

A NEW SPECIES OF *CEROPEGIA* (APOCYNACEAE: ASCLEPIADOIDEAE)
FROM INDIA WITH NOTES ON RARE AND THREATENED
CEROPEGIA IN NILGIRIS OF WESTERN GHATS

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ABSTRACT

Continuing studies in the genus *Ceropegia* in Nilgiri phytogeographical region of southern Western Ghats resulted in the discovery of a new species, *Ceropegia manoharii* Sujanapal, Salim, Anil & Sasidh., sp. nov. Description, illustration and photographs are provided for *Ceropegia manoharii*. Additional study has shed light on the details of three edible *Ceropegia* species, as hitherto undescribed host plants of a butterfly, *Danaus genutia*, and the conservation status.

KEY WORDS: *Ceropegia*, new species, Conservation status, Western Ghats

RESUMEN

Continuando los estudios en el género *Ceropegia* en la región fitogeográfica de Nilgiri del sur de Western Ghats se descubrió una nueva especie, *Ceropegia manoharii* Sujanapal, Salim, Anil & Sasidh., sp. nov. Se aporta una descripción, ilustración y fotografías de *Ceropegia manoharii*. El estudio adicional ha arrojado luz sobre los detalles de tres especies comestibles de *Ceropegia*, como que son plantas hospedadoras de una mariposa, *Danaus genutia*, y su status de conservación.

INTRODUCTION

Nilgiris, or Blue Mountains, the meeting place of three mountain systems of Peninsular India (Chatterjee 1995), is blended with incomparable natural beauty, exceptional physiography, rich biodiversity and blessed climate. The natural habitats vary from montane Shola-Grasslands at Doddabetta, the second highest peak south of Himalayas, to the dry deciduous forests in the lower feet of Deccan plateau in the east and tropical wet evergreen-moist deciduous combinations in the west. Altitudinal arrays from 40 m to 2637 m asl and topographical oddity wrought the region a biodiversity hotspot and the center is the home of several southern Western Ghats endemic and threatened species. Large scale plantations of tea, coffee, cardamom, eucalyptus, pine and teak have resulted in the unprecedented destruction of substantial areas of virgin forests along its scenic valleys. Since the hill stations of Nilgiris are the important tourist destinations in India, anthropogenic engagements shattered the existing natural vegetation. Now, most of the natural habitats, outside the Protected Areas, are highly degraded.

Ceropegia L. (Asclepiadoideae-Ceropegieae), a tropical Old World genus of more than 200 species, exhibits its tremendous diversity with respect to habit, habitat, flower architecture and ecological adaptations (Dyer 1983; Bruyns 1997; Kambale et al. 2012). Basely inflated tubular corolla, often lined with downwardly pointed hairs, forms a temporary trap for small flies and the group is widely known as 'fly trap flowers' (Masinde 2004; Ollerton et al. 2009). Ansari (1984), in the revision of Indian *Ceropegia*, recorded 44 species, of which 28 are reported to be endemic to India. Later six novelties have been added and presently the genus is represented in India by about 50 species, of which 38 are distributed in the Western Ghats (Yadav & Kamble 2008; Yadav & Shendage 2010). Many species of *Ceropegia* are narrow endemics and are placed under different IUCN Red-List categories (Nayar & Sastry 1987–1989).

Ceropegia manoharii Sujanapal, Salim, Anil & Sasidh., sp. nov. (Figs. 1j–l, 2). TYPE: INDIA. KERALA: Wayanad District, Meppadi forests, 11°32.369'N, 76°04.553'E, ±1830 m asl, 10 Dec 2009, P. Sujanapal & P.M. Salim MSSH 0403 (HOLOTYPE: MH; ISOTYPES: CALI, KFRI, MSSH).

Ceropegia manoharii Sujanapal, Salim, Anil & Sasidh. sp. nov., is allied to *C. vincaefolia* Hook. due to the longer corolla lobes than tube; however, it can be easily distinguished from the latter with its fascicled tuberous roots, one- or two-flowered cyme, and elegant green and cream colour combinations of corolla lobes against the single tuberous root, many flowered cymes, and brown and pale yellow combination of corolla lobes. Further, the corolla tube of the new species is hardly dilated above, calyx segments small, peduncle and corolla lobes glabrous whereas in *C. vincaefolia*, corolla tube is funnel shaped, calyx segments long, and peduncle and corolla lobes hairy. Another important peculiarity of the new species is the presence of long, adpressed, brown hairs along the margins of corolla lobes.

Twining herbs; secondary root tuberous, few, to 30 cm long, 1–1.5 cm diam.; stem to 0.5 cm diam., terete, glabrous, branched. Leaves simple, decussate, thickly coriaceous; petiole 0.8–1.5 cm long; lamina 5–10 × 2–3.5 cm, lanceolate, apex acuminate, base rounded or acute, dark green, shining above, pale green below, margin smooth, laxly ciliate. Cymes axillary or extra axillary, mostly one- or two-flowered; peduncle 0.8–1.2 cm long, ca. 1.5 mm diam., glabrous; pedicel 1.8–2.4 cm, ca. 1 mm diam., glabrous; bract solitary, 2–4 × 0.2–0.5 mm, linear, acuminate, glabrous. Sepal 3–5 × 0.6–0.9 mm, linear, acuminate, glabrous. Corolla 3–4 cm long; tube 1.4–1.8 cm long, greenish yellow, dilated at base, conical with sudden constriction above, striated with purplish brown lines on the upper half, glabrous, mouth of the inflated part with inwardly directed hairs inside, inner deeply purple; lobes 1.6–2.2 cm long, strictly and completely folded back along midrib, linear oblong with rounded apex, lower half creamy white internally with an artistic roundish end, externally with brown blotches, upper half dark greenish, margin with long brown adpressed hairs, lobes connate at tip forming an ovoid head. Outer corona cupular, lobes 5, each lobe bifurcate into two divergent horn-like projections, each projection ca. 1.5 mm long, ciliate, horns of adjacent lobes paired apically; inner corona of five linear, connivent, purple lobes, ca. 2.5 mm long, apically rounded. Pollinia yellow, attached to the brown corpusculi by short caudicles; pollinarium 0.3 × 0.25 mm in total. Follicle pairs unequal, larger 15–18 × 0.3–0.4 cm and the smaller 10–13 × 0.3–0.4 cm, slightly curved, glabrous; seeds ca. 5 × 2 mm, ovate-oblong, black; coma 0.8–1.5 cm long, white, silky.

Local status and Population.—Rare in the locality, a total of 44 mature individuals were located in the Montane Grasslands of Meppadi Forest Range. Most of the growing spots are inaccessible due to steep cliffs and sharp rocky cuttings.

Habitat.—Grasslands between 1500–1850 m asl.

Geographical distribution.—So far known only from the montane grasslands of South Wayanad Forest Division (Nilgiri, Western Ghats, Kerala, India).

Etymology.—The specific epithet '*manoharii*' derived from a Malayalam word '*manoharam*' which means beautiful, denotes the elegant flowers of the new species.

Flowering and Fruiting.—August–February.

PARATYPES.—INDIA. Kerala: Wayanad District, Meppadi forests, 11°32.372'N, 76°04.568'E ±1800 m asl, 20 Dec 2010, P. Sujanapal & P.M. Salim MSSH 0412; 12 Jan 2011, P. Sujanapal & P.M. Salim MSSH 0428.

Distribution and Habitat of *Ceropegia* Species in Nilgiris

During the study, a total of nine taxa of *Ceropegia* were collected from Nilgiris. Among the collections an undescribed, elegant species was included, named here as *Ceropegia manoharii* Sujanapal, Salim, Anil & Sasidh. sp. nov., shows a very narrow distribution in the Meppadi Hill ranges of Wayanad. Except *C. hirsuta* and *C. juncea*, all other species are endemic to the Peninsular India - Sri Lanka mega-diversity center. *Ceropegia juncea* Roxb., a leafless species with succulent stem is restricted to dry habitats towards the eastern side of Nilgiris. Species such as *C. manoharii*, *C. ciliata* Wight, and *C. thwaitesii* Hook. are confined to montane wet grasslands. *Ceropegia candelabrum* L. is found in the moist deciduous forests and similar areas. *Ceropegia decaisneana* Wight, *C. hirsuta* Wight & Arn., and *C. elegans* Wall. are occurring in evergreen forests and similar habitats above 500 m asl. Most of the species of *Ceropegia* in this region are habitat specific with a narrow distribution range. Therefore, they are highly vulnerable and deserve special attention for conservation.

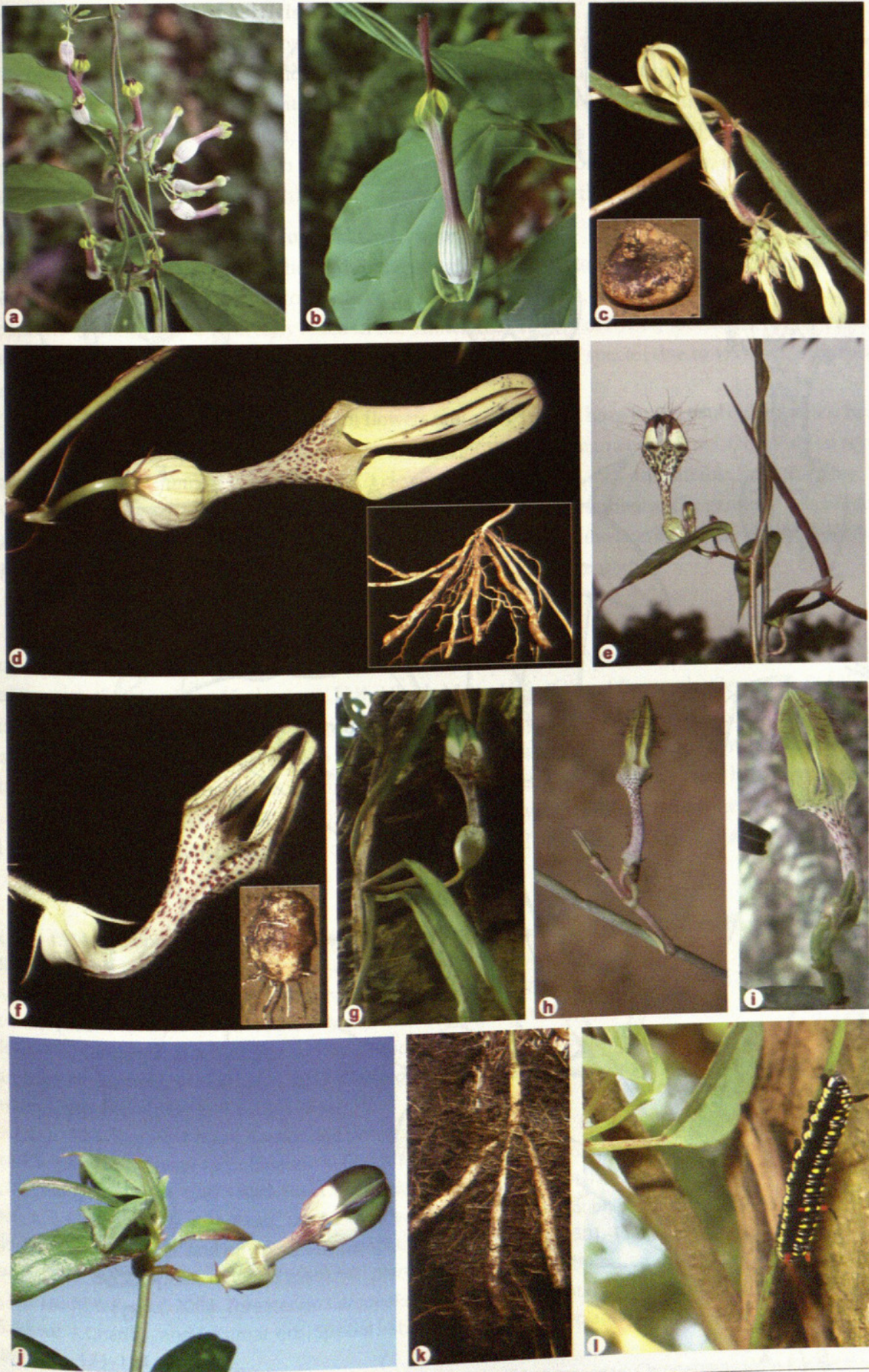


FIG. 1. Diversity of *Ceropegia* in Nilgiris. **a**, *Ceropegia candelabrum* ssp. *candelabrum*; **b**, *C. candelabrum* ssp. *tuberosa*; **c**, *C. ciliata*; **d**, *C. decaisneana*; **e**, *C. elegans*; **f**, *C. hirsuta*; **g**, *C. thwaitesii*; **h–i**, *C. juncea*; **j–l**, *C. manoharii* (**j**, flower; **k**, fleshy (tuberous) secondary roots; **l**, caterpillar of *Danaus genutia*) (inset – tubers).

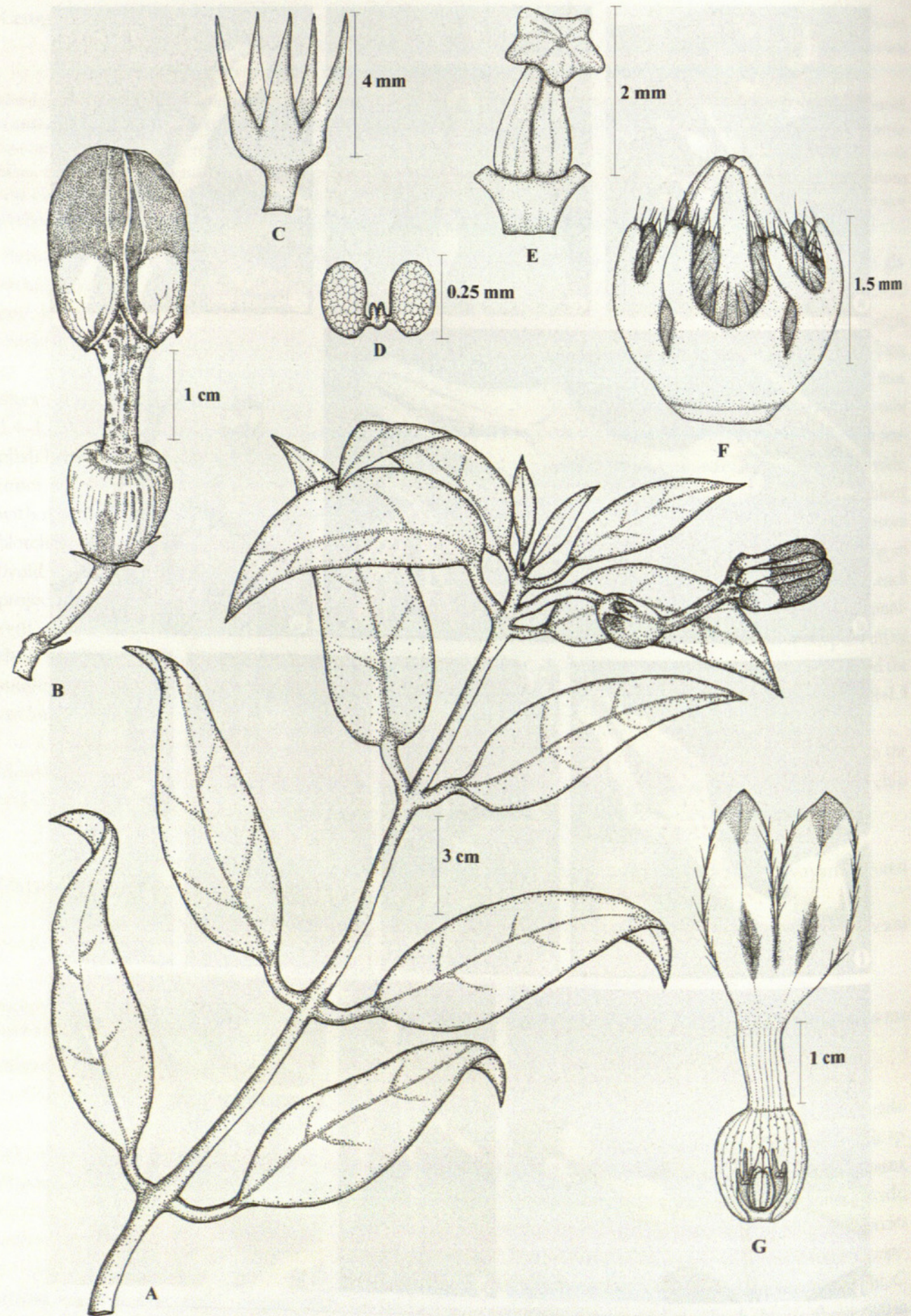


FIG. 2. *Ceropegia manoharii* Sujanapal, Salim, Anil & Sasidh., sp. nov. A. flowering twig; B. flower; C. calyx; D. pollinarium; E. carpel; F. corona; G. flower, l.s.

Socio-ecology of *Ceropegia* of Nilgiris

The genus *Ceropegia* is characterized by root tubers either as single large potato-like tuber or fascicled tuberous roots. Tubers and leaves of many species of *Ceropegia* are used as food in various parts of the Old World (Mabberly 1987). It is also used in indigenous systems of medicines (Pullaiah 2006). Inquiry with the tribes, as well as other local people of the study area, revealed that tubers of *C. hirsuta* and leaves of *C. decaisneana* are consumed by local communities. Though *C. decaisneana* doesn't form a potato-like tuber, the leaves are used as 'Paalaancheera' (Milk tasted Amaranth) and are a delicious item during the fasting period such as 'Eidh'.

Rare and Threatened Species and Horticultural Importance

Among the nine taxa collected from the study area, seven are endemic to Western Ghats-Sri Lanka Biodiversity Hotspot and three taxa are restricted to southern Western Ghats region. Among the three Western Ghats endemic species *C. decaisneana* is already listed in the Vulnerable category of IUCN; species such as *C. ciliata* and *C. manoharii* are very rare and facing a higher threat than the red-listed species due to various anthropogenic and environmental factors.

Ceropegia is distinctive with magnificent flowers and a few species have leafless succulent vines; because of this peculiarity, many species of *Ceropegia* are widely cultivated as ornamental plants. Observation revealed that species such as *C. juncea*, *C. manoharii*, *C. elegans*, *C. decaisneana*, etc., are suitable for gardening. Since many of these species are host plants of butterflies, they will attract butterflies to the gardens. It is found that the caterpillar of the butterfly, *Danaus genutia*, feeds on *C. elegans*, *C. thwaitesii* and the newly described *C. manoharii*. These species are hitherto undescribed host plants of *Danaus genutia*.

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