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Original Paper

Nomenclatural novelties and synopsis of *Passovia* (Loranthaceae): new synonyms, new combinations and reinstated species

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Abstract

Passovia includes Neotropical mistletoes characterised by inflorescences composed of bracteolate triads, rarely monads with one bract and two bracteoles; small tetra-hexamerous flowers; and laterally excavated filaments with basifixed anthers. The genus occurs from Mexico to Bolivia and Brazil, including Jamaica. Twenty-four species were recognised, including four reinstated species: *P. alternifolia*, *P. lepidobotrys*, *P. micrantha*, *P. myrsinites*, and three new combinations are proposed: *P. intermedia*, *comb. nov.*, *P. lobaterae*, *comb. nov.*, and *P. murcaei*, *comb. nov.* An identification key to species, synonyms, and typifications are presented.
Key words: *Cladocolea*, *Furarium*, *Oryctina*, Psittacanthinae, typifications.

Resumo

Passovia reune espécies hemiparasitas neotropicais caracterizadas pelas inflorescências compostas por tríades bracteoladas, raro mônades com uma bráctea e duas bractéolas; pequenas flores 4-6-meras, filetes escavados lateralmente com anteras basifixas. Ocorrem desde o México até a Bolívia e o Brasil, incluindo a Jamaica. Foram reconhecidas 24 espécies, sendo quatro reintegradas: *P. alternifolia*, *P. lepidobotrys*, *P. micrantha*, *P. myrsinites* e três novas combinações propostas: *P. intermedia*, *comb. nov.*, *P. lobaterae*, *comb. nov.*, e *P. murcaei*, *comb. nov.* É apresentada uma chave de identificação para as espécies, sinônimos e tipificações.
Palavras-chave: *Cladocolea*, *Furarium*, *Oryctina*, Psittacanthinae, tipificações.

Introduction

Passovia H.Karst. is a genus of Neotropical hemiparasites with 24 species characterized mainly by the epicortical roots emerging either from the base of the plant along its branches or both. Its racemous inflorescences (racemes or spikes, simple or compound) with flowers 4–6-merous, uni- or bisexual arranged in triads (rarely in monads) subtended by bracts, bracteoles or both. The basifix anthers and laterally excavated filaments are the main diagnostic characters (Kuijt 2011, 2013, 2015).

The generic name was proposed by Hermann Karsten in honor of the Prussian consul Friedrich Passow who worked in Puerto Cabello (Venezuela) (Karsten 1852a; Kuijt 2011). The names first appeared as "*Passavia suaveolens* Karst.", in an advertisement for the sale of dry specimens (Karsten 1846a: 102).

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In the same year, Karsten (1846b) published details of his travel diary together with some comments on 17 plants, previously offered for sale (Karsten 1846a: 102), among which *Passovia suaveolens*, now spelled with "o" and in both articles with a "v" (Karsten 1846b: 107). In his comments Karsten (1846b) mentions the morphological characteristic of the embryonic sac that separates *Passovia* from *Loranthus* Jacq. In addition, he notes that the species is widely distributed, presenting many fruits and seedlings on *Hura* spp. and on several species of *Citrus* L. (Karsten 1846b: 107).

In 1852 Karsten publishes another study featuring the genus (Karsten 1852a: 305), now written with a "w", and describes a single species "*Passowia odorata*". There is no mention of *Passovia suaveolens* and none of the previous publications; perhaps the omission occurred because both epithets have the same meaning. Other articles with details of the hosts and the anatomy of "*Passowia odorata*" were published in the same year (Karsten 1852b, c, d).

The publication of these different binomials has caused confusion, which led Kuijt (1976) to consider *Passowia odorata* as the type species of the genus, that he later changed (Kuijt 1993, 2011) and indicated *Passovia suaveolens* as its nomenclatural type.

Eichler (1868) considered *Passovia* (*Passowia* Karsten 1852a) as a synonym for *Phthirusa* Mart., including it along with *Phthirusa theobromae* (Willd. *ex* Schult.f.) Eichler, in *Phthirusa* sect. *Euphthirusa*. Engler (1889: 181) recognized the synonym proposed by Eichler (1868), however in a section of his own called *Phthirusa* sect. *Passowia*. This section was maintained by Engler (1897: 135), Engler & Krause (1935: 175) and Rizzini (1952: 452, 1956: 121).

Among the naturalists of the 19th century, the genus *Passovia* was only accepted by Tieghem (1895) who considered that *Phthirusa* was represented by a single species, *P. clandestina* (Mart.) Mart., and transferring all other names to *Passovia*.

Passovia was reinstated by Kuijt (2011) after two frustrated attempts of its rejection (Kuijt 1976, 1993) in favor of *Phthirusa*, the circumscription proposed by Eichler (1868) (Brummitt 1978, 2005).

Kuijt (2011) transferred most of the names recognised in *Phthirusa sensu* Eichler to *Passovia*, as had already been suggested by Tieghem (1895), by publishing seven new species and ten new combinations. Four of these new combinations were superfluous, as they had already been published by Tieghem (1895).

Recent works on *Passovia* (Kuijt 2011, 2014) repeat problems in species circumscriptions resulting from the confusing generic interpretation adopted by Kuijt (1991, 2003b, 2009), where some species of *Passovia* (such as those described in *Phthirusa*) were placed in *Cladocolea* Tiegh. or in *Oryctina* Tiegh.

Molecular studies position *Passovia* (using samples of *Passovia pyrifolia* (Kunth) Tiegh.) with *Dendropemon* (Blume) Rchb. and *Oryctanthus* (Griseb.) Eichler (Vidal-Russell & Nickrent 2008; Wilson & Calvin 2006). Grímsson *et al.* (2018) and Nickrent *et al.* (2019) found that *Passovia* is the sister of a clade formed by *Dendropemon* + *Oryctanthus*. This position gains morphological support by the fact that the three genera share epicortical roots, the farinaceous coverin of the cork on the surface of branches and inflorescences, the presence of monads (rare in *Passovia*), hexamerous flowers and stamens with sterile anthers, even though some of these characters may not be present in all species of *Passovia*. Anatomical characters that unite these genera are the leaf fibers present in all species of *Oryctanthus* (Caires 2012; Kuijt & Lye 2005) and the cristarque cells present in *Dendropemon* (Kuijt & Lye 2005) and in the seven species of *Passovia* (Caires *et al.* 2017; Kuijt & Lye 2005) that have been studied anatomically.

The pollen analyses presented by Feuer & Kuijt (1985) and Grímsson *et al.* (2018) also demonstrate that *Passovia* has an affinity with *Dendropemon* and *Oryctanthus*, characterizing a lineage with circular pollen grains that are demicolpate-lobed.

However, the generic relationships based on pollen data is less clear. *Passovia* presents two pollen types, one shared only with *Dendropemon* (*e.g.*, *P. pyrifolia*) and the other forming by the species *P. lobaterae* (G.Ferrari *ex* Rizzini) Caires, *P. ovata* (Pohl *ex* DC.) Tiegh., *P. pedunculata* (Jacq.) Kuijt, *P. stenophylla* (Eichler) Tiegh. and *P. theloneura* (Eichler) Tiegh. These latter species have pollen that is similar to that of *Oryctina* and *Maracanthus* Kuijt. *P. coarctata* (A.C.Sm.) Kuijt, *P. lepidobotrys* (Griseb.) Kuijt, *P. micrantha* (Eichler) Tiegh., *P. pycnostachya* (Eichler) Tiegh. and *P. rufa* (Mart.) Tiegh. have intermediate pollen morphology (Feuer & Kuijt 2005; Grímsson *et al.* 2018).

We note that in these revisions of *Passovia* there is no identification key for the species, and in addition, several names previously treated as *Phthirusa* in *incertae sedis* are maintained. By means of bibliographical searches, field trips, and visits to herbaria to analyse morphological variation and nomenclatural types, we present proposals to clarify the limits of *Passovia* and its species.

Material and Methods

The collecting expeditions occurred in the states of Amazonas, Goiás, Mato Grosso, Minas Gerais, Pará and Tocantins. The specimens collected were deposited in the herbaria EAFM, HPAN, HERBAM and UB. Additionally, material from the following herbaria were analysed: ALCB, ASE, BAH, BHCB, BM, BR, B-W C, CEN, CEPEC, CESJ, CGMS, EAC, EAP, EAFM, ESA, ESAL, F, G, G-DC, HEPH, HERBAM, HJ, HUEFS, HUEG, HPAN, HRB, HTO, HUAM, HUFU, HUTO, HXBH, IAN, IBGE, INPA, IPA, K, L, LINN, MBM, MBML, MEXU, MG, MO, NY, OUPR, OXF, P, PAMG, PEUFR, QCA, RB, S, SP, SPF, TEPB, TRIN, UB, UC, UFG, UFMT, UFP, UEC, UESC, UFRR, US, VEN and W, acronyms according to Thiers (continuously updated) and RBH (2019). The specimens analysed are accompanied by the sign (!) and record or barcode numbers. An index for the binomials names treated in this paper is available in Appendix S1 (see Supplemetary Material <https://doi.org/10.6084/m9.figshare.16664686.v1>.

Results and Discussion

Taxonomic treatment

Passovia H.Karst., Bot. Zeitung (Berlin) 4: 107. 1846. Type: *Passovia pedunculata* (Jacq.) Kuijt. (see Kuijt, 2014).

Steirotis Raf., Ann. Gen. Sci. Phys. 6: 79. 1820, *nom. nud.* Type: *Loranthus pedunculatus* Jacq.

Passowia H.Karst., Bot. Zeitung (Berlin) 10(18): 305, Taf. IV, 1852. Type: *Passowia odorata* H.Karst, *nom. superfl.*

Phthirusa Mart. sect. *Passowia* (H.Karst.) Engl., Nat. Pflanzenfam. (ed. 1), 3(1): 181. 1889. Type: *Passowia odorata* H.Karst.

Furarium Rizzini, Rodriguésia 30/31: 155. 1956. Type: *Furarium disjectifolium* Rizzini.

Hemiparasite, much branched, herbaceous or lianescent, erect or pendent, glabrous or with a brown farinaceous (scaly) suber. Epicortical roots emitted from the base of the plant and/or along the branches. Leaves simple, sessile or petiolate, decussate or alternate, several shades of green or reddish brown when young, membranous or fleshy *in natura*, papyraceous or coriaceous *in sicco*, glabrous or with a farinaceous cover on the petiole, margins and median vein; festooned brochidodromous or basal actinodromous venation. Inflorescences terminal or axillary, lax or congested, simple or compound (racemes, spikes, panicles, panicles of spikes) subtending several pairs of triads (rarely monads) decussate, sessile or pedicellate. Flowers tetra-hexamerous, uni or bisexual, sessile or sub-sessile, cream-coloured, greenish white, red or vinaceous; flowers in the triad subtended by free or conical bracts, flowers in the monads subtended by a bract and two bracteoles. Androecium isostemonous, heterodynamous, epipetalous, with or without staminodium (empty anthers); filaments laterally excavated, anthers basal, bi or tetrasporangiate. Inferior ovary, thick style, stigma capitate or little differentiated, pistillode present in male flowers. Fruit baccaceous, yellow, orange, red or purple. Embryo chlorophyllous and dicotyledonous.

Passovia comprises 24 species in this treatment, with *P. pedunculata* (Jacq.) Kuijt and *P. pyrifolia* (Kunth) Tiegh. widely distributed in Central and South America, occurring from Mexico to Bolivia and Brazil, including the Caribbean region. The other species occur mainly in northern South America and southeastern Brazil (Kuijt 2011, 2014, 2015).

Identification key to *Passovia* species

1. Petioles and inflorescences with scaly and/or brownish farinaceous suber covering totally or partially petioles, veins, leaf margins and inflorescence axes.
    2. Hexamerous flowers; pedunculate triads (rarely monads).
        3. Compound terminal inflorescences (racemes of spikes), lateral branches of the inflorescence larger than 3 cm in length.....20. *Passovia rufa*
        3’. Non-compound terminal inflorescences (simple racemes with triads or spikes with triads), lateral branches of the inflorescence less than 3 cm in length.

4. Racemes of pedunculate triads; vinaceous flowers.
    5. Sessile leaves, cordate base ..... 6. *Passovia cordata*
    5’. Petiolate leaves, acute or obtuse base.
        6. Triads congested at the apex of the inflorescence axis (umbelliform); bract of the primary flower forming a dome ..... 17. *Passovia pycnostachya*
        6’. Triads distributed along the raceme; bracts not forming a dome.
            7. Triads with flowers facing down; little-developed peduncles and bracts (smaller than the flowers) ..... 18. *Passovia pyrifolia*
            7’. Triads with flowers facing up; well-developed peduncles and bracts (larger than the flowers) ..... 10. *Passovia lepidobotrys*
4’. Sessile spikes (rarely absent) of triads (rarely monads); greenish flowers.
    8. Spike axis lax; median vein not protruding, with non-farinaceous suber.
        9. Long spikes (up to 20 cm in length) ..... 3. *Passovia bisexualis*
        9’. Short spikes (up to 6 cm in length) ..... 4. *Passovia brasiliana*
    8’. Spike axis congested; median vein abaxially protruding and with farinaceous suber .... 14. *Passovia myrsinites*

2’. Tetramerous flowers; sessile triads (rarely monads).
    10. Inflorescence terminal (rarely lateral spikes) consisting of an aphyllous axis and several pairs of spikes with triads; non-mucronate leaves ..... 8. *Passovia disjectifolia*
    10’. Inflorescence axillary (simple spikes or congested triads); mucronate leaves.
        11. Spikes conspicuous, larger than 1 cm in length; margin and median vein (conspicuous) farinaceous.
            12. Leaves with retuse or emarginate apex; spikes with lax triads, slender axis with non-prominent bracts.
                13. Spathulate or obovate leaves (rarely elliptical) (7 × 3 cm); spikes < 2 cm in length; pairs of triads very lax ..... 21. *Passovia santaremensis*
                13’. Broad-elliptical or orbicular leaves (8 × 6 cm); spike ca. 1.5–2 cm in length; pairs of congested triads ..... 13. *Passovia murcaei*
            12’. Leaves with acute or rounded apex; spikes with congested triads, thick axis with prominent bracts ..... 5. *Passovia coarctata*
        11’. Spikes inconspicuous, less than 1 cm in length; non-farinaceous margin and median vein (inconspicuous).
            14. Leaves obovate, not papillose, emarginate apex; large leaves (3 × 1.5 cm); leaves with 3–5 conspicuous veins ..... 12. *Passovia micrantha*
            14’. Leaves elliptical or orbicular, papillose, rounded apex; small leaves (1.5 × 1.5 cm); inconspicuous veins ..... 9. *Passovia intermedia*

1’. Petioles, veins, leaf margins and inflorescence axis glabrous.
    15. Inflorescences congested, little developed ..... 1. *Passovia alternifolia*
    15’. Inflorescences lax, well developed.
        16. Inflorescences simple (rarely with lateral branches).
            17. Racemes with 8 or more pairs of triads.
                18. Densely and diffusely branched plants; sub-alternate leaves, narrow-elliptical, acute or long-attenuate apex and base ..... 7. *Passovia diffusa*
                18’. Little-branched plants; opposite, ovate or narrow-lanceolate leaves, acute or attenuate apex and obtuse base (rarely acute).
                    19. Young stems angular; leaves wide-elliptical; narrow-pedunculate triads .... 23. *Passovia subtilis*
                    19’. Young stems cylindrical; leaves narrow-lanceolate; triads with conspicuous peduncles ..... 24. *Passovia theloneura*
            17’. Racemes bearing a maximum of 7 pairs of triads.
                20. Young stems angular; leaves ovate or lanceolate, acute apex and obtuse base; inflorescence axis angular ..... 2. *Passovia beckii*

20'. Young stems cylindrical; leaves elliptical, oblong or lanceolate, obtuse apex and attenuate base; cylindrical inflorescence axis.
21. Papillose connective longer than the anthers; leaves oblong or lanceolate ..... 11. *Passovia lobaterae*
21'. Papillose connective shorter than the anthers; leaves narrow-elliptical..... 22. *Passovia stenophylla*

16'. Inflorescences compound, usually paniculate.
22. Plants very robust; elliptical leaves, ca. 15 × 5 cm; petiole 1.5–2 cm in length; connectives larger than the anthers .....19. *Passovia robusta*
22'. Plants delicate; ovate, elliptical or lanceolate leaves, smaller than 15 cm in length; petioles shorter than 1.5 cm in length; connectives smaller than the anthers.
23. Leaves ovate; racemes terminal and/or axillary, little-branched; (Central Brazil) .....15. *Passovia ovata*
23'. Leaves ovate, elliptical or lanceolate; racemes terminal and/or axillary, much branched (paniculate); (Jamaica, Central and South America).....16. *Passovia pedunculata*

1. *Passovia alternifolia* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa alternifolia* Eichler, *Fl. bras.* (Martius) 5(2): 66. 1868. *Cladocolea alternifolia* (Eichler) Kuijt, Novon 13(1): 72, figs. 1, 2. 2003. Type: BRAZIL. RIO DE JANEIRO: in Prov. Rio de Janeiro, Copacabana, 29.X.1867, *A.F.M. Glaziou 2142* (lectotype, designated by Kuijt 1994 [first step] and [second step], *hic designatus*: BR 517754!; isolectotypes: BR 517674!, P 00756254!). **Remaining syntypes**: BRAZIL. RIO DE JANEIRO: Copacabana, 26.I.1870, *A.F.M. Glaziou 4011* (B† - F. Neg. 11788!), F 976946!, K 000567883!, P 05369361!, P 05369363!); *H.W. Schott 4584* (P 05369364!).

Iconography: Kuijt (2003b), figs. 1 and 2.

Kuijt (1975, 2013, 2015) characterises the genus *Cladocolea* Tiegh. for possessing ebracteolate monads and determinate inflorescences, differing from *P. alternifolia* which has bracteolate triads and indeterminate inflorescences (see Kuijt 2003b, fig. 1c-e). Kuijt (2003b) associates *P. alternifolia* with *C. roraimae* (Steyerm.) Kuijt, however, the latter currently belongs to the genus *Peristethium* Tiegh. (Kuijt 2012a: 572). Another important point to be considered is the excavated filament (see Kuijt 2003b, fig. 2b), a diagnostical characteristic of *Passovia*.

This species has an affinity with *P. myrsinites* (Eichler) Tiegh. due to the apparent absence of an inflorescence but differs by the ovate leaves (9 × 4 cm) and alternate phyllotaxy *versus* orbicular or obovate leaves and opposite phyllotaxy (*P. myrsinites*). It is easily mistaken for *Phthirusa macrophylla* (Kuijt) Kuijt, however, it is readily distinguishable by the hexamerous flowers (Kuijt 2003b) *versus* tetramerous (*P. macrophylla*).

In addition to the morphological questions, it is important to notice that most of the species of *Cladocolea* recorded for South America are currently placed in *Peristethium*, namely: *Cladocolea archeri* (A.C.Sm.) Kuijt recorded for Colombia (= *Peristethium archeri* (A.C.Sm.) Kuijt), *C. nitida* Kuijt for Guyana (= *P. nitidum* (Kuijt) Kuijt), *C. peruviensis* Kuijt for Peru (= *P. peruviense* (Kuijt) Kuijt), *C. primaria* Kuijt for Panama (= *P. primarium* (Kuijt) Kuijt) and *C. roraimensis* (Steyerm.) Kuijt recorded for Venezuela (= *P. roraimense* (Steyerm.) Kuijt).

Eichler (1868: 66) indicated as types of *Phthirusa alternifolia* the specimens of *Glaziou* and *Schott* from Rio de Janeiro, but did not mention collection numbers for them. On the other hand, Glaziou (1905) informs that the collections were numbered 2142 and 4011 carried out in the Copacabana sandbanks between October and November. Kuijt (1994: 193) based on this information correctly designated and marked one of the specimens of *Glaziou 2142* deposited in the BR herbarium as a lectotype, which was follwed by Kuijt (2003b: 72). However, there are two specimens of the *Glaziou 2142* deposited in the BR herbarium, therefore, we are carrying out the second step of lectotypification according to Art. 7.11 (ex. 12) and 9.17 (Turland *et al.* 2018).

The species is distributed in Brazil (RJ, SP) (Eichler 1868; Glaziou 1905; Kuijt 1994, 2003b, 2009; Rizzini 1952, 1956).

2. *Passovia beckii* Kuijt, Plant Div. Evol. 129(2): 182, fig. 10. 2011. Type: BOLIVIA. LA PAZ: Prov. Sud Yungas, Chulumani, 2-4 km hacia Irupana, en

el declive del camino, 1600m, sobre Compositae, 13.IX.1987, *S.G. Beck 14239* (holotype: UC 1965893!; isotype: LPB 0000711!).

Iconography: Kuijt (2011), fig. 10.

According to Kuijt (2011), this species possesses odoriferous and cream-colored flowers, and is close to *Passovia ovata* (Pohl *ex* DC.) Tiegh., differing by its stem which lacks lenticels, calyculus of a smooth margin and by its long accrescent connective (horn-like). In our analyses, the inflorescences with few flowers associated it to *P. stenophylla* (Eichler) Tiegh. and *P. lobaterae* (G.Ferrari *ex* Rizzini) Caires, differing from *P. ovata* which possesses terminal and axillary compound inflorescences supporting numerous flowers.

The species is distributed in Bolivia (Kuijt 2011).

3. *Passovia bisexualis* (Rizzini) Kuijt, Plant Div. Evol. 129(2): 185, figs. 12 and 13. 2011. *Phthirusa bisexualis* Rizzini, Ernstia 24: 14. 1984. Type: VENEZUELA. AMAZONAS: Depto. Atabapo, sabanas y bosques ribereño en los alrededores de Canaripó, en la margen izquierda (Sur) del bajo Río Ventuari, a unos 20 km al E de la confluencia con el Río Orinoco, 04º03'N, 66º49'W, 98 m, 29.V.1978, *O. Huber 1864* (holotype: RB 00540532!; isotypes: NY 00285187!, VEN 000166836!). **Paratypes**: VENEZUELA. AMAZONAS: Depto. Atabapo, etiam in savanna substrato sabuloso albescente ad Caño Perro de Agua, in ripa dextra fluminis Orinoco, propter fluvium Ventuari, 20.II.1979, *O. Huber 3282* (VEN, not located). Quoque in flumini Ventuari sed ad Depto. Atures, in simili savana, 22.VIII.1978, *O. Huber 2446* (VEN, not located).

Iconography: Kuijt (2011), figs. 12 and 13.

Characterised by the long (9–20 cm), axillary and terminal lax spikes, displaying a high affinity to *Passovia brasiliana* Kuijt. It can be distinguished from that species by its elliptical leaves, 4.0–4.5 × 1.6–2.0 cm, with blackened margins, by the inflorescences as described above (composed of up to 48 pairs of triads) and by the young triads that are protected by the conspicuous bracts of the first flower, these bracts usually blackened and acute.

Collected on beaches of the Tapajós River, *igarapé*, savannah, *campo limpo* (grassy savannah), in the upper part of the floodplain zone and in sandy soil. On top of Melastomataceae and *Humiria balsamifera* (Aubl.) A.St.-Hill. (Humiriaceae).

The species is distributed in Brazil (AM, PA) and Venezuela (Kuijt 2001, 2011; Rizzini 1984).

4. *Passovia brasiliana* Kuijt, Plant Div. Evol. 129(2): 189, fig. 14. 2011. Type: BRAZIL. AMAZONAS: Itaituba - Humaitá, km 480, 06º20'S, 58º30'W, 130 m, forêt dense de terre ferme, epis de petits boutons floraux verts, parasite sur 5397, 16.II.1976, *P. Bamps 5398* (holotype: BR 521652!; isotypes: MO 05057015!, RB 00206494!, UC 1965694!).

Iconography: Kuijt (2011), fig. 14.

Characterised by the lax, short (3.5–6 cm), axillary spikes, densely covered by farinaceous suber, close to *P. bisexualis.* It is distinguishable by the presence of leaves that are elliptical-oblong, or narrow-elliptical to oblong-linear, 5.3–8.0 × 1.2–4.3 cm, with a hyaline margin, by the inflorescence that is composed of up to 25 triads, and by the young triads that are protected by the inconspicuous, brown, obtuse bracts of the first flower.

The species is distributed in Brazil (AM, RO) (Kuijt 2011).

5. *Passovia coarctata* (A.C.Sm.) Kuijt, Plant Div. Evol. 129(2): 189, fig. 15. 2011. *Phthirusa coarctata* A.C.Sm., Lloydia 2(3): 175. 1939. Type: GUIANA. Basin of Rupununi River, Karenambo, 03º45'N, perianth pale yellow, scrub savanna, 9.X.1937, *A.C. Smith 2204* (holotype: NY 00285188!; isotypes: A 00035812!, F 1017130!, G 00343939!, K 000567880!, MO 1163370!, P 00756245!, S 4459!, U 0003760!, US 00107390!).

Iconography: Kuijt (2011), fig. 15.

This species belongs to a complex composed of *Passovia micrantha* (Eichler) Tiegh., *P. murcaei* (Rizzini) Caires, *P. intermedia* (Rizzini) Caires and *P. santaremensis* (Eichler) Tiegh. In this complex, the spikes are variable, lax or congested, and the leaf apex varies from rounded, retuse, or emarginate, with or without a mucro, creating difficulties in distinguishing the species. However, we can use the well-developed spikes, larger than 1.5 cm in length, the congested triads, the thick axis with prominent bracts and elliptical (rarely ovate or spathulate), glabrous leaves, with acute or rounded apex with a mucro, and median vein abaxially prominent and farinaceous as diagnostical for *P. coarctata*. The flowers are pale yellow.

Kuijt (2011) indicates the specimen deposited in the F herbarium as the holotype of *Phthirusa coarctata*. We believe however that in this he was in error, since Albert Charles Smith worked at the New York Botanical Garden at the time of

publication. In the paragraph where he indicates the nomenclatural type Smith (1939: 176) does not mention the herbarium where it is deposited. However, analyzing several duplicate specimens, we were able to verify that only the specimen deposited in NY has the binomial handwritten on the label next to the "type" determination; in other herbaria, this information is type-written. Thus, we believe that the specimen deposited in NY should be considered the holotype.

The species is distributed in Guiana (Kuijt 2011; Smith 1939).

6. ***Passovia cordata*** Kuijt, Plant Div. Evol. 129(2): 191, fig. 16. 2011. Type: COLOMBIA. VALLE: Bajo Calima area, ca. 15 km N of Buenaventura, Cartón de Colombia concession, Juanchaco region, transition between wet and pluvial forest, 500 m, 03º56'N, 77º08'W, 27.III.1986, *A.H. Gentry et al. 53723* (holotype: UC 1965690!; isotype: MO 3393555!). **Paratype**: COLOMBIA. VALLE: Bajo Calima, Concesión Pulpapel/Buenaventura, bosque pluvial tropical, 03º55'N, 77ºW, 100 m, 12.XI.1986, *M. Monsalve B. 1235* (MO 3506158!, UC).

Iconography: Kuijt (2011), fig. 16.

This species bears an affinity with *Passovia lepidobotrys* (Griseb.) Kuijt and *P. pyrifolia* (Kunth) Tiegh. but is easily distinguishable by its sessile and cordate leaves and the bract of the triad primary flower forming a dome protecting the three flowers (see Kuijt 2011, fig. 16c).

The species is distributed in Colombia (Kuijt 2011).

7. ***Passovia diffusa*** Kuijt, Plant Div. Evol. 129(2): 193, fig. 17. 2011. Type: BOLIVIA. SANTA CRUZ: Prov. Velasco, Reserva Ecológica El Refugio, 900 m S of camping area, 14º46'17"S, 61º02'38"W, 150 m, 21.I.1995, *R. Guillén & R. Choré 2971* (holotype: USZ; isotype: UC 1965691!).

Iconography: Kuijt (2011), fig. 17.

The delicate appearance of the branches and the leaf blade morphology approach this species to *Passovia subtilis* Kuijt and *P. theloneura* (Eichler) Tiegh. However, the dense and diffuse branching, sub-alternate, narrow-elliptical leaves, acute or long-attenuate apex and base distinguish *P. diffusa*.

The species is distributed in Bolivia (Kuijt 2011).

8. ***Passovia disjectifolia*** (Rizzini) Kuijt, Plant Div. Evol. 129(2): 194, figs. 18 and 19. 2011. *Furarium disjectifolium* Rizzini, Rodriguésia 30/31: 155, tab. 24. 1956. *Phthirusa disjectifolia* (Rizzini) Kuijt, Proc. Kon. Ned. Akad. Wetensch. 93(2): 114. 1990. Type: BRAZIL. AMAZONAS: Macará, Rio Negro, capoeira, 05.IV.1947, *J.M. Pires 223* (holotype: IAN 28188; isotypes: MO 100654762, RB 00540555!, VEN 66264!).

Iconography: Rizzini (1956), tab. 24; Rizzini (1982), fig. 29; Kuijt (2001), fig. 37; Kuijt (2011), figs. 18-19.

Resembles *Passovia bisexualis* by its long inflorescences and *P. pycnostachya* (Eichler) Tiegh. by its compound inflorescences. It differs from *P. bisexualis* by presenting several aphyllous terminal internodes from which axillary spikes appear. In addition to these characteristics, it can be distinguished from *P. pycnostachya* by the sessile triads, arranged along a lateral spike with the primary flower bract forming neither a closed sheath nor a dome.

Collected in *terra firme* forest, *igapó* forest and white (regosol) or black sand *campina*, usually in sandy-clay soils. On top of *Licania emarginata* Spruce *ex* Hook.f. Chrysobalanaceae (*W.C. Steward 110*), *Gaulettia racemosa* (Benth. *ex* Hook.f.) Sothers & Prance (Chrysobalanaceae, *G.T. Prance 23481*) and *Hirtella* sp. (Chrysobalanaceae, *G.A. Black 57-19599*).

The species is distributed in Brazil (AM, PA, RR), Guiana, French Guiana and Venezuela (Kuijt 1990, 2001, 2011; Rizzini 1956, 1978, 1982, 1983, 1984).

9. ***Passovia intermedia*** (Rizzini) Caires, *comb. nov. Phthirusa intermedia* Rizzini, Ernstia 24: 18. 1984. *Cladocolea intermedia* (Rizzini) Kuijt, Fl. Venez. Guayana 6: 38. 2001. Type: VENEZUELA. BOLÍVAR: San Pedro de Las Dos Bocas, forest along river, open areas and wet savannah, 06º59'N, 62º59'W, 200m, 22.VII.1978, *R. Liesner & A.C. González 5599* (holotype: RB (two sheets: barcodes 00856508! and 00284250!)).
Cladocolea apiculata Kuijt, Brittonia 39(4): 447, fig. 1. 1987. Type: VENEZUELA. BOLÍVAR: en la sabana de La Paragua, adherida a las ramas de *Curatella americana* L., 70 m, 26.III.1940, *L. Williams 12712* (holotype: US 00151828!).

Iconography: Kuijt (1987), fig. 1.

As observed by Kuijt (1987: 447), this species presents variable features in its inflorescence and he states: "I might suggest that this is an inflorescence

in the process of evolving a bracteolate, triadic condition". Apart from some triads, the presence of bracts and bracteoles is inconsistent with the diagnosis of *Cladocolea*, and the affinity with *C. primaria* Kuijt (= *P. primarium* (Kuijt) Kuijt) suggested by Kuijt (1987) should be disregarded. The female flower morphology is identical to that presented for *P. santaremensis* (Kuijt 1987: fig. 1d-e; Kuijt 2011: fig. 22c).

The analyses suggest the inclusion of *P. intermedia* in the complex composed of *P. micrantha*, *P. murcaei* and *P. santaremensis*, distinguishing it from these by its papillose, elliptical or orbicular leaves, round or retuse apex with indistinct mucro and median vein.

The species is distributed in Venezuela (Kuijt 1987, 2001; Rizzini 1984).

10. *Passovia lepidobotrys* (Griseb.) Kuijt, Smithsonian Contr. Bot. 98: 479. 2012. *Loranthus lepidobotrys* Griseb., Fl. Brit. W. I. [Grisebach]: 311. 1860. *Phthirusa lepidobotrys* (Griseb.) Eichler, *Fl. bras*. (Martius) 5(2): 134i. 1868. Type: JAMAICA. SAINT ANNS: on road from Green Park to Brown's Town, 25.VII.1850, *R.C. Alexander* (holotype: GOET 005495!; isotype: K 000567886!).

Iconography: Fawcett & Rendle (1914), fig. 26.

Kuijt (2014) synonymises this species with *Passovia pyrifolia*. Although we consider both as related species, we can distinguish *P. lepidobotrys* by the robustness of the inflorescences, the pedicels and the bracts of the well-developed triads (larger than the flowers). In addition to these characteristics, *P. lepidobotrys* has a singular pollen type, although somewhat similar in shape to that of *Dendropemon*; it is intermediate between that of *P. pyrifolia* and that of the other species (Feuer & Kuijt 2005; Grímsson *et al.* 2018). Therefore, we accept the re-established *P. lepidobotrys*, as previously suggested by Kuijt (2012b).

The species is distributed in Jamaica (Fawcett & Rendle 1914; Grisebach 1860; Kuijt 2012b; Urban 1897).

11. *Passovia lobaterae* (G.Ferrari *ex* Rizzini) Caires, *comb. nov. Phthirusa lobaterae* G.Ferrari *ex* Rizzini, Flora de Venezuela 4(2): 47, fig. 10a,b. 1982. Type: VENEZUELA. TACHIRA: Depto. Lobatera, Carretera Palo Grande-Michelena, en la parte baja y plana, sobre *Acacia tortuosa* Willd., 21.V.1972, *L.C. de Guevara 1366* (holotype: MY 020592!).

Phthirusa subcorymbosa Rizzini, Ernstia 24: 20. 1984. Type: VENEZUELA. APURE: Distrito Pedro Camejo: lecta ad Laguna La Guacharaca, haud procul a Galeras de Cinaruco, 70 m, in silva ciliari staturae humilis, 24.II.1979, *G. Davidse & A.C. González 15657* (holotype: RB 00284261!; isotype: MO 1623460), *syn. nov.*

Passovia ensifera Kuijt, Pl. Div. Evol. 129(2): 197, fig. 20. 2011. Type: BRAZIL. AMAZONAS: Rio Preto, tributary of Rio Negro, 00º14'12"S, 65º05'23"W, 100 m, 8 km N along Rio Preto (165 km from Barcelos), 17.VIII.1996, *P. Acevedo-Rodriguez et al. 8441* (holotype: UC 1965695!; isotypes: INPA 189525!, US 00980553), *syn. nov.*

Iconography: Rizzini (1982), fig. 10a-b; Kuijt (2011), fig. 20.

Close to *P. stenophylla* (Eichler) Tiegh., differing by the papillose, well-developed connective (horn-like), and oblong or lanceolate leaves. The specimens described by Rizzini (1982, 1984) clearly represent female specimens, confirming the indication that this species is dioecious by Kuijt (2011).

The affinity between the species *Phthirusa lobaterae* and *P. subcorymbosa* was noted by Rizzini (1984) in the protologue of the latter species; he distinguished them by the angular branches as well as larger leaves and bracteoles of *P. lobaterae*. However, analyzing the type specimens we notice that both have old cylindrical stems and that the type specimen of *P. lobaterae* is clearly an older and therefore more developed portion of the plant.

Collected in savannah, *caatinga*, white sand *campina* and *igapó*. On top of *Humiria balsamifera* (Aubl.) A.St.-Hill. (Humiriaceae, *G.T. Prance 29748*).

The species is distributed in Brazil (AM, PA, RO, RR) and Venezuela (Kuijt 2011; Rizzini 1982, 1984).

12. *Passovia micrantha* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa micrantha* Eichler, *Fl. bras.* (Martius) 5(2): 65, tab. 19, fig. 9. 1868. *Struthanthus micranthus* (Eichler) Baehni & J.F. Macbr., Candollea 7: 290. 1937. *Struthanthus micranthus* (Eichler) Baehni & J.F. Macbr., Publ. Field Mus. Nat. Hist., Bot. ser. 13(2): 414. 1937, *comb. superfl. Cladocolea micrantha* (Eichler) Kuijt, Syst. Bot. 16(2): 288, figs. 1-8. 1991. Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: in vicinia Manaos,

Barra, V.1851, *R. Spruce 1782* (holotype: M = F Neg. 19048!; isotypes: K 000567889!, P 05369369!, TCD 0007495!).

Phthirusa sandwithii Maguire, Bull. Torrey Bot. Club 75(3): 302. 1948. *Cladocolea sandwithii* (Maguire) Kuijt, Syst. Bot. 16(2): 289. 1991. Type: GUIANA. Kaieteur savanna, on small bushes on rocky ground near falls, 1200 ft., 06.IX.1937, *S.W. Sandwith 1404* (holotype: NY 00022519!; isotypes: K 000567888!, U), *syn. nov.*

Phthirusa micrantha Eichler var. *bolivariensis* Rizzini, Rodriguésia 41: 12. 1976. *Phthirusa micrantha* Eichler var. *bolivariensis* Rizzini, Flora de Venezuela 4(2): 61, fig. 15. 1982, *nom. superfl.* Type: VENEZUELA. BOLÍVAR: Cerro Cotorro (El Vigía), entre La Paragua y San Pedro de las Bocas, en ladera boscosa a lo largo del Río Paragua (lado sur), 600 m, *J.A. Steyermark 86879* (lectotype designated by Rizzini (1982): VEN; isolectotype: RB).

Phthirusa bernardiana Rizzini, Rodriguésia 41: 12. 1976. Type: VENEZUELA. BOLÍVAR: crescit in silva pluviali ad flumina Ríos Icabaru e Hacha, 450-850 m, *A.L. Bernardi 2840* (fem.) (lectotype, designated by Kuijt (1991): RB; isolectotype: VEN 122807!). **Remaining syntypes**: *Phthirusa bernardiana*: VENEZUELA. BOLÍVAR, *A.L. Bernardi 2795* (masc.) (not located)

Cladocolea elliptica Kuijt, Novon 2(4): 354, fig. 2. 1992. Type: SURINAME. Wilhelmina Gebergte, Zuid river, in savanna and disturbed areas, Kayser airstrip, 45 km above confluence with Lucie river, 270 m, 24.IX.1963, *H.S. Irwin et al. 57535* (holotype: P 00756252!; isotypes: BBS, F 1843953!, NY), *syn. nov.*

Cladocolea rostrifolia Kuijt, Brittonia 61(2): 146, fig. 2. 2009. Type: BRAZIL. AMAZONAS: Manaus, river side of Rio Negro, near Ponta Negra, on shrubby zone in sandy soil, 50-60 m, 2.VIII.1987, *S. Tsugaru & Y. Sano B-646* (holotype: MO 04644092!; isotype: NY 02219699!), *syn. nov.*

Iconography: Eichler (1868), tab. 19, fig. 9; Rizzini (1982), figs. 15-16; Kuijt (1991), figs. 1-8; Kuijt (1992), fig. 2; Kuijt (2001), fig. 31.

Variation in the pattern of *Passovia micrantha* inflorescences observed by Kuijt (1991, as *Phthirusa micrantha*), sometimes presenting inflorescences reduced to a single pair of triads with a terminal flower, or sometimes presenting several pairs of triads and the androecium extremely reduced, are also observed in other species such as: *Passovia brasiliana*, *P. bisexualis* and *P. disjectifolia*.

In general, *P. micrantha* possesses very congested indeterminate inflorescences formed by triads and the presence of these reductions does not justify its placement in *Cladocolea*. In addition, pollen morphology (Grímsson *et al.* 2018) indicate its similarity to *Passovia* and not to *Cladocolea*. There is no morphological character capable of isolating *C. rostrifolia* from *P. micrantha*, as the leaf apex presented by Kuijt (2009: fig. 2b) is also observed in *P. micrantha.* However, in *Phthirusa sandwithii* and *C. elliptica*, the observed leaf variation is evident, the elliptical ones having acute or mucronate apex, differing from the other specimens which possess obovate leaves with emarginate apex. The leaf plasticity found in this group is very common, and therefore, not a reason to maintain these entities apart.

Passovia micrantha is close to *P. murcaei* but differs in its narrow leaves (3 × 1.5 cm), with 3–5 visible veins and little-developed spikes, shorter than 1 cm in length.

Collected in transition forest with wet grasslands and ruderal swamp; parasitising *Bauhinia* sp. (Fabaceae) and *Anacardium occidentale* L. (Anacardiaceae).

The species is distributed in Brazil (AM, RR), Guiana, French Guiana, Peru, Suriname and Venezuela (Kuijt 1991, 1992, 1994, 2001, 2009; Macbride 1937; Maguire 1948; Rizzini 1952, 1956, 1976, 1982; Ule 1907).

13. *Passovia murcaei* (Rizzini) Caires, *comb. nov. Phthirusa murcaei* Rizzini, Dusenia 3(6): 457. 1952. Type: BRAZIL. AMAZONAS: São Gabriel, Uaupés, flores amareladas, 31.X.1947, *J.M. Pires 823* (holotype: IAN 030295!; isotype: RB 00204579!).

Passovia biloba Kuijt, Plant Div. Evol. 129(2): 185, fig. 11. 2011. Type: VENEZUELA. AMAZONAS: Depto. Atures, right shore of Río Sipapo, Isla Chispita, via a Isla Ratón, 04º54' - 05º03'N, 67º34'46"W, bosque inundable, 20.IX.1996, *A. Castillo 3891* (holotype: UC 1965692!; isotype: VEN 301396!), *syn. nov.*

Iconography: Kuijt (2011), fig. 11.

According to Kuijt (2011), *P. murcaei* (as *P. biloba*) is close to *P. disjectifolia* when comparing the shape of the inflorescences and the merosity of the flowers; however, he cites the leaf shape as unique within the Neotropical Loranthaceae.

In our analysis, this species is close to *P. santaremensis* and *P. micrantha*, distinguished from both species by its broad leaves (7 × 5.5 cm),

abaxially protruding and farinaceous median vein, and by the visible spike ca. 1.5–2 cm in length.

The species is distributed in Brazil (AM) and Venezuela (Kuijt 2011; Rizzini 1952, 1956).

14. *Passovia myrsinites* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa myrsinites* Eichler, *Fl. bras.* (Martius) 5(2): 66, tab. 19, fig. 10. 1868. *Oryctina myrsinites* (Eichler) Kuijt, Syst. Bot. 16(2): 290, figs. 9-15. 1991. *Ixocactus myrsinites* (Eichler) Kuijt, Taxon 43: 193. 1994. Type: BRAZIL. PARÁ: Santarem, fl. Tapajoz, growing on a *Mimosa* (389), I.1850, *R. Spruce 618* (lectotype, designated by Kuijt (1991): P 00603810!, F Neg. 40218; isolectótipo: K 000651823!). **Remaining syntypes**: BRAZIL. AMAZONAS: Alto Amazonas, prope San Carlos, ad Rio Negro, X.1853, *R. Spruce 3125* (K 000852887!, P 05368941!). PARÁ: S. Carlos et Manaos, Barra, V.1851, *R. Spruce 1783* (P 05368940!).
Phthirusa savannarum Maguire, Bull. Torrey Bot. Club 75(3): 301. 1948. *Phthirusa myrsinites* Eichler var. *savannarum* (Maguire) Rizzini, Mem. New York Bot. Gard. 29: 25. 1978. Type: SURINAME. TAFELBERG: Savanna II, semi-parasite on shrub, flowers yellowish-green, immature fruit green, leaves coriaceous, 12.IX.1944, *B. Maguire 24702* (holotype: NY 00022520!; isotypes: A 00035816!, F 1286826!, K 000651822!, U 0003762!, US 00107400!).
Oryctina atrolineata Kuijt, Brittonia 55(2): 169, fig. 1. 2003. Type: GUIANA. DEMERARA: Mahica. Timehri: a proximité de l'aéroport, 06º23'N, 58º10'W, savane haute arbustive, 24.VIII.1989, *G. Cremers et al. 10912* (holotype: CAY 007308!; isotype: UC 1955565!). **Paratype**: *Oryctina atrolineata*. GUIANA. DEMERARA: East Demerara region, Yarowkabra settlement and Forestry Commission Station, ca. 6 km ESE of station, 06º30'N, 58º10'W, 1-10 m, on *Archytatea*, 23.V.1986, *J.J. Pipoly & H. Godfrey 7388* (UC, NY)

Iconography: Eichler (1868), tab. 19, fig. 10; Rizzini (1976), fig. 2; Rizzini (1978), fig. 42; Kuijt (1991), figs. 9-15; Kuijt (2001), fig. 34; Kuijt (2003a), fig. 1.

Analysis under Scanning Electron Microscopy showed that the inflorescence of *P. myrsinites* is constituted of triads grouped in a very congested inflorescence. Inflorescences with this structure, also observed in *P. intermedia* and *P. micrantha,* have caused misinterpretations over the years. Another important character for maintaining *P. myrsinites* is the presence of epicortical roots and fibres in its leaf mesophyll (Caires *et al.* 2017).

Collected in savannah environment, *capoeira* (secondary forest), gallery forest with sandy clay soil, shrubby grasslands, on top of *Hirtella* sp. (Chrysobalanaceae, *R.S. Cowan 38648*), *Licania incana* Aubl. (Chrysobalanaceae, *R.S. Cowan 38107*) and Ochnaceae.

The species is distributed in Brazil (AM, AP, PA), Guiana, French Guiana, Suriname and Venezuela (Caires *et al.* 2017; Kuijt 1991, 1994, 2001; Maguire 1948; Rizzini 1952, 1956, 1976, 1978, 1982).

15. *Passovia ovata* (Pohl *ex* DC.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Loranthus ovatus* Pohl *ex* DC., Prodr. [A.P. de Candolle] 4: 315. 1830. *Notanthera ovata* (Pohl *ex* DC.) G. Don, Gen. Hist. 3: 430. 1834. *Phthirusa ovata* (Pohl *ex* DC.) Eichler, *Fl. bras.* (Martius) 5(2): 60. tab. 19, fig. 7. 1868. *Passovia ovata* (Pohl *ex* DC.) Kuijt, Plant Div. Evol. 129(2): 200. 2011. *comb. superfl.* Type: BRAZIL. GOIÁS [Prov. "Goyas"]: prope S. Rita ad fluvium Bayagem, 1828, *Pohl* (holotype: G-DC = F Neg. 8070!; isotype: M = F Neg. 19050!).
Phthirusa papillosa Pilg., Bot. Jahrb. Syst. 33(2), Beibl. 72: 15. 1903. Type: BRAZIL. GOIÁS [Goyas]: Rio Areias, auf Bäumen, IX.1894, fl., *A.F.M. Glaziou 22022* (lectotype, designated by Kuijt & Kellogg 1996: P 05369056!; isolectotypes: B† = F Neg. 11794!, K 000567969!, P 05368998!), *syn. nov.*
Struthanthus gardnerianus Rizzini, Rev. Brasil. Biol. 10(4): 407. 1950. Type: BRAZIL. PIAUÍ: ad Paranagua, VIII.1839, fl., *G. Gardner 2632* (holotype: BM 000797637!; isotypes: K 000016629!, OXF 00084795!), *syn. nov.*
Phthirusa ovata (Pohl *ex* DC.) Eichler var. *nemorosa* Rizzini, Arq. Jard. Bot. Rio de Janeiro 24: 26. 1980. Type: BRAZIL: DISTRITO FEDERAL. Brasília, Catetinho, mata de galeria, alta, sombreada perenifolia, flores cremes, 26.X.1975, *E.P. Heringer 14872* (lectotype, *hic designatus*: UB 92999!; isolectotype: HB 64115!), *syn. nov.*

Iconography: Barboza (2000), fig. 11.

Passovia ovata has affinities with *P. robusta* and *P. pedunculata* and is distinct from both by its generally ovate leaves, acute or attenuate apex, obtuse or rounded base with terminal and/or axillary little-branched racemes. Such similarity led Kuijt & Kellogg (1996: 51) to temporarily propose *P. ovata* and *P. robusta* as synonyms of *P. pedunculata*.

Rizzini (1980: 26) did not indicate the herbarium of the *P. ovata* var. *nemorosa* holotype, but informed in the protologue that the specimens came from UB and IBGE. As we did not find any specimens deposited in RB (where Rizzini was based) and as there are no annotations by him on any of the other specimens, the UB specimen is being indicated as lectotype.

According to the author, *P. ovata* var. *nemorosa* is distinct from the type variety by its triads whose lateral flowers possess elongate pedicels (1–3 mm) and sessile median flowers, but in the material analysed both bracts and pedicels varied in size, thus not being a useful character to distinguish this variety.

The species is distributed in Brazil (DF, GO, MG, MT, PI, TO) (Barboza 2000; Glaziou 1905; Kuijt 2011; Kuijt & Kellogg 1996; Pilger 1903; Rizzini 1950, 1952, 1956, 1980).

16. *Passovia pedunculata* (Jacq.) Kuijt, Novon 23(2): 177. 2014. *Loranthus pedunculatus* Jacq., Enum. Syst. Pl. 18. 1760, *non Loranthus pedunculatus* Spreg. *ex* Steud., Nomencl. Bot. [Steudel], ed. 2, 2: 71. 1841. *Dendropemon pedunculatus* (Jacq.) Blume, Syst. Veg. 7(2): 1729. 1830, *nom. nud. Struthanthus pedunculatus* (Jacq.) G.Don, Gen. Hist. 3: 414. 1834. *Allohemia pedunculata* (Jacq.) Raf., Sylva Tell. 125. 1838. Type: COLOMBIA. CARTAGENA: Baru or Tierra Bomba, in sylvaticis, praesertim ad inundata maritima (not located, Howard 1973). PANAMA. PANAMA: seaside just W of Vera Cruz, sea level, on *Laguncularia racemosa*, 30.V.1978, *B. Hammel 3298* (neotype, designated by Kuijt (2014): MO 3135383!; isoneotypes: PMA 27256!, UC 1956357!). *Loranthus sessilis* Jacq., Enum. Syst. Pl. 18. 1760. *Struthanthus sessilis* (Jacq.) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus sessilis* (Jacq.) G.Don, Gen. Hist. 3: 414. 1834. Type: COLOMBIA. CARTAGENA: Baru or Tierra Bomba, in sylvis (not located, Howard 1973) (see Kuijt 2014: 178).

Loranthus stelis L., Sp. Pl. ed. 2, 1: 473. 1762, *non L. stelis* G. Forster, Fl. Ins. Austr. 25: 1786. *Struthanthus stelis* (L.) Blume, Syst. Veg. 7(2): 1732. 1830, *nom. nud*. *Struthanthus stelis* (L.) G.Don, Gen. Hist. 3: 414. 1834. *Phthirusa stelis* (L.) Kuijt, Taxon 43(2): 193. 1994. *Passovia stelis* (L.) Kuijt, Plant Div. Evol. 129(2): 205. 2011. Type: [VENEZUELA]. [CUMANA]: "Habitat in Cumanae arboribus" (not located). (see Kuijt, 2014: 178).

Loranthus retroflexus Ruiz & Pav., Fl. Peruv. 3: 49, t. 279a. 1802. *Struthanthus retroflexus* (Ruiz & Pav.) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus retroflexus* (Ruiz & Pav.) G.Don, Gen. Hist. 3: 415. 1834. *Phthirusa retroflexa* (Ruiz & Pav.) Kuijt, Brittonia 32(4): 521. 1980. Type: PERU. Habitat in Peruviae Andium nemoribus supra arbores et frutices ad Chinchao et Macora tractus, floret maio, junio et julio, *J.A. Pavón* (lectotype, *hic designatus*: MA 811325!; isolectotypes: MA 811326!, BM 000993512!, BM 000993513!, F 845133!, MO 1606859!).

Loranthus aduncus G. Mey., Prim. Fl. Esseq. 149. 1818. *Struthanthus aduncus* (G.Mey.) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus aduncus* (G.Mey.) G.Don, Gen. Hist. 3: 414. 1834. *Phthirusa adunca* (G.Mey.) Maguire, Bull. Torrey Bot. Club 75(3): 301. 1948. Type: SURINAME. River Essequibo, 1814, *E.C. Rodschied* (holotype: B†).

Loranthus paniculatus Kunth, Nov. Gen. Sp. [H.B.K.] 3: 442. 1818[1820]. *Loranthus tetragonus* Willd. *ex* Schult.f., Syst. Veg., ed. 15, 7(1): 131. 1829, *nom. illeg. Struthanthus paniculatus* (Kunth) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus paniculatus* (Kunth) G.Don, Gen. Hist. 3: 413. 1834. *Phthirusa paniculata* (Kunth) J.F.Macbr., Publ. Field. Mus. Nat. Hist., Bot. Ser. 11(1): 17. 1931. Type: VENEZUELA. SUCRE: Cumaná, "crescit prope Cumana, in arboribus", *F.W.H.A. Humboldt [32]* (holotype: P 00215977!; isotype: B-W 06949-010!).

Loranthus conduplicatus Kunth, Nov. Gen. Sp. [H.B.K.] 3: 441. 1818[1820]. *Loranthus anceps* Willd. *ex* Schult.f., Syst. Veg., ed. 15, 7(1): 131. 1829, *nom. illeg. Struthanthus conduplicatus* (Kunth) Martius, Flora 13(1): 105. 1830. *Notanthera conduplicata* (Kunth) G.Don, Gen. Hist. 3: 430. 1834. Type: VENEZUELA. SUCRE: Cumaná, "crescit prope Cumana et Cumanacoa, in arboribus", *F.W.H.A. Humboldt [199]* (holotype: P 00215978!; isotype: B-W 06950-010!).

Loranthus orinocensis Spreng., Syst. Veg. [Sprengel] 2: 129. 1825. *Loranthus marginatus* Kunth, Nov. Gen. Sp. Pl. (ed. 4) [H.B.K.] 3: 442, tab. 299. 1818(1820), *nom. illeg.*, non *Loranthus marginatus* Desr., Encycl. [Larmarck] 3(2): 595-596. 1792, nec *Loranthus marginatus* De Wild., Bull. Jard. Bot. Bruxelles 4: 419. 1914, *nom. illeg. Loranthus sessilis* Willd., *nom. nud. Struthanthus orinocensis* (Spreng.) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus orinocensis* (Spreng.) G.Don, Gen. Hist. 3: 413. 1834. *Phthirusa*

orinocensis (Spreng.) Eichler, *Fl. bras.* (Martius) 5(2): 60. 1868. *Passovia orinocensis* (Spreng.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. *Struthanthus aduncus* (G.Mey.) G.Don var. *orinocensis* (Spreng.) Baehni & J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13(2): 411. 1937. *Phthirusa aduncа* (G.Mey.) Maguire var. *orinocensis* (Spreng.) Steyerm., Fieldiana, Bot. 28(1): 224. 1951. Type: VENEZUELA. ad Orinoco, *F.W.H.A. Humboldt [821]* (lectotype *hic designatus*: B-W 06947-010!; isolectotype: B = F Neg. 11793!).
Loranthus magdalenae Cham. & Schltdl., Linnaea 3: 219. 1828. *Struthanthus magdalenae* (Cham. & Schltdl.) G.Don, Gen. Hist. 3: 414. 1834. *Phthirusa magdalenae* (Cham. & Schltdl.) Eichler, *Fl. bras.* (Martius) 5(2): 55, tab. 19, fig.1. 1868. *Passovia magdalenae* (Cham. & Schltdl.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. *Phthirusa adunca* (G.Mey.) Maguire var. *magdalenae* (Cham. & Schltdl.) Rizzini, Fl. Venez. 4(2): 79. 1982. Type: 1822, *C.L.G. Bertero* ("vermutlich eine Pflanze von Bertero ...") (holotype: G-DC = F Neg. 8065!; isotype: B† = F Neg. 11792!, M).
Loranthus theobromae Willd. *ex* Schult.f., Syst. Veg. 7(1): 132. 1829. *Struthanthus theobromae* (Willd. *ex* Schult.f.) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus theobromae* (Willd. *ex* Schult.f.) G.Don, Gen. Hist. 3: 411. 1834. *Phthirusa theobromae* (Willd. *ex* Schult.f.) Eichler, *Fl. bras.* (Martius) 5(2): 56, tab. 14, fig.1. 1868. *Passovia theobromae* (Willd. *ex* Schult.f.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: BRAZIL. PARÁ: "ad Para Brasil ubi herva dos passeros, in Theobromate cacao", *J.C. Hoffmannsegg* (holotype: B-W 06945-010!, 06945-020, fragmented). BRAZIL. AMAZONAS [Prov. Rio Negro]: in sylvis Yapurensibus, *C.F.P. Martius* (neotype, designated by Kuijt & Kellogg 1996: M).
Loranthus avicularius Mart., Syst. Veg. 7(1): 132. 1829. *Struthanthus avicularius* (Mart.) Mart., Flora 13(1): 105. 1830. Type: BRAZIL ["In Brasilia frequens"], not located.
Loranthus virgatus Mart., Syst. Veg. 7(1): 132. 1829. *Struthanthus virgatus* (Mart.) Mart., Flora 13(1): 105. 1830. *Phthirusa virgata* (Mart.) Eichler, *Fl. bras.* (Martius) 5(2): 55, tab. 19, fig. 2. 1868. *Passovia virgata* (Mart.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: Rio Negro, habitat in silvis Yapurensibus, *C.F.P. Martius* (holotype: M = F Neg. 19052!).
Loranthus erythrocarpus Mart., Syst. Veg. 7(1): 138. 1829. *Struthanthus erythrocarpus* (Mart.) Mart., Flora 13(1): 105. 1830. *Phthirusa erythrocarpa* (Mart.) Eichler, *Fl. bras.* (Martius) 5(2): 58. tab. 19, fig. 4. 1868. *Passovia erythrocarpa* (Mart.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: Rio Negro, in silvis montis Arara-Coara, *C.F.P. Martius* (holotype: M = F Neg. 19046!).
Loranthus nitens Mart., Syst. Veg. 7(1): 150. 1829. *Struthanthus nitens* (Mart.) Mart., Flora 13(1): 105. 1830. *Phthirusa nitens* (Mart.) Eichler, *Fl. bras.* (Martius) 5(2): 59. tab. 19, fig. 5. 1868. *Passovia nitens* (Mart.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: in silvis ad Manaos, Barra do Rio Negro, *C.F.P. Martius* (holotype: M = F Neg. 19049!), *syn. nov.*
Loranthus flexistylus Miq., Linnaea 18(1): 65. 1844. Type: SURINAME. Paramaribo: on *Crescentia cujete*, IV, *H.C. Focke 765 on Hibiscus* (lectotype *hic designatus*: U 0123425!; isolectotypes: HAL 0111242!, K 000567974!), *syn. nov.*
Passovia suaveolens H.Karst., Bot. Zeitung (Berlin) 4(6): 102 1846. [*Passavia suaveolens*]. (see Kuijt 2011).
Passovia odorata H.Karst., Bot. Zeitung (Berlin) 10(18): 305, Taf. IV, 1852 [Passowia]. Type: COLOMBIA. Puerto Cabello, *H. Karsten* (holotype: not located; lectotype, *hic designatus*: Taf. IV, published by Kastern in Bot. Zeitung (Berlin) 10(18), 1852).
Phhirusa theobromae f. *parvifolia* Eichler, *Fl. bras.* (Martius) 5(2): 57. 1868. Type: BRAZIL. PIAUÍ [Prov. "Piauhy"]: *G. Gardner 2181a* (lectotype, *hic designatus*: P 00756241!).
Phthirusa polystachya Eichler, *Fl. bras.* (Martius) 5(2): 57, tab. 19, fig. 3. 1868. *Passovia polystachya* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. *Struthanthus eichleri* J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. ser. 13(2): 412. 1937. Type: BRAZIL. PARÁ [Prov. Paraënsis]: Serra de Santarem, on *Inga* (1015), VIII.1850, *R. Spruce 1018* (lectotype *hic designatus*: P 00756236!; isolectotypes: B† = F Neg. 11797!, K 000567968!, NY 00285196!, TCD 0007515!).
Phthirusa adenostemon Eichler, *Fl. bras.* (Martius) 5(2): 58, tab. 14, fig. 2. 1868. Type: BRAZIL. AMAZONAS: Prope Panuré ad Rio Uaupés, X.1852-I.1853, *R. Spruce 2906* (lectotype *hic designatus*: BR 517669!; isolectotypes: K 000567973!, K 000567972!, P 00756240!, TCD 0007498!).

Phthirusa abdita S.Moore, Trans. Linn. Soc. London, Bot. Ser. 2, 4: 450. 1895. Type: BRAZIL. MATO GROSSO: crescit ad Santa Cruz, super *Helicterem guazumaefoliam*, itaque in eodem loco super Malpighiaceae, *S. Moore 594* (holotype: NY 00285185!; isotypes: B† = F Neg. 11787!, K 000567971!, P 05368958!, R 000006500!).

Phthirusa bauhinae S.Moore, Trans. Linn. Soc. London, Bot. Ser. 2, 4: 451. 1895. Type: BRAZIL. MATO GROSSO: crescit ad Santa Cruz, super *Bauhinia cumanense* et plantam ignotam verisimiliter *Vochysiaceae quandam*, *S. Moore 749* (holotype: NY 00285186!; isotypes: B† = F Neg. 11789!, K 000567882!), *syn. nov.*

Phthirusa jamaicensis Krug & Urb., Bot. Jahrb. Syst. 24(1): 15. 1897. *Loranthus avicularius* Kunth *ex* Griseb., Fl. Brit. W.I. [Grisebach] 749. 1864, *nom. illeg.*, *non L. avicularius* Mart., Syst. Veg. 7(1): 132. 1829. *Passovia jamaicensis* (Krug & Urb.) Kuijt, Smithsonian Contr. Bot. 98: 479. 2012. Type: JAMAICA. *W. Purdie* (holotype: K 000567887!).

Phthirusa seitzii Krug & Urb., Bot. Jahrb. Syst. 24(1): 16. 1897. Type: TOBAGO: inter castellum et portum Gomez ab arboribus dependens, 21.X.1889, *H.F.A. Eggers 5521* (lectotype, *hic designatus*: P 00756239!; isolectotypes: K 000567885!, L 0837550!, L 0837546!, L 1675481!, P 00756237!, P 00756238!, US 00107402!). **Remaining syntypes**: TOBAGO. *A. Seitz 69* (not located). TRINIDAD. Saint Annes: in Queens Park, VIII. *Bot. Gard. Herb. 6100* (not located). SURINAME. *H.R. Wullschlaegel 226* (not located).

Phoradendron tafallaeoides Rusby, Bull. New York Bot. Gard. 4(14): 441. 1907. Type: BOLIVIA, *M. Bang 2554* (holotype: NY 00029697!), *syn. nov.*

Phthirusa orbicularis Rusby *ex* De Wild., Pl. Nov. Herb. Hort. Then. 2(2): 57, pl. 74. 1909. Type: COLOMBIA. District de Santa Marta, *H.H. Smith 2513* (lectotype, *hic designatus*: F 139220!; isolectotype: MO), *syn. nov.*

Phthirusa cochliostyla Ule, Notizbl. Königl. Bot. Gart. Berlin 59(6): 288. 1915. Type: BRAZIL. AMAZONAS: Rio Branco, Serra de Mairarí, 900 m, II.1909, *E. Ule 8385* (holotype: B† = F Neg. 11790!; lectotype *hic designatus*: IAN 52451!, isolectotypes: MG 13457!).

Phthirusa amazonensis Weir, Dept. Bull. U.S.D.A. 1380: 95, pl. 24. 1926. Type: BOLIVIA. RIBERALTA: Rio Beni, on *Hevea brasiliensis*, 30.IX.1923, *J.R. Weir* (holotype: US 01108403!; isotype: US 01108404!).

Phthirusa angulata K.Krause, Recueil. Trav. Bot. Néerl. 22: 344, fig. 4. 1926. Type: SURINAME. fluv. Coppenama pr. Onobidi, 04.III.1915, *J.W. Gonggrijp & G. Stahel 1104* (holotype: U 0003759!), *syn. nov.*

Phthirusa glandulosa Rusby *ex* R.Knuth, Repert. Spec. Nov. Regni Veg. Beih. 43: 302. 1927. Type: COLOMBIA. Santa Marta, 100 ft., 11.VII.1903, *H.H. Smith 1291* (holotype: K 000567961!; isotype: F 138218!, P 05369033!), *syn. nov.*

Phthirusa elongata Gleason, Bull. Torrey Bot. Club 58(6): 357, fig. 4c. 1931. Type: VENEZUELA. ESMERALDA: middle Camp, 500 ft., VIII.1928-IV.1929, *G.H.H. Tate 946* (holotype: NY 00285189!).

Phthirusa punctata Gleason, Bull. Torrey Bot. Club 58(6): 359, fig. 4b. 1931. Type: VENEZUELA. Savanna Hills, South bank of Caño Negro, 4,400 ft., on number 535 [*Archytaea multiflora* Bentham], 4,400 ft., *G.H.H. Tate 853* (holotype: NY 00285199!; isotype: US 00107398!).

Phthirusa tortuosa A.C.Sm., Bull. Torrey Bot. Club 59(9): 514. 1932. Type: COLOMBIA. HUILA: on the plain between Río Cabrera to Villavieja, 500-550 m, 26.VII.1917, *H.H. Rusby & F.W. Pennell 377* (holotype: NY 00285205!; isotypes: GH 00035818!, US 00107412!).

Phthirusa gonioclada A.C.Sm., Bull. Torrey Bot. Club 59(9): 515. 1932. Type: COLOMBIA. NORTE DE SANTANDER: western side of Culugá Valley, north of Labateca, open hillside, 1,480-1,550 m, 12.III.1927, *E.P. Killip & A.C. Smith 20537* (holotype: NY 00285191!; isotypes: A 00035814!, GH 00035813!, N, US 00107391!). **Paratype**: COLOMBIA. NORTE SANTANDER: dense woods in Pica-Pica Valley, above Tapatá, north Toledo, 2,100-2,400 m, *E.P. Killip & A.C. Smith 20020* (NY).

Phthirusa krukovii A.C.Smith, Brittonia 2: 146. 1936. Type: BRAZIL. PARÁ: near Bocca do Paru, VIII.1934, *B.A. Krukoff 5938* (holotype: NY 00285194!; isotypes: A 00035815!, F 873498!, GH, K 000567970!, MICH 1111661!, S 4460!, U 0003761!, US 00107394!).

Phthirusa adenostemon Eichler var. *huberi* Rizzini, Dusenia 3(6): 458. 1952. Type: BRAZIL. PARÁ: Arumanduba, Miritizal, 3.V.1903, *A. Ducke* (holotype: MG 3552!).

Phthirusa maritima Rizzini, Rev. Fac. Agron. (Maracay) 8(3): 92. fig. 9. 1975. Type: VENEZUELA. FALCÓN: Distr. Silva, crescit super arbusculas in insulis coralliferis prope Cayo Borracho et Caño Ramadita, 28.VIII.1974, *J.A. Steyermark & B.J. Manara 110306* (holotype: RB

00854710!). **Paratypes**: VENEZUELA. FALCÓN: Distrito Silva, Saline flats and manglares, at Caño Ramadita, 4,7 km north of Boca de Aroa, 10º44'N, 68º20'W, 3 m, 01.IX.1974, *J.A. Steyermark & B.J. Manara 110514* (RB 00540529!); Distrito Silva, Cayo Sal, northeast of Chichiriviche, 1 m, 10º58'N, 68º15'W, 28.VIII.1974, *J.A. Steyermark & B.J. Manara 110328* (RB 00540530!).

Phthirusa adunca (G.Mey.) Maguire var. *rigidifolia* Rizzini, Bol. Soc. Venez. Ci. Nat. 32(132/133): 326. 1976. Type: VENEZUELA. BOLÍVAR: Meseta del Jaua, Cerro Jaua, selva de galeria al borde del tributario del río Marajano, 04º48'50"N, 64º34'10"W, 1,750-1,800 m, 22-28.II.1974, *J.A. Steyermark et al. 109290* (holotype: RB 00206484!; isotype: VEN 98179!).

Phthirusa pedicularis Rizzini, Fl. Venez. 4(2): 51. 1982. Type: VENEZUELA. APURE: Distrito Pedro Camejo, 27 km directly (in a straight line) WSW of Paso de Cinaruco, along the banks of the Río Cinaruco, 06º31'N, 67º45'W, 65 m, tall (25-30 m) well developed gallery forest on the south side of the river, parasite on 12537, 2-3.V.1977, *G. Davidse & A.C. González 12536* (holotype: RB 00284258!; isotypes: MO 1622123, VEN 132496!), *syn. nov.* **Paratypes**: VENEZUELA. APURE: Distrito Pedro Camejo, banks of the Río Orinoco on Isla Poyatón opposite the Serranía de Baraguán on the Apure side of Estrecho de Baraguán of the Río Orinoco, 07º02'N, 67º05'W, 27.IV.1977, *G. Davidse & A.C. González 12230A* (MO 1622128); 2.5 km up-stream from the mouth of the Río Capanaparo, 07º10'N, 67º03'W, 05.V.1977, *G. Davidse & A.C. González 12672* (MO 1622131, RB 00207673!); banks of the Río Capanaparo between caños La Pica and La Guardia, 06º54'N, 67º18'W, 06.V.1977, *G. Davidse & A.C. González 12726* (MO 1236922); 4 km directly NE of El Betun along the banks of the Río Capanaparo, 06º58'N, 67º49'W, 11.V.1977, *G. Davidse & A.C. González 13024* (MO 1622130, RB 00207699!).

Phthirusa pyramidalis Rizzini, Fl. Venez. 4(2): 54. 1982. Type: VENEZUELA. MIRANDA: Distrito Páez, ca. de 1-2 km upstream from the mouth of the río Chiquito at its intersection with the Río Caura, S of El Gaupo, secondary growth along the river, 100 m, 03.VI.1977, *G. Davidse & A.C. González 13591* (holotype: RB 00284260!; isotypes: MO 1623063, P 05096439!, VEN 132492!).

Phthirusa anastyla Rizzini, Fl. Venez. 4(2): 69. 1982. Type: VENEZUELA. FALCÓN. Distrito Colina, a lo largo del Río Macoruca, Las Barancas (zona de represa), 300 m, 12.II.1977, *J.A. Steyermark & A. González 113765* (holotype: RB 00284245!; isotype: VEN 132282!).

Phthirusa schneeana G.Ferrari *ex* Rizzini, Flora de Venezuela 4(2): 70. 1982. Type: VENEZUELA. Edo. Aragua: Maracay, hemiparásita sobre almendrón, 29.VII.1964, *G. Ferrari 44* (holotype: MY 007013!), *syn. nov.* **Paratype**: VENEZUELA. GUARICO: Distrito Infante, *H. Zerpa* (not located).

Phthirusa adunca (G.Mey.) Maguire var. *magdalenae* (Cham. & Schltdl.) Rizzini f. *magnifolia* Rizzini, Fl. Venez. 4(2): 81. 1982. Type: VENEZUELA. MIRANDA: Vista Linda, al SE de Urb. Vista Linda, al E de Urb. Alto Hatillo, en las cabeceras del Río Guarita, laderas y quebradas con restos de selva transicional, 10º26'N, 66º49'W, 1,100 m, 10.VIII.1975, *J.A. Steyermark & P. Berry 111889* (holotype: RB 00540526!; isotype: VEN).

Phthirusa cothurnata Rizzini, Ernstia 24: 16. 1984. Type: VENEZUELA. DELTA AMACURO: Depto. Tucupita, Caño Jota-Sabuca, between Laguna del Consejo and Caño Mariusa, north of Río Grande of Río Orinoco, 50 m, 24.X.1977, *J.A. Steyermark et al. 115315* (holotype: RB 00284247!; isotypes: MO 3017080!, VEN 173138!). **Paratypes**: VENEZUELA. DELTA AMACURO: Depto. Pedernales, along Caño Angosturita SE of Pedernales, mangrove formation, 09º55'N, 62º08'W, 50 m, 6.X.1977, *J.A. Steyermark et al. 114293* (P 05152940!, RB 00540527!, VEN 255177!).

Phthirusa perdivergens Rizzini, Ernstia 24: 19. 1984. Type: VENEZUELA. TACHIRA: Quebrada La Lejia, south of Quebrada Agua Azul, along and above stream on steep slopes, 15-16 km SE of Delicias, 07º30'N, 72º24'W, 2,150-2,300 m, 25.VII.1979, *J.A. Steyermark & R. Liesner 118565* (holotype: RB 00284259!; isotype: VEN 140097!).

Phthirusa rubromicans Rizzini, Ernstia 32: 10, fig. 4. 1985. Type: VENEZUELA. AMAZONAS: Cerro Cariche, sandstone hill near left bank of Río Orinoco, half way between Tama Tama and San Antonio, escarpment edge, 125-150 m, 29.VII.1959, *J.J. Wurdach & L.S. Adderley 43673* (holotype: VEN 174854!; isotype: RB 00207981!), *syn. nov.* Paratypes: VENEZUELA. AMAZONAS: Praeterea, Cerro Yapacana, Rio Orinoco, floribus in vivo albis, masculis partim sterilibus, filamentis minus papillosis, habitu scandens, 02.I.1951, *B. Maguire et al. 30628* (VEN).

Phthirusa steyermarkiana Rizzini, Ernstia 32: 10. 1985. Type: VENEZUELA. DISTRITO FEDERAL: Depto. Libertador, beach area at

west end of playa of Chichiriviche, 10º33'15"N, 67º14'45"W, 10.X.1976, *J.A. Steyermark & V.C. Espinoza 112735* (holotype: VEN 159247!; isotype: RB 00540531!), *syn. nov.*

Phthirusa geniculifera Rizzini & A.Mattos, Revista Brasil. Biol. 46(2): 319, fig. 2. 1986. Type: BRAZIL. BAHIA: habitat ad Santo Inácio, in Caatinga substrato sabuloso, 03.XII.1980, *A. Furlan et al. 368* (holotype: RB 00284249!; isotype: SPF 22456!), *syn. nov.*

Phthirusa delicatula Rizzini, Revista Brasil. Biol. 47(3): 456. 1987. Type: VENEZUELA. DISTRITO FEDERAL: Colinas de Bello Monte, Arboretum de la Escuela de Biología, bosque seco premontano, parasitando *Capparis*, 10º28'N, 66º53'W, 1,100 m, 08.VI.1981, *A. Castillo 1072* (holotype: RB 00540623!; isotype: VEN 285840!), *syn. nov.*

Phthirusa verruculosa Rizzini, Revista Brasil. Biol. 47: 456. 1987. Type: VENEZUELA. AMAZONAS: Depto. de Atures, bosque húmedo del Río Cataniapo, con la desembocadura con el Río Orinoco, 06º25'N, 67º25'W, 37 m, 24.VII.1981, *A. Castillo 1325* (holotype: RB 00540625!; isotype: VEN 227896!), *syn. nov.*

Iconography: Ruiz & Pavón (1802), t. 279a; Bonpland *et al.* (1820), tab. 299; Eichler (1868), tab. 14; Engler (1889), fig. 123; Warburg (1905), fig. 5; Wildeman (1909), plate 74; Engler & Krause (1935), fig. 91; Martins Jr. (1972), fig. 1; Rizzini (1982), fig. 17; Burger & Kuijt (1983), fig. 6; Kuijt (1986), figs. 21-22; Kuijt (2001), fig. 36; Kuijt (2002), fig. 170.

Among the species of *Passovia*, this is the most polymorphic and the most widely distributed. It is characterised by branches with a delicate appearance (when compared to those of *P. robusta* and *P. ovata*), extremely variable leaves (ovate, ovate-lanceolate, lanceolate, elliptical), usually with an obtuse base and acute, acuminate or cuspidate apex. Its inflorescences are paniculate, resembling those of *P. robusta* and *P. ovata*, where numerous pairs of pedunculate triads are distributed along a branched terminal axis (rarely axillary).

Kuijt (2011) maintains *Passovia nitens* as a different species, however, our analyses of the type material indicate that it is a male specimen of *P. pedunculata*.

Struthanthus pseudolepidotus Rizzini has been included as a likely synonym for *P. nitens* by Kuijt (2001: 44, 47, fig. 38), but our analysis of the type material leaves no doubt that it is indeed a *Struthanthus* and therefore this proposal of synonymy should be rejected as well as the illustration presented by Kuijt (2001: 47, fig. 38) which clearly represents *S. pseudolepidotus* (*J.J. Wurdack & L.S. Adderley 43482* - RB!) and holds no resemblance to the *L. nitens* type material whatsoever (F. Neg. 19049!).

The various synonyms can be analysed by using the works of Kuijt (2001, 2011, 2014) and Kuijt & Kellogg (1996).

The species is distributed in Bolivia, Brazil (AC, AM, AP, BA, MA, MG, MT, PA, PI, RR), Costa Rica, Colombia, Ecuador, Guiana, French Guiana, Jamaica, Panama, Peru, Suriname, Trinidad & Tobago and Venezuela (Arbeláez & Callejas 1999; Burger & Kuijt 1983; Dueñas-Gómez & Franco-Roselli 2001; Engler 1889, 1897; Fawcett & Rendle 1914; Glaziou 1905; Gleason 1931; Kuijt 1978, 1980, 1986, 1994, 2001, 2002, 2008, 2011, 2012a,b, 2014; Kuijt & Kellogg 1996; Macbride 1931, 1937; Maguire 1948; Maguire & Rizzini 1972; Martins Jr. 1972; Moore 1895; Pilger 1903; Pulle 1906; Rizzini 1952, 1956, 1961, 1975, 1978, 1982, 1984, 1985, 1987; Rizzini & Mattos-Filho 1986; Rusby 1907; Sáenz 1997; Smith 1932; Steyermark 1951; Ule 1907,1915; Urban 1897; Warburg 1905).

17. *Passovia pycnostachya* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa pycnostachya* Eichler, *Fl. bras.* (Martius) 5(2): 62. 1868. *Passovia pycnostachya* (Eichler) Kuijt, Plant Div. Evol. 129(2): 200, fig. 21. 2011, *comb. superfl.* Type: GUIANA FRANCESA [Habitat in Guyana gallica]. *P.A. Poiteau* (holotype: P 00756242!).

Phthirusa monetaria Sandwith, Bull. Misc. Inform. Kew 1932(5): 227. 1932. Type: GUIANA. MORABALLI CREEK: Essequibo River, near Bartica, 20.IX.1929, *N.Y. Sandwith 313* (holotype: K 000567878!; isotypes: B, NY 00285195!, RB 00284252!, RJ, U 0097259!), *syn.nov.* **Paratypes**: GUIANA. Moraballi Creek, Essequibo River, 1929, *N.Y. Sandwith 421* (not located); Near Bartica, Essequibo River, 1886-7, *G.S. Jenman 2534* (not located); *G.S. Jenman 3635* (not located); *G.S. Jenman 3639* (not located); Demerara River, 1889, *G.S. Jenman 5344* (not located).

Struthanthus umbellatus Kuijt, Proc. Kon. Ned. Akad. Wetensch. 93(2): 126, fig. 7. 1990. Type: GUIANA FRANCESA: route du Tour de 1'Ile de Cayenne, RN 2, Savanne du PK 16, 28.III.1986, *G. Cremers 9424* (holotype: CAY 027897!; isotypes: P 00077222!, UC 1955641!). **Paratypes**: GUIANA FRANCESA. SE Cayenne: Pont de la RN 2 sur

la Comté, sur une manguier, *J.J. Granville 3228* (CAY 027899!, UC); SURINAM. katiam kama man (Ndjuka), Man kaba, 18.08.1985, *M. Sauvain 468* (CAY 027900!, UC).

Iconography: Kuijt (1990), fig. 7; Kuijt (2011), fig. 21.

Close to *P. disjectifolia*, distinguished by its pedunculate triads, congested at the apex of the inflorescence axis, and the primary flower bract forming a dome. Some specimens analyzed (*e.g.*, *H.S. Irwin et al. 48462*, IAN) have the aphilary terminal branches with up to six internodes from which inflorescences appear covered with farinaceous brown cork, and whose triads have a corymbiform appearance.

Found in forest environment, on top of *Hirtella glandulosa* Spreng. and *H. racemosa* Lam. (Chrysobalanaceae - *H.S. Irwin et al. 48463*).

The species is distributed in Brazil (AP), Guiana, French Guiana (Kuijt 1990, 1994, 2002, 2011; Rizzini 1952, 1956; Sandwith 1932).

18. *Passovia pyrifolia* (Kunth) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia pirifolia*]. *Loranthus pyrifolius* Kunth, Nov. Gen. Sp. [H.B.K.] (quarto ed.) 3: 441. 1818[1820], *non L. pyrifolius* Willd. *ex* Schult.f., Syst. Veg., ed. 15 bis, 7(2): 1647. 1830, *nom. illeg*. *Loranthus hoffmannseggianus* Schult.f., Syst. Veg., ed. 15 bis, 7(1): 113. 1829, *nom. illeg. Loranthus verticillatus* Hoffmanns. *ex* Schult.f., Syst. Veg., ed. 15 bis, 7(1): 113. 1829, *nom. illeg. Struthanthus pyrifolius* (Kunth) Blume, Syst. Veg. 7(2): 1731. 1830, *nom. nud*. *Struthanthus pyrifolius* (Kunth) G.Don, Gen. Hist. 3: 413. 1834. *Phthirusa pyrifolia* (Kunth) Eichler, *Fl. bras.* (Martius) 5(2): 63, tab. 17. 1868. Type: COLOMBIA. CAUCA: "crescit in calidis Provinciae Popayanensis, prope Carthago, on *Crescentia cujete*, alt. 500 hex., floret octobri", *F.W.H.A. Humboldt* [*1872*] (holotype: P 00215979!; isotypes: B-W 06951-010!, F Neg. 11796!).

Loranthus macrostachys Willd. *ex* Schult.f., Syst. Veg., ed. 15 bis, 7(1): 162. 1829. Type: Herb. Willdenow (holotype: B-W 06980-010!).

Loranthus affinis Mart., Syst. Veg. 7(1): 151. 1829. *Struthanthus affinis* (Mart.) Mart., Flora 13: 105. 1830. Type: BRAZIL. AMAZONAS: Rio Negro, in sylvis Japurensibus, *C.F.P. Martius* (not located).

Loranthus subcampestris Mart., Syst. Veg. 7(1): 151. 1829. *Struthanthus subcampestris* (Mart.) Mart., Flora 13: 105. 1830. Type: BRAZIL. MINAS GERAIS [Provinciae Minas Geraes]: in campis, *C.F.P. Martius* (not located).

Loranthus catocarpus Benth., Pl. Hartw. [Bentham] 190. 1845. Type: COLOMBIA. in arboribus prope Popayan, 1843, *T. Hartweg 1045* (lectotype *hic designatus*: K 000567964!; isolectotypes: K 000567963!, LD 1228935!), *syn. nov.*

Phthirusa pyrifolia (Kunth) Eichler var. *grandifolia* Eichler, *Fl. bras.* (Martius) 5(2): 63. 1868. Type: BRAZIL. PARÁ: circa Santarem, *R. Spruce 738* (lectotype, designated by Kuijt (1994): M), *syn. nov.*

Phthirusa pyrifolia (Kunth) Eichler var. *intermedia* Eichler, *Fl. bras*. (Martius) 5(2): 63. 1868. (lectotype *hic designatus*: tab. 17 in Eichler *Fl. bras*. (Martius) 5(2): 63 "*Huc tabula nostra*", 1868), *syn. nov.*

Phthirusa pyrifolia (Kunth) Eichler var. *parvifolia* Eichler, *Fl. bras.* (Martius) 5(2): 63. 1868. Type: BRAZIL. PARÁ [Prov. Pará]: *e.g.*, circa Santarem, *R. Spruce 178* (lectotype, designated by Kuijt (1994): M), *syn. nov.*

Struthanthus lehmannii Engl., Nat. Pflanzenfam. Nachtr. [Engler & Prantl] 1: 134. 1897. Type: COLOMBIA [N. Granat.]. *F.C. Lehmann 8273* (holotype: B† = F. Neg. 3291!; lectotype, *hic designatus*: F V0199059F!), *syn. nov.*

Phthirusa platyclada Ule, Verh. Bot. Vereins Prov. Brandenburg 48: 153. 1907. *Struthanthus platycladus* (Ule) Bahenni & J.F. Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13(2): 413. 1937. Type: [BRAZIL]. Schumarotzer auf Gesträuch am Lago de Esperança unweit Juruá Miry, VIII.1901, *E. Ule 5713* (holotype: B† = F Neg. 11795!, lectotype, *hic designatus*: HBG 522992!), *syn. nov.*

Phthirusa heterophylla Rusby, Bull. New York Bot. Gard. 6(22): 500. 1910. Type: BOLIVIA. SAN BUENA VENTURA: a slender shrub, 1,400 ft., 13.XI.1901, *R.S. Williams 667* (holotype: NY 00285193!; isotype: US 00107393!), *syn. nov.*

Phthirusa brasiliensis Weir, Dept. Bull. U.S.D.A. 1380: 95, pl. 25. 1926. Type: BRAZIL. AMAZONAS: Río Madeira, Urucurituba, on *Hevea brasiliensis*, 28.VIII.1923, *J.R. Weir* (holotype: US 01108405!; isotype: K 000567881!).

Phthirusa pyrifolia (Kunth) Eichler var. *terminalis* J.F.Macbr., Candollea 5: 349. 1934. *Struthanthus pyrifolius* (Kunth) G.Don var. *terminalis* (J.F.Macbr.) J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. ser. 13(2): 414. 1937. Type: PERU. SAN MARTÍN: San Roque, 1,350-1,500 m, I-II.1930, *L. Williams 7482* (holotype: F 626233!), *syn. nov.*

Phoradendron gentlei Trel., Publ. Field Mus. Nat. Hist., Bot. Ser. 12: 410. 1936. Type: BELIZE. parasite on 506, *P.H. Gentle 505* (holotype: MICH 1111466!), *syn. nov.*
Struthanthus minutiflorus Lundell, Field & Lab. 13(1): 1. 1945. Type: BELIZE. TOLEDO: on river bank Botan Creek, Rio Grande, "scorn de earth" on tree, 22.V.1944, fl., *P.H. Gentle 4633* (holotype: LL 00370518!; isotypes: F 1988077!, S 5969!, TEX 00370518!), *syn. nov.*

Iconography: Eichler (1868), tab. 17; Wildeman (1909), plate 73; Rizzini (1961), fig. 76; Martins Jr. (1972): fig. 2; Kuijt (1964), fig. 12; Burger & Kuijt (1983), fig. 6; Kuijt (1986), fig. 18.

This is the second species of *Passovia* with a wide geographical distribution. Even with some variation in its morphology and degree of development, the species clearly maintains its diagnostical characters, which are: young stems, petioles, margins and median vein of the leaf, in addition to the floral axes, covered in a brown farinaceous cover, axillary, simple, racemose inflorescences, supporting pedunculate triads, with flowers generally facing down; the petals are vinaceous and, in general, the anthers are whitish.

Recorded on top of several hosts, and in Brazil found on top of Combretaceae, Myrtaceae, Sapotaceae and Solanaceae.

The species is distributed in Belize, Bolivia, Brazil (AC, AM, AP, CE, DF, ES, MT, PA, PB, PE, RR, TO), Colombia, Costa Rica, El Salvador, Ecuador, Guiana, French Guiana, Honduras, Mexico, Panama, Peru, Suriname and Venezuela, including Jamaica, Tobago (Burger & Kuijt 1983; Dueñas-Gómez & Franco-Roselli 2001; Engler 1897; Glaziou 1905; Hieronymus 1895; Kuijt 1964, 1978, 1986, 1994, 2001, 2002, 2008, 2011, 2012b; Macbride 1934, 1937; Maguire 1948; Martins Jr. 1972; Pulle 1906; Rizzini 1952, 1956, 1961, 1980, 1982; Rusby 1900, 1910; Sáenz 1997; Standley 1931, 1937; Standley & Calderón 1925; Standley & Record 1936; Standley & Steyermark 1946; Ule 1907; Urban 1897; Yuncker 1930).

19. *Passovia robusta* (Rusby) Kuijt, Plant. Div. Evol. 129(2): 202, fig. 9. 2011. *Phthirusa robusta* Rusby, Bull. New York Bot. Gard. 6(22): 501. 1910. Type: BOLIVIA. SANTA CRUZ: 5,000 ft., 24.VIII.1902, *R.S. Williams 1503* (lectotype, *hic designatus*: NY 00285202!; isolectotypes: K 000567959!, NY 00285201!, US 00107399!).
Phthirusa caucana Eichler, *Fl. bras.* (Martius) 5(2): 60. 1868. *nom. nud*. Type: COLOMBIA. CAUCA: near La Paita, 13.V.1853, *I.F. Holton 651* (lectotype, *hic designatus*: K 000567962!; isolectotypes: F 1546913!, F Neg. 27830!, P 05369091!), *syn. nov.*

Iconography: Kuijt (1986), figs. 19-20; Kuijt (2015), fig. 19.

This species' robust appearance with clearly elliptic leaves (10–17 × 4–8 cm) and long petioles (2.5–3 cm long) sets this species apart. In our analysis it resembles *Passovia ovata* and *P. pedunculata*; its affinity to the latter was also observed by Kuijt (1986). Kuijt & Kellogg (1996: 51) temporarily considered *P. robusta* a probable synonym of *P. pedunculata*, but *P. robusta* was later reestablished by Kuijt (2011).

Considering the information that Robert Statham Williams was a botanist at the New York Botanical Garden (Rusby 1910: 487), the holotype was cited by Kuijt & Kellogg (1996: 51) and Kuijt (2011: 202) for the NY herbarium. However, there are two specimens of collection *Williams 1503* deposited in NY, so we are carrying out the second step of lectotypification according to Art. 9.17 (Turland *et al.* 2018) and have chosen the specimen NY 00285202, with flower buds, over the specimen NY 00285201, with only fruits, thus enhancing the match with the generic circumscription.

The name *Phthirusa caucana* was published in a note by Eichler (1868: 60) in which he indicated a type ("*Flora Neo-Granatino-Caucana prope La Paita a cl. Holton lecta*"), noted its affinity with other species and provided a good diagnosis. However, Kuijt & Kellogg (1996: 50) did not consider the name as validly published, taking into account the sentence of Eichler (1868: 60): "*Phth. caucana pro tempore nobis vocata*". We consider this interpretation of Kuijt & Kellogg (1996) correct based on Art. 36.1 (ex. 6) of the Code (Turland *et al.* 2018).

There is no indication of the holotype in the literature for *Phthirusa caucana* and among the three specimens found, the one deposited in K herbarium is the most complete, presenting all the data mentioned in the original work on its label and is therefore being chosen a lectotype.

Analyzing the specimens of both names, it is clear that *Phthirusa caucana* should be considered synonymous with *Passovia robusta* and not with *Passovia pedunculata* as initially suggested by Kuijt & Kellogg (1996), therefore we propose a new synonymization.

The species is distributed in Bolivia, Colombia, Ecuador and Peru (Kuijt 1986, 2008,

2011; Kuijt & Kellogg 1996; Rusby 1910).

20. *Passovia rufa* (Mart.) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Loranthus rufus* Mart., Syst. Veg. 7(1): 130. 1829. *Struthanthus rufus* (Mart.) Mart., Flora 13(1): 105. 1830. *Phthirusa rufa* (Mart.) Eichler, *Fl. bras.* (Martius) 5(2): 61, tab. 16. 1868. *Struthanthus rufus* (Mart.) J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. ser. 13(2): 414. 1937, *comb. superfl. Passovia rufa* (Mart.) Kuijt, Plant Div. Evol. 129(2): 202. 2011, *comb. superfl.* Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: in silvis Yapurensibus ad S. João do Príncipe, *C.F.P. Martius* (holotype: M). *Struthanthus squamulosus* Klotzsch, Reis. Br.-Guiana [Ri. Schomburgk] 3: 978. 1849, *nom. nud. Phthirusa squamulosa* Eichler, *Fl. bras.* (Martius) 5(2): 62. 1868. *Passovia squamulosa* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: SURINAME, ad plantationem Bergendal, 1851, *H.R. Wullschlägel 227* (lectotype designated by (Kuijt 1994): BR).

Phthirusa rufa (Mart.) Eichler var. *tentaculifera* Kuhlmann *ex* Rizzini, Dusenia 3(6): 457. 1952. Type: BRAZIL. AMAZONAS: Rio Apuahú [Apuaí], affl. do baixo Rio Negro, super *Parinarium brachystachyum*, 26.VII.1929, *A. Ducke* (holotype: RB (four sheets, barcodes 00284253!, 00854716!, 00854717 and 00854718!); isotype: NY 00285203!), *syn. nov.*

Phthirusa rufa (Mart.) Eichler var. *gigantea* Rizzini, Dusenia 3(6): 458. 1952. Type: BRAZIL. AMAZONAS: Rio Negro, Manaus [Manáos], Schmarotscend auf Gestrauch, II.1901, *E. Ule 5426* (holotype: MG 005375!), *syn. nov.*

Iconography: Eichler (1868), tab. 16.

This species is easy to recognise, has a compound (much branched), terminal inflorescence, covered by a brown suber; inflorescence axes (spikes) supporting sessile triads; and flowers with red ovary and petals, and yellow stamens. The plant is robust in size, with a cylindrical stem, fissured when mature. Its dark green leaves are ovate or ovate-lanceolate with acute or acuminate apex. According to Feuer & Kuijt (2005), the pollen of *P. rufa* has significant differences among its related species.

The species is distributed in Brazil (AM, PA), Guiana, Peru, Suriname and Venezuela (Eichler 1868; Gleason 1931; Kuijt 1994, 2011; Macbride 1937; Maguire 1948; Pulle 1906; Rizzini 1952, 1956; Schomburgk 1848; Ule 1907).

21. *Passovia santaremensis* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa santaremensis* Eichler, *Fl. bras.* (Martius) 5(2): 64, tab. 19, fig. 8. 1868. *Struthanthus santaremensis* (Eichler) Bahenni & J.F.Macbr., Candollea 7: 290. 1937. *Struthanthus santaremensis* (Eichler) Baehni & J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13(2): 414. 1937, *comb. superfl. Passovia santaremensis* (Eichler) Kuijt, Plant Div. Evol. 129(2): 203, fig. 22. 2011, *comb. superfl.* Type: BRAZIL. PARÁ [Prov. Paraënsis]: in vicinia Santarem, *R. Spruce 735* (lectotype designated by Kuijt (1994): M = F Neg. 19051!). **Remaining syntypes**: BRAZIL. PARÁ: habitat in vicinia Santarem, R. Tapajoz, I.1850, *R. Spruce 618* (K 000567976!, P 00756244!); Tapajoz, II.1850, *R. Spruce 754* (K 000567975!); *R. Spruce 869* (P 05368955!).

Viscum guianensis Klotzsch, Reis. Br.-Guiana (Ri. Schomburgk) 3: 1161. 1849, *nom. nud*. *Phthirusa guyanensis* Eichler, *Fl. bras.* (Martius) 5(2): 64. 1868. *Passovia guyanensis* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: GUIANA. "ad ripas fl. Rupununy et ad sinum Wai-ipukari", on *Oreodaphne schomburgkiana* Nees, *R. Schomburgk 1602* (holotype: B† = F Neg. 11791!).

Phthirusa phaeoclados Eichler, *Fl. bras.* (Martius) 5(2): 65. 1868. *Passovia phaeoclados* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. *Struthanthus phaeoclados* (Eichler) Baehni & J.F.Macbr., Candollea 7: 290. 1937. *Struthanthus phaeoclados* (Eichler) Baehni & J.F.Macbr., Publ. Field Mus. Nat. Hist., Bot. Ser. 13(2): 414. 1937, *comb. superfl.* Type: BRAZIL. AMAZONAS [Prov. do Alto Amazonas]: prope Manaos, Barra, on a species of *Psidium*, 1852, *R. Spruce 1767* (holotype: P 00756243!, B† = F Neg. 40217; isotype: K 000567879!).

Phthirusa janeirensis Eichler, *Fl. bras.* (Martius) 5(2): 65. 1868. *Passovia janeirensis* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [Passowia]. Type: BRAZIL. RIO DE JANEIRO [prope Rio de Janeiro]: *C.F.P. Martius* (holotype: M = F Neg. 19047!).

Phthirusa elliptica Rizzini, Dusenia 3(6): 456. 1952. Type: BRAZIL. AMAZONAS: Rosarinho, flumem Madeira, *J.G. Kuhlmann 205* (holotype: RB 00284248!), *syn. nov.*

Phthirusa perforata Rizzini, Rev. Fac. Agron. (Maracay) 8(3): 91. figs. 7-8. 1975. Type: VENEZUELA. AMAZONAS: San Carlos de Río Negro, sabana y selva alrededores del aeropuerto,

parasite on *Vochysia* (*J.A. Steyermark 102762*), 125 m, 17-18.IV.1970, *J.A. Steyermark & G. Bunting 102749* (holotype: RB 00540533!; isotypes: MO 2670113!, VEN 88046!).

Phthirusa calloso-albida Rizzini, Ernstia 24: 15. 1984. Type: VENEZUELA. AMAZONAS: Depto. Atabapo, sabanita ubicada a unos 15 km al N del Cerro Yapacana y a pocos km E del Alto Caño Maraya, 03º49'N, 66º50'W, 100 m, sobre *Neoxythece atabapoensis* (Sapotaceae), 27.VII.1980, *O. Huber & S.S. Tillet 5550* (holotype: RB 00206469!; isotype: VEN 164861!).

Phthirusa castillana Rizzini, Rev. Brasil. Biol. 47: 455. 1987. Type: VENEZUELA. AMAZONAS: Depto. de Atures: bosque húmedo del Río Cataniapo, con la desembocadura con el río Orinoco, 06º25'N, 67º25'W, 37 m, sobre *Caraipa llanorum*, 14.II.1983, *A. Castillo 1610* (holotype: RB 00540622!; isotype: VEN 227895!). **Paratypes**: VENEZUELA. AMAZONAS: Depto. de Atures, bosque húmedo del Río Cataniapo, aguas abajo margen izquierdo, 06º25'N, 67º25'W, 37 m, 23.VII.1981, *A. Castillo 1251* (RB 00540621!, VEN 227894!); Depto. de Atures, sector puente aguas abajo margen izquierdo, 06º25'N, 67º25'W, 37 m, 23.VII.1981, *A. Castillo 1236* (RB 00540620!, VEN 227897!).

Iconography: Rizzini (1975), figs. 7-8; Rizzini (1982), figs. 13-14; Kuijt (2001), fig. 39; Kuijt (2011), fig. 22.

In our analysis, this species is close to *Passovia murcaei* and *P. micrantha*, distinguished from both species by its spathulate or obovate (rarely elliptical) leaves (7 × 3 cm); spikes < 2 cm in length; and the very lax pairs of triads.

The synonyms proposed by Kuijt (2001, 2011) have all been confirmed. In addition to these previously mentioned synonyms, we are including *Phthirusa elliptica* Rizzini as a new synonym. The male plant was described by Rizzini (1975): Brazil. Amazonas: Ilha das Flores, Vaupés river, 18.IV.1947, *J.M. Pires 428* (RB 73197).

The species is distributed in Brazil (AM, PA), Guiana, French Guiana, Peru, Suriname and Venezuela (Eichler 1868; Gleason 1931; Kuijt 1994, 2001, 2011; Macbride 1937; Maguire 1948; Rizzini 1952, 1956, 1975, 1978, 1982, 1984, 1987; Schomburgk 1848; Ule 1907).

22. *Passovia stenophylla* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa stenophylla* Eichler, *Fl. bras.* (Martius) 5(2): 60, tab. 19, fig. 6. 1868. Type: BRAZIL. "ad flumina Casiquiari, Vasiva et Pacimoni, 1853, *R. Spruce 3307* (holotype: P 00756235!; isotypes: BR, F 1547491!, G, GH 00035817!, LD 1214414!, NY 00285204!, RB 00284254!, F Neg. 27831, TCD 0007592!).

Phrygilanthus megathermicus Rizzini, Rodriguésia 41: 13. 1976. *Phthirusa megathermica* (Rizzini) Rizzini, Fl. Venez. 4(2): 49, fig. 11. 1982. Type: VENEZUELA. AMAZONAS: Santa Cruz, margem del Río Atapabo, cerca de la boca del Río Atacavi, 04.IX.1960, *E. Foldats 3652* (holotype: VEN 53105!).

Phthirusa huberi Rizzini, Ernstia 24: 17. 1984. Type: VENEZUELA. AMAZONAS: Depto. Atabapo, área pantanosa abierta, seca temporalmente, a la orilla derecha (W) del Alto Caño Yagua, 03º44'N, 66º33'W, 130 m, sobre Euphorbiaceae (3186), 18.II.1979, *O. Huber 3188* (holotype: RB 00206400!; isotype: VEN 000166838!).

Phthirusa percrassa Rizzini, Ernstia 24: 18. 1984. Type: VENEZUELA. AMAZONAS: Depto. Atabapo, pequeña sabana a unos 5 km al S del Caserío Puruname en el Río Puruname bajo, 03º22'N, 66º30'W, 100 m, 08.III.1980, *O. Huber 5078* (holotype: RB 00540624!; isotypes: K 000567960!, NY 00285197!, VEN 000164857!).

Iconography: Rizzini (1982): fig. 11, Kuijt (2001): fig. 35.

Close to *P. lobaterae*, differing by the papillary connective that is smaller than the anthers and the narrow-elliptic leaves. In addition, it presents a scandent habit while *P. lobaterae* has a clearly erect or pendulous habit. Rizzini (1982, 1984) recognized the great similarity between *Phthirusa megathermica* and *P. huberi*, as well as the affinity of *P. megathermica* with *Phthirusa stenophylla*.

There is no doubt that the sexual dimorphism accentuated by environmental conditions and by the development and phenological status of the specimens has promoted much confusion over the years, not only for this species, but for this whole group of plants, causing a proliferation of synonyms.

The species is distributed in Brazil (AM) and Venezuela (Gleason 1931; Kuijt 1994, 2001, 2011; Rizzini 1952, 1956, 1976, 1982, 1984).

23. *Passovia subtilis* Kuijt, Pl. Div. Evol. 129(2): 206, fig. 23. 2011. Type: BOLIVIA. BENI: Prov. Vaca Diez, Tumi Chucua a 20-25 km de Riberalta

al SE Laguna Tumi Chucua, 220 m, 15.VII.1985, on Mimosaceae, *M. Moraes 197* (holotype: UC 1965697!; isotype: LDP). **Paratype**: BOLIVIA. BENI: Cachuela Esperanza, Río Beni, *G. Meyer 97* (UC).

Iconography: Kuijt (2011): fig. 23.

Close to *P. pedunculata* and *P. theloneura*, differing from the former for presenting an inflorescence formed by a simple and axillary raceme, supporting pedunculate triads; in contrast to *P. theloneura* that presents angular young stems, cylindrical in adult plants, wide-elliptical leaves and short-pedunculate triads.

The species is distributed in Bolivia (Kuijt 2011).

24. *Passovia theloneura* (Eichler) Tiegh., Bull. Soc. Bot. France 42(2): 172. 1895 [*Passowia*]. *Phthirusa theloneura* Eichler, *Fl. bras.* (Martius) 5(2): 59, tab. 15. 1868. Type: BRAZIL. PARÁ [Prov. Pará]: "Ad Santarem", *R. Spruce 176* (lectotype designated by Kuijt (1994): M). **Remaining syntypes**: BRAZIL. PARÁ: *R. Spruce 177* (TCD 0007597!); Santarém, II.1850, *R. Spruce 686* (K 000567965!, P 05369016!); in vicinibus Santarém, parasitic on 720, II.1850, *R. Spruce 726* (K 00567966!, K 00567967!, P 05369017!).

Iconography: Eichler (1868), tab. 15.

Close to *P. pedunculata* and *P. subtilis*, differing from the former by presenting an inflorescence formed by a simple and axillary raceme, supporting pedunculate triads in both male and female individuals; it differs from *P. subtilis* by presenting young and adult plants with cylindrical stems, narrow-lanceolate leaves and triads with conspicuous peduncles.

The species is distributed in Brazil (PA, PE, MT) (Dubs, 1998; Eichler, 1868; Kuijt 1994, 2011; Rizzini 1952, 1956).

Excluded or unplaced names

Passovia podoptera (Cham. & Schltdl.) Kuijt, Pl. Div. Evol. 129(2): 200. 2011. *Loranthus podopterus* Cham. & Schltdl., Linnaea 3: 218. 1828. *Phthirusa podoptera* (Cham. & Schltdl.) Kuijt, Taxon 43(2): 198. 1994. Type: BRAZIL ["In Brasilia aequinoctiali"], *F. Sellow* (not located). ALAGOAS [Prov. Alagoas], *G. Gardner 1330* (neotype designated by Kuijt & Kellogg (1996): P 05368951!; isoneotype: NY 00644401!) = ***Struthanthus podopterus*** (Cham. & Schltdl.) G.Don.

Loranthus pterygopus Mart. *in* Schultes & Schultes f., Syst. Veg. 7: 155. 1829. *Struthanthus pterygopus* (Mart.) Mart., Flora 13: 105. 1830. Type: BRAZIL. MINAS GERAIS [Prov. Minarum], campis Taboleiro inter fl. Rio Verde et S. Francisci, *C.F.P. Martius* (lectotype designated by Kuijt (1994): M) = ***Struthanthus podopterus***.

According to Oliveira & Caires (2018), the filaments of the specimens analysed from the Sergipe and Alagoas flora (Caires, personal observation) are totally identical to those illustrated in *Flora Brasiliensis*, lacking the diagnostical characteristics of *Passovia*. Kuijt (2011) and Kuijt & Kellogg (1996) reported that their anther analyses differed from the images presented by Eichler (1868), but when analysing the specimen (*B. Maguire et al. 37480*) cited by Kuijt & Kellogg (1996: 49, fig. 11), we noticed that it is a specimen of *P. pedunculata* (see RB collection).

Another detail to be observed is the typification presented by Kuijt (2011) for both names, which differs from those presented by Kuijt (1994) and Kuijt & Kellogg (1996), that we present in this paper, for they have priority according to the Code (Turland *et al.* 2018).

Phthirusa brachystachya Diels, Notizbl. Bot. Gart. Berlin-Dahlem 14(121): 30. 1938. Type: Ecuador. San Carlos de los Colorados: Urwaldrest auf Potrero, 150 m, 20.X.1935, *H. Schultze-Rhonhof 1983* (holotype: B†).

According to Diels (1938), this species is close to *P. iodocarpa* Diels (=*Peristethium archeri* (Smith) Kuijt), however, the diagnosis does not allow us to infer its current position.

Phthirusa organensis Rizzini, Arq. Jard. Bot. Rio de Janeiro 13: 187. 1954, *nom. nud.* Type: Brazil. Rio de Janeiro: Serra dos Órgãos, Abrigo 2, 1600 m, bosques secos, 29.XI.1952, *C.T. Rizzini 1152* (holotype: RB; isotype: MO). = ***Struthanthus taubatensis*** Eichler.

This binomial only appears in the literature in Rizzini's (1954) original work. In it he does not mention any examined material (the aforementioned specimen arose through the crossing of the acronyms which appear associated with the binomial in the original work), nor does he describe the plant; he just names it and includes a brief diagnosis in Latin "scandens, fructibus atro-violaceis", so this name was not validly published.

Phthirusa santessoniana Rizzini, Dusenia 3(6): 458. 1952. Type: BRAZIL. Minas Gerais: VI.1845, *J.F. Widgren 434* ser 2 (holotype: UPS 140187!). = ***Struthanthus*** sp.

According to Rizzini (1952) the stamens are presented as small rudiments without traces of anthers. By analysing the type specimen, Mats Hjertson (UPS) wrote: "However, I am very sorry to tell you that there are no flowers present on the type specimen, only extremely young buds. The envelope only contains leaf parts". Even without the floral information it is possible to associate the specimen with *Struthanthus flexicaulis* (Mart.) Mart.

Phthirusa sodiroi Diels, Biblioth. Bot. 116: 83. 1937. Type: Ecuador. Pichincha, in silvis subtropicis vallis Nanegal, III.1900, *A. Sodiro 148/9b* (holotype: B†).

According to Diels (1937) this species is close to *P. iodocarpa*. The diagnosis does not allow us to infer its current position.

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References

Arbeláez MV & R Callejas (1999) Flórula de la meseta de arenisca de la comunidad de Monochoa (Región de Araracuara, Medio Caquetá). Tomo XIX. Estudios en la Amazonia colombiana. Tropenbos, Santafé de Bogotá, D.C.. 296p.

Barboza MA (2000) Loranthaceae e Viscaceae no Bioma Cerrado. Dissertação de Mestrado. Universidade de Brasília, Brasília. 115p.

Bonpland AJA, FWHA Humboldt & KS Kunth (1818[1820]) Nova Genera et Species Plantarum. Tomus 3. Librairie Grecque-Latine-Allemande, Paris. Pp. 432-445.

Brummitt RK (1978) Report of the Committee for Spermatophyta, 20. Taxon 27: 285-289.

Brummitt RK (2005) Report of the Committee for Spermatophyta, 57. Taxon 54: 1093-1103.

Burger W & Kuijt J (1983) Loranthaceae sensu lato. *In*: Burger W (ed.) Flora Costaricensis. Fieldiana: Botany 13: 29-79.

Caires CS (2012) Estudos taxonômicos aprofundados de *Oryctanthus* (Griseb.) Eichler, *Oryctina* Tiegh. e *Pusillanthus* Kuijt (Loranthaceae). Tese de Doutorado. Universidade de Brasília, Brasília. 332p.

Caires CS, Gomes-Bezerra KM & Proença CEB (2017) *Passovia myrsinites* a restablished name including *Oryctina atrolineata* (Loranthaceae). Phytotaxa 313: 285-288.

Diels L (1937) Beiträge zur Kenntnis der Vegetation und Flora von Ecuador. Bibliotheca Botanica 116: 1-189.

Diels L (1938) Neue Arten aus Ecuador. Notizblatt des Königl. botanischen Gartens und Museums zu Berlin 14: 25-44.

Dubs B (1998) Prodromus Florae Matogrossensis. Betrona-Verlag, Küsnacht. 444p.

Dueñas-Gómez HC & Franco-Roselli P (2001) Sinopsis de las Loranthaceae de Colombia. Caldasia 23: 81-99.

Eichler AW (1868) Loranthaceae. *In*: CFP Martius (ed.) *Flora brasiliensis*. R. Oldenbourg, Lipsiae. Vol. 5, pars 2, pp. 1-136.

Engler A (1889) Loranhtaceae. *In*: A Engler & K Prantl (eds.) Die Natürlichen Pflanzenfamilien, Nachträge zu Teil III, Abteilung 1. Verlag von Wilhelm Engelmann, Leipzig. Pp. 156-198.

Engler A (1897) Loranhtaceae. *In*: A Engler & K Prantl (eds.) Die Natürlichen Pflanzenfamilien, Nachträge zu Teil III, Abteilung 1. Verlag von Wilhelm Engelmann, Leipzig. Pp. 124-140.

Engler A & Krause K (1935) Loranthaceae. *In*: Engler A & Prantl KAE (eds.) Natürlichen Pflanzenfamilien. Ed. 2, 16b. Verlag von Wilhelm Engelmann, Leipzig. Pp. 98-203.

Fawcett W & Rendle AB (1914) Flora of Jamaica. Vol. 3. Trustees, London. Pp. 1-103.

Feuer SM & Kuijt J (1985) Fine structure of mistletoe pollen VI. Small-flowered Neotropical Loranthaceae. Annals of the Missouri Botanical Garden 72: 187-212.

Glaziou AFM (1905) Plantae Brasiliae centralis a Glaziou lectae: liste des plantes du Brésil Central recueillies en 1861-1895. Mémoires de la Société Botanique de France 3: 606-610.

Gleason HA (1931) Botanical results of the Tyler-Duida Expedition. Bulletin of the Torrey Botanical Club 58: 345-404.

Grímsson F, Grimm GW & Zetter R (2018) Evolution of pollen morphology in Loranthaceae. Grana 57: 16-116.

Grisebach AHR (1860) Flora of the British West Indian islands - Part 3. Lovell Reeve & Co, London. Pp. 311-315.

Hieronymus G (1895) Plantae Lehmannianae in Guatemala, Costa Rica, Colombia et Ecuador collectae, additis quibusdam ab aliis collectoribus ex iisdem regionibus necnon e Venezuela et Peruvia allatis, quas determinavit et descripsit adjuvantibus aliis auctoribus. Botanische Jahrbücherfür Systematik 20, Beiblatt 49: 1-72.

Howard RA (1973) The enumeratio and selectarum of Nicolaus von Jacquin. Journal of the Arnold Arboretum 54: 435-470.

Karsten H (1846a) Pflanzenverkauf. Botanische Zeitung 4: 101-103.

Karsten H (1846b) Bermerkungen des Hrn. Dr. H. Karsten zu den in der botan. Zeitung (St. 6) zum Verkauf ausgebotenen pflanzen aus Columbien: ein auszug aus dessen tagebuche. Botanische Zeitung 4: 105-112.

Karsten H (1852a) Beitrag zur entwickelungsgeschichte der Loranthaceen. Botanische Zeitung 10: 305-314.

Karsten H (1852b) Beitrag zur entwickelungsgeschichte der Loranthaceen. Botanische Zeitung 10: 321-325.

Karsten H (1852c) Beitrag zur entwickelungsgeschichte der Loranthaceen. Botanische Zeitung 10: 337-344.

Karsten H (1852d) Beitrag zur entwickelungsgeschichte der Loranthaceen. Botanische Zeitung 10: 361-366.

Kuijt J (1964) A revision of the Loranthaceae of Costa Rica. Botanische Jahrbücher für Systematik 83: 250-326.

Kuijt J (1975) The genus *Cladocolea* (Loranthaceae). Journal of the Arnold Arboretum 56: 265-335.

Kuijt J (1976) Proposal for the conservation of the genus name *Phthirusa* Eichler (1868) over *Phthirusa* Martius (1830) and *Passowia* Karsten (1852). Taxon 25: 196-197.

Kuijt J (1978) Commentary on the mistletoes of Panama. Annals of the Missouri Botanical Garden 65: 736-763.

Kuijt J (1980) Miscellaneous mistletoe notes 1-9. Brittonia 32: 518-529.

Kuijt J (1986) Loranthaceae. *In*: Harling G & Sparre B (eds.) Flora of Ecuador 24: 115-197.

Kuijt J (1987) Miscellaneous mistletoe notes, 10-19. Brittonia 39: 447-459.

Kuijt J (1990) New species and combinations in Neotropical mistletoes (Loranthaceae and Viscaceae). Proceedings, Koninklijke Nederlandse Akademie van Wetenschappen 93: 113-162.

Kuijt J (1991) Inflorescence structure and generic placement of some small-flowered species of *Phthirusa* (Loranthaceae). Systematic Botany 16: 283-291.

Kuijt J (1992) Two new species of *Cladocolea* (Loranthaceae) from México and Surinam. Novon 2: 351-354.

Kuijt J (1993) Proposal to conserve *Phthirusa* (Loranthaceae) with a conserved type, and to reject *Passovia* Karsten. Taxon 42: 893-895.

Kuijt J (1994) Typification of the names of New World mistletoe taxa (Loranthaceae and Viscaceae) described by Martius and Eichler. Taxon 43: 187-199.

Kuijt J (2001) Loranthaceae. *In*: Steyermark JA, Berry PE & Yatskievych K (eds.) Flora of the Venezuelan Guayana. Vol. 6 (Liliaceae - Myrsinaceae). Missouri Botanical Garden Press, Saint Louis. Pp. 37-59.

Kuijt J (2002) Loranthaceae. *In*: Mori SA, Cremers G, Gracie CA, Granville JJ, Heald SV, Hoff M & Mitchell JD (eds.) Guide to the vascular plants of central French Guiana - Part 2. Dicotyledons. Memoirs of the New York Botanical Garden 76: 405-408.

Kuijt J (2003a) A new species of Oryctina (Loranthaceae) from Guyana. Brittonia 55: 169-172.

Kuijt J (2003b) Miscellaneous mistletoe notes, 37-47. Novon 13: 72-88.

Kuijt J (2008) Loranthaceae. *In*: Daly D & Silveira M (eds.) Primeiro catálogo da flora do Acre, Brasil. EDUFAC, Rio Branco. 555p.

Kuijt J (2009) Miscellaneous mistletoe notes, 48-60: descriptions of twelve new species of Loranthaceae and Viscaceae. Brittonia 61: 144-162.

Kuijt J (2011) Pulling the skeleton out of the closet: resurrection of *Phthirusa* sensu Martius and consequent revival of *Passovia* (Loranthaceae). Plant Diversty and Evolution 129: 159-211.

Kuijt J (2012a) Reinstatement and expansion of the genus *Peristethium* (Loranthaceae). Annals of the Missouri Botanical Garden 98: 542-577.

Kuijt J (2012b) Loranthaceae. *In*: Acevedo-Rodríguez P & Strong MT (eds.) Catalogue of seed plants of the West Indies. Smithsonian Contributions to Botany 98: 1-1192.

Kuijt J (2013) A brief taxonomic history of neotropical mistletoe genera, with a key to the genera. Blumea 58: 263-266.

Kuijt J (2014) Five new species, one new name, and tranfers in Neotropical mistletoes (Loranthaceae), miscellaneous notes, 61-68. Novon 23: 176-186.

Kuijt J (2015) Santalales. *In*: Kubitzki K (ed.) The families and genera of vascular plants. Vol. 12. Flowering Plants Eudicots. Springer, Berlin. 213p.

Kuijt J & Kellogg EA (1996) Miscellaneous mistletoe notes, 20-36. Novon 6: 33-53.

Kuijt J & Lye D (2005) A preliminary survey of foliar sclerenchyma in Neotropical Loranthaceae. Blumea 50: 323-355.

Macbride JF (1931) Spermatophytes, mostly Peruvian. Fieldiana, Botany 11: 1-18.

Macbride JF (1934) New or renamed Spermatophytes mostly peruvian. Candollea 5: 346-402.

Macbride JF (1937) Flora of Peru - II. Fieldiana, Botany 13: 257-416.

Maguire B (1948) Plant explorations in Guiana in 1944, chiefly to the Tafelberg and the Kaieteur Plateau - III. Bulletin of the Torrey Botanical Club 75: 286-323.

Maguire B & Rizzini CT (1972) The Botany of the Guayana Highland - Part IX. Memoirs of the New York Botanical Garden 23: 1-832.

Martins Jr AG (1972) Fanerógamos parasitos da flora do Brasil. Leandra 3: 73-103.

Moore SM (1895) The phanerogamic botany of the Matto Grosso expedition, 1891-92. Transactions of the Linnean Society of London, Ser. 2 Botany, 4: 265-516.

Nickrent DL, Anderson F & Kuijt J (2019) Inflorescence evolution in Santalales: integrating morphological characters and molecular phylogenetics. American Journal of Botany 106: 1-13.

Oliveira EVS & Caires CS (2018) Loranthaceae. *In*: Prata APN, Farias MCV & Mota AC (orgs.) Flora de Sergipe. Vol. 3. EDUFAL, Maceió. Pp. 75-97.

Pilger R (1903) Loranthaceae. *In*: Urban J (ed.) Plantae novae americanae imprimis glaziovianae. V. Botanische Jahrbücher fur Systematik 33, Heft 2, Beiblatt 72: 15-32.

Pulle A (1906) An enumeration of the vascular plants known from Surinam: together with their distribution and synonymy. E.J. Brill, Leiden. Pp. 1-555.

RBH - Rede Brasileira de Herbários (2019) Sociedade Botânica do Brasil. Available at: <www.botanica.org.br/catalogo-da-rede-brasileira-de-herbarios/>. Access on 23 May 2019.

Rizzini CT (1950) Struthanthi brasiliae eiusque vicinorum. Revista Brasileira de Biologia 10: 393-408.

Rizzini CT (1952) Phthirusae Brasiliae terrarumque adiacentium. Dusenia 3: 451-462.

Rizzini CT (1956) Pars specialis: prodromi monographiae Loranthacearum Brasiliae terrarunque finitimarum. Rodriguésia 30/31: 87-264.

Rizzini CT (1961) Flora of Panama. Annals of the Missouri Botanical Garden 47: 263-290.

Rizzini CT (1975) Loranthaceae Novae. Revista Faculdad Agronomía (Maracay) 8: 83-109.

Rizzini CT (1976) Loranthaceae Austro-Americanae Novae. Rodriguésia 41: 7-35.

Rizzini CT (1978) Loranthaceae. *In*: The Botany of the Guayana Highland - Part X. Memoirs of the New York Botanical Garden 29: 23-36.

Rizzini CT (1980) Loranthaceae of the Central Brazil. Arquivos do Jardim Botânico do Rio de Janeiro 24: 19-50.

Rizzini CT (1982) Loranthaceae. *In*: Luces FZ & Steyermark JA (eds.) Flora de Venezuela 4: 7-316.

Rizzini CT (1983) Emenda ao género *Furarium* Rizz. (Loranthaceae). Rodriguésia 57: 5-6.

Rizzini CT (1984) Adenda à Flora de Venezuela - Loranthaceae. Ernstia 24: 1-24.

Rizzini CT (1985) New or less known Loranthaceae from Brasil and Venezuela. Ernstia 32: 1-16.

Rizzini CT (1987) Três espécies novas de *Phthirusa* (Loranthaceae). Revista Brasileira de Biologia 47: 455-456.

Rizzini CT & Mattos-Filho A (1986) Três espécies novas de Minas Gerais e Bahia, Brasil. Revista Brasileira de Biologia 46: 317-321.

Ruiz H & Pavón J (1802) Flora Peruviana, et Chilensis, sive descriptiones, et icones plantarum peruvianarum, et chilensium, secundum systema Linnaeanum digestae, cum characteribus plurium generum evulgatorum reformatis. Tomus III. Superiorum Permissu: Gabrielis de Sancha. Typis Gabrielis de Sancha, Madrid. Pp. 44-50. Tabulas 273-279.

Rusby HH (1900) An enumeratio of the plants collected by Dr. H.H. Rusby in South America, 1885-1886, XXX (continued). Bulletin of the Torrey Botanical Club 27: 124-137.

Rusby HH (1907) An enumeratio of the plants collected in Bolivia by Miguel Bang, Part 4. Bulletin of the New York Botanical Garden 4: 309-470.

Rusby HH (1910) New species from Bolivia, collected by R.S. Williams - I. Bulletin of the New York Botanical Garden 6: 487-517.

Sáenz MS (1997) Catálogo preliminar comentado de la flora del Medio Caquetá. XII. Tropenbos, Santafé de Bogotá, D.C. Pp. 1-557.

Sandwith NY (1932) Contributions to the Flora of Tropical America: XII. Bulletin of Miscellaneous Information 1932: 209-229.

Schomburgk R (1848) Reisen in Britisch-Guiana in den jahren 1840-1844. J.J. Weber, Leipzig. 1260p.

Smith AC (1932) Studies of South American plants. II. New Loranthaceae and Monimiaceae from the Northern Andes. Bulletin of the Torrey Botanical Club 59: 513-524.

Smith AC (1939) Notes on a collection of plants from British Guiana. Lloydia 2: 161-218.

Standley PC (1931) Flora of the Lancetilla Valley, Honduras. Fieldiana, Botany 10: 1-396.

Standley PC (1937) Flora of Costa Rica. Publications of Field Museum of Natural History, Botanical Series 18: 401.

Standley PC & Calderón S (1925) Lista preliminar de las plantas de El Salvador. La Union. - Dutriz Hermanos, San Salvador. 271p.

Standley PC & Record SJ (1936) The forests and flora of British Honduras. Fieldiana, Botany 12: 1-414.

Standley PC & Steyermark JA (1946) Flora of Guatemala - IV. Fieldiana, Botany 24: 1-488.

Steyermark JA (1951) Contributions to the flora of Venezuela - I. Fieldiana, Botany 28: 1-226.

Thiers B [continuously updated] Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual

Herbarium. Available at <http://sweetgum.nybg.org/science/ih/>. Access on 23 May 2019.

Tieghem P van (1895) Sur le groupement des espèces en genres dans les Loranthées a calice dialysépale et anthères oscillantes ou Struthanthées. Bulletin de la Société Botanique de France 42: 161-180.

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber W-H, Li D-Z, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ & Smith GF (2018) International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. Koeltz Botanical Books, Glashütten. 254p. DOI <https://doi.org/10.12705/Code.2018>.

Urban I (1897) Additamenta ad cognitionem florae Indiae occidentalis - IV, Loranthaceae. Botanische Jahrbücher für Systematik, Pflanzengeschichte. Verlag Wilhelm Engelmann, Leipzig. Pp. 10-77.

Ule E [1906 (1907)] II. Beiträge zur Flora der Hylaea nach den Sammlungen von Ule's Amazonas-Expedition. Verhandlungen des Botanischen Vereins der Provinz Brandenburg 48: 117-208.

Ule E (1915) Loranthaceae. *In*: Pilger R (ed.) Plantae Uleanae novae vel minus cognitae - 4 Notizblatt des Königl. Botanischen Gartens und Museums zu Berlin-Dahlem 6: 22-293.

Vidal-Russell R & Nickrent DL (2008) Evolutionary relationships in the showy mistletoe family (Loranthaceae). American Journal of Botany 95: 1015-1029.

Warburg O (1905) Die Kautschukmisteln. *In*: Warburg O & Wohltmann F (eds.) Der Tropenpflanzer: zeitschrift für tropische landwirtschaft. Vol. 9. Jahrgang, Berlin. Pp. 633-647.

Wildeman E (1909) Plantae novae vel minus cognitae ex Herbario Horti Thenensis. Vol. 2. Veuve Monnom, Bruxelas. 136p.

Wilson CA & Calvin CL (2006) An origin of aerial branch parasitism in the mistletoe family, Loranthaceae. American Journal of Botany 93: 787-796.

Yuncker TG (1930) Flora of the Aguan valley and the coastal regions near La Ceiba, Honduras. Fieldiana, Botany 9: 245-287.

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