

New taxa and new combinations in Mesoamerican Spiranthinae (Orchidaceae, Spirantheae)

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The following new species of the subtribe Spiranthinae (Orchidaceae, Spirantheae) are described and illustrated: *Brachystele tamayoana* Szlach., Rutk. & Mytnik and *Kionophyton pollardiana* Szlach., Rutk. & Mytnik. Keys for determination of the Mesoamerican species of *Brachystele*, *Kionophyton* and *Galeottiella* are provided. The following new combinations are proposed in Spiranthinae: *Deiregyne* Schltr. subgenus *Aulosepalum* (Garay) Szlach., Rutk. & Mytnik *stat. & comb. nova*, *Microthelys hintoniorum* (Todzia) Szlach., Rutk. & Mytnik, *comb. nova* and *Galeottiella orchioides* (Lindl.) R.Gonzalez T.

Key words: nomenclature, Orchidaceae, Spirantheae, Spiranthinae, taxonomy

The large subtribe Spiranthinae (Orchidaceae, Spirantheae) embraces about 30 genera (Szlachetko 1995a). This group can be distinguished by the viscidium, which is produced on the adaxial layer of rostellum, and by the rostellum remnant being deeply notched or foveolate. All species of this subtribe were once placed in the genus *Spiranthes*. Such a situation prevailed until a revision of Spiranthinae *s. lato* by Schlechter (1920) was published. The author divided *Spiranthes* into 24 genera, of which 17 were described as new. His work was criticized by American orchidologists (Williams 1951, Schweinfurth 1958), who accused Schlechter of an inconsistent usage of criteria proposed by himself. The genus *Spiranthes* inflated again. New attempts to revise this heterogenous group appeared in the 1980s. Two independent studies, by Garay (1982) and by Burns-Balogh

(1982), were published almost at the same time. They presented fundamentally different taxonomic notions. In the 1990s the problem of classification of Spiranthinae was taken up by D. Szlachetko. After detailed studies by him the undoubtedly heterogenous genus *Spiranthes* was again divided into several taxa that are now included in the subtribes Spiranthinae, Stenorhynchidinae and Cyclopogoninae.

Revising herbarium materials of the tribe Spirantheae (Orchidaceae) for *Flora Mesoamericana* we found some specimens that did not fit descriptions of any species known so far. Additionally, we realized that new combinations at various taxonomic levels in the subtribe Spiranthinae should be proposed.

The genus *Brachystele* includes 18 species native to South America and the West Indies but until now only three of them have been found in

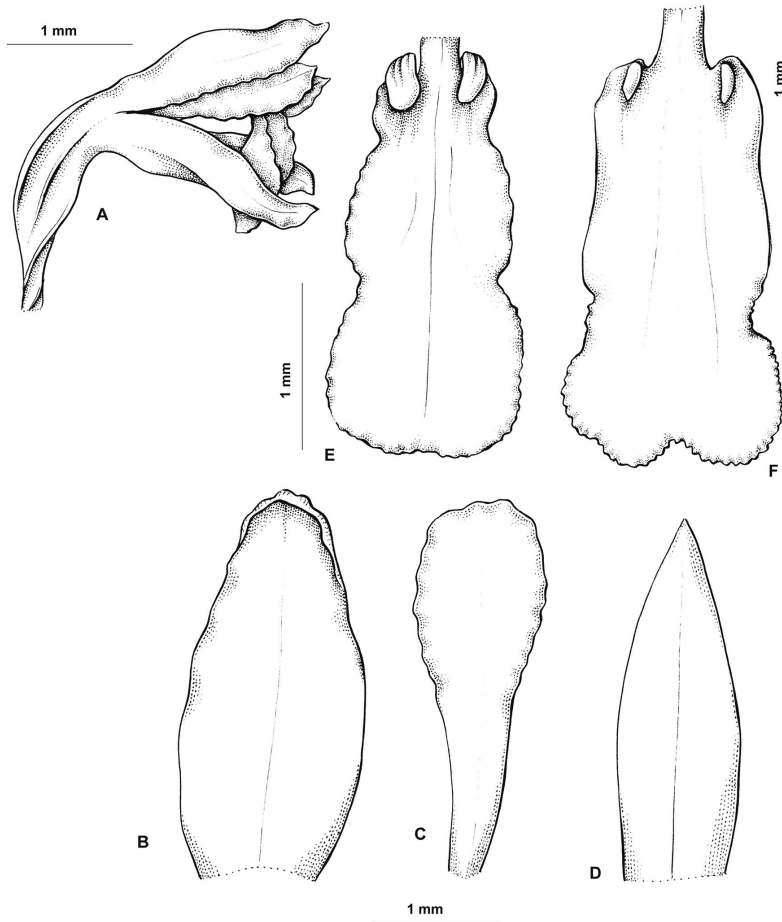


Fig. 1. *Brachystele tamayoana* (A–E from Nagel & Juan Gonzales 6656, AMES; F from holotype). — A: Flower. — B: Dorsal sepal. — C: Petal. — D: Lateral sepal. — E and F: Lip.

Mesoamerica, viz. *B. affinis*, *B. guayanensis* and *B. luzmariana*. This genus has terrestrial plants with small to minute, rarely medium-sized, inconspicuous and resupinate flowers. Their gynostemium is characterised by a ventrally positioned, bilobed but confluent and nearly flat stigma. The clinandrium is well-developed and membranous, and the gynostemium is short but erect, with the viscidium suspended on its adaxial surface. The anther base is set near the stigma base.

Brachystele tamayoana Szlach., Rutk. & Mytnik, *sp. nova* (Fig. 1)

Species nova B. luzmariana et *B. affini* accedit, sed prior species a nostra labello duplo majore, nervatio simplici et hypochilo pandurato-subquadrato, secundo labello supra medio con-

stricto, sub apicem vel in medio hypochili latissimo distinguitur.

TYPE: Mexico. Baja California, Cape Region, 200 m, 16–18.V.1959 *Thomas 7883* (holotype BM!).

Roots fasciculate, tuberous, fleshy. Leaf single, basal, petiolate; petiole 3.5 cm long, narrow; blade 5.5 cm long, 2.3 cm wide, ovate-lanceolate, acute. Scape 16–24 cm long, erect, delicate, completely glabrous. Cauline sheaths 7–9, tubular, acute to acuminate, tightly adnate to scape, scarious, glabrous, usually as long as or shorter than internodes. Raceme 9–10 cm long, ca. 25–45-flowered, lax or sublax, all-sided. Flowers small, inconspicuous, white. Floral bracts 5–6 mm long, ovate-lanceolate, acuminate, scarious, glabrous. Pedicel 0.5–1.5 mm long, twisted, glabrous. Ovary 1.5–3 mm long,

narrowly cylindrical, glabrous. Sepals dissimilar, connate at base only, glabrous. Dorsal sepal 3–4 mm long, 1–1.2 mm wide, ovate, subacute to obtuse, concave in centre, 1-nerved. Petals 2.8–3.5 mm long, 0.9–1 mm wide, falcate, oblong obovate to linear-lanceolate, truncate, 1-nerved. Lateral sepals 3.1–4.5 mm long, 0.9–1 mm wide, oblong-lanceolate, subacute, suberect, 1-nerved. Lip twice as long as wide, with simple nervation, shortly clawed; claw 0.5 mm long; lamina constricted near the apical third; hypochile 2–3 mm long, 1.3–1.9 mm wide, pandurate-subquadrate, widest near apex, with small, basal, subglobose thickenings; epichile 1–1.5 mm long, 1.4–2 mm wide, transversely elliptic, truncate to shallowly bilobulate, with minutely denticulate margins. Gynostemium 2 mm long.

ETYMOLOGY: Dedicated to Dr. Roberto Gonzalez Tamayo (IBUG), an eminent Mexican orchidologist.

ECOLOGY: Terrestrial in meadows surrounded by forests of *Quercus* and *Pinus cembroides*, occasionally in open meadows. Flowering in May.

DISTRIBUTION: Mexico (Baja California, Guanajuato). Alt. 200 m.

ADDITIONAL SPECIMENS EXAMINED (paratypes). — **Mexico.** Guanajuato, W of San Miguel Allende, *Dickinson 7191*. (SEL!). Without precise locality, *Nagel & Juan Gonzales 6656* (AMES!).

This species is related to *B. luzmariana* and *B. affinis*. From the former it differs in having the lip twice as long as wide and with simple nervation, and in the pandurate-subquadrate hypochile, and from the latter by the lip, which is constricted above the middle and widest at the apex or in the middle of the hypochile.

Key to the species of *Brachystele* in Mesoamerica

1. Lip with digitate basal auricles *B. guayanensis*
1. Lip with a pair of basal, subglobose calli 2.
2. Lip entire, widest at deltoid base *B. affinis*
2. Lip constricted above middle, widest at apex or in middle of hypochile 3.
3. Lip slightly longer than wide, with a dendritic nervation, hypochile transversely elliptic *B. luzmariana*
3. Lip twice as long as wide, with simple nervation, hypochile pandurate-subquadrate *B. tamayoana*

The genus *Deiregyne* was established by Schlechter (1920). It includes nine species found primarily in Mexico but also in Guatemala, Honduras, El Salvador and Nicaragua. The problem around it arose when Burns-Balogh (1988) and Garay (1982) published conflicting concepts of *Deiregyne*. Those authors lectotypified the genus differently: Burns-Balogh chose *Spiranthes hemichrea* Lindl. as the type, while Garay chose *Spiranthes chloreaeformis* A. Rich. & Gal. As a result, different species were included in *Deiregyne* by the two authors (Table 1). According to Szlachetko (1995b) the lectotype proposed by Burns-Balogh was more in accordance with the protologue than that proposed by Garay.

Species belonging to *Deiregyne* are terrestrial plants with erect, usually fairly strong stems, covered with transparent and paper-like cauline bracts, usually leafless during flowering. The flowers are small or tiny. The sepals form a distinct, basal sepaline tube. The long unguiculate lip is most frequently divided into hypochile and epichile and adorned with two small, fleshy processes. The column foot is long and adnate to the long ovary neck. The large viscidium, dropping from the rostellum usually leaves a large, sinuate indentation on its apex.

We propose to separate *Aulosepalum* as a subgenus characterised by lateral sepals connate up to halfway and forming a prominent sepaline tube, and with staminodes fused with the style distinctly below the stigmatic surface.

Deiregyne Schltr. subgenus *Aulosepalum* (Garay) Szlach., Rutk. & Mytnik, *stat. & comb. nova*

BASIONYM: *Aulosepalum* Garay, Bot. Mus. Leafl. Harvard Univ. 28: 298. 1982.

TYPE SPECIES: *Deiregyne tenuiflora* (Greenm.) Burns-Balogh (= *Spiranthes tenuiflora* Greenm.).

The genus *Kionophyton* (Garay 1982) embraces plants living in humid forests. They are characterised by possessing foliage at flowering time, green to yellowish flowers, stem not concealed by scarious bracts, floral bracts green at flowering time, spike secund, lacking mammilliform calluses at the base of the lip which

is subsagittate. The column is elongate, slender, and the lip is subsagittate, canaliculate without anastomosing veins, the apex of the lip is papillose. The viscidium is ventrally sulcate and the rostellum is triangular.

Within this genus Garay (1982) included the following taxa known from Mexico and Guatemala: *Kionophyton pyramidalis* (= *Spiranthes pyramidalis*), *K. sawyeri* and *K. seminuda*. Burns-Balogh (1988) segregated *Spiranthes pyramidalis* as *Deiregyne pyramidalis* and described the new species *D. riodelayensis* into the section *Pyramidales*, based on the following combination of features: nectary short, saccate; perianth parts free, except at the base of the lateral sepals and lip; lamina and disc of labelum not differentiated; nectar glands situated at the base of the lip; ovary neck and column foot short. Catling (1989) did not agree with

Burns-Balogh and transferred *D. riodelayensis* to *Kionophyton*. Gonzalez and Szlachetko (Szlachetko 1995b) transferred *K. pyramidalis* and *K. riodelayensis* to the newly proposed genus *Gracielanthus*. Burns-Balogh (1986a) classified *K. sawyeri* in his monotypic genus *Greenwoodia*.

We came across a specimen collected by Ofelis from Mexico, Oaxaca, which should be separated as a new species in *Kionophyton*.

Kionophyton pollardiana Szlach., Rutk. & Mytnik., *sp. nova* (Fig. 2)

Species haec K. seminudo similis sed labello supra constrictionem basalem transversim ovali apice quadrato et sepalis petalisque superioribus infra apice incrassato latissimis recedit.

Table 1. Generic concept of *Deiregyne* according to Schlechter (1920), Garay (1982), Burns-Balogh (1982) and Szlachetko *et al.* (2000).

<i>Deiregyne</i>	Schlechter (1920)	Burns-Balogh (1982)	Garay (1982)	Szlachetko <i>et al.</i> (2000)
<i>albovaginata</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Stenorhynchos</i>
<i>aline</i>	–	–	–	<i>Deiregyne</i>
<i>chartacea</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>chloreaeformis</i>	<i>Deiregyne</i>	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Burnsbaloghia</i>
<i>cochleata</i>	–	–	–	<i>Deiregyne</i>
<i>confusa</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Funkiella</i>
<i>dendroneura</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Schiedeella</i>
<i>diaphana</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Burnsbaloghia</i>
<i>durangensis</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Funkiella</i>
<i>eriphora</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>falcata</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>hemichrea</i>	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>hondurensis</i>	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Gularia</i>	<i>Schiedeella</i>
<i>nelsonii</i>	–	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>obtecta</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>obtusa</i>	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>pandurata</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>pseudopyramidalis</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>
<i>pterygodium</i>	–	–	–	<i>Deiregyne</i>
<i>pulchra</i>	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>pyramidalis</i>	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Kionophyton</i>	<i>Gracielanthus</i>
<i>ramentacea</i>	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>rhomilabia</i>	–	<i>Deiregyne</i>	<i>Deiregyne</i>	<i>Triceratostris</i>
<i>riodelayensis</i>	–	<i>Deiregyne</i>	–	<i>Gracielanthus</i>
<i>tamayoi</i>	–	–	–	<i>Deiregyne</i>
<i>tenella</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Funkiella</i>
<i>tenuiflora</i>	<i>Gramosepalum</i>	<i>Deiregyne</i>	<i>Aulosepalum</i>	<i>Deiregyne</i>
<i>thelymitra</i>	<i>Deiregyne</i>	<i>Schiedeella</i>	<i>Gularia</i>	<i>Schiedeella</i>
<i>trilineata</i>	<i>Deiregyne</i>	<i>Schiedeella</i>	<i>Gularia</i>	<i>Schiedeella</i>
<i>velata</i>	–	<i>Schiedeella</i>	<i>Deiregyne</i>	<i>Oestlundorchis</i>

TYPE: Mexico. Oaxaca. San Felipe, 1.X.1969 *Ofelis* S-133 (holotype SEL!).

Roots ca. 10, up to 6 cm long and up to 0.3 cm in diameter, clustered, thickened, fleshy, pubescent. Stem 37.5 cm tall, erect, slender, upper part densely glandular. Leaves 3, cauline, gathered in basal quarter, petiolate; petiole up to 2 cm long, narrow; blade 5–7 cm long, 2–3 cm wide, ovate-lanceolate, acute to acuminate, slightly oblique, subspread. Cauline sheaths 4, tubular, acuminate, herbaceous, thin, glabrous or uppermost glandular outside, as long as or longer than internodes. Spike 15 cm long, loosely ca. 20-flowered, subsecund. Flowers small, resupinate, arcuate, tubular, with spreading apices. Floral bracts 8–9 mm long, broadly ovate, acute to acuminate, herbaceous, thin, glabrous. Ovary 6–8 mm long, cylindrical, twisted at base, densely and softly pubescent. Sepals dissimilar, connate at base only, densely pubescent outside. Dorsal sepal 7.5–9 mm long, 2–2.5 mm wide, oblong-obovate, subacute to acute, concave at base, thickened at apex, 3-nerved. Petals 7–8 mm long, 1.8 mm wide, spatulate above linear lower half, falcate, obliquely acute, thickened at apex, 2-nerved. Lateral sepals 8–9 mm long, 1.5–2 mm wide, oblong-oblancheolate, falcate, subobtuse to subacute, oblique at base, reflexed, 3-nerved. Lip shortly clawed, more or less arcuate; lamina 8–9 mm long, 3.5 mm wide, squeezed just above base, thickened auricles, transversely elliptic above with a subquadrate, truncate, papillate apex, widest above middle. Gynostemium 4 mm long. Viscidium 1 mm long.

ETYMOLOGY: Named in honour of Mr. Glenn Pollard, who collected plants intensively in Mexico and found among other material the type specimen of this new species.

ECOLOGY: No data available. Flowering in October.

DISTRIBUTION: Mexico (Oaxaca).

This species appears to be related to *K. seminuda* from which it differs in the lip being transversely elliptic above the basal constriction and with a subquadrate apex. The dorsal sepal and petals of *K. pollardiana* are widest below apex and thickened apically.

The genus now has three species known from Mexico and Guatemala.

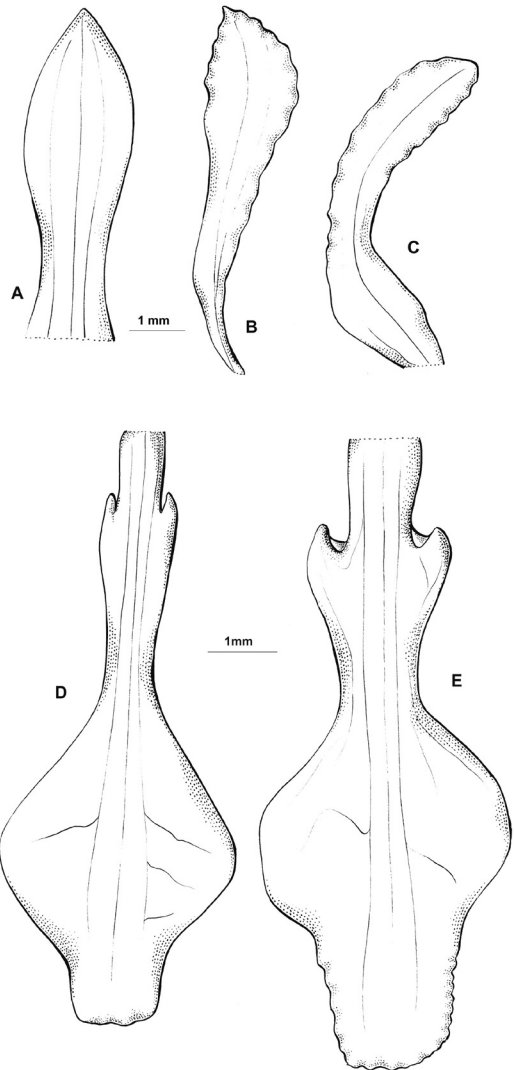


Fig. 2. *Kionophyton pollardiana* (from holotype). — A: Dorsal sepal. — B: Petal. — C: Lateral sepal. — D and E: Lip.

Key to the species of *Kionophyton*

1. Sepals and petals at least 10 mm long; lip 9–15 mm long; column foot obscure; rostellum remnant distinctly 3-dentate, middle tooth longer than lateral ones *K. sawyeri*
1. Sepals and petals up to 9 mm long; lip 6–9 mm long; column foot prominent; rostellum remnant obscurely 3-dentate, all teeth nearly equal 2.
2. Lip obovate in outline above basal constriction; dorsal sepal and petals widest near middle or below *K. seminuda*
2. Lip transversely elliptic above basal constriction, with a subquadrate apex; dorsal sepal and petals widest below apex *K. pollardiana*

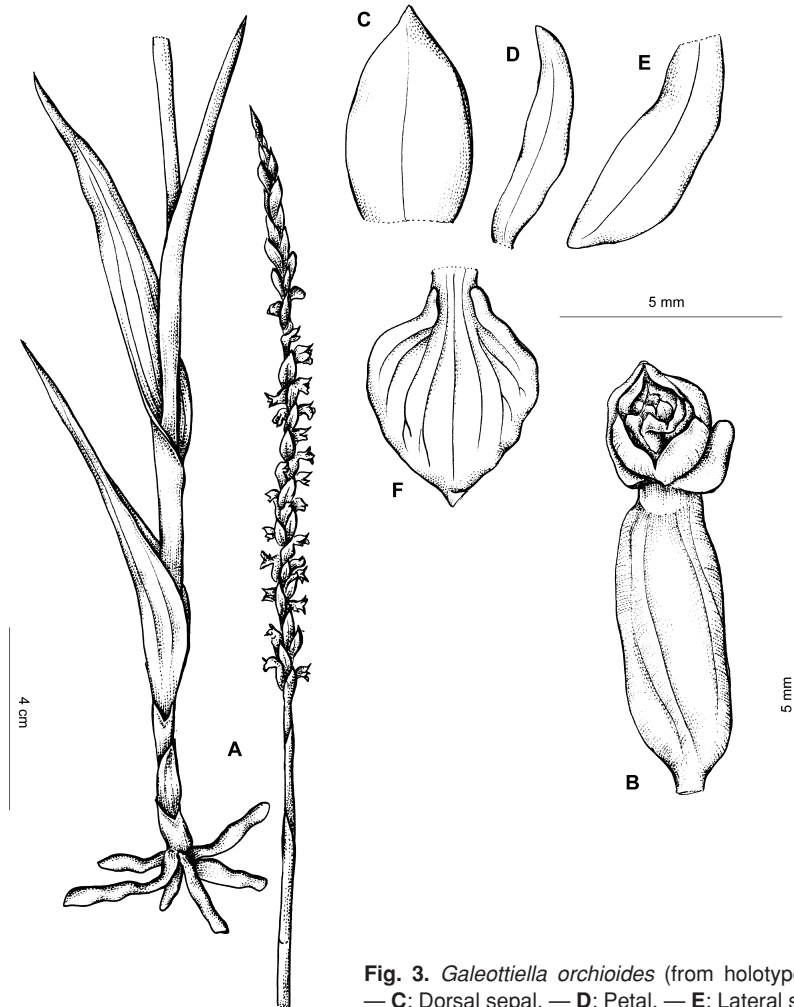


Fig. 3. *Galeottiella orchioides* (from holotype). — A: Plant. — B: Flower. — C: Dorsal sepal. — D: Petal. — E: Lateral sepal. — F: Lip.

The genus *Microthelys* proposed by Garay (1982) embraces terrestrial plants with sepals subsimilar, parallel, with somewhat diverging apices. The dorsal sepal is adnate to the gynostemium and the petals are decurrent on column foot. The stigma is bilobed, confluent, subquadrate, and the fovea of rostellum commonly persistent upon drying. Within this genus Garay included the following taxa occurring in Mexico, Guatemala and Costa Rica: *Spiranthes rubrocallosa*, *S. nutantiflora* and *S. minutiflora*. Burns-Balogh (1982, 1986b) included *S. rubrocallosa* in the genus *Schiedeella* and *S. minutiflora* in *Brachystele*. Szlachetko (1991) wrote that these three species are closely related to *Galeottiella* as regards the structure of the gynostemium and the perianth, and proposed including *Microthelys*

in *Galeottiella* as a section. Szlachetko (1996) later changed his opinion on the generic status of *Microthelys* and made the combinations *M. constricta* (Szlach.) Szlach., *M. intagana* (Dods. & Dressl.) Szlach., *M. markowskiana* (Szlach.) Szlach. and *M. santa-elenae* (Szlach.) Szlach. We propose a further new combination here.

Microthelys hintoniorum (Todzia) Szlach., Rutk. & Mytnik, *comb. nova*

BASIONYM: *Galeottiella hintoniorum* Todzia, Brittonia 46: 332. 1994. — TYPE: Mexico. Nuevo Leon, Mpio, Zaragoza, Cerro Viejo, 1840 m, 20.II.1993 *Hinton et al.* 22636 (holotype TEX, isotype AMO). — *Brachystele hintoniorum* (Todzia) Espejo & Lopez-Ferrari, Phytologia 82(2): 79. 1997.

The genus *Galeottiella* is characterised by a *Habenaria*-like habit, rather unusual for Spirantheae, and minute, inconspicuous, tubular flowers with strongly reflexed lateral sepals long decurrent on the column foot. The lip has a short or a long claw with thin or thickened margins; the lamina is entire, broadly obovate to obcordate, widest near the apex, or broadly ovate, widest just above the base, very fleshy or relatively thin, with narrow thin margins. The gynostemium is rather short, slightly arched with rostellum formed of the entire and greatly reduced middle stigma lobe, truncate to rounded. The rostellum remnant is shallowly notched, foveolate, the lobes being rounded at the apex.

A careful examination of the type specimen of *Prescottia orchioides* showed that the species must be transferred to *Galeottiella*.

***Galeottiella orchioides* (Lindl.) R. Gonzalez T., comb. nova (Fig. 3)**

BASEONYM: *Prescottia orchioides* Lindl., Ann. Mag. Hist. Nat. 15: 386. 1845. — TYPE: Mexico. Jalisco. Bolaños. *Hartweg s.n.* (holotype K!).

Galeottiella now has two species known from Mexico and Guatemala, and they can be separated as follows.

Key to the species of *Galeottiella*

1. Lip short-clawed, lamina broadly ovate, widest just above base, attenuate towards an acute apex *G. orchioides*
1. Lip long-clawed, lamina broadly obovate to obcordate, widest at apex, with a fleshy, reflexed apiculus *G. sarcoglossa*

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