosulate

<sup>2</sup> Mentioned collections represent populations where apex of lateral sepals in flower varies from simple, acute to bi- and tridentate. Marginal forms with sepals of three distinct acute teeth at apex were described recently as separate species, *Paphiopedilum tridentatum* on the base of material illegally exported from Vietnam without any data on their locality (Chen S.C., Liu Z.J., Zhang J.Y., 2001). Observation and study of floral variation in natural populations gives evidence that individuals with tridentate sepals deserve taxonomical rank not higher than rank of a form.

herb on mossy shady cliff, leaves uniform green, with dirty purple-violet marks at the base, not common, 8 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5671a.*

52. *Pecteilis* Raf.

52.139. *P. susannae* (L.) Raf.

**Tay Ninh** prov., **Tan Bien** distr., Tan Binh mun., around point 11°38'27"N, 105°51'23"E, at elev. about 15 m a.s.l., dry secondary dipterocarp woodlands and grasslands on alluvial swampy ferralite soils, terrestrial tuberiferous herb up to 1.2 m tall in open wet places, flowers white, with light lemon fragrance, rare, 4 October 2005, *P.K. Loc, L. Averyanov, D.V. Son et al., HLF 5110.*

53. *Peristylus* Blume

53.140. *P. calcaratus* (Rolfe) S.Y. Hu

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°08'31"N, 108°39'01"E, at elev. about 1400 m a.s.l., open secondary grassy coniferous woodland on tops of hills, terrestrial tuberiferous ephemeroïd herb, flowers light greenish, not common, 17 October 2005, *L. Averyanov, N.T. Vinh, HLF5280.* **Lam Dong** prov., **Lac Duong** distr., Lat mun., Suoi Vang locality around point 11°59'12"N, 108°22'12"E, at elev. about 1450 m a.s.l., secondary open grasslands and coniferous woodlands on tops and hill slopes, terrestrial ephemeroïd tuberiferous herb, rare, 25 October 2005, *L. Averyanov, P.K. Loc, N.V. Duy et al., HLF 5384a.*

53.141. *P. gracilis* Blume

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°07'39"N, 108°39'17"E, at elev. 1600–1800 m a.s.l., W slope of Bi Doup mt, grassy secondary woodlands with *Pinus kesiya* on steep mt slopes, terrestrial tuberiferous ephemeroïd herb up to 1.2 m tall, flowers light green, not common, 15 October 2005, *L. Averyanov, P.K. Loc, J. Regalado et al., HLF 5203.* **Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., E slopes of Chu Yang Sin mt at elev. 600–850 m a.s.l., around point 12°30'27"N, 108°22'50"E, secondary broad-leaved evergreen forest with bamboo on steep rocky mt slopes, terrestrial tuberiferous ephemeroïd herb up to 0.5 m tall, flowers green, locally common, 30 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5484.*

54. *Phaius* Lour.

54.142. *Ph. indochinensis* Seidenf. & Ormerod

**Dak Nong** prov., **Dak Glong** distr., Dak Plao mun., steep mt slopes along main ridge of Ta Dung mt at elev. 1700–1985 m a.s.l., around point of highest peak at 11°51'30"N, 108°02'08"E, primary broad-leaved evergreen closed wet mossy cloudy forest on crystalline highly metamorphosed sandstone, terrestrial herb up to 1.5 m tall on shady rocky slope, tepals brown, lip white, purple speckled, rare, 8 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5664.* **Lam Dong** prov., **Dalat** city, mt forest in Dalat city area, flowers odorless, tepals brown, yellow striped to uniform red-brown, lip white with red-brown stripes to white with light purple-violet markings, hairs silvery-white, occasional, 14 November 2005, *L. Averyanov, P.K. Loc, HAL 8637.*

54.143. *Ph. longicornu* Guillaumin

**Thua Thien** – **Hue** prov., **A Luoi** distr., Hong Kim mun., around point 16°17'54"N, 107°12'41"E near A Nor waterfall at elev. 700–800 m a.s.l., wet closed secondary broad-leaved forest on very steep slopes of A Nor stream composed with shale and granite, lithophytic herb on open wet waterfall cliffs, tepals white, lip light yellowish with purple striping, occasional, 26 April 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 7535.

55. *Pholidota* Lindley ex Hook.55.144. *Ph. chinensis* Lindley

**Ha Giang** prov., **Hoang Su Phi** distr., Ho Thau mun., around point 22°37'24"N, 104°38'00"E, at elev. 900–1000 m a.s.l., primary and secondary closed evergreen broad-leaved forest on very steep slopes of mt composed with shale and granite with quartzite, epiphyte in shady narrow stream canyon, occasional, 9 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al.*, HAL 6615.

55.145. *Ph. guibertiae* Finet

**Thua Thien** – **Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°13'36"N, 107°35'09"E, SW slopes of Mang Chan ridge at elev. 450–500 m a.s.l., primary closed evergreen broad-leaved forest along steep stream slopes composed with shale with quartzite, epiphyte on mossy trees along stream, flowers orange, occasional, 12 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8188.

55.146. *Ph. missionariorum* Gagnep.

**Ha Giang** prov., **Yen Minh** distr., Lao Va Chai mun., around point 23°06'30"N, 105°04'32" E, at elev. about 1400 m a.s.l., in limestone coniferous submontane forest (with *Pseudotsuga sinensis*), 26 November 2004, *S.K. Wu, L.K. Han, X. Gong et al.*, WP 704B. **Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, very common, lip bright brown, 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH 5950*.

55.147. *Ph. roseans* Schlechter

**Ha Giang** prov., **Quan Ba** distr., Can Ty mun., mt Hang Tang Chang, 1100 m a.s.l., on rocks in open place, very common, 12 December 2004, *N.T. Hiep, P.V. The, T.V. Thao, NTH 5941*.

55.148. *Ph. rubra* Lindley

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers light greenish to light dull pink, very common, 25 November 2005, *L. Averyanov, P.K. Loc, HAL 8320*.

55.149. *Ph. yunnanensis* Rolfe

**Ha Giang** prov., **Quan Ba** distr., Thanh Van mun., around point 23°05'49"N, 105°00'28"E, at elev. about 1050 m a.s.l., secondary broad-leaved forest on rocky highly eroded marble-like limestone remnant mt, lithophyte and epiphyte, flowers light pink, anther orange, common, 7 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al.*, HAL 8363. **Ha Giang** prov., **Meo Vac** distr., Sung Tra mun., around point 23°10'12"N, 105°17'39"E, at elev. about 1100–1150 m a.s.l., remnants of primary

coniferous forest with *Pseudotsuga sinensis* on tops of high rocky remnant ridge composed with highly eroded marble-like limestone, creeping lithophyte on very steep mossy rocky slope, flowers light pink, lip with yellow center on epichile, common, 10 December 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8465.*

56. *Podochilus* Blume

56.150. *P. banaensis* Ormerod

**Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., vic. of Krong Kmar river, NE slopes of Chu Yang Sin mt at elev. 600–700 m a.s.l., around point 12°28'21"N, 108°20'33"E, primary and secondary broad-leaved closed evergreen forest on steep stream slopes, epiphyte along shady wet rocky stream valley, flowers white, locally common, 29 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5467.*

57. *Pomatocalpa* Breda, Kuhl et Hasselt

57.151. *P. angustifolia* Seidenf.\* (Plate 2, e).

**Quang Tri** prov., **Huong Hoa** distr., Huong Viet mun., to N of Sa Mui pass, around point 16°51'14"N, 106°34'13"E, at elev. 550–650 m a.s.l., remnants of primary broad-leaved evergreen lowland forest on rocky remnant highly eroded solid marble-like limestone hills and low mt with very steep slopes and vertical cliffs, epiphyte on shady slope, flowers sweet fragrant, yellowish, tepals with two reddish stripes, rare, 31 March 2006, *N.T. Hiep, L. Averyanov, P.K. Loc et al., HLF 5934.*

58. *Porpax* Lindley

58.152. *P. elwesii* (Reichenb. fil.) Rolfe

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°16'17"N, 107°11'30"E, at elev. 300–350 m a.s.l., primary and secondary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, tiny creeping epiphyte on branches of tall trees, not common, 5 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4815.*

59. *Pteroceras* Hasselt ex Hassk.

59.153. *P. simondianum* (Gagnep.) Aver.

**Ha Tinh** prov., **Huong Son** distr., Son Hong mun., around point 18°34'06"N, 105°11'40"E, primary broad-leaved evergreen dry forest on steep mt slopes composed with shale at elev. about 250–350 m a.s.l., epiphyte on shady slope, locally common, 10 May 2004, *P.K. Loc, L. Averyanov, P.V. The et al., HAL 5298.*

60. *Schoenorchis* Reinw.

60.154. *S. gemmata* (Lindley) J.J. Smith

**Quang Binh** prov., **Minh Hoa** distr., Thuong Hoa mun., Phong Nha – Ke Bang N.P., around point 17°40'21"N, 105°58'00"E, primary and secondary closed evergreen broad-leaved forest and scrub on rocky ridge composed with solid and stratified



marble-like highly eroded crystalline limestone at elev. 550–650 m a.s.l., epiphyte along tops of ridge, sepals purple-violet, lip white, very common, 18 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 5835.*

61. *Smithinandia* Holttum

61.155. *S. micrantha* (Lindley) Holttum

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°16'17"N, 107°11'30"E, at elev. 300–350 m a.s.l., primary and secondary closed evergreen and semi-deciduous broad-leaved lowland dry forest and open woodlands on hill slopes on basalt and shale mother rocks, epiphyte, flowers white, lip with purple-violet apex, occasional, 6 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 4818.*

62. *Spathoglottis* Blume

62.156. *S. pubescens* Lindley

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°08'31"N, 108°39'01"E, at elev. 1400–1500 m a.s.l., open grassy woodlands with *Pinus kesiya* on hill slopes, terrestrial ephemeroïd tuberiferous herb, flowers bright yellow lateral sepals and lip with brown-purple marks at base, not common, 23 October 2005, *L. Averyanov, N.T. Vinh, HLF 5369.* **Dak Lak** prov., **Krong Bong** distr., Hoa Son mun., NE slopes of Chu Yang Sin mt at elev. 600–700 m a.s.l., around point 12°28'21"N, 108°20'33"E, primary and secondary broad-leaved closed evergreen forest on steep stream slopes, terrestrial and lithophytic erect herb on wet open granite rocks along river, flowers yellow, not common, 29 October 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5454.*

63. *Stereosandra* Blume

63.157. *S. javanica* Blume

**Thua Thien** – **Hue** prov., **A Luoi** distr., A Roang mun., around point 16°04'41"N, 107°29'06"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale, sandstone and granite at elev. 700–800 m a.s.l., achlorophyllous white ground tuberiferous saprophyte on shady slope of rocky stream valley, tepals (including lip) white with black-violet tips, column white, fruits white with dirty purple-violet marks, later light yellowish, rare, 22 April 2005, *L. Averyanov, P.K. Loc, J. Regalado et al., HAL 7380.* **Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°47'42"N, 106°35'50"E, at elev. about 1000 m a.s.l., secondary broad-leaved evergreen submontane forest on shale mt, terrestrial achlorophyllous white saprophyte on rocky shady stream slope with bamboo, rare, 28 March 2006, *L. Averyanov, P.K. Loc, P.V. The, HLF 6264;* around point 16°48'36"N, 106°34'44"E, at elev. about 1200–1300 m a.s.l., 29 March 2006, *N.T. Hiep, L. Averyanov, P.K. Loc et al., HLF 6291;* around point 16°47'42"N, 106°35'50"E, at elev. about 1050 m a.s.l., 17 March 2006, *P.K. Loc, HLF 5760.*

64. *Taeniophyllum* Blume64.158. *T. glandulosum* Blume

**Thua Thien** – Hue prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'50"N, 107°36'29"E, mt and hill slopes composed with shale at elev. 200–250 m a.s.l., primary and secondary closed evergreen broad-leaved forest on steep stream slopes, canopy epiphyte on mossy trees along rocky stream valley, flowers light greenish, locally common, 14 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8241.*

65. *Tainia* Blume65.159. *T. angustifolia* (Lindley) Benth. et Hook. fil.

**Lam Dong** prov., **Dalat** city area, terrestrial herb, 18 April 2004, *L. Averyanov, P.K. Loc, N.T. Hiep, HAL 4601.* **Quang Binh** prov., **Bo Trach** distr., Hung Trach mun., Phong Nha – Ke Bang N.P., around point 17°26'50"N, 106°23'41"E, at elev. about 600 m a.s.l., primary closed broad-leaved evergreen forest on steep slopes of mt composed with shale and sandstone along stream canyon, terrestrial and lithophytic herb in shady rocky slope, flower buds yellowish-brown, occasional, not common, 1 February 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6318.*

65.160. *T. hongkongensis* Rolfe

**Quang Binh** prov., **Minh Hoa** distr., Thuong Hoa mun., Phong Nha – Ke Bang N.P., around point 17°40'21"N, 105°58'00"E, primary closed evergreen broad-leaved and coniferous lowland forest (with *Dacrydium elatum*) along rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 550–650 m a.s.l., terrestrial herb in open forest with bamboo on top of ridge, flower buds brown, not common, 21 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 5986.*

65.161. *T. latifolia* (Lindley) Reichenb. fil.

**Quang Binh** prov., **Bo Trach** distr., Hung Trach mun., Phong Nha – Ke Bang N.P., around point 17°27'24"N, 106°23'14"E, at elev. 600–700 m a.s.l., primary closed broad-leaved evergreen forest on slopes of mt composed with shale, sandstone and occasionally granite, terrestrial and lithophytic herb on shady slope of stream valley along stream, flowers olive-brownish, lip white, locally common, 30 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 6266.*

65.162. *T. ruybarrettoi* S.Y.Hu et Barretto

**Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°47'42"N, 106°35'50"E, at elev. about 1000 m a.s.l., secondary broad-leaved evergreen submontane forest on shale mt, terrestrial herb on shady rocky stream slope, flowers olive-yellowish, not common, 28 March 2006, *L. Averyanov, P.K. Loc, P.V. The, HLF 6261.*

66. *Thrixspermum* Lour.66.163. *T. annamense* (Guillaumin) Garay

**Thua Thien** – Hue prov., **Nam Dong** distr., Huong Son mun., around point 16°10'22"N, 107°36'24"E, primary closed broad-leaved evergreen lowland forest along

La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. about 300 m a.s.l., canopy epiphyte along rocky stream valley, flowers white, later with yellowish tint, rare, 30 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 7099*. **Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°13'23"N, 107°35'16"E, SW slopes of Mang Chan ridge at elev. 350–500 m a.s.l., primary closed evergreen broad-leaved forest along steep stream slopes composed with shale with quartzite, canopy epiphyte on mossy trees along rocky stream canyon, flower buds white, locally very common, 11 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8145*. **Dak Nong** prov., **Dak Glong** distr., Dak Som mun., steep hill slopes at elev. 800–900 m a.s.l., around point 11°52'50"N, 107°55'35"E, primary broad-leaved evergreen dry forest along ridge edge, canopy epiphyte in shady wet place, flower buds yellowish-white, not common, 5 November 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5543*. **Quang Tri** prov., **Da Krong** distr., Huc Nghi mun., around point 16°29'00"N, 107°00'40"E, at elev. about 432 m a.s.l., secondary closed evergreen broad-leaved lowland forest on shale, epiphyte, occasionally common, 24 March 2006, *P.K. Loc, N.S. Khang, D.C. Tri et al., HLF 6176*.

66.164. *T. centipeda* Lour.

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'52"N, 107°36'22"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale at elev. 300–450 m a.s.l., epiphyte on shady slope, flowers light yellowish-white, not common, 25 March 2005, *L. Averyanov, N.T. Hiep, P.K. Loc et al., HAL 6877*. **Thua Thien – Hue** prov., **A Luoi** distr., A Roang mun., around point 16°04'41"N, 107°29'06"E, primary closed evergreen broad-leaved forest on very steep mt slopes composed with shale, sandstone and granite at elev. 700–800 m a.s.l., epiphyte on tall trees along stream valley, tepals light orange, lip with white apex and light orange side-lobes marked with red spots, common, 22 April 2005, *L. Averyanov, P.K. Loc, J. Regalado et al., HAL 7327*. **Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°12'50"N, 107°36'29"E, mt and hill slopes composed with shale at elev. 200–250 m a.s.l., primary and secondary closed evergreen broad-leaved forest on steep stream slopes, canopy epiphyte on mossy trees along rocky stream valley, locally very common, 14 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8245*.

66.165. *T. pygmaeum* (King & Pantl.) Holttum

**Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., vic. of Sa Mui pass, around point 16°48'36"N, 106°34'44"E, at elev. about 1400–1500 m a.s.l., primary broad-leaved evergreen mt cloudy forest along main ridge of Sa Mui mt, epiphyte on mossy trees near top of mt, rare, 1 April 2006, *N.T. Hiep, L. Averyanov, P.K. Loc et al., HLF 6516*.

66.166. *T. stelidioides* Aver. et Averyanova

**Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'58"N, 107°36'07"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale and sandstone at elev. 300–400 m a.s.l., canopy epiphyte on very steep shady rocky stream slope, flowers light yellowish, rare, 31 March 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL*

7157. **Thua Thien Hue** prov., **Phu Loc** distr., Bach Ma mt, around 1100 m a.s.l., epiphyte, along the stream, 9 October 2005, *N.T. Hiep, T.V. Thao, N.S. Khang et al., CFH-302B*.

66.167. *T. amplexicaule* (Blume) Reichenb. fil.\* (Plate 2, f).

**Dak Nong** prov., **Dak Glong** distr., Dak Som mun., around point 11°53'06"N, 107°55'15"E, at elev. about 800 m a.s.l., open shrubby and grassy swamp along stream in depression between low hills composed with basalt, hemi-woody vine 0.5–1.5 m long in open shrubs, flowers odorless, tepals and lip light violet, lip light violet with white apex and white side-lobes, rare, 10 November 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HLF 5731*.

67. *Trias* Lindley

67.168. *T. nasuta* (Reichenb. fil.) Stapf

**Binh Phuoc** prov., **Phuoc Long** distr., Bu Gia Map mun., Bu Gia Map N.P., around point 12°05'12"N, 107°09'26"E, at elev. about 200 m a.s.l., dry secondary evergreen broad-leaved forest and open woodlands on basalt soils, creeping epiphyte on tall trees, locally very common, 13 April 2005, *P.K. Loc, L. Averyanov, N.T. Vinh et al., HLF 5084*.

68. *Trichotosia* Blume

68.169. *T. dalatensis* (Gagnep.) Seidenf.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, epiphyte on mossy tree, flowers deep purple-brown, not rare, 20 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5322*.

68.170. *T. dasyphylla* (Par. et Reichenb. fil.) Kraenzl.

**Lam Dong** prov., **Lac Duong** distr., Da Chais mun., around point 12°11'09"N, 108°41'20"E, at elev. about 1500 m a.s.l., primary mixed forest with *Pinus dalatensis* and *P. krempfii* on W slope of Hon Giao ridge, epiphyte on mossy tree, not rare, 20 October 2005, *T.T.T. Trang, T.V. Thao, N.T. Vinh, HLF 5322a*.

68.171. *T. pulvinata* (Lindley) Kraenzl.

**Thua Thien – Hue** prov., **Huong Thuy** distr., Duong Hoa mun., around point 16°13'25"N, 107°34'09"E, SW slopes of Mang Chan ridge at elev. about 825 m a.s.l., primary closed evergreen broad-leaved forest along steep slopes and mt tops composed with shale with quartzite, epiphyte on tall trees, flowers white, very common, 12 May 2005, *L. Averyanov, P.K. Loc, T.V. Thao et al., HAL 8192*.

69. *Vanda* Jones ex R. Br.

69.172. *V. brunnea* Reichenb. fil.

**Lao Cai** prov., **Sa Pa** distr., vic. of Sa Pa town, mt forest at elev. about 1500 m a.s.l., flowers odorless, sepals and petals brown with indistinct yellowish spots, lip brown with white base and white side-lobes speckled with purple, column white, anther light yellowish, epiphyte, not rare, 24 November 2005, *L. Averyanov, P.K. Loc, HAL 8312*.

70. *Vanilla* Plum. ex Mill.

70.173. *V. annamica* Gagnep.

**Ha Giang** prov., **Bac Me** distr., Phieng Luong mun., around point 22°39'29"N, 105°19'35"E, primary closed evergreen broad-leaved forest on slopes and tops of mt composed with solid highly eroded crystalline limestone at elev. about 900–1150 m a.s.l., lithophytic and epiphytic creeping succulent vine up to 10 m long, flower buds light greenish, locally common, 7 March 2005, L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6575.

71. *Vrydagzynea* Blume

71.174. *V. formosana* Hayata

**Quang Binh** prov., **Bo Trach** distr., Tan Trach mun., Phong Nha – Ke Bang N.P., around point 17°23'22"N, 106°12'47"E, primary closed evergreen coniferous forest (with *Calocedrus rupestris*) on steep slopes and tops of rocky ridge composed with solid marble-like highly eroded stratified crystalline limestone at elev. 800–900 m a.s.l., terrestrial and lithophytic creeping herb, leaves uniform green, flowers white to light yellowish, not common, 24 January 2005, L. Averyanov, P.K. Loc, P.V. The et al., HAL 6058; around point 17°23'32"N, 106°12'46"E, at elev. about 750–900 m a.s.l., 25 January 2005, L. Averyanov, P.K. Loc, P.V. The et al., HAL 6148; around point 17°27'51"N, 106°22'46"E, at elev. 900–1000 m a.s.l., 29 January 2005, L. Averyanov, P.K. Loc, P.V. The et al., HAL 6229. **Quang Binh** prov., **Quang Ninh** distr., Truong Son mun., Phong Nha – Ke Bang N.P. around point 17°26'50"N, 106°23'41"E, at elev. about 600 m a.s.l., primary closed broad-leaved evergreen forest on steep slopes of mt composed with shale and sandstone along stream canyon, creeping terrestrial and lithophytic herb in shady rocky slope, flowers white, later yellowish, very common, 1 February 2005, L. Averyanov, P.K. Loc, P.V. The et al., HAL 6316. **Thua Thien – Hue** prov., **Nam Dong** distr., Huong Son mun., around point 16°09'52"N, 107°36'22"E, primary closed broad-leaved evergreen lowland forest along La Ma river on very steep hill slopes composed with clayey shale at elev. about 300–450 m a.s.l., 25 March 2005, L. Averyanov, N.T. Hiep, P.K. Loc et al., HAL 6896a.

72. *Zeuxine* Lindley

72.175. *Z. flava* (Wall. ex Lindley) Trimen

**Quang Tri** prov., **Huong Hoa** distr., Huong Viet mun., to N of Sa Mui pass, around point 16°51'14"N, 106°34'13"E, at elev. 550–650 m a.s.l., remnants of primary broad-leaved evergreen lowland forest on rocky remnant highly eroded solid marble-like limestone hills and low mt with very steep slopes and vertical cliffs, terrestrial creeping herb up to 40 cm tall in shady place, flowers yellow, rare, 31 March 2006, N.T. Hiep, L. Averyanov, P.K. Loc et al., HLF 5939.

72.176. *Z. grandis* Seidenf.\* (Plate 2, g, h).

**Quang Tri** prov., **Huong Hoa** distr., Huong Phung mun., Sa Mui pass, around point 16°47'42"N, 106°35'50"E, at elev. 1000–1200 m a.s.l., primary and secondary broad-leaved evergreen submontane forest on shale mt, lithophytic and terrestrial

creeping herb on rocky cliffs along rocky shady stream valley, sepals olive-green at base, light dull pinkish at apex, petals and lip pure white, occasional, 28 March 2006, *L. Averyanov, P.K. Loc, P.V. The, HLF 6278.*

72.177. *Z. nervosa* (Lindley) Clarke

**Quang Binh** prov., **Minh Hoa** distr., Thuong Hoa mun., around point 17°40'21"N, 105°58'00"E, Phong Nha – Ke Bang N.P., primary and secondary closed evergreen broad-leaved forest and scrub on rocky ridge composed with solid and stratified marble-like highly eroded crystalline limestone at elev. 550–650 m a.s.l., terrestrial herb on shady steep slope, leaves with whitish broad central stripe, sepals light brownish-green, lip white with light brown-greenish central spot, not common, 18 January 2005, *L. Averyanov, P.K. Loc, P.V. The et al., HAL 5868.*

72.178. *Z. pauciflora* (Ridl.) Seidenf.

**Thanh Hoa** prov., **Ba Thuoc** distr., Co Lung mun., around point 20°25'56"N, 105°14'12"E, primary evergreen seasonal broad-leaved closed lowland forest on crystalline marble-like highly eroded limestone, very steep rocky mt slopes at elev. 500–850 m, terrestrial creeping herb, leaves green with silvery wide median stripe, occasional, 23 September 2003, *L. Averyanov, D.T. Doan, J. Regalado et al., HAL 3310a.* **Ha Giang** prov., **Hoang Su Phi** distr., Ho Thau mun., around point 22°37'24"N, 104°38'00"E, at elev. 900–1000 m a.s.l., remnants of primary and secondary closed evergreen broad-leaved forest on very steep slopes of mt composed with shale and granite with quartzite, terrestrial creeping herb in open forest with bamboo, leaves uniform green, sepals light greenish-brown, lip pure white with light yellowish central spot, rare, 9 March 2005, *L. Averyanov, P.K. Loc, N.T. Vinh et al., HAL 6620.* **Lang Son** prov., **Bac Son** distr., Tan Tri mun., Khau Kieng ridge composed with shale, primary and secondary broad-leaved evergreen wet forest with bamboo at elev. 800–1100 m a.s.l., terrestrial creeping herb on shady rocky slope, leaves uniform light green, sepals light green, petals white, lip white with yellow central spot, occasional, 15 March 2005, *L. Averyanov, N.T. Hiep, P.V. The et al., HAL 6790.* **Dak Nong** prov., **Dak Glong** distr., Dak Som mun., steep hill slopes at elev. 800–900 m a.s.l., around point 11°52'27"N, 107°55'33"E, secondary broad-leaved open evergreen and mixed forest with *P. kesiya* and bamboo, terrestrial creeping herb on steep shady slope, leaves light green with wide longitudinal silvery stripe, sepals light greenish, petals and lip pure white, locally common, 3 November 2005, *L. Averyanov, T.V. Thao, N.T. Vinh, HLF 5503a.*

### Acknowledgments

Authors cordially thank all participants and organizers of the field botanical explorations in Vietnam, particularly Dr. Nguyen Tien Hiep and Prof. Phan Ke Loc for their key role in organization of expeditions according to all investigation programs. We also wish to thank authorities of the Institute of Ecology and Biological Resources and Dalat Institute of Biology of the Academy of Science and Technology of Vietnam for their kindest permission for our studies of herbarium and living orchid collections housed in these institutions.

Permit for the collection and export of herbarium plant specimens were granted by the

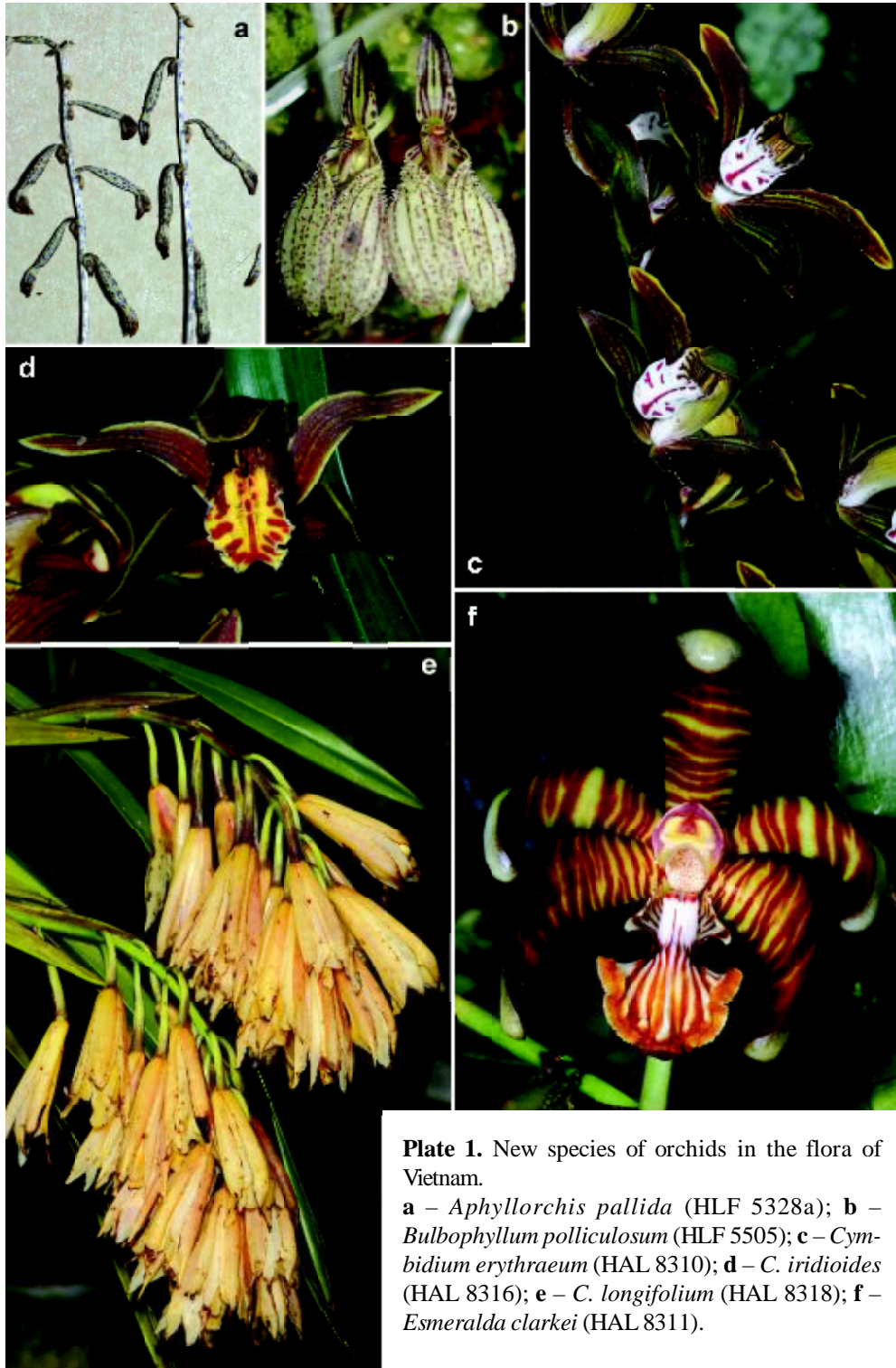
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#### РЕЗЮМЕ

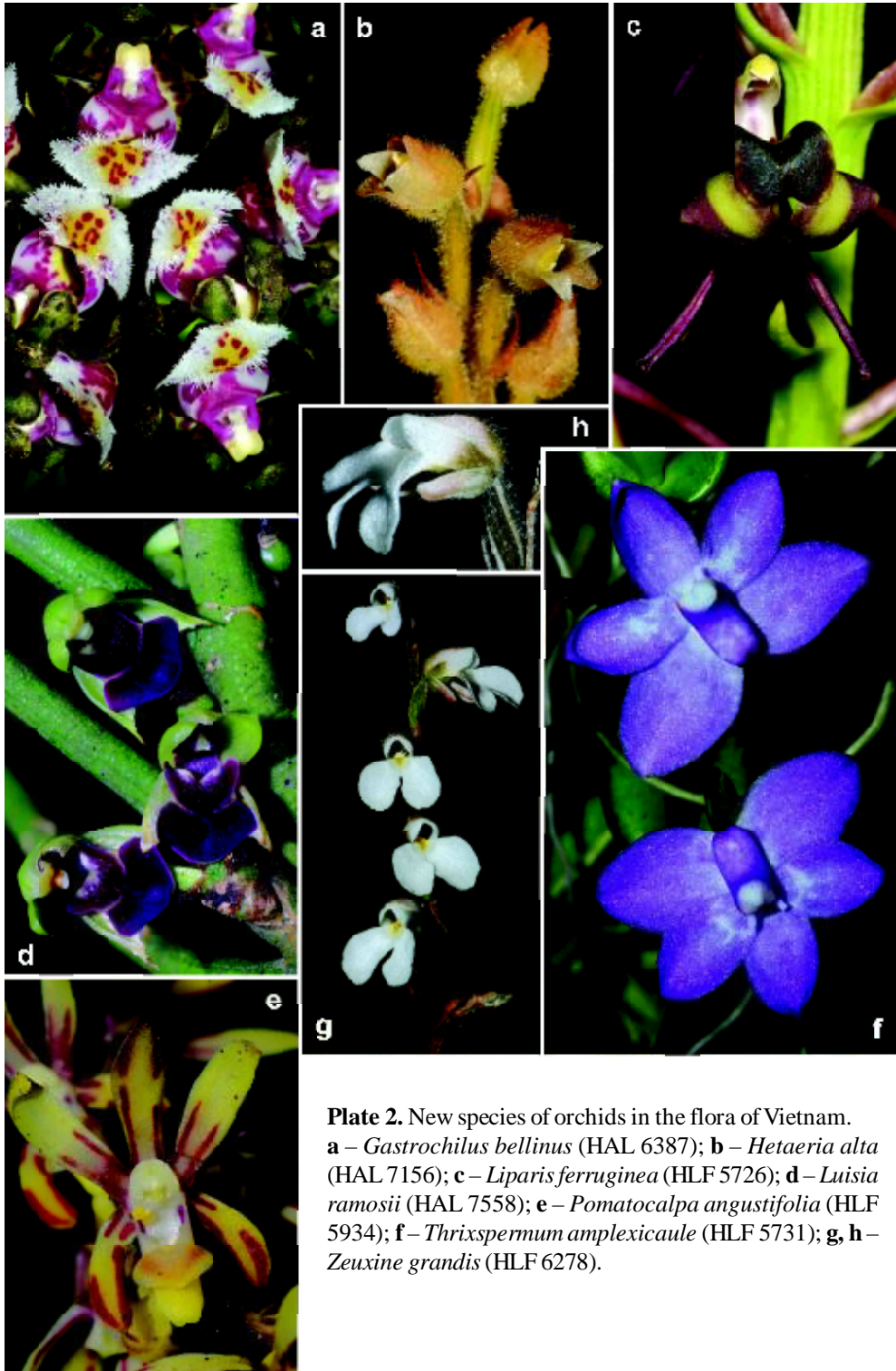
В статье приводятся новые местонахождения 178 редких видов орхидных из 72 родов, собранных на территории Вьетнама во время полевых работ 2004–2006 годов, а также обнаруженных в гербариях и частных коллекциях СПб. Один род (*Esmeralda*) и 13 видов (*Aphyllorchis pallida*, *Bulbophyllum polliculosum*, *Cymbidium erythraeum*, *C. iridioides*, *C. longifolium*, *Esmeralda clarkei*, *Gastrochilus bellinus*, *Hetaeria alta*, *Liparis ferruginea*,



**Plate 1.** New species of orchids in the flora of Vietnam.

**a** – *Aphyllorchis pallida* (HLF 5328a); **b** – *Bulbophyllum polliculosum* (HLF 5505); **c** – *Cymbidium erythraeum* (HAL 8310); **d** – *C. iridioides* (HAL 8316); **e** – *C. longifolium* (HAL 8318); **f** – *Esmeralda clarkei* (HAL 8311).





**Plate 2.** New species of orchids in the flora of Vietnam.  
**a** – *Gastrochilus bellinus* (HAL 6387); **b** – *Hetaeria alta* (HAL 7156); **c** – *Liparis ferruginea* (HLF 5726); **d** – *Luisia ramosii* (HAL 7558); **e** – *Pomatocalpa angustifolia* (HLF 5934); **f** – *Thrixspermum amplexicaule* (HLF 5731); **g, h** – *Zeuxine grandis* (HLF 6278).

*Luisia ramosii*, *Pomatocalpa angustifolia*, *Thrixspermum amplexicaule*, *Zeuxine grandis*) найдены во Вьетнаме впервые. Предложено две номенклатурные комбинации в ранге разновидности (*Habenaria dentata* var. *parageniculata*) и формы (*Paphiopedilum ap-pletonianum* f. *tridentatum*).

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Получено 01.06.2006 г.