

## TWO NOVELTIES IN GENUS *PLATYSTELE* (ORCHIDACEAE: PLEUROTHALLIDINAE) FROM COSTA RICA

ADAM P. KARREMANS<sup>1,2</sup> & DIEGO BOGARÍN<sup>1,2,3</sup>

<sup>1</sup> Lankester Botanical Garden, University of Costa Rica. P.O. Box 302-7050 Cartago, Costa Rica.

<sup>2</sup> Naturalis Biodiversity Center, The Netherlands.

<sup>3</sup> Herbario UCH, Universidad Autónoma de Chiriquí, 0427, David, Chiriquí, Panama.

\*Author for correspondence: [adam.karremans@ucr.ac.cr](mailto:adam.karremans@ucr.ac.cr)

**ABSTRACT.** Two new species of *Platystele* allied to the *P. oxyglossa* complex are described from Costa Rica. *Platystele carl-lueriana* can be distinguished from *P. catiensis* and *P. oxyglossa* by the compact inflorescence that barely exceeds the leaf, from *P. pedicellaris* by the large plants with long leaves and small flowers, and from *P. tausensis* by the yellowish sepals and petals (*vs.* purple stained) and the minutely glandular (*vs.* apically hirsute) lip. The second species, *Platystele jane-lueriana*, can be easily distinguished by the glabrous flowers, and the conspicuously inflated, bulbous lip, with an incurved apex. Among the other members of the complex, it is most closely resembles *P. pedicellaris* in the compact inflorescence that is subequal to the leaves, but is distinguished by tail-less sepals and the linear-ligulate petals. With these additions, the total number of Costa Rican *Platystele* reaches twenty species.

**KEY WORDS:** Flora of Costa Rica, new species, *Platystele carl-lueriana*, *Platystele jane-lueriana*, taxonomy

**Introduction.** *Platystele* Schltr. belongs to subtribe Pleurothallidinae and currently includes about 110 species (Karremans *et al.* 2016). The genus is closely related to *Scaphosepalum* Pfitzer and *Teagueia* (Luer) Luer, all belonging to the *Specklinia* Lindl. affinity (Pridgeon, Solano & Chase 2001, Karremans 2016). Species of *Platystele* can be recognized by the small plants, the tiny flowers, which are frequently flat, with free and spreading sepals and petals, a simple lip with a basal glenion, a short column with an apical anther and bilobed stigma (Luer, 1990).

In the latest monographic study of the genus from Costa Rica, Luer (2003) recorded 13 species. Subsequent authors added five species *Platystele catiensis* Karremans & Bogarín, *P. speckmaieri* Luer & Sijm, *P. sylvestrei* Karremans & Bogarín, *P. tausensis* Bogarín & Karremans, and *P. tica* Karremans & Bogarín to the country's flora (Bogarín & Karremans 2010, Fernández, Bogarín, Karremans & Jiménez 2014, Rakosy, Speckmaier, Weber, Huber & Weissenhofer 2013).

While revising material of *Platystele* in preparation for a revision of the genus from Costa Rica, we encountered two unnamed entities. Unfortunately, we were unable to retrieve any additional material for

study, and have to rely on what is currently available to name these two distinct taxa. They are described here forth bringing the total number of species of Costa Rican *Platystele* to twenty.

### TAXONOMIC TREATMENT

*Platystele carl-lueriana* Karremans & Bogarín, *sp. nov.* (Fig. 1–2).

**TYPE:** Costa Rica. Limón: Pococí, Guápiles, Jiménez, 10°10'09.35"N 83°46'54.94"W, 457 m. En árboles solitarios en potreros. Floreció en cultivo en la colección personal de Gerson Villalobos el 29 de agosto 2014, *A.P. Karremans 6310* (holotype, JBL-Spirit).

*Platystele carl-lueriana* is florally similar to *P. catiensis* and *P. oxyglossa* Schltr., but can be easily distinguished the compact inflorescence that barely exceeds the leaf (versus an elongate, loosely flowered inflorescence).

*Plant* minuscule, epiphytic, caespitose, erect, up to 2.4 cm tall, including the inflorescence. Roots basal, flexuous, filiform. *Ramicauls* erect, slender, abbreviated, enclosed by tubular, imbricating, slightly compressed, membranous sheaths, becoming brownish

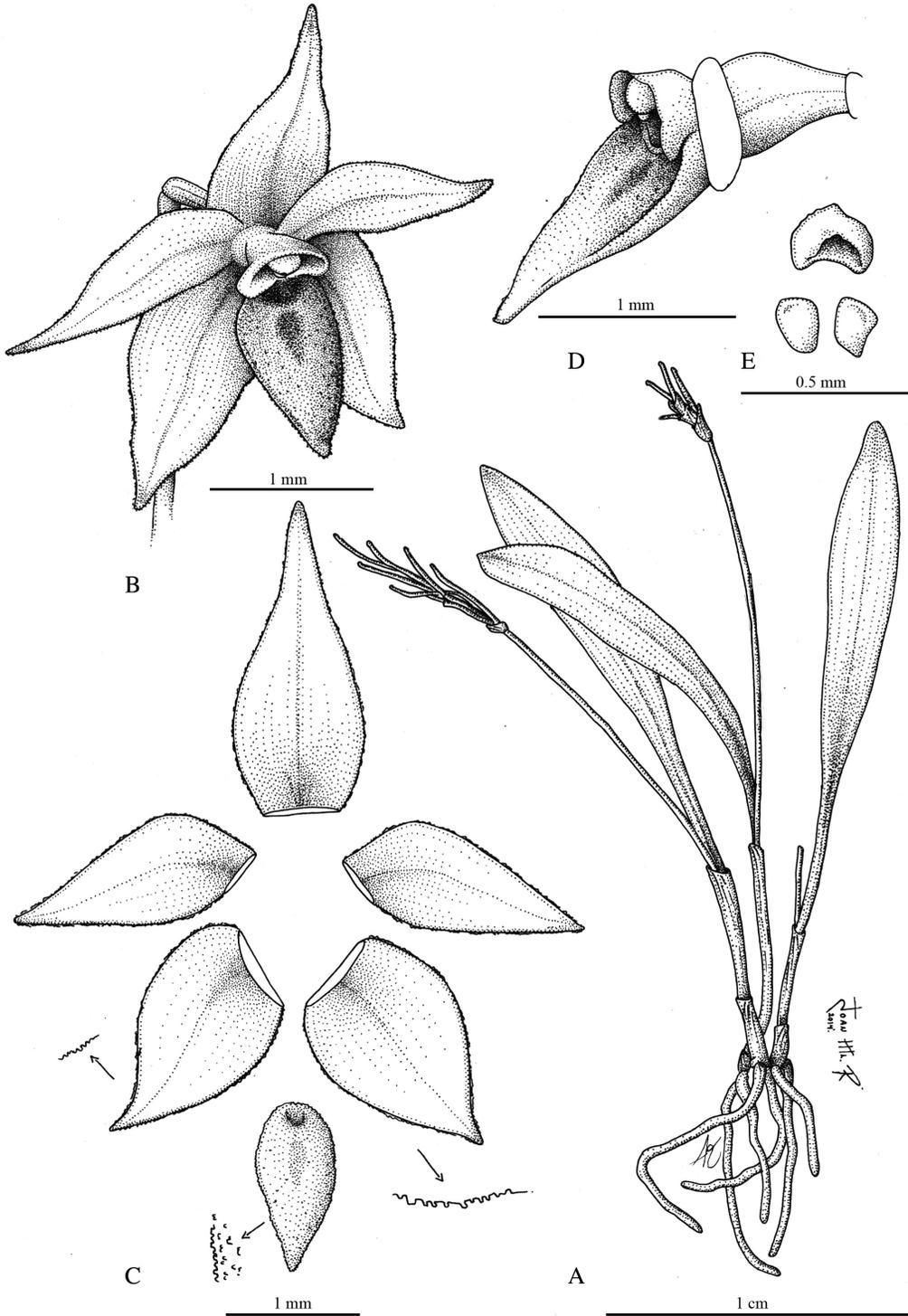


FIGURE 1. *Platystele carl-lueriana* Karremans & Bogarín. A. Habit. B. Flower. C. Dissected perianth. D. Ovary, column and lip, lateral view. E. Anther cap and pollinarium. Drawing by A.P. Karremans and Joan Ramírez from the holotype.



FIGURE 2. *Platystele carl-lueriana* Karremans & Bogarín showing the relatively elongate leaves and congested inflorescence. Based on the plant that served as type. Photograph by A. P. Karremans.

and papery with age. *Leaf* narrowly-elliptic to ligulate, erect, conduplicate, subacute, emarginate, abaxially keeled and terminating in a short apiculus, 1.9–2.1 × 0.1–0.2 cm, narrowed at the base into a conspicuous, conduplicate petiole. *Inflorescence* racemose, distichous, congested, successively flowered, with one flower open at a time, shortly surpassing the leaf, up to 2.2 cm long, peduncle to 1.8 mm long, pedicels 2–3 mm long. *Floral bracts* acute, conduplicate, to 0.1 mm long. *Ovary* terete, smooth, to 0.6 mm long. *Flower* with the sepals and petals yellowish, the lip and column red. *Dorsal sepal* narrowly ovate to lanceolate, acute-acuminate, margin erose-dentate, spreading, 2.3 × 1.0 mm. *Lateral sepals* subequal to the dorsal sepal, slightly oblique, ovate, acute, shortly apiculate, margin erose-dentate, spreading, 1.7–1.8 × 1.0–1.1 mm. *Petals* obliquely lanceolate to narrowly-ovate, margin erose-dentate, spreading, acute, 1-veined, 1.8–1.9 × 0.7–0.8 mm. *Lip* narrowly-ovate, acute, margin erose-dentate, glandular, with a small glenion at the base, 1.2–1.3 mm × 0.6 mm. *Column* short, sub-cylindrical, 0.3–0.4 mm long. *Anther* apical cucullate, pollinia two, laterally flattened. *Stigma* subapical, transversely bilobed at each side of the anther.

**EPONYMY:** The name honors Carlyle A. Luer on his 95th birthday. Luer has dedicated four decades to the

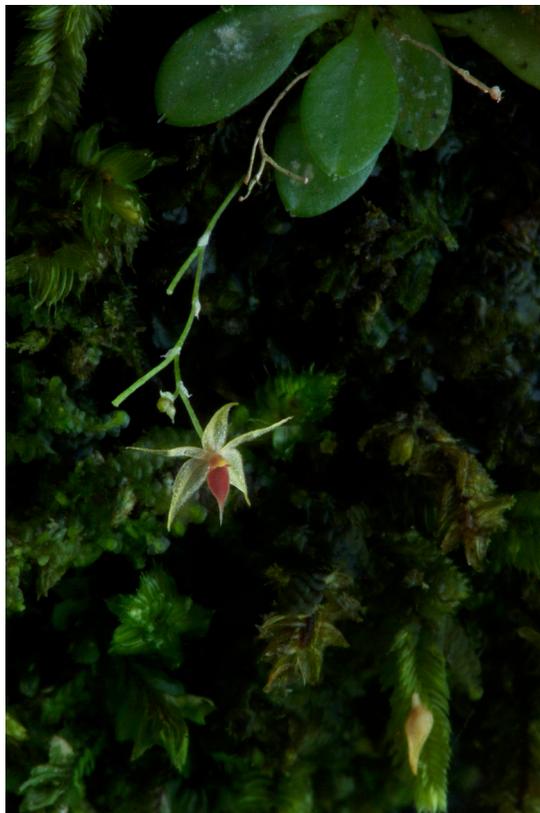


FIGURE 3. *Platystele catiensis*, (Karremans 5442, JBL-spirit). Photograph by A.P. Karremans.

study of Pleurothallidinae, his work set a solid base for other authors to study the species of this tremendously diverse and complex subtribe. It is in great part thanks to his monographs that we are now able to reveal the novelties here described.

**PHENOLOGY:** Plants were registered to flower in August.

**HABITAT AND DISTRIBUTION:** Apparently endemic to Costa Rica, where it is known only from the type locality. Plants grow in secondary forest, at about 457 m in elevation.

The new species is a member of the *Platystele oxyglossa* species complex. It can be easily distinguished from the florally similar *P. catiensis* (Fig. 3) and *P. oxyglossa* Schltr. (Fig. 4) by the compact inflorescence that barely exceeds the leaf (versus an elongate, loosely flowered inflorescence). The most vegetatively similar species are *P. pedicellaris* (Schltr.) Garay (Fig. 5) and *P. tausensis* (Fig. 6), the first is



FIGURE 4. *Platystele oxyglossa* (Karremans 7074, JBL-spirit). Photograph by A.P. Karremans.



FIGURE 5. *Platystele pedicellaris* (Karremans 2628, JBL-spirit). Photograph by D. Bogarín.



FIGURE 6. *Platystele tausensis* (Bogarín 7394, JBL-spirit). Photographed by D. Bogarín.

easily distinguished by the shorter plants and larger flowers (sepals 1.7–2.0 × 1.0–1.1 mm vs up to 6 × 2.0 mm), and the second by the purple stained sepals and petals (vs. yellow-green) and the hirsute lip apex (vs. glabrous). The new species is also somewhat reminiscent of *P. propinqua* (Ames) Garay (Fig. 7), but differs in the narrow, acuminate lateral sepals, petals and lip (vs. lateral sepals and lip ovate and acute).



FIGURE 7. *Platystele propinqua* (Karremans 917, JBL-spirit). Photograph by D. Bogarín.

*Platystele jane-lueriana* Karremans & Bogarín, *sp. nov.* (Fig. 8).

TYPE: Costa Rica. Cartago: Turrialba, Moravia de Chirripó, hills north of Moravia across the plain with pasture, 9°50'18" N 83°26'45" W, ca. 1135 m, premontane wet forest, secondary mature vegetation and remnants of secondary vegetation in pastures, 12 June 2002, F. Pupulin 3971, M. Bonilla, R. Gómez, H. León-Páez & W. Schug (holotype, JBL-Spirit!).

Similar to *Platystele pedicellaris*, but is distinguished by tail-less sepals and the linear-ligulate petals (vs. acuminate sepals and elliptic petals).

*Plant* minuscule, epiphytic, caespitose, erect, up to 1.3 cm tall, including the inflorescence. *Roots* basal, flexuous, filiform. *Ramicauls* erect, slender, abbreviated, enclosed by tubular, imbricating, slightly compressed, membranous sheaths. *Leaves* elliptic, erect, thick, conduplicate, subacute, emarginate, abaxially keeled and terminating in a short apiculus, 6.5–9.0 × 2.1–2.7 mm, narrowed at the base into a conduplicate petiole. *Inflorescence* racemose, distichous, successively flowered, with one flower open at a time, up to 1 cm long, peduncle to 8.5 mm long, pedicels 1 mm long. *Floral bracts* acute, conduplicate, to 3–5 mm long. *Ovary* terete, smooth, to 5 mm long. *Dorsal sepal* narrowly lanceolate-elliptic, acute, with a conspicuous mid-vein, spreading widely, 4.8 × 1.4 mm. *Lateral sepals* subequal to the dorsal sepal, narrowly ovate, with a conspicuous mid-vein, acute, with a conspicuous mid-vein, spreading widely, 4.3–4.5 × 1.8–2.0 mm. *Petals* spreading widely, narrowly linear-ligulate, acute, 1-veined, 4.5–4.8 × 0.8–1.1 mm. *Lip* ovate-elliptic, shortly acuminate, apically incurved (in the only specimen), glabrous, with a small glenion at the base, 4.0 × 1.7 mm. *Column* short, subcylindrical, 0.6 mm long. *Anther apical*, *Pollinia* not seen. *Stigma* subapical, transversely bilobed at each side of the anther.

EPONYMY: The name honors Jane Luer, wife and long life companion of Carl Luer, and who undoubtedly has played a key role in these four decades of Luer's studies of the Pleurothallidinae.

PHENOLOGY: The plant was registered to flower in June, however, likely its flowering period is much longer.

HABITAT AND DISTRIBUTION: Apparently endemic to Costa Rica, where it is known only from the type locality around Moravia de Chirripó in the Caribbean watershed of Cordillera de Talamanca. Plants grow in secondary forest at 1135 m in elevation.

Among the species of the *P. oxyglossa* complex, *P. jane-lueriana* can be distinguished by the glabrous flowers, and the conspicuously inflated, bulbous lip, with an incurved apex (at least in the studied specimen). It most closely resembles *Platystele pedicellaris* in the compact inflorescence that is subequal to the leaves, but is distinguished by tail-less sepals and the linear-ligulate petals (vs. acuminate sepals and elliptic petals).

ACKNOWLEDGMENTS. This manuscript was prepared as part of a dedicatory issue commemorating the 95th birthday of Carl Luer, who's extensive work on the Pleurothallidinae is the basis for most current studies in the subtribe, including the present. We owe thanks to Gerson Villalobos for aiding this study with providing plant material and localities. Joan Ramirez is thanked for the two illustrations of the new species. We thank two anonymous reviewers for their kind comments that improved the manuscript. We are also thankful to the Costa Rican Ministry of Environment and Energy (MINAE) and its National System of Conservation Areas (SINAC) for the scientific permits. We thank the Vice-Presidency of Research of the University of Costa Rica for providing support through the project: "Taxonomía, filogenia molecular, aislamiento reproductivo y diferenciación de nichos de *Specklinia endotrachys*" (814-B3-075).

#### LITERATURE CITED

- Bogarín, D. & Karremans, A. P. (2010). A new *Platystele* (Orchidaceae: Pleurothallidinae) from Central Costa Rica / Un nuevo *Platystele* (Orchidaceae: Pleurothallidinae) de la parte central de Costa Rica. *Orquideología*, XXVII(2), 208–220.
- Fernández, M., Bogarín, D., Karremans, A. P. & Jiménez, D. (2014). New species and records of Orchidaceae from Costa Rica III. *Lankesteriana*, 13(3), 259–282.
- Karremans, A. P. (2016). Genera Pleurothallidarum: an updated phylogenetic overview of Pleurothallidinae. *Lankesteriana*, 16(2), 219–241.
- Karremans, A. P., Albertazzi, F. J., Bakker, F. T., Bogarín, D., Eurlings, M. C. M., Pridgeon, A., Pupulin, F. & Gravendeel, B. (2016). Phylogenetic reassessment of *Specklinia* and its allied genera in the Pleurothallidinae (Orchidaceae). *Phytotaxa*, 272(1), 1–36.

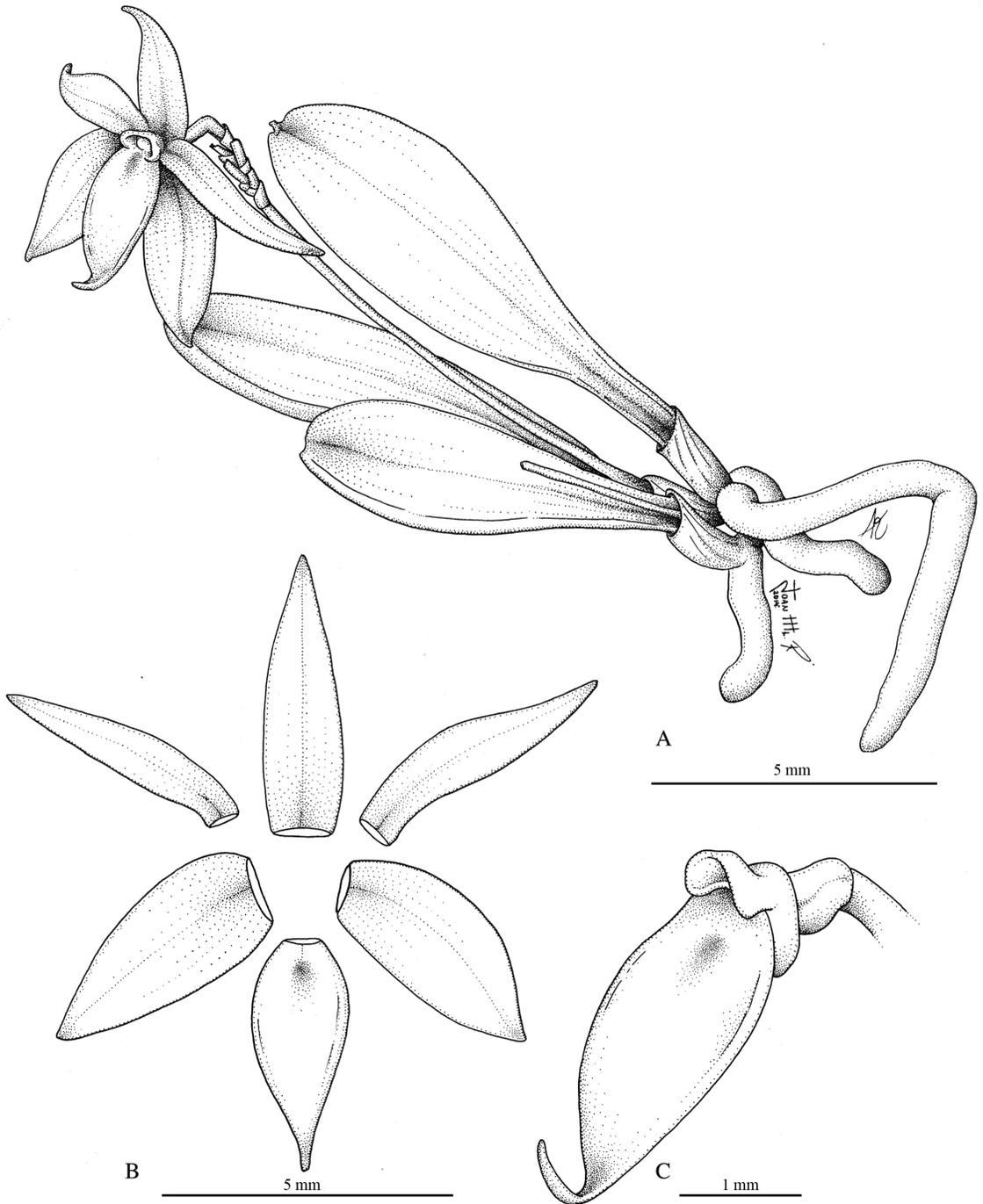


FIGURE 8. *Platystele jane-lueriana* Karremans & Bogarín. A. Habit and flower. B. Dissected perianth. C. Ovary, column and lip, lateral view. Drawing by A.P. Karremans and Joan Ramírez from the holotype.

- Luer, C. A. (1990). Pleurothallidinarum VII. Systematics of *Platystele*. *Monographs in Systematic Botany from the Missouri Botanical Garden*, 38, 1–135.
- Luer, C. A. (2003). *Platystele*. In: B. E. Hammel, M. H. Grayum, C. Herrera & N. Zamora (Eds.), *Manual de Plantas de Costa Rica. Vol. 3. Monocotiledóneas (Orchidaceae-Zingiberaceae). Monographs in Systematic Botany from the Missouri Botanical Garden*, 93, 381–386.
- Pridgeon, A. M., Solano, R. & Chase, M. W. (2001). Phylogenetic relationships in Pleurothallidinae (Orchidaceae): combined evidence from nuclear and plastid DNA sequences. *American Journal of Botany*, 88, 2286–2308.
- Rakosy, D., Speckmaier, M., Weber, A., Huber, W., Weissenhofer, A. (eds) (2013). *Orchids: Botanical Jewels of the Golfo Dulce Region, Costa Rica*. Vienna, Austria: Verein zur Förderung der Tropenstation La Gamba.

