

New combinations and new names in Malagasy Asclepiadoideae (Apocynaceae)

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ABSTRACT

In the genus *Pentatropis*, *P. madagascariensis* is recognized as a subspecies of *P. nivalis*. In the stem-succulent species of *Cynanchum*, *C. bekinolense* is considered a northern subspecies of *C. gerrardii*. All species of *Folotsia*, *Karimbolea* and *Platykeleba*, as well as the Malagasy species of *Sarcostemma*, are formally transferred to *Cynanchum*.

RÉSUMÉ

Nouvelles combinaisons et nouveaux noms dans les Asclepiadoideae (Apocynaceae) de Madagascar.

MOTS CLÉS

Apocynaceae,
Asclepiadoideae,
Pentatropis,
Cynanchum,
Madagascar.

Pentatropis madagascariensis est transféré dans *P. nivalis*, au rang de sous-espèce. Parmi les espèces de *Cynanchum* à tiges succulentes, *C. bekinolense* est considéré comme une sous-espèce septentrionale de *C. gerrardii*. Toutes les espèces de *Folotsia*, *Karimbolea* et *Platykeleba*, de même que les espèces malgaches de *Sarcostemma* sont transférées dans le genre *Cynanchum*.

In the course of preparing the treatment of Asclepiadeae (Apocynaceae – Asclepiadoideae) for Flora of Madagascar (Liede, in press), two geographically restricted taxa were found to resemble very closely widespread, variable taxa, but differering in one or a few minor but constant characters. They are considered subspecies of their widespread relatives. The first of these taxa is the Madagascan representative of the genus *Pentatropis* R. Br., *P. madagascariense*

Decne., which has often been included in *P. nivalis* (J.F. Gmel.) D.V. Field & J.R.I. Wood, a species distributed from East Africa to India. The Malagasy plants are generally smaller and more tender than the mainland plants and thus easy to recognize. In floral characters, though, they are almost indistinguishable. The second plant is a member of the equally widespread *Cynanchum gerrardii* complex, described as *C. bekinolense* Choux. The plants of northern

Madagascar and the Comores are more slender than those from southern Madagascar, mainland Africa and Arabia, the fruits are keeled, the staminal corona parts are not more succulent than the interstaminal ones and the pedicels are characteristically curved. In general structure, though, the close relationship of *C. bekinolense* and *C. gerardii* is unmistakable.

A molecular analysis using chloroplast spacers and ITS (Liede & Täuber submitted, Liede & Kunze, in prep.) has shown beyond doubt that all stem-succulent cynanchoid taxa are monophyletic and nested within the Malagasy clade of *Cynanchum*. Thus, all small stem-succulent genera and the larger genus *Sarcostemma* s.str. need to be included in *Cynanchum*, and numerous name changes are necessary. The former genus *Sarcostemma* s.str. comprises a species complex in which delimitation of species and subspecies is still a matter of debate. A detailed study using RAPDs is being carried out in our lab to clarify the structure of this complex. Before this study is completed, new combinations for all published *Sarcostemma* names would be premature; therefore, only the name changes necessary for the Flora of Madagascar treatment are proposed here.

Pentatropis nivalis (J.F. Gmel.) D.V. Field & J.R.I. Wood subsp. **madagascariensis** (Decne.) Liede & Meve, **comb. et stat. nov.**

Pentatropis madagascariensis Decne. in DC., Prodr. 8: 536 (1844). — Type: *Bojer s.n.*, Madagascar, in arenosis ad sinum St. Augustin or. occident." (holo-, P!).

Plants ascending, twining. Shoots herbaceous, sparsely pubescent along a single line with 0.18–0.2 mm long trichomes, glabrescent. Pseudostipules absent. Leaves with 2–3 mm long petiole; colleters absent; leaf blades herbaceous, 12–27 mm long, 7–9 mm wide, elliptic, basally rounded, apically obtuse, adaxially isolatedly covered with 0.2–0.25 mm long trichomes restricted to the midvein and the margins, abaxially glabrous. Inflorescences sessile, 2–3-flowered, all flowers open synchronously. Flowers with 10–25 mm long pedicels. Calyx basally fused; lobes 2 mm long, triangular. Corolla basally fused,

c. 8 mm long, abaxially and adaxially purple, apically yellow; adaxially densely covered with c. 0.1 mm long trichomes; lobes 3 mm wide, triangular, incurved. Corona of free staminal parts attached to the back of the stamens, shorter than the gynostegium, carinate, glabrous. Gynostegium c. 1.5 mm high, 0.8 mm diam., sessile. Anthers longer than broad, rectangular, abaxially planar. Anther wings 1.5 mm long, following the basal lateral margin of the anther; consisting of proximal and distal ridge, space between the ridges almost glabrous. Connective appendages 0.2 mm long, 0.3 mm wide, ovate, narrower than the anther, slightly inflexed. Pollinarium: corpusculum 0.16 mm long, about as long as broad, ovoid; caudicles 0.06 mm long, cylindrical, straight, declinate; pollinia subapically attached to the caudicles, 0.2 mm long, 0.12 mm wide, ovate in cross-section, ovoid. Styler head green, c. 0.8 mm diam., 0.6 mm high, upper part 0.4 mm high, depressed-conical. Follicles c. 55 mm long, 6 mm diam., obclavate, apically strongly beaked, wingless, light brown. Seeds ovate, c. 5.5 mm long, 2.7 mm wide, seta and a seta side sculptured with longitudinal ridges, marginally with slightly emarginate, 0.15 mm wide wing; coma c. 20 mm long.

Chromosome number: $2n=22$ (Liede & Conrad 2749).

DISTRIBUTION AND HABITAT. — Madagascar, prov. Antsiranana, Fiarantsoa, Mahajanga, Toliara; sea level to 200 m, on sand and rocks close to the sea, rocky places in dry forest.

FLOWERING TIME. — All year.

VERNACULAR NAME. — Tsinainkibo (Toliara; used medicinally fide *Sussman 324*).

SPECIMENS EXAMINED. — MADAGASCAR: *Bojer s.n.*, in sinus St. Augustin (P), type; *Bosser 27*, Lambomakondro, 17 May 1951 (P); *Croat 30925*, forest of Besaka Zombitzy, 730–750 m, 7 Feb. 1975 (MO); *Croat 31397*, 2 km W of Ampanihy, SW of Ampanihy on road to Androka between Ampanihy and PK 10, 150–200 m, 16 Feb. 1975 (MO); *D'Arcy & Rakotozafy 15462*, 5 km N of Bealandra, 17 May 1983 (MO); *Decary 3349*, Ambovombé, 5 Dec. 1924 (P); *Decary 8529*, Ambovombé, 3 Jan. 1932 (TAN), *Decary 9529*, Ambovombé, 3 Jan. 1932 (P); *Descoings 1924*, Dec. 1956 (P); *Grandidier s.n.*, Manambé à Mourondave, Feb. 1869 (P); *Humbert & Perrier de la*

Bâthie 2492, environs de Tuléar, Delta de Fiherenana, 2-10 m, Sep. 1924 (P); *Liede & Conrad* 2749, Fort Dauphin, seaside, ± 5 m, 17 Feb. 1990 (P, TAN, UBT); *Peltier & Peltier* 3131, s.loc. (P); *Peltier & Peltier* 4917, Belahamy, 26 Jan. 1964 (P); *Perrier de la Bâthie* 1233, Amboanio près de Mahajanga, Feb. 1901 (P); *Perrier de la Bâthie* 11697, baie de Bombetoke, Oct. 1907 (P); *Poisson* 97, Belabaka, 8 Jan. 1921 (P); *Rakotozafy* 779, Tuléar, col sale, près du terrain d'aviation, Apr. 1968 (P); *Rakotozafy* 1524, Ramena à l'est de Diégo-Suarez, Oct. 1975 (TAN); *Sussman* 324, near Analafaly, 40 km NE of Betioky Andrekerere, 17 Oct. 1987 (MO).

The genus *Pentatropis* is very widespread along the West and East African, as well as the Asian coast as far as Australia. While specific and subspecific delimitation is not well understood, the Malagasy material matches *P. nivalis* (J.F. Gmelin) D.V. Field & J.R.I. Wood from East Africa in floral structure, but the plants are easily distinguished by their small, elliptic leaves, the generally much more tender habit and the slightly smaller size of the flowers. As these characters are restricted to Malagasy material, recognition on subspecific level is appropriate as compared to species concepts applied throughout the subfamily.

Cynanchum gerrardii* (Harvey) Liede subsp. *bekinolense* (Choux) Liede & Meve, **comb. et stat. nov.*

Cynanchum bekinolense Choux, Ann. Inst. Bot.-Géol. Colon. Marseille, sér. 3, 2: 311 (1914). — Type: *Perrier de la Bâthie* 11740 (holo-, P!).

Plants twining. Subterranean organs unknown. Shoots semi-succulent, finely striate, obscurely glaucous, glabrous; internodes 1-1.5 mm diam. Leaf scales sessile, fleshy, 1-1.2 mm long, 1-1.2 mm wide, triangular, apically acute. Inflorescences bostrychoid, 3-10-flowered, 1-3 flowers synchronously, pedunculate; rachis 1-2 mm long. Floral bracts 0.4-0.5 mm long, 0.2-0.3 mm wide at the base, triangular, glabrous. Pedicels 2-3 mm long, glabrous. Floral buds 1.5-1.7 mm long, 1-1.2 mm diam., cylindrical, with imbricate aestivation. Calyx basally fused, glabrous; lobes 0.2 mm long, 0.2 mm wide, triangular, apically acute. Corolla campan-

ulate, basally fused; 1.5-2 mm long, abaxially and adaxially yellow, purple along the main nerves; lobes 0.8-1 mm wide, horizontal to decurved, oblong to triangular, apically acute. Gynostegial corona yellow, tubular, 1-1.2 mm high, equalling the gynostegium in height, consisting of staminal and interstaminal corona parts fused for 1/4 to 1/2 of total corona length, only staminal corona parts differentiated. Staminal corona parts appressed to the back of the anthers, apically erect, adaxially with a basal protuberance corresponding to the filament; lobes of staminal corona parts laminar, oblong, with straight margins. Gynostegium 1.5-1.7 mm high, 1.2-1.3 mm diam., sessile. Stamens with filament 0.25-0.35 mm long; anthers longer than broad; rectangular, abaxially planar to convex. Anther wings 0.7-0.8 mm long, extending beyond the anther proper, forming a basal arch; adjacent anther wings divergent towards the base, in the same plane as the anther. Connective appendages 0.5-0.6 mm long, 0.6-0.75 mm wide, widely ovate, equalling the stamen in width, strongly inflexed. Pollinarium: corpusculum 0.25-0.28 mm long; caudicles 0.12-0.14 mm long, cylindrical, straight, declinate, thickened at the insertion of the pollinium; pollinia 0.3-0.35 mm long, 0.17-0.2 mm wide, ovate in cross-section, ovoid, laterally attached to the caudicles. Stylar head 1.2-1.4 mm diam., 0.5-0.6 mm high; upper part 0.25-0.3 mm high, umbonate to tabular. Follicles one per flower, pendant, c. 70 mm long, 3.5 mm diam., obclavate, obtusely deltate in cross-section, apically shortly beaked, keeled, medium brown, glabrous. Seeds 3-3.5 mm long, 1.5-1.8 mm wide, pyriform, medium brown, seta and aleta side regularly papillose and with regularly arranged 125-150 mm long trichomes, wingless; coma 15-20 mm long.

Chromosome number unknown.

DISTRIBUTION AND HABITAT. — Comores, Madagascar, prov. Mahajanga; 0-150 m; calcareous rocks at the seaside.

FLOWERING TIME. — January to February, May.

SPECIMENS EXAMINED. — MADAGASCAR: *Abraham* 133, Marosalazo, 50 km N de Morondava, 0 m, 11 June 1974 (P); *Boivin* 3211 (P); *Bosser* 18033,

Moheli, près de Nioumachoua, May 1963 (P); *Humboldt 1114*, Mayotte (P); *Klackenberg 93.03.11-10*, 11 km E Antsalova, near the edge of the Tsingy of Bemaraha, 11 Mar. 1995 (P); *Klackenberg 93.02.12-25*, 12 Mar. 1995 (P); *Labat 2632*, Ambinda, Ambodiriana, au NE d'Antsalova, RN9 Tsingy de Bemaraha, 100 m, 26 Feb. 1995 (MO, P); *Labat 2770*, Mayotte, Mamoudzou, Parc de la pointe de Mahabou, 10 m, 22 Apr. 1996 (P); *Leandri & Saboureau 3056*, Antsingy, vers l'Ambodiriana (E d'Antsalova), 100-150 m, 9 Feb. 1960 (P); *Morat 4877*, Bemara, RN 9, Antsingy d'Antsalova, Jan. 1975 (P); *Perrier de la Bâthie 11463*, Vohemarina-Salem, Apr. 1910 (P); *Perrier de la Bâthie 11643*, Tuléar, Apr. 1910 (P); *Perrier de la Bâthie 11649*, pont de Vohémar, 200-250 m, 1920 (P); *Perrier de la Bâthie 11740*, Mt. Amboloandro, près de Zazafotsy, ± 900 m, Mar. 1912 (P), type; *Villiers, Klackenberg & Badré 4953*, 15 km E of Ankilimomotsy, 27 km SE Antsalova, 28 Mar. 1993 (P, S).

Corona and gynostegium structure are almost identical to those of the typical subspecies; however, the small flowers on strongly curved, thin pedicels, the staminal corona parts not thicker than the relatively short interstaminal parts and the keeled fruits are different.

NEW COMBINATIONS AND NEW NAMES NEEDED AFTER THE INCLUSION OF *FOLOTSIA* COSTANTIN & BOIS, *KARIMBOLEA* DESC., *PLATYKELEBA* N.E. BR. AND *SARCOSTEMMA* R. BR. IN *CYNANCHUM* L.

LIEDE & TÄUBER (submitted) show that all stem-succulent Madagascan taxa and *Sarcostemma* are monophyletic and nested in the leafy Madagascan *Cynanchum* clade, a conclusion supported by LIEDE & KUNZE (in prep.). Therefore, *Folotsia*, *Karimbolea*, *Platykeleba* and *Sarcostemma* are placed in the synonymy of *Cynanchum* by LIEDE & KUNZE (in prep.). The following name changes are necessary for the Flora of Madagascar:

Cynanchum ambovombense* (Liede) Liede & Meve, **comb. nov.*

Folotsia ambovombense Liede, Bull. Mus. Natl. Nat., B, Adansonia 18: 131 (1996). — Type: *Decary 8374* (holo-, P!).

Cynanchum antsiranense* (Meve & Liede) Liede & Meve, **comb. nov.*

Sarcostemma antsiranense Meve & Liede, Kew Bull. 52: 491 (1997). — Type: *Lavranos, Rössli & Hoffmann 28772* (holo-, K!; iso-, MSUN!).

Cynanchum decorsei* (Costantin & Gall.) Liede & Meve, **comb. nov.*

Sarcostemma decorsei Costantin & Gall., Bull. Mus. Hist. Nat. (Paris) 2: 418 (1906). — Type: *Decorse s.n.* (spirit collection P, not located).
Drepanostemma luteum Jum. & H. Perrier, Rev. Gén. Bot. 23: 256 (1911). — Type: *Jumelle s.n.*, 25 May 1911 (iso-, K!).

The type of *C. decorsei* could not be located. However, the detailed protologue and the numerous specimens in P labelled “*Sarcostemma decorsei*” by PERRIER DE LA BÂTHIE and DECARY leave no doubt as to its identity.

Cynanchum elachistemmoides* (Liede & Meve) Liede & Meve, **comb. nov.*

Sarcostemma elachistemmoides Liede & Meve, Bot. J. Linn. Soc. 118: 41 (1995). — Type: *Decary 7890* (holo-, P!).

Cynanchum floriferum* Liede & Meve, **nom. nov.*

Folotsia floribunda Desc., Adansonia, n.s. 1: 313 (1961), non *Cynanchum floribundum* R. Br. (1809). — *Prosopstelma grandiflorum* Choux, Ann. Inst. Bot.-Géol. Colon. Marseille, sér. 2: 317 (1914), non *Cynanchum grandiflorum* Cav. (1797). — Type: *Perrier de la Bâthie 12104* (holo-, P!).

Cynanchum grandidieri* Liede & Meve, **nom. nov.*

Decanema grandiflorum Jum. & H. Perrier, Ann. Inst. Bot.-Géol. Colon. Marseille, sér. 2, 6: 195 (1908). — *Folotsia grandiflora* (Jum. & H. Perrier) Jum. & H. Perrier, Rev. Gén. Bot. 23: 254 (1911),

non *Cynanchum grandiflorum* Cav. (1797). — Type: *Perrier de la Bâthie 1442* (holo-, P!).

Folotsia sarcostemmaoides Costantin & Bois, *Compt. Rend. Hebd. Séances Acad. Sci.* 147: 258 (1908), non *Cynanchum sarcostemmaoides* K. Schum. (1895). — Type: *Geay 6024* (lecto-, P!).

Cynanchum humbercapuronii Liede & Meve, **nom. nov.**

Folotsia humbertii Liede, *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 18: 132 (1996), non *Cynanchum humbertii* Choux (1926). — Type: *Humbert & Capuron 29382* (holo-, P!).

Cynanchum insigne (N.E. Br.) Liede & Meve, **comb. nov.**

Platykeleba insignis N.E. Br., *Bull. Misc. Inform. Kew* 250 (1895). — *Sarcostemma insigne* (N.E. Br.) Desc., *Adansonia, n.s.* 1: 314 (1961). — Type: *Baron 973* (iso-, P!).

Cynanchum mariense (Meve & Liede) Liede & Meve, **comb. nov.**

Karimbolea mariensis Meve & Liede, *Bradleya* 16: 10 (1998). — Type: *Liede & Conrad 2825* (holo-, K; iso-, MSUN, ULM, in alc.).

Cynanchum membranaceum (Liede & Meve) Liede & Meve, **comb. nov.**

Sarcostemma membranaceum Liede & Meve, *Bot. J. Linn. Soc.* 118: 43 (1995). — Type: *Liede & Conrad 2765* (holo-, P!).

Cynanchum toliari Liede & Meve, **nom. nov.**

Prosopostelma madagascariense Jum. & H. Perrier, *Rev. Gén. Bot.* 23: 256 (1911). — *Folotsia madagascariense* (Jum. & H. Perrier) Desc., *Adansonia, n.s.* 1: 313 (1961); non *Cynanchum madagascariense* (K. Schum.) K. Schum. (1895). — Type: *Grandidier s.n.* (lecto-, P!).

Cynanchum verrucosum (Desc.) Liede & Meve, **comb. nov.**

Karimbolea verrucosa Desc., *Cactus (Paris)* 15: 77-80 (1960). — Type: *Descoings 3999* (holo-, P!).

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