American Cynanchum (Asclepiadaceae)—A Preliminary Infrageneric Classification

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ABSTRACT. A subdivision of American Cynanchum at the sectional level is suggested and is understood to comprise the following: C. sect. Cynanchum (also found in the Old World), C. sect. Formosum, C. sect. Macbridea, C. sect. Micropylhum, C. sect. Telminostelma, C. sect. Roulinia, and C. sect. Mellichampia. The identity of Dicarpophora is clarified and the position of Telminostelma is discussed. Four new combinations are proposed: Cynanchum mazzuchii (Spegazzini) Liede, Cynanchum brasiliense (Morillo) Liede, Cynanchum gentryi (Morillo) Liede, and Cynanchum gilbertii Liede (replaces Metalepis prevostiae Morillo). Orthosia is recognized as distinct from Cynanchum. A checklist of species and their sectional affinities is given and poorly understood taxa are highlighted.

The large genus Cynanchum (ca. 400 species) is distributed worldwide, with centers of distribution in Madagascar, southern China, and the northeastern Andes. Following the exclusion of Vincetoxicum Wolf, the ca. 150 Old World species of the genus, though highly diverse in many characters, form a well delimited group and can be accommodated in two sections (Liede, 1996). Here, species delimitation is usually easy, and most species, except for some Madagascan endemics, are relatively widespread and frequent.

In contrast, the New World species are taxonomically extremely difficult: most of them constitute narrow endemics; species delimitation is difficult because characters are rather cryptic; and Woodson (1941), based only on North American material, united morphologically distinct taxa with Cynanchum, especially the equally diverse and difficult genus Metastelma. Numerous workers have described new species galore without following any clearcut concept of the genus. In a previous paper, Liede and Meve (1997) attempted to exclude obvious misfits from Cynanchum; the present paper provides a framework against which future descriptions can be compared, so that, in the end, a complete revision of the American members of the genus will be possible.

So far, only one group of American species has been treated at this level, Cynanchum subg. Mellichampia Sundell (Sundell, 1981). Sundell (1981) described four sections in this subgenus, two of which, sect. Roulinia (Decaisne) Sundell and sect. Mellichampia (A. Gray ex S. Watson) Sundell, are well delimited and are almost certainly “true” members of Cynanchum. The position of the monotypic section Ampelamus (Rafinesque) Sundell cannot be ascertained at present. Its only member, C. laeve (Michaux) Persoon, deviates from all other members of the genus by its entirely free corona lobes and clear latex. Because a comparison of morphological characters alone is insufficient to determine the position of this aberrant taxon, I am arguing for the conservative view not to change its current placement (Sundell, 1981), even though a re-establishment of the genus Ampelamus Rafinesque to me would seem the more adequate expression for its status. The fourth section, Metalepis (Grisebach) Sundell, deserves a more thorough discussion (see below).

During my seven years of study of the genus Cynanchum, the question of delimitation of natural groups in the New World has taken a major part of my efforts. While some of the herbaria holding type material proved remarkably unresponsive to my repeated requests for material, nevertheless I have been able to study most species consulting original material. Drawings showing detailed floral structure were available for a few species only and have been used to determine the position of a species if no original material could be borrowed. Although my studies are incomplete, I am able to provide an annotated checklist-type survey of the New World Cynanchum, so that future researchers will find a useful framework for their studies. Because I am hesitant as to the relationships between the groups delimited here, sectional rank is attributed to all of them. Known heterotypic synonymy is indicated; however, gradually increasing collections are likely to expose still more taxa as merely representative of the extremes of a gradient. To account for the preliminary character of this paper, the number of new combinations has been kept as low as
possible. In particular, the new combinations resulting from Orthosia (incl. Amphistelma) considered as a genus well distinct from Cynanchum have not been carried through, awaiting an in-depth revision.

**Materials and Methods**

More than 500 specimens from the holdings of AAU, B, BM, CTES, G, GA, GB, L, LIL, LPB, M, MO, MPU, P, S, SGO, SI, UC, and USZ have been studied. Dried material was supplemented by my own collections of living and spirit material from Argentina, Bolivia, Chile, Mexico, and the United States.

**Key to the Sections of Cynanchum and Frequently States.**

Argentina, Bolivia, Chile, Mexico, and the United States.

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**Key to the Sections of Cynanchum and Frequently States.**

1. Leaves ovate, at least 5 cm long, with cordate to deeply cordate leaf bases .......................... 2
1'. Leaves either linear or ovate, if ovate, then much smaller than 5 cm (except C. goertisanum and C. morrenioides), leaf bases not deeply cor
date .......................................................... 5
2. Stipule-like leaflets absent, inflorescences axillary, complex, dichasial, follicles, as far as known, ovoid-fusiform, thick-walled (one per flower) .......................... C. sect. Telminostelma
2'. Stipule-like leaflets regularly present, inflorescences "extra-axillary," simple, dichasial or bostrychoid, follicles, as far as known, fusiform or elongated, thin-walled (one or two per flower) .......................... 3
3. Plants regularly forming two follicles per flower, follicles elongated, three-folded in cross section, inflorescences dichasial, corona highly connate .......................... C. sect. Formosum
3'. Plants only occasionally forming two follicles per flower, follicles fusiform, circular in cross section, inflorescences bostrychoid, corona connate for not more than 1/2 of its length .......................... 4
4. Stems and leaves softly pubescent, corollas small, greenish or whitish, stylopod heads papillate (except C. iguatalum) .......................... C. sect. Mellichampia
4'. Stems and leaves glabrous, corollas large, pur
culent, stylopod heads flat, depressed ..........................

C. sect. Roulinia
5. Corolla bearded, corona of five staminal lobes not laterally fused .................. 6
5'. Corolla glabrous or with trichomes, but not bearded, corona of staminal parts fused for at least 1/4 of corona length .................. 7
6. Staminatal corona parts simple .................. Metastelma
6'. Staminatal corona parts with an adaxial ligule (sometimes rather small) .......................... Ditassa
7. Follicles regularly two per flower, narrowly oblong; inflorescences frequently axillary, staminal parts of the corona frequently tridentate with prominent median tooth .......................... 8
7'. Follicles regularly one per flower, fusiform, inflorescences extra-axillary, staminal parts of the corona not tridentate .......................... 9
8. Inflorescences complex, bostrychoid, corona highly connate, or frequently with a ring of fused staminal and interstaminal parts in addition to free staminal parts .................. Tassadia
8'. Inflorescences simple, scidioideal, corona basi
cally connate, free staminal parts never present ............................................................. Orthosia
9'. Branching pattern monochasial .......................... 10
10. Leaves ovate, corona highly connate .......................... C. sect. Cynanchum
10'. Leaves linear, corona connate for 1/2 of its length or absent .......................... C. sect. Machridea

**Annotated Checklist (Compare Table 1)**

**Cynanchum sect. Cynanchum**

A number of species, particularly from southern South America, do not display any characters differentiating them from the smaller members of the genus in South Africa. As those are attributed to the typical section, their South American counterparts should also be included there.

Small (usually less than 1 m tall, with exception of C. goertisanum Morillo), predominantly herbaceous twiners, more rarely shrublets with or without twining apical shoots, leaves small (less than 5 cm long, often not exceeding 1 cm, with exception of C. goertisanum Morillo), leaf bases only slightly cordate, more frequently rounded or acute, inflorescences extra-axillary, the corolla lobes adaxially either glabrous or with widely spaced, conical, verrucose trichomes, corona consisting of highly fused staminal and interstaminal parts; follicles one per flower, obclavate; seeds usually ovate, winged, smooth or sculptured.

With the exception of the Brazilian C. morrenioides, which bears a strong resemblance to some Madagascan species with its strongly centrifugal anther wings and the main corona lobes opposite the corolla lobes (compare, e.g., C. danguyanum Choux), and the aberrant C. goertisanum from the Guianas, all species originate from southern Argentina and Chile.

C. acutifolium (Philippi) Reiche
C. boerhaavifolium Hooker & Arnott
C. bulligerum (Spegazzini) Macloskie
C. descolei T. Meyer
C. diemii T. Meyer
C. goertisanum Morillo
C. hickenii Malme
C. lancifolium Hooker & Arnott (incl. Cynoctonum nemorosum Philippi)
C. morrenioides Goyder
C. myrtifolium Hooker & Arnott
C. nummulariaefolium Hooker & Arnott (incl. C. mucronatum (Decaisne) Reiche, C. chilense (Philippi) Malme, C. nanum Skottsberg)
Table 1. American *Cynanchum* and genera confused with it.

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Branching pattern</td>
<td>monochasial</td>
<td>monochasial</td>
<td>monochasial</td>
<td>dichasial</td>
<td>present</td>
</tr>
<tr>
<td>Adventitious buds</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>present</td>
<td>green.</td>
</tr>
<tr>
<td>Shoots</td>
<td>basally woody, herbaceous</td>
<td>basally woody,</td>
<td>green, basally woody, herbaceous</td>
<td>absent</td>
<td>distichous</td>
</tr>
<tr>
<td>Stipules</td>
<td>absent</td>
<td>present</td>
<td>absent</td>
<td>present</td>
<td></td>
</tr>
<tr>
<td>Leaf arrangement</td>
<td>decussate</td>
<td>decussate</td>
<td>decussate</td>
<td>decussate</td>
<td></td>
</tr>
<tr>
<td>Leaf shape</td>
<td>ovate</td>
<td>ovate</td>
<td>linear</td>
<td>ovate</td>
<td>ovate</td>
</tr>
<tr>
<td>Leaf bases</td>
<td>obtuse</td>
<td>deeply cordate</td>
<td>acute to acuminate</td>
<td>deeply cordate</td>
<td>rounded to</td>
</tr>
<tr>
<td>Inflorescence position</td>
<td>extra-axillary</td>
<td>extra-axillary</td>
<td>extra-axillary</td>
<td>extra-axillary</td>
<td>slightly cordate</td>
</tr>
<tr>
<td>Inflorescence structure</td>
<td>simple, bostrychoid</td>
<td>simple, dichasial</td>
<td>simple, sciadial</td>
<td>simple, sciadial</td>
<td>extra-axillary</td>
</tr>
<tr>
<td>Petal length</td>
<td>2–4 mm</td>
<td>6–8 mm</td>
<td>5 mm</td>
<td>5–10 mm</td>
<td>4 mm</td>
</tr>
<tr>
<td>Corolla, adaxially</td>
<td>glabrous or with sparse verrucose trichomes</td>
<td>glabrous</td>
<td>glabrous or with short trichomes</td>
<td>glabrous or with short trichomes</td>
<td></td>
</tr>
<tr>
<td>Corona</td>
<td>C(is), highly connate</td>
<td>C(is), highly connate</td>
<td>C(is), connate for ca. ½ or</td>
<td>C(is), connate for ca. ½ of length</td>
<td>C(is), basally connate</td>
</tr>
<tr>
<td>Follicles per flower</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Follicle shape</td>
<td>fusiform, ± circular in cross section</td>
<td>elongated, three-angled in</td>
<td>fusiform, ± circular in</td>
<td>fusiform, ± circular in cross section</td>
<td></td>
</tr>
<tr>
<td>Seed shape and</td>
<td>ovate; smooth/ tuberculate winged or</td>
<td>ovate; smooth,</td>
<td>ovate; smooth/ tuberculate</td>
<td>ovate; tuberculate, winged or wingless</td>
<td></td>
</tr>
<tr>
<td>structure</td>
<td>wingless</td>
<td>winged</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*C. pachyphyllum* (Decaisne) K. Schumann  
*C. patagonicum* (Philippi) Malme  
*C. undulatum* (Decaisne) K. Schumann  
*C. viride* (Philippi) Reiche

*Cynanchum* sect. *Formosum* Liede, sect. nov.  
Dicarpophora Spegazzini, Physis (Buenos Aires) 8: 269. 1926. TYPE: *Dicarpophora mazzuchii* Spegazzini.  

Lianae foliiis alte cordatis, inflorescentis extra-axillaribus, multifloris, partibus coronae staminibus interstaminibus late connatis, folliculis duplicibus, oblongiformibus, triangularibus in diametro.  

Plants large twiners (5 m tall or taller), leaves ovate, basally deeply cordate, with "stipules"; inflorescences constituting richly branched bostrychoid cymes, flowers large (to 1 cm diam.), corolla lobes glabrous, corona consisting of highly fused staminal and interstaminal parts, overtopping the gynostegium, follicles always two per flower, three-angled, seeds smooth, winged. This small but conspicuous group of species is restricted to the Andes of Ecuador and Peru.
Table 1. Continued.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>monochasial absent</td>
<td>monochasial absent</td>
<td>monochasial absent</td>
<td>dichasial absent</td>
<td>monochasial absent</td>
<td></td>
</tr>
<tr>
<td>basally woody, herbaceous present</td>
<td>basally woody, herbaceous</td>
<td>absente</td>
<td>absente</td>
<td>brown, woody</td>
<td></td>
</tr>
<tr>
<td>decussate</td>
<td>decussate</td>
<td>decussate</td>
<td>decussate</td>
<td>absente</td>
<td></td>
</tr>
<tr>
<td>ovate</td>
<td>ovate</td>
<td>ovate to obvate</td>
<td>ovate to obvate</td>
<td>absente</td>
<td></td>
</tr>
<tr>
<td>deeply cordate</td>
<td>cordate to deeply cordate</td>
<td>obtuse or acute</td>
<td>obtuse</td>
<td>rounded</td>
<td></td>
</tr>
<tr>
<td>extra-axillary</td>
<td>extra-axillary</td>
<td>extra-axillary</td>
<td>extra-axillary-axillary</td>
<td>extra-axillary-axillary</td>
<td></td>
</tr>
<tr>
<td>simple, bostrychoid</td>
<td>complex, dichasial</td>
<td>simple, sciadiodal</td>
<td>simple, sciadiodal</td>
<td>complex, bostrychoid</td>
<td></td>
</tr>
<tr>
<td>4—7 mm</td>
<td>1.5—3 mm length ≥ width</td>
<td>1—4 mm</td>
<td>1—4 mm</td>
<td>1—2 mm</td>
<td>2—3 mm</td>
</tr>
<tr>
<td>sparse or with short and long trichomes in the sinus</td>
<td>with short trichomes</td>
<td>bearded, rarely glabrous</td>
<td>bearded, rarely glabrous</td>
<td>glabrous</td>
<td></td>
</tr>
<tr>
<td>C(is), connate for ca. ½ of length</td>
<td>C(is), highly connate, often C dominant</td>
<td>double Cs</td>
<td>simple Cs</td>
<td>C(is), highly connate, or C(is) + Cs</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>fusiform, ± circular in cross-section</td>
<td>fusiform</td>
<td>fusiform, ± circular in cross-section</td>
<td>elongated, ± circular in cross-section</td>
<td>cymbiform;</td>
<td></td>
</tr>
<tr>
<td>ovate; tuberculate, winged or wingless</td>
<td>ovate; smooth, winged</td>
<td>ovate; smooth, winged</td>
<td>smooth or tuberculate, wingless or apically winged</td>
<td>smooth or tuberculate, wingless or apically winged</td>
<td></td>
</tr>
</tbody>
</table>


The type specimen of the monotypic genus Dicarpophora has not been traced, despite an intense search in LP and LPS, where Spegazzini's material is usually kept. B also does not possess a specimen. Correspondence between J. Fontella Pereira and E. de la Sota indicates that the specimen has been missing at least since 1983. However, the photograph of the type accompanying the original diagnosis shows all the typical features of a plant of the C. formosum affinity. The type collection originates from a garden in Bolivia; no other material of this section has been found in Bolivia. However, I have found C. formosum in the vicinity of a garden in Chile (Liede & Conrad 3061, MSUN, ULM), and it has probably been more widely cultivated because of its showy, sweetly scented flowers. While it is therefore very likely that C. mazzuchii is a synonym
of *C. formosum*, the photograph of the type is insufficient to determine details of flower structure and confirm this suspicion.

*C. canoi* Morillo
*C. formosum* N. E. Brown (incl. *C. ecuadorense* Schlechter, *C. eurystephanum* Malme)
*C. longirostrum* (K. Schumann) W. D. Stevens
*C. tarmense* Schlechter (Fig. 1)
*C. tiaratum* Malme


*Tylodontia* Grisebach, Cat. PI. Cub. 175. 1866. TYPE: *Tylodontia cubensis* Grisebach, Cat. PI. Cub. 175, nom. nov. for *Aslephanus grisebachii* M. Gomez, Periannth 276. 1894.

Plants herbaceous, twining, leaves lanceolate to linear, inflorescences extra-axillary, sciadioidal, corolla abaxially glabrous, corona absent or consisting of basally fused staminal and interstaminal parts, with only staminal lobes differentiated, but these exceeding the gynostegium, anther wings centrifugal, stylar head conical, fruits single, obclavate, seeds rather elongate, slightly sculptured.

The delimitation of this difficult section against *Orthosia* is not yet fully understood, as both groups share a dichasial branching pattern, the frequent occurrence of ridged green shoots, and an often distichous arrangement of leaves. However, *Orthosia* possesses two characteristic narrowly oblong fruits containing cymbiform seeds, a combination characterizing *Tassadia*, while section *Microphyllum* shares with most other sections of *Cynanchum* a single fusiform follicle containing ovate seeds. Also, inflorescences in *Orthosia*, as in *Tassadia*, are predominantly secondarily axillary (see Liede & Weberling, 1995) while those in section *Microphyllum*, like in most sections of *Cynanchum*, are strictly extra-axillary. Description of inflorescence position has been frequently found to be incorrect in the protologue and needs careful reassessment.

In Ecuador, two members of section *Microphyllum*, *C. brachyphyllum* (with stipitate gynostegium) and *C. velutinum* (with sessile gynostegium), display a dense yellowish indumentum on all vegetative plant parts, a very rare character in the *Cynanchum* sect. *Microphyllum* Liede, sect. nov. TYPE: *Cynanchum microphyllum* Kunth, in Humboldt & Bonpland, Nov. Gen. Sp. Pl. 3: 204, t. 236. 1818. TYPE: Ecuador. Prope Pasto, Nov, Bonpland s.n. (holotype, P).

Lianae herbaceae, dichasiale ramificantes, saepe gemmis adventitis, inflorescentis extra-axillaris, floribus minutis, partibus coronae staminalibus interstaminalibus brevi connatis, folliculis singulis, obclavatis.

Plants with a pronouncedly dichasial branching pattern, frequently with adventitious branches and ridged, green shoots. Leaves small (normally not exceeding 1 cm length), shortly petiolate, basally obtuse or very slightly cordate, inflorescences extra-axillary, mostly sciadioidal, corolla lobes mostly glabrous, rarely with verrucose trichomes (*C. luteynnii*), corona of connate staminal and interstaminal parts, only staminal parts differentiated, gynostegium sessile or stipitate, fruits single, obclavate, seeds rather elongate, slightly sculptured.
Cynanchum alliance. All species of this section, except for *C. filisepalum* from Costa Rica, live in the Ecuadorian, Peruvian, and Colombian Andes, and, as far as known, at altitudes between 3000 and 4000 m.

*C. bifidum* Liede & Meve
*C. brachyphyllum* K. Schumann (Fig. 2)
*C. chimboracense* Morillo
*C. filisepalum* (Standley) L. O. Williams
*C. intricatum* K. Schumann
*C. longecalicinum* Morillo
*C. luteynii* Morillo
*C. microphyllum* Kunth
*C. veleziae* Morillo
*C. velutinum* Morillo

**Cynanchum** sect. **Telminostelma** (E. Fournier)

Plants large twiners (5 m tall or taller), leaves large to very large, ovate, basally broadly cordate, inflorescences axillary, frequently richly, at least basally dichasially branched, many-flowered, corolla lobes glabrous or with trichomes, corona of basally fused staminal and interstaminal parts, either might be differentiated, gynostegium sessile or stipitate, pollinaria characteristically with long translator arms, stylar head flat, fruits, as far as known, very large and thick-walled.

The species of this section are found in Central and northern South America. All species seem to be rare, and most of them are known from a few collections only. This section is particularly interesting for its strong resemblance to Gonolobeae genera, and its thorough study might shed light on the origins of the subtribe Gonolobinae.

This section is taxonomically particularly difficult. Sundell (1981) described *Cynanchum* sect. **Metalepis** (Grisebach) Sundell, based on **Metalepis cubense** Grisebach. Morillo (1991), without considering Sundell's work, recognized the genus **Metalepis**, described several new species, and published two new combinations. At the same time as Sundell, however, Fontella and Schwarz (1981) transferred **Metalepis** to the Gonolobeae following the study of the isosyntype of **M. cubense** (Wright 2799), a placement independently suggested by Liede and Albers (1994). Sundell admits to not having seen the type of his new
section. The other species placed in section *Metalepis* by Sundell (1981), *C. ekmanii* (Malme) Sundell, is recognized as Asclepiadaceae by Fontella and Schwarz (1981). From this history it emerges that both section *Metalepis* (Grisebach) Sundell and the new descriptions and combinations of Morillo (1991) need correction.

Fontella and Schwarz (1981) suggested placing the remaining species of section *Metalepis* together with the species of section *Roulina* (Decaisne) Sundell and *Mellchampia* (A. Gray ex S. Watson) Sundell into the genus *Telminostelma* E. Fournier. The type of *Telminostelma*, *T. roulinioides* E. Fournier, constitutes a synonym of *Roulina parvisetosa* Decaisne (*C. contrapetalum* Sundell). This species, excluded from subgenus *Mellchampia* by Sundell (1981), is characterized by a corona of fused staminal and interstaminal parts, with the lobes, however, in interstaminal position. The same feature is clearly shown in the drawing of *Metalepis prevostiae* Morillo, even though Morillo (1991) does not even mention this peculiarity in the text. Such a shift in the position of the main corona lobes, although uncommon and problematically functional, is by no means absent in *Cynanchum* (e.g., the *C. lineare* N. E. Brown and *C. danguyanum* Choux groups in Madagascar). Therefore, it is insufficient for the delimitation of an independent genus. *Cynanchum ekmanii*, *C. contrapetalum*, and the species subsumed under *Metalepis* by Morillo (1991) form a well-delimited group of species, which, however, cannot be regarded as an independent genus unless the same status were granted to *Mellchampia* and *Roulina* as well. As such a split seems undesirable at present, it is suggested here to delimit this group of species as a section under *Cynanchum*. It needs to be mentioned, though, that the inclusion of section *Mellchampia* and section *Roulina* in a genus *Telminostelma* as suggested by Fontella and Schwarz (1981) seems equally undesirable at present, because section *Roulina*, in particular, is morphologically quite similar to members of section *Cynanchum* from Africa and Asia. As a corollary to the present discussion it might be noted that the new combination *T. foetidum* (Cavanilles) Fontella & E. A. Schwarz unites *C. foetidum* (Cavanilles) Kunth and *C. monteviense* Sprengel, two very different species from Central and South America, respectively.


*C. albiflorum* (Urban) Woodson
*C. brasiliense* (Morillo) Liede
*C. contrapetalum* Sundell
*C. ekmanii* (Malme) Sundell
*C. gentryi* (Morillo) Liede
*C. gilbertii* Liede
*C. haughtii* Woodson
*C. marsdenioides* Woodson
*C. peraffine* Woodson
*C. subpaniculatum* Woodson

*Cynanchum sect. Roulina* (see Sundell, 1981)

*Cynanchum sect. Mellchampia* (see Sundell, 1981)

*Orthosia* Decaisne in Candolle, Prodr. 8: 526. 1844. TYPE: *Orthosia congesta* (Vellozo) Decaisne.


Plants forming herbaceous, large, twining tangles, usually dichasially branched, shoots green, ridged, leaves ovate, usually apically acute, basally rounded, inflorescences extra-axillary to axillary, flowers small (usually less than 5 mm diam.), often dark colored, corolla lobes usually glabrous (occasionally with short conical trichomes), corona of basally fused staminal and interstaminal parts, only staminal parts differentiated and normally either tridentate or with a prominent central tooth, follicles two per flower, elongate, seeds very long-ovate, cymbiform, (almost) smooth, only apically winged. Widespread from the Caribbean to northern Argentina.

A particularly large and difficult assemblage is formed by the species that have been—or could be—attributed to *Orthosia* and *Amphistelma*. While *Orthosia* is usually easily recognizable by its axillary inflorescences, this character is not prominent in *Amphistelma*. However, intermediates between extra-axillary and axillary inflorescences have been found occasionally in American *Cynanchum* (sect.
Roulinia; Liede & Weberling, 1995), so that this character cannot be used as “the” generic character of Orthosia. Nevertheless, both groups are characterized by a tendency toward leaf reduction, staminal corona lobes with a pointed central tooth, twinned follicles with almost the same diameter over their entire length, and cymbiform, only apically winged, smooth seeds. To my understanding, Orthosia including Amphistelma thus forms a natural group of species not closely related to Cynanchum. In contrast, corona structure and fruit and seed morphology suggest that Orthosia represents a sister genus to Tassadia Decaisne. This placement is reflected by Fontella and Schwarz (1982), who placed one of the most prominent Orthosia species, *O. melantha* Malme of southwestern South America, in Tassadia. However, the characteristic inflorescence structure and the usually double corona separate Tassadia from Orthosia. On the other hand, delimitation of some Orthosia against species of Cynanchum sect. Microphyllum is difficult in many cases, especially if the material does not show flowers, fruits, and seeds. Furthermore, I expect a high degree of synonymy among these taxa, because Orthosia species seem to be by far more widespread than their Cynanchum counterparts. For these reasons, and in order not to upset the already difficult nomenclature of American Cynanchinae, the numerous new combinations necessary if Orthosia is recognized as a genus are not performed here. Rather, a checklist of existing names and of species presently included in other genera is presented to create a basis for a future revision of this difficult group.

Orthosia arenosa Decaisne
*O. bahiensis* Schlechter
*O. congesta* (Vellozo) Decaisne (incl. *O. decaisnei* E. Fournier, *O. urceolata* E. Fournier)
*O. dusenii* (Malme) Fontella
*O. ecuadoriensis* Schlechter
*O. eichleri* E. Fournier
*O. grandis* Handel-Mazzetti
*O. itatiaiensis* Malme
*O. kunthii* Decaisne (incl. A. graminifolium Grisebach, *C. lanceolatum* Kunth, *C. bonplandianum*
Figure 4. *Cynanchum wurdlackii* Morillo. —A. Flower. —B. Gynostegium with corona. —C. Gynostegium. —D. Pollinarium. (From Erikson 59107, AAU, drawn by U. Meve.)

Roemer & Schultes, *Metastelma angustifolium* Turczaninow, *C. wigginsii* Shinners

- *O. latipes* Malme
- *O. loandensis* Fontella & Valente
- *O. mollis* Schlechter
- *O. multiflora* E. Fournier
- *O. paniculata* Klotzsch
- *O. serpyllifolia* (Kunth) Decaisne
- *O. stenophylla* Schlechter
- *O. suberosa* Decaisne
- *O. tarmensis* Schlechter
- *O. thymifolia* Schlechter
- *O. tomentosa* (E. Fournier) Malme
- *O. trianaei* Schlechter
- *O. umbrosa* Decaisne

*Amphistelma atrorubens* Schlechter

- *A. ephedroides* Grisebach
- *A. ferrugineum* E. Fournier
- *A. filiforme* Grisebach
- *A. leptocladon* (Decaisne) Schlechter
- *A. parviflorum* E. Fournier
- *A. pearcei* Rusby

A. *riedelii* E. Fournier

- *A. scoparium* Nuttall
- *A. selloanum* E. Fournier
- *Cynanchum balslevii* Morillo
- *C. beckii* Morillo
- *C. bonariense* (Decaisne) T. Meyer
- *C. campii* Morillo
- *C. carmensemiliae* Morillo
- *C. cassythoides* Suessenguth
- *C. dombeyanum* (Decaisne) Morillo
- *C. dorrii* Morillo
- *C. ellemannii* Morillo
- *C. fernandezii* Morillo
- *C. junale* Poiret
- *C. glaberrimum* L. O. Williams
- *C. isidrensis* Morillo
- *C. meridense* Morillo
- *C. miserum* L. O. Williams
- *C. pichinchense* K. Schumann
- *C. purpureiflorum* Morillo (Fig. 3)
- *C. samuelsonii* Malme
- *C. sepium* (Decaisne) Standley
C. sodiroi K. Schumann
C. stannardii Morillo
C. stenospira Schlechter
C. tamense Morillo
C. trifurcatum (Grisebach) Lillo
C. wurdackii Morillo (Fig. 4)
Metastelma pubescens (Greenman) W. D. Stevens
M. rariflorum Schlechter
M. retinaculatum Schlechter
M. rubens (L. O. Williams) W. D. Stevens
Tassadia subulata (Vellozo) Fontella & E. A. Schwarz [incl. O. melantha (Decaisne) Malme]

**UNCERTAIN SPECIES**

For some species, the affinity could not be determined with certainty, mostly due to lacking or incomplete material. These species include:

C. cardozoi Morillo
C. caudigerum R. W. Holm
C. confusum R. W. Holm
C. ekmanii Alain (nom. and comb. nov. for Astephanus schlechterianus Urban; non C. ekmanii (Malme) Sundell)
C. erikseniae Morillo
C. fasciculiflorum Morillo
C. granatense (Baillon) Morillo
C. guanchezii Morillo
C. leucophellum Diels
C. mariquitense Mutis
C. microphyllum Rafinesque
C. pallidum Sessé & Moçinho
C. robertii (S. Moore) Malme
C. rusbyi Malme
C. tabascense Sessé & Moçinho
C. trollii Liede & Meve ined.
C. unguiculatum Ruiz & Pavón
C. uniflorum Sessé & Moçinho
C. violator R. W. Holm

**EXCLUDED SPECIES**

_Cynanchum harlingii_ Morillo probably represents a species of _Blepharodon_ close to _B. mucronatum_ Decaisne.

_C. jennmani_ Morillo belongs to the subtribe Gonolobinae.

_C. sarcostemma_ Lillo

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**Literature Cited**


