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OLIM VANILLACEAE

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During the last 25 to 30 years much has been written about the evolution, phylogeny and the systematics of the orchid family. To comment here on all of those papers and books in detail surely would exceed the number of their printed pages. Some of those papers dealing with these subjects are exceptionally good in providing important new data, the majority of them, however, fall rather short in their purported goals. Admittedly, during the past quarter of a century I myself did find it almost irresistible at times not to board some of the popular eclipsing trains of the then prevailing trends and techniques in evolutionary biology, such as cytology, cytogenetics, numerical and/or chemotaxonomy, scanning electron microscopy, not to mention the most recent promises of cladistics. While they all made, or are still making, their respective contributions within their own discipline, none by themselves have provided the satisfactory answer or answers for which we are still searching, namely the understanding of the present-day complexity of the orchid family. The present contribution is no exception. In the following pages I merely propose to share some of the insights that I have gained during my studies of a small group of interrelated plants together with pertinent data published about them by others elsewhere.

OH THOSE SEEDS!

Already in 1960 I was much intrigued during my studies of the evolution and systematics of orchids by the occurrence of certain unique seed types in a few, totally unrelated genera. In these seeds all layers of the outer integument and most of the inner integument together form the seed coat which tightly surrounds the embryo; moreover, the outermost layer of the outer integu-

ment becomes sclerotic and completely opaque due to the accumulation of infiltrating materials inside the cells and their walls (Swamy 1947, 1949). As opposed to this condition, in the remaining orchid genera, the plants have seeds in which during development the cells of the outermost layer of the integument lose their protoplasts, thus, the seed coat becomes transparent, hence, tunicate. Both Swamy (1949) and Netolitzky (1926) have emphasized that multilayered, opaque and highly sclerotic seed coats are found usually in the relatively primitive orchids. Since at that time Apostasia, Adactylus, Neuwiedia, Selemipedium and Vanilla were the only genera known to me with sclerotic seeds, in agreement with Swamy and Netolitzky, I brought into focus this fact stating that "It is remarkable that the presence of a primitive type of seed in the Apostasioideae, Cypripedioideae and Neottioideae corresponds to the respective status of these groups."

This latter statement has been interpreted recently as a circular reasoning by Burns-Balogh and Funk (1986) in their cladistical analysis of the orchid family. They are quite emphatic that "A character is not primitive because it is found in a primitive group. Our results agree with those of Rasmussen (1983 sic!): the sclerotic seed coat is more likely secondarily derived." Although the authors do not demonstrate how they obtained their results, it is refreshing to know that the loss of protoplasts of the cells in the seed coat is a primitive condition in the Orchidaceae. If their claim is a fact, then the former MICROSPERMAE must be regarded as the most primitive group of the Monocotyledons. What a revolutionary idea! Of course, Rasmussen (1982) said "I can see no morphological obstacles against regarding the seeds of Vanilla and Galeola as derived from ordinary orchid seeds." Where Rasmussen appears to have no visionary problems in his own assumptions in refilling the cells, then multiplying the layers, Burns-Balogh and Funk treat them as proven evidence. And this is how some of the cladistic trees in phylogeny grow!

Indeed, I myself can see no morphological obstacles to derive the origin of tunicate seeds from such winged-type, sclerotic

seeds as found in Eriaxis, Epistephium and Clematepistephium, or even from such as are found in *Neuwiedia Griffithii* and *N. veratrifolia* through the reduction in the number of layers of the integument. Future investigators may find it rewarding to study those seeds which still exhibit the remnants of some possible steps in an ancient ontogeny which are pointing to that direction, and which have remained unaltered in the cul-de-sac of saprophytism. Such possible steps may be changing from ovoid seeds (Vanilla) to lenticular ones with a cellular edge *(Cyrtosia javanica)* to several-layered keels *(Galeola septentrionalis)*, to truly alate seeds (Eriaxis, Epistephium, Clematepistephium). The step (from here ?) to the one-layered, tunicate testa is, however, a major one which remains yet to be demonstrated.

As a matter of fact, the recently published new information about certain orchids with sclerotic seeds stimulated me to review here the group once called by Lindley the Vanilla family. For the first time good photographs of the fruits and seeds of Rhizanthella, a subterranean orchid from Australia, were provided by George and Cook in 1981. Although differently sculptured, the seeds are those of the Vanilla type, and so are also the fleshy, indehiscent fruits with parietal placentation; these fruits also have a scent like Vanilla (Anonymous 1982). Both Veyret (1981) and Dressler (1983) have published excellent photographs of the cross sections of ovaries of various Palmorchis species revealing an axile placentation similar to that of Apostasia, while the sclerotic seeds are also of the Vanilla type. These bits of new information shed more light on their actual phylogenetic affinities than the various speculations already offered in print. These papers also prompted me to survey all the genera and species which have been attributed in the broadest sense to the relationship of Vanilla, Palmorchis and Rhizanthella in the past.

It must be emphasized that in any reliable systematic, evolutionary or phylogenetic study the examination of every species in every genus is crucial, because not every one of them provides important information. All of the so-called systems, including the recently published cladistic surveys, are based only on what-

ever material was available to the researchers, as evidenced by their long list of exsiccatae, the usefulness of which, impressive as they appear, all add up to the value of a hay stack.

Remarks on the tribe Vanilleae.

When Lindley established the family VANILLACEAE in 1835, as a separate group next to the ORCHIDACEAE, he characterized it with one sentence: "Seeds with tight skin" *versus* "Seeds in a loose skin". The following year he gave a full description of this plant family with emphasis on the uniqueness of its associate characters (Lindley, 1836). "I separate Vanilla and Epistephium from Orchidaceae because of their succulent valveless fruit, of their seeds not having the loose testa which exists in all true Orchidaceae, and of their peculiar habit; to which may be added their aromatic properties. The winged seeds of *Vanilla* ? *pterosperma* [now = Galeola] form no exception to the character of the order [now = family], for their nucleus is as tightly coated by the testa as in common Vanilla". —Of course Vanillaceae as a family was abandoned by Lindley himself in 1840.

The succulent, indehiscent fruits with sclerotic seeds found in all Vanilla species are the essential characters of the foundation upon which the vanilla line must rest, regardless at what level above the genus it is studied. One of the early rewards of the above mentioned systematic review of genera and species is the recognition of these foundation characters in Cyrtosia plants. The genus itself was described by Blume in 1825, but since 1883 it was successfully buried in Galeola by Bentham and Hooker notwithstanding Blume's additional observation made in 1837. The fruits and seeds of Rhizanthella, as already mentioned above, are also fully in line with the original circumscription set forth by Lindley.

While the fruits of Vanilla, Cyrtosia and Rhizanthella are unilocular with parietal placentation—contrary to the claims of Burns-Balogh and Funk that Vanilla has a "three chambered ovary"—Palmorchis is now known to have a three locular ovary with axile placentation, while the seeds are those of the Vanilla type. These crucial details of Palmorchis were not known to me

in 1960, when I proposed the five subfamilies or distinct phyletic lines in the Orchidaceae. These phyletic lines were shown to have evolved in a parallel manner, a conclusion reached through the discussed disparities in their respective endomorphic and exomorphic features. In that phyletic spectrum Apostasioideae, Cypripedioideae and Neottioideae occupy the lesser evolved or primitive end, while Orchidoideae and Epidendroideae were shown to be advanced or derived. With the new data on Palmorchis the position of the subfamily Neottioideae is considerably strengthened with respect to the possible common ancestry of these subfamilies. The plants of Apostasia/Neuwiedia, Selenipedium and Palmorchis are all terrestrial with fibrous roots, plicate leaves, and have three-locular ovaries and apterous, sclerotic seeds. Moreover, Palmorchis shares with Vanilla, in addition to the sclerotic seed coat, other important characters, such as the incumbent anther with the pollinia unattached to the rostellum and the prominent stigma. Neobartlettia, commonly included in Palmorchis, needs to be reinstated because of the lack of fusion between the column and the lip. These are the only genera which I now regard to comprise the subtribe Vanillinae *sensu stricto*. It must be mentioned here that, while reviewing every species in the genus Vanilla, *V. Dietschiana* Edwall had to be removed into a genus of its own, because of the sympodial growth habit of the plants, their undifferentiated leaves and bracts and the completely free floral segments. Another species, *Vanilla calyculata,* known to me only from the original description and illustration, needs further elucidations. The presence of the epicalyx (hypocalyx of Rasmussen) i.e., the calyculate ovary is indeed unique in the genus, but I consider that this structure has evolved more than once independently in the Neottioideae. Because of the presence of the calyculus in the plants of Lecanorchis, this latter genus has always been assigned to the subtribe VANILLINAE notwithstanding the very disharmonious colunmar structures and the tunicate seeds.

The remaining genera directly or indirectly mentioned by Lindley and commonly followed even today, i.e., Epistephium, Galeola and also Eriaxis, I consider to form a new subtribe, GALEOLINAE beside VANILLINAE. The plants of these genera

always have dry, dehiscent fruits with prominently winged, sclerotic seeds. *Epistephium smilacifolium* Rchb.f. from New Caledonia has justly been elevated to a genus of its own by Hallé (1977) because of the scandent habit of the plants and their unique, three-locular ovary with axile placentation in addition to its geographical separation. I have personally studied plants of this species in the field in New Caledonia together with those of Eriaxis. The plants of this latter genus, however, contrary to the statements of Burns-Balogh and Funk, have a unilocular capsule with parietal placentation. The genus Galeola itself in its present status is an assemblage of strikingly discordant elements. Having removed Cyrtosia, I also find it necessary to reinstate from synonymy the genus Erythrorchis on account of the plants being saprophytic, the long and slender column of the flowers provided with a short but distinct foot, and the nature of the adnation of the lip to the column-foot. Also widely different from the original characters of Galeola is a third group of plants with large foliaceous bracts; the long, slender footless column of the flowers is basally fused with the lip to form a small, saccate to subtubular nectary. For these plants I propose a new genus based on their twining habit and Vanilla-like flowers in addition to the above mentioned characters.

Systematic considerations.

In reassessing the genera here grouped around Vanilla as was originally perceived by Lindley, we find that some of the component parts in the past were quite distantly removed from one another. Both Rhizanthella and Palmorchis are currently regarded as representatives of their own subtribes. Their actual positions have been shifted from one subfamily to another, they have even been allocated to separate subfamilies concurrently, thus, expressing not even a most tenuous relationship between them. Indeed, the position of the VANILLEAE or rather VANILLINAE has always been problematic, especially so when practical applications were considered. A review of the various individual approaches not attempted here, because in principle such an

undertaking would not provide any new information. Yet, with a fleeting comment one must mention the latest effort by Burns-Balogh and Funk (1986) in their Phylogenetic Analysis of the Orchidaceae. This treatise is heavily dependent on another recently published phylogenetic or cladistic study by Rasmussen (1982). Whereas Rasmussen's discourses, in order to present a seemingly coherent picture in outlining hypothetical lineages, are liberally saturated with such factual words and phrases as "imagined", "probably", "may be derived", "possibly" or even "I believe" to mention a few, Burns-Balogh and Funk accept all such assumptions as facts. Although Rasmussen emphasizes that the study of phylogeny or cladistics is basicly independent of classificatory problems, Burns-Balogh and Funk base their new system of orchid classification on cladistics. In reality their "New System" is a mere half-digested mish-mash made unique by their lack of comprehension of the distinction between facts and hypotheses offered by other investigators. Finally this "New System" is brought to perfections through their lack of familiarity with the requirements of the International Code of Botanical Nomenclature. With respect to this latter phenomenon we are presented with two new tribal names, PRASOPHYLLEAE and PTEROSTYLIDEAE, as nomenclatorial transfers without supporting basionyms.

As a matter of fact, future students will find in the genera and species commonly assigned to the subtribes PRASOPHYLLINAE, DIURIDINAE, GASTRODIINAE and EPIPOGONINAE, the latter of which also includes the genus Sylvorchis J. J. Sm., another well-defined evolutionary line in the Neottioideae, which is not only comparable in advancement to, but which has also evolved in a parallel manner with the line of the Orchidoideae.

The purpose of this paper, however, is to bring together and interpret as well the known facts and sundry details pertaining to the Vanilla tribe for future students of orchid systematics, or even possibly for those of cladistical phylogenetics, rather than to propose new hypotheses. These facts and details are presented here in the form of a key to genera, which in turn is a summary of the current make-up of the VANILLEAE as I understand it.

SUBFAMILY NEOTTIOIDEAE, THE TRIBE VANILLEAE.

1. Seeds sclerotic - TRIBE VANILLEAE 2
1a. Seeds tunicate ..... TRIBE NEOTTIEAE
2. Fruits succulent, indehiscent; seeds exalate - SUBTRIBE VANILLINAE 3
2a. Fruits dry, dehiscent; seeds winged - SUBTRIBE GALEOLINAE 8
3. Plants autotrophic 4
3a. Plants saprophytic 7
4. Leaves plicate; ovary three-locular, hence placentation axile 5
4a. Leaves conduplicate; ovary unilocular, hence placentation parietal 6
5. Lip bassally fused with column ..... **Palmorchis**
5a. Lip free from column to base ..... **Neobartlettia**
6. Growth habit sympodial; plants rhizomatous; leaves and bracts undifferentiated, reticulately veined; lip free from column ..... **Dictyophyllaria**
6a. Growth habit monopodial; plants scandent; leaves and bracts differentiated, none reticulately veined; lip basally united with column ..... **Vanilla**
7. Plants terrestrial; inflorescnece with small bracts and fully exposed flowers produced in succession, racemose to paniculate; lip fused with base of footless column ..... **Cyrtosia**
7a. Plants subterranean; inflorescence with large, imbricating bracts completely hiding the flowers and forming a capitulum; lip articulate with column-foot, mobile ..... **Rhizanthella**
8. Wings of seeds oval to elliptic in outline, entire; plants foliaceous 9
8a. Wings of seeds often deeply cleft, biparted; plants aphyllous... 11
9. Leaves rather thin when dry, prominently reticulate; ovary glabrous, variously calyculate; flowers glabrous 10
9a. Leaves rigid when dry, obscurely reticualte; ovary tomentose, without a calyculus; flowers tomentose ..... **Eriaxis**
10. Plants twining, vine-like; ovary with axile placentation, three-locular [New Caledonia] ..... **Clematepistephium**

10a. Plants erect, caespitose; ovary with parietal placentation, unilocular [Tropical America] . . . . . **Epistephium**

11. Plants with slender stems; rachis glabrous; flowers thin, glabrous; column slender, erect; lip easily flattened, explanate 12

11a. Plants with stout stems; rachis pubescent-furfuraceous; flowers fleshy, furfuraceous to pubescent; column stout, arcuate-clavate; lip cup-shaped to saccate, cannot be flattened . . . . . **Galeola**

12. Bracts at base of branches small, non-foliaceous; column with a short, descending foot, tapering into the thick, median ridge of lip; pollinia solid; lip with numerous transversely parallel ridges on both sides of median ridge . . . . . **Erythrorchis**

12a. Bracts at base of branches foliaceous; column footless; pollinia granular-farinaceous; lip basally fused with column forming a short, saccate nectary; disc of lip densely verrucose . . . . . **Pseudovanilla**

NOMENCLATORIAL MATTERS.

Dictyophyllaria Garay, *Gen. nov.*

Etymology: *dictyon* = net, mesh and *phyllarion* = small leaf; in reference to the appearance of the leaves and bracts.

Sepala petalaque subsimilia, libera, plus minusve patentia; labellum convolutum, liberum; columna libera, gracilis, subclavata, facie glaberrima; clinandrium cucullatum; anthera incumbens, bilocularis; pollinia 2, exappendiculata, pulvereogranulosa, rostello haud affixa, sessilia; stigma sub rostello tranversum, subreniforme.

Plantae terrestres, ut videtur semper ramosae, basi radicantes, rhizomatis interdum ramosis; caules erecti, ramosi, foliati, foliis sursum decrescentibus exeuntibusque, laminis supra distincte reticulato-plurinervulosis; flores satis parvi, subsessiles, segmentis plus minusve patulis; ovarium gracile; fructus cylindricus, indehiscens, niger; semina sclerotica, exalata, nitida.

TYPUS: **Vanilla Dietschiana** Edwall.

ENUMERATION OF SPECIES.

Dictyophyllaria Dietschiana (Edwall) Garay, *comb. nov.*

Basionym: *Vanilla Dietschiana* Edwall in Revist. do Centr. Sci. Letr. e Art. de Campin. No. 4: extr. p.1, t.2, July 1903.

REPORTED FROM: Brazil.

OBSERVATION: The sympodial growth habit, the reticulately veined leaves and bracts and the free lip are characters which are not present in Vanilla. The reticulate venation of the undifferentiated leaves and bracts are reminiscent of those found in Epistephium.

Cyrtosia Bl., Bijdr. pt. 8: 396, 1825.

"Perigonium pentaphyllum, erecto-connivens. Labellum ecalcaratum, concavum, ima basi ungui gynostemii continuum; limbo erecto, integerrimo. Gynostemium brevissime unguiculatum, subincurvum, apice subfornicatum. Anthera terminalis, opercularis, bilocularis. Pollinia duo, tereti-falcata, farinoso-pulposa, libera. Bacca siliquaeformis, carnosa. Semina in pulpa nidulantia, aptera. — Herba terrestris, caulescens. Caules erecti, continui, foliis nanis squamaeformibus instructi. Flores laxe spicati, mediocres." Blume in Rumphia 1: 199, 1837.

LECTOTYPUS: **Cyrtosia javanica** Bl. [Rumph. 1:199,1837].

ENUMERATION OF SPECIES.

Cyrtosia integra (Rolfe ex Downie) Garay, *comb. nov.*

Basionym: *Galeola integra* Rolfe ex Downie in Kew Bull. 409, 1925.

REPORTED FROM: Thailand, Laos.

Cyrtosia javanica Bl., Bijdr. pt. 8: 396, Tabellen f.6, 1825.

Syn: *Galeola javanica* (Bl.) Benth. & Hook., Gen. Pl. 3: 590, 1883.

REPORTED FROM: Ceylon, Vietnam, Thailand, Malaya, Sumatra, Java, Borneo.

OBSERVATION: The identification of the plants described by J. J. Smith under this name in Bull. Jard. Bot. Buitenzorg, ser 2, 9: 12, 1913, and illustrated in Bull. Jard. Bot. Buitenzorg ser. 3, 5(3): t.25, f.3, 1922, because of the floral details, especially the glabrous lip, is highly questionable, so is the material reported and illustrated by G. Seidenfaden from Thailand in Dansk Bot. Arkiv 32(2): 130, 1978.

Cyrtosia minahassae (Schltr.) Garay, *comb. nov.*

Basionym: *Galeola minahassae* Schltr. in Fedde, Rep. 10: 6, 1911.

REPORTED FROM: Celebes.

OBSERVATION: Although the details of the lip are almost identical with those of found in *C. javanica,* the columnar structure is very different in both species.

Cyrtosia nana (Rolfe ex Downie) Garay, *comb. nov.*

Basionym: *Galeola nana* Rolfe ex Downie in Kew Bull. 409, 1925.

REPORTED FROM: Thailand.

Cyrtosia septentrionalis (Rchb.f.) Garay, *comb. nov.*

Basionym: *Galeola septentrionalis* Rchb.f., Xenia Orch. 2: 78, 1865.

REPORTED FROM: Japan.

Subtribus Galeolinae Garay, *subt. nov.*

Plantae sympodiales, erectae vel scandentes, interdum volubiles; capsulae siliquaeformes, dehiscentes; semina membranaceo-marginata vel valde alata.

TYPUS: **Galeola** Lour.

Erythrorchis Bl. in Rumphia 1: 200, 1837.

"Perigonium pentaphyllum, erecto-connivens. Labellum ecalcaratum, ima basi ungui gynostemii concretum: limbo erecto, sublobato. Gynostemium brevissime unguiculatum, subincurvum, clavatum [basi in pedem brevem productum]. Anthera terminalis, opercularis, bilocularis. Pollinia duo, conduplicata, solidiuscula, libera. Capsulae siliquaeformes, inanes, rimis 2–3 longitudinalibus dehiscentes. Semina membranaceo-marginata [potius alata]. Herba terrestris, aphylla. Caules sarmentosi, nodoso-articulati, ad nodos radicantes squamis solitariis, pro foliis, instructi. Flores laxe spicati." Syn.: *Haematorchis* Bl. in Rumph. 4: t.200B, 1848. *Ledgeria* F. Muell., Fragm. 1: 238, 1859.

TYPUS: **Cyrtosia altissima** Bl.

ENUMERATION OF SPECIES.

Erythrorchis altissima (Bl.) Bl. in Rumph. 1: 200, 1837.
Basionym: *Cyrtosia altissima* Bl., Bijdr. pt. 8: 396, 1825.
Syn.: *Haematorchis altimssima* (Bl.) Bl. in Rumph. 4: t.200B, 1848.
Galeola altissima (Bl.) Rchb.f., Xenia Orch. 2: 77, 1865.
REPORTED FROM: Malaya, Java, Borneo, Philippines.

Erythrorchis cassythoides (A. Cunn. ex Lindl.) Garay, *comb. nov.*
Basionym: *Dendrobium cassythoides* A. Cunn. ex Lindl. in Bot. Reg. 21: *sub* t. 1828, 1836.
Syn.: *Ledgeria aphylla* F. Muell., Fragm. 1: 239, 1859.
Erythrorchis aphylla (F. Muell.) F. Muell., Fragm. 2: 167, 1861.
Galeola cassythoides (A. Cunn. ex Lindl.) Rchb.f., Xenia Orch. 2: 77, 1865.
REPORTED FROM: Australia.

Erythrorchis ochobiensis (Hayata) Garay, *comb. nov.*
Basionym: *Galeola ochobiensis* Hayata, Icon. Pl. Formos. 6: 87, 1916.
REPORTED FROM: Assam, Tenasserim, Thailand, Vietnam, Cambodia, Malaya?, Taiwan, Ryukyu Islands, Japan.
Observation: Previously this species has been considered to be synonymous with *E. altissima.* The rather slender to almost filiform fruits, in addition to the mutually exclusive distribution pattern, readily separate the two from one another.

Pseudovanilla Garay, *Gen. nov.*
Etymology: *Pseudo* = false and *Vanilla* = a generic name; in reference to the casual similarity of the plants in both genera.

Sepala petalaque plus minusve similia, patentia, nisi petala angustiora; labellum convolutum basi columnae adnatum et cum ea nectarium sacculatum formantium, disco multipapilloso; columna apoda, elongata, paululo arcuata, gracilis, apice subclavata, facie glaberrima; clinandrium humile; anthera

majuscula, cucullata, quadrangularis, plus minusve incumbens, imperfecte bilocularis; pollinia 2, bipartita, exappendiculata, pulvereo-granulosa, libera; stigma sub rostello haud bene evolutum, suborbiculere.

Plantae terrestres, alte scendentes, aphyllae vel foliis bracteiformibus ad basin ramorum satis magnis, sursum descrescentibus; inflorescentiae ramosae, pluriflorae; flores conspicui, segmentis patulis; ovarium cylindricum; fructus cylindricus, dehiscens; semina prominenter alata.

TYPUS: **Ledgeria foliata** F. Muell.

ENUMERATION OF SPECIES.

Pseudovanilla affinis (J. J. Sm.) Garay, *comb. nov.*

Basionym: *Galeola affinis* J. J. Sm. in Bull. Jard. Bot. Buitenz. ser. 2, 9: 7, 1913.

REPORTED FROM: Java.

Pseudovanilla anomala (Ames & L. O. Wms.) Garay, *comb. nov.*

Basionym: *Vanilla anomala* Ames & L. O. Wms. in Bot. Mus. Leafl. Harv. Univ. 5: 108, 1938.

REPORTED FROM: Fiji Islands.

Pseudovanilla foliata (F. Muell.) Garay, *comb. nov.*

Basionym: *Ledgeria foliata* F. Muell., Fragm. 2: 167, 1861.

Syn.: *Erythrorchis foliata* F. Muell.. Fragm. 2: 167, 1861, *nom. alter.*

Galeola foliata (F. Muell.) F. Muell., Fragm. 8: 31, 1873.

Galeola Ledgeri Fitzger., Austr. Orch. 2(2): t., 1885.

Galeola montigena Schltr. in Fedde, Rep. Beih. 1: 29, 1911.

REPORTED FROM: Australia, New Guinea.

Pseudovanilla gracilis (Schltr.) Garay, *comb. nov.*

Basionym: *Galeola gracilis* Schltr. in Fedde, Rep. Beih. 1: 28, 1911.

REPORTED FROM: New Guinea.

Pseudovanilla philippinensis (Ames) Garay, *comb. nov.*

Basionym: *Galeola philippinensis* Ames, Sched. Orch. 6: 5, 1923.

REPORTED FROM: Philippines.

Pseudovanilla ponapensis (Kaneh. & Yamam.) Garay, *comb. nov.*

Basionym: *Vanilla ponapensis* Kaneh. & Yamam, in Trans. Nat. Hist. Soc. Form. 23: 21. 1933.

Syn.: *Galeola ponapensis* (Kaneh. & Yamam.) Tuyama in Journ. Jap. Bot. 16: 632, 1940.

REPORTED FROM: Ponape Island.

Pseudovanila ternatensis (J. J. Sm.) Garay, *comb. nov.*

Basionym: *Galeola ternatensis* J. J. Sm. in Bull. Jard. Bot. Buitenz. ser. 3, 5: 16, 1922.

REPORTED FROM: Moluccas, Ternate Island.

Pseudovanilla vanilloides (Schltr.) Garay, *comb. nov.*

Basionym: *Galeola vanilloides* Schltr. in Fedde, Rep. Beih. 1: 29, 1911.

REPORTED FROM: New Guinea.

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