

**CALYPTOCARPUS VIALIS LESS. (ASTERACEAE),
A NEWLY NATURALIZED WEED IN TAIWAN¹**

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Abstract

Calyptocarpus vialis, a composite species of tropical and subtropical American origin, has recently been naturalized in Taipei City. The present study gives the taxonomic description and determines the chromosome number of this non-native species. Furthermore, the diagnostic characters of *C. vialis* and its close relative, *Synedrella nodiflora*, which is commonly found in Taiwan, are compared.

Key words: *Calyptocarpus vialis* Less.; weed; taxonomy; chromosome number; *Synedrella nodiflora* (L.) Gaertn.

Forest clearance, rapid industrialization and extension of both domestic and international trade and travel that accompanied the flourishing economic growth in Taiwan in recent years have provided ample opportunities for the immigration and spreading of many exotic weeds. Such newly naturalized species have been reported by Hsu (1973), Peng (1978), Kuo and Koyama (1978), Kao and Chiu (1978), Kuoh and Wu (1978, 1979), Chiu and Kao (1979), Chen (1980, 1981), Ou & Liu (1981), and others. Many of these alien species were of restricted distribution initially, but have since been spreading rapidly. For example, *Taraxacum officinale* Weber is now dominant in many traffic islands in Taipei City, and *Hypochoeris radicata* L. is a common sight along the Central Cross-island Highway and its nearby mountain trails at the elevation of ca. 1,500-2,500 m in Taiwan.

In this paper we report the recent finding of an additional adventive species, *Calyptocarpus vialis* Less. in Taiwan. The composite genus *Calyptocarpus* is of tropical and subtropical American origin and is bitypic. *Calyptocarpus wendlandii* Schultz Bip., the only other congeneric of *C. vialis*, had not, however, been considered valid

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by most authors until 1967, when McVaugh and Smith, on morphological and geographical grounds, ably and conclusively pointed out that the two species were indeed distinct. Separation of the two taxa was further supported by data from chromosome numbers. Turner *et al.* (1961) reported $n=12$ and $n=36$ for two populations identified as *C. vialis*. Upon reexamination of the voucher specimens, McVaugh and Smith (1967) indicated that the collection with $n=36$ represented, in fact, *C. wendlandii*. The difference in chromosome numbers of the two species was further confirmed by Solbrig *et al.* (1972).

The morphological as well as cytological studies show that our new record is *Calyptocarpus vialis* Less. The description and illustrations (Figs. 1 and 2) of *C. vialis* are as follows:

Calyptocarpus vialis Less., Syn. Gen. Comp. 221. 1832; McVaugh and Smith in Brittonia 19: 270, figs. 4-6. 1967.

Syn.: *Oligogyne tampicana* DC., Prodr. 5: 629. 1836.

Herbaceous perennial. Stems rounded, prostrate, many from base, rooting at nodes, densely appressed strigillose, the hairs 0.2-0.6 mm long. Leaves opposite, ovate to broadly ovate, up to 35 mm long, 25 mm wide, densely appressed strigillose on both surfaces and hirtellous especially beneath, the hairs up to 1.3 mm long; apex acute and apiculate, margins crenate-serrate, base attenuate; petioles 3-8 mm long, narrowly winged on upper part, ciliate along the margins, the hairs up to 1.5 mm long. Stipules 0. Heads axillary, solitary on each node, subsessile, occasionally with peduncles up to 15 mm long. Involucres narrowly oblong-ob lanceoloid, 6-7 mm long, 2.5-3.5 mm across. Phyllaries 4, concave, lanceolate, acuminate and apiculate, entire, 6-7 mm long, 3-3.5 mm wide, erect, glabrous within, strigillose without, in 2 series, the outer series with hirtellous hairs 0.6-1.4 mm long additionally. Pales hyaline, narrowly elliptic, narrowly acute at apex, 3.5-4.8 mm long, 0.8-1 mm wide. Ray florets 3-7(-8), fertile, yellow; corollas 4.5-6.2 mm long, 1.4-1.8 mm wide, remotely puberulent abaxially; tubes white, about $\frac{1}{2}$ as long as the yellow limbs; limb apices often 2-3 irregularly notched; achenes oblanceolate, 3.5-4 mm long, 1.7-2 mm wide, tan to blackish at maturity, flattened, nearly smooth on both surfaces, with small lateral winglike projections, pappus of usually 2 ascending-divergent awns, 1.2-2.4 mm long, sometimes with 1 (-2) additional much shorter awns. Disc florets 3-7(-8); corollas 2.6-3.6 mm long, throats yellow, slightly longer and wider than the whitish tubes; apical lobes 4, ovate-deltoid, 0.7-0.75 mm long, 0.5-0.6 mm wide, densely papillose within; anthers black, 1 mm long, the apical appendages lanceolate, obtuse; pollen yellowish; style branches emergent; achenes similar to those of rays but slightly narrower and thicker, sometimes 3-angled, 1.1-1.7 mm across, evidently muricate, without distinct marginal projections.

Distribution. Southeastern Texas, eastern Mexico, Yucatan, and Cuba (McVaugh

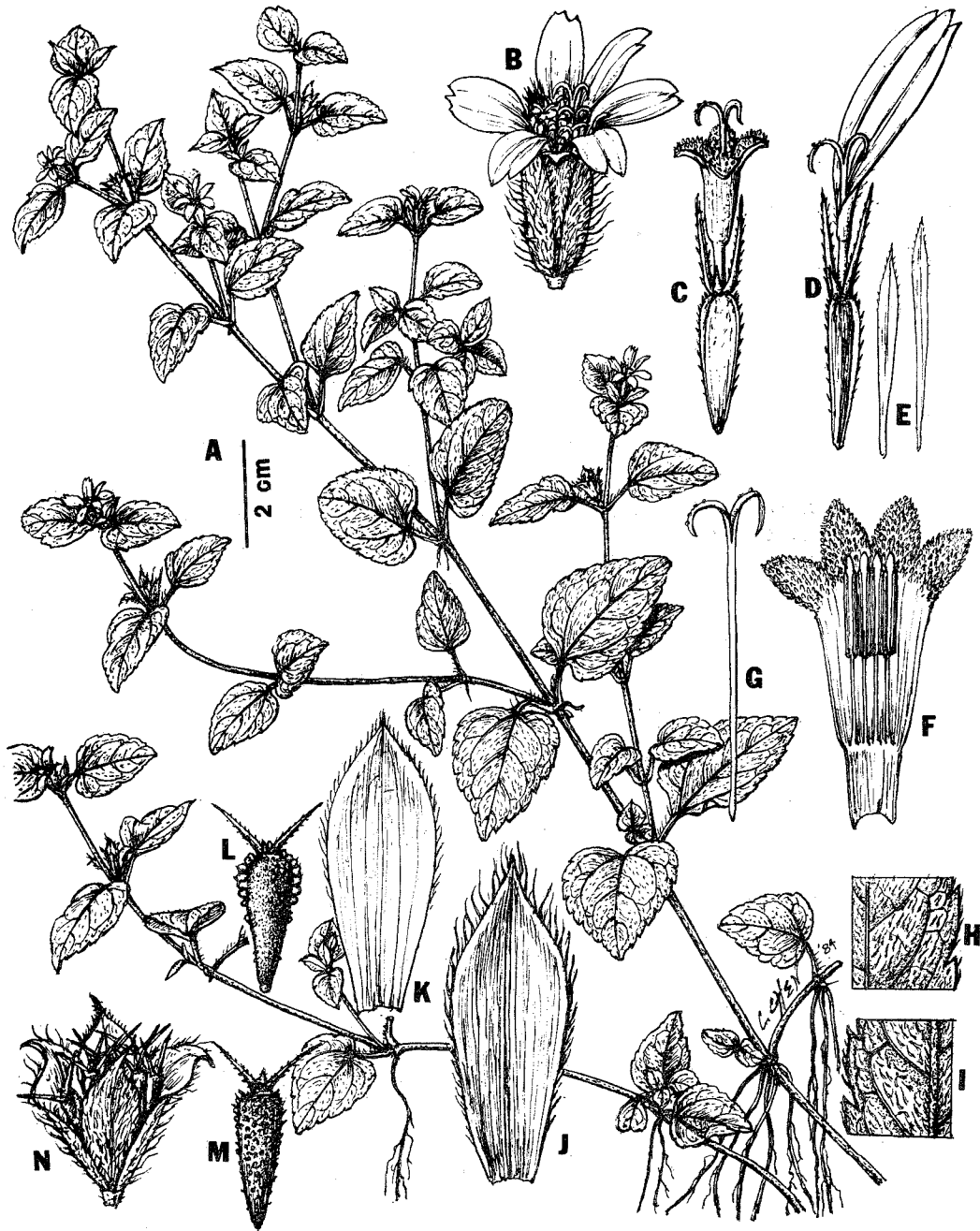


Fig. 1. *Calyptocarpus vialis* Less. A. Habit. B. Head. C. Disc floret. D. Ray floret. E. Pales. F. Disc corolla, dissected, showing stamens. G. Style branches. H. Portion of upper leaf surface. I. Portion of lower leaf surface. J. Outer phyllary, adaxial surface. K. Inner phyllary, adaxial surface. L. Ray achene. M. Disc achene. N. Head with mature achenes.

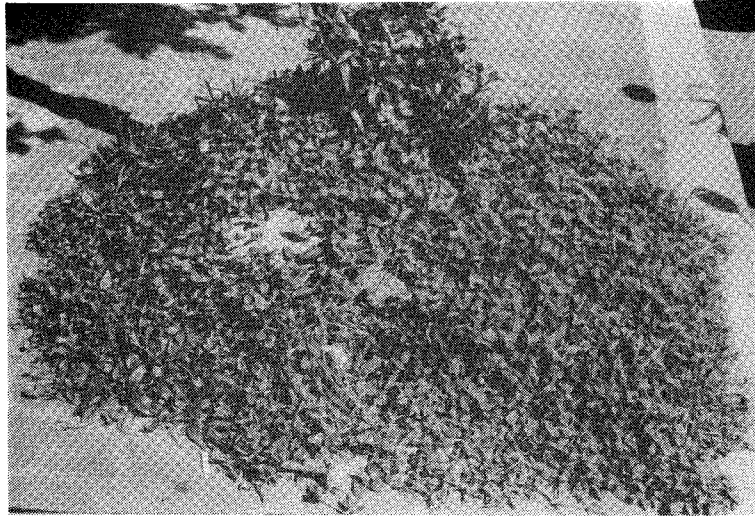


Fig. 2. *Calyptocarpus vialis* forms a dense mat over the base of *Ficus microcarpa*, the street tree.

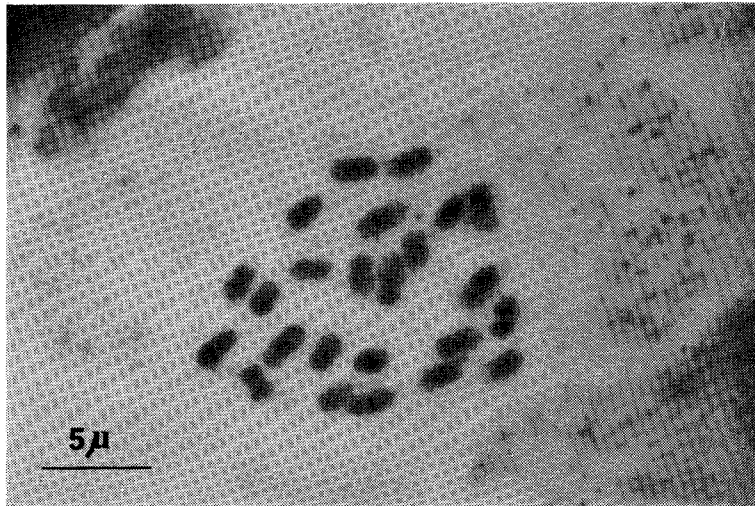


Fig. 3. Photograph of somatic metaphase chromosomes of *Calyptocarpus vialis* Less. (*Peng 6043*), showing $2n=24$.

and Smith, 1967). Introduced to Hawaii (T.F. Stuessy, pers. comm., 1984) and Taiwan.

Specimens examined. TAIWAN. Taipei Co.: Shihpai, Taipei City. 9 Oct 1983, *Kao 9982* (TAI); 21 Oct 1983, *Peng 6043* (Academia Sinica, Taipei).

Habitat. On sandy soil along sidewalks outside of the Veteran's General Hospital, forming mats over the base of *Ficus microcarpa* L.f., the street tree. Associated with the following weeds: *Alternanthera philoxeroides* (Moq.) Griseb., *Amaranthus viridis* L., *Brachiaria subquadripata* (Trin.) Hitchc., *Centella asiatica* (L.) Urban, *Conyza sumatrensis* (Retz.) Walker, *Digitaria henryi* Rendle, *Eleusine indica* (L.) Gaertn., *Emilia sonchifolia* (L.) DC., *Lactuca indica* L., *Malvastrum coromandelianum* (L.) Garcke, *Oxalis corniculata* L., *Paederia scandens* (Lour.) Merr., *Paspalum orbiculare* Forst., *Solanum capsicastrum* Link ex Schauer.

Cytology. Somatic chromosome number of $2n=24$ (Fig. 3) is obtained for *Peng 6043*. This result is in agreement with the two previous reports (Turner *et al.*, 1961; Solbrig *et al.*, 1972) for *Calyptocarpus vialis*. The chromosomes are small, ranging from 1.6–2.4 μ . They are either metacentric or submetacentric.

Calyptocarpus vialis is similar to *Synedrella nodiflora* (L.) Gaertn., which is commonly found in lowlands throughout Taiwan. A comparison of diagnostic characters of the two taxa is summarized in Table 1.

Table 1. Comparison of *Calyptocarpus vialis* with *Synedrella nodiflora*

Characters	<i>Calyptocarpus vialis</i>	<i>Synedrella nodiflora</i>
Habit	Prostrate perennial, rooting at nodes	Erect annual, rooting only at stem base
Inflorescence	Heads axillary, solitary on each node	Heads usually several (up to 7) in compact axillary glomerules
Inner pales	Narrowly acute	Obtuse
Ray florets	3-7(-8)	6-9
Disc florets	3-7(-8)	10-16
Margins of ray achene	With small, interrupted projections (more pronounced above)	Distinctly winged (broader below) and sharply lacerate
Awns of disc achene	Subequal to those of ray achenes	At least 2 times as long as those of ray achenes
Differences in ray and disc achenes	Slight	Marked

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臺灣新歸化菊科植物——金腰箭舅*

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金腰箭舅* (*Calyptocarpus vialis* Less.) 原產美國德州，墨西哥以及古巴，新近歸化臺北市石牌地區。本文除對其分類特徵及生態環境加以描述外，並報導其染色體數，且將本種與臺灣平野常見之近緣植物——金腰箭 (*Synedrella nodiflora* (L.) Gaertn.) 之重要特徵表列比較。

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