A synopsis of the genus *Cynoglossum* L. (Boraginaceae) in Madagascar and the Comoro Islands

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ABSTRACT
The species of *Cynoglossum* L. known from Madagascar and the Comoro Islands are revised and six species are recognized from the region. *Cynoglossum lanceolatum* is a widespread species that is common throughout Madagascar and also Africa and Asia; *C. cernuum* occurs in Madagascar and the Mascarene Islands, but the other four species are endemic to Madagascar, three of which (*C. birkinshawii*, *C. lowryanum*, and *C. tsaratananense*) are described as new. Of the six species of *Cynoglossum* known from Madagascar and the Comoro Islands, four face significant threat of extinction and three are critically endangered.

INTRODUCTION
The flora of Madagascar remained very poorly known prior to 1900 with only a limited number of collections available that provided an uneven picture of plant diversity. The situation has changed as hundreds of thousands of herbarium specimens were collected during the 20th century and, in association with this massive inventory effort, the *Flore de Madagascar et des Comores*...
project (Muséum national d’Histoire naturelle, Paris) began to publish fascicle family treatments. Boraginaceae are among the families that have never been published for the Flora, and the Malagasy members of the family were poorly treated in most encyclopedic works of the 1800s (e.g., CANDOLLE 1845) because of the paucity of collections available at that time. The woody Boraginaceae were not included in the completed parts of ENGELER’s Pflanzenreich, whereas the herbaceous members of the family were covered in two parts (BRAND 1921, 1931). However, the number of collections available to BRAND was inadequate to understand species-level diversity of Cynoglossum L. within Madagascar. Recent efforts to review the family and prepare a treatment for the Flore de Madagascar et des Comores have resulted in revisions for the Malagasy species of Cordia (MILLER 2001a), Ehretia (MILLER 2002), Heliotropium (MILLER 2003a), Hilsenbergia (MILLER 2003b), and Tournefortia (MILLER 2001b); this article surveys the diversity of Cynoglossum L., the last genus with native species in Madagascar.

Cynoglossum comprises about 55 species that occur throughout temperate regions and upland parts of the tropics. No modern revision of the genus has been published since the last comprehensive review of BRAND (1921). Since that time, most taxonomic work on Cynoglossum has been published in various floras (e.g., MARTINS 1990; NOWICKE & MILLER 1991; VERDECOURT 1991). Recent review of the collections of Cynoglossum at the Muséum national d’Histoire naturelle in Paris, the Natural History Museum in London, the Royal Botanic Gardens, Kew, the Missouri Botanical Garden, and the two main herbaria in Madagascar (TAN and TEF) revealed that six species occur in Madagascar, three of which are described here as new.

GEOGRAPHY AND CONSERVATION

Six species of Cynoglossum are recognized in Madagascar, four of which are narrowly distributed endemics. Cynoglossum lanceolatum Forssk., one of the two non-endemic taxa, is a widespread species that grows in disturbed habitats and ranges throughout many parts of Africa and Asia as well as Madagascar. It is not clear, however, whether this species is native or introduced. Cynoglossum cernuum Baker is known from upland areas in Madagascar but also occurs on the Mascarene Islands. The other four species of Cynoglossum are all endemic to Madagascar, and all of them are very narrowly distributed. Each of the four endemic species has been recorded from at least one of Madagascar’s protected areas, but none are known from more than a small number of collections, and they all appear to be in danger of extinction.

The locality data for specimens of species of Cynoglossum from Madagascar and the Comoro Islands have been analyzed for a provisional assessment of their risk of extinction following IUCN Red List Categories and Criteria (IUCN 2001). The data used for the analysis and the resulting conclusions are summarized in Table 1; more detailed information is provided following the discussion under each species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of collections</th>
<th>Two most recent collections</th>
<th>Extent of Occurrence</th>
<th>Area of Occurrence</th>
<th>IUCN Red List category</th>
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<td>1975; 1975</td>
<td>10603</td>
<td>10</td>
<td>VU</td>
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<tr>
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<td>1</td>
<td>1929</td>
<td>100</td>
<td>1</td>
<td>CR</td>
</tr>
</tbody>
</table>
CYNOGLOSSUM L.


Type. — *Cynoglossum officinale* L.

Perennial, or less frequently annual or biennial herbs from a thickened rootstock, usually branched, pubescent or rarely glabrous. Leaves alternate, simple, entire, the basal leaves on distinct petioles, the cauline leaves often sessile. Inflorescences racemes or panicles, the branches scorpioid, usually ebracteate. Flowers bisexual, actinomorphic, usually pedicellate; sepals 5, distinct nearly to the base, often accrescent in fruit; corolla blue, purple, or rarely white, salverform to campanulate, 5-lobed, with 5 faucal appendages; stamens 5, the anthers on short filaments or nearly sessile, oblong to ellipsoid; ovary 4-lobed, the style gynobasic, the stigma 1, capitate. Fruits of 4 spreading nutlets, attached apically to the gynobase, the scar restricted to the apical half of the ventral surface, the dorsal surface usually with short glochidiate spines.

Key to the Malagasy species of Cynoglossum

1. Nutlets glabrous on the dorsal surface or glochidiate on a marginal wing and/or with a median line or scattered glochidia .................................................. 2
1'. Nutlets more or less evenly glochidiate on the dorsal surface ........................................................................... 5
2. Fruits less than 6 mm in diam.; nutlets less than 3 mm broad........................................................................... 3
2'. Fruits c. 10 mm in diam.; nutlets c. 5 mm broad .................................................................................................. 4
3. Basal leaves obtuse to rounded at the base and then abruptly decurrent along the petiole for 5-10 mm; leaf margin minutely erose to undulate with magnification ........................................... 4. *C. lowryanum*
3'. Basal leaves attenuate at the base; leaf margin entire .................................................................................. 2. *C. cernuum*
4. Basal leaf blades narrowly elliptic to lanceolate, 11-17(-20) cm long, apex acute to slightly acuminate; petioles 10-20 cm long .................................................................................................. 6. *C. tsaratananense*
4'. Basal leaf blades oblanceolate, 2.5-5.5 cm long, apex obtuse to rounded; petioles 1.5-3.5 cm long ........................................................................................................... 1. *C. birkinshawii*
5. Leaf margin unevenly serrate or minutely erose ................................................................................................. 6
5'. Leaf margin more or less entire .................................................................................................................. 3. *C. lanceolatum*
6. Lower leaves clustered in a basal rosette, the base obtuse to rounded and then abruptly decurrent along the petiole for 5-10 mm; leaf margin minutely erose to undulate with magnification .............. 4. *C. lowryanum*
6'. Lower leaves not clustered in a rosette, the base clasping; leaf margin unevenly serrate, sometimes minutely so .................................................................................................................. 5. *C. monophlebium*

1. Cynoglossum birkinshawii J.S.Mill., sp. nov.

Haec species inter congeneros madagascarienses quoad nuculas dorsiter glabras 4-5 mm latae atque fructum in diam. 7-10 mm ad Cynoglossum tsaratananense maxime accedit, sed ab eo foliorum basilium laminis oblanceolatis 2.5-5.5 cm longis apice obtusis rotundatisse atque petiolis 1.5-3.5 cm longis distinguitur.

Typus. — Birchshaw 915, Madagascar, Prov. Antsiranana, Tsaratanana Massif, Mahatsabory Mica, 12 km N of Mangindrano, around dried-up lake and adjacent mid-elevation humid evergreen forest, 2050 m, 14°09'09"S, 48°57'21"E, fl., 15 Oct. 2001 (holo-, MO!, iso-, TAN).
Fig. 1. — *Cynoglossum birkinshawii* J.S.Mill.; A, flowering plant; B, flower. Birkinshaw 915 (MO).
scattered hairs; cauline leaves alternate, sessile, blades lanceolate, 1.5-4 cm long, 0.5-0.8 cm wide, the apex acute or obtuse, the base obtuse to clasping, the margin entire.

Inflorescences terminal, the stems unbranched or branched one time; flowers bisexual, on pedicels 2-6 mm long; sepals ovate, 2-2.5 mm long, 1-1.3 mm wide, acute to obtuse at the apex, sparsely to moderately strigillose; corolla blue, campanulate, the tube 2-2.5 mm long, with 5 saccate granular faucal appendages, the lobes widely depressed ovate, 1.5-2 mm long; anthers borne just beneath the faucal appendages, c. 1 mm long, sessile or nearly so; ovary less than 1 mm tall, the style c. 1 mm long, the stigma capitate.

Fruits 7-10 mm broad; nutlets ovoid, 4-5 mm broad, margin with a spiny to nearly entire wing, the dorsal surface glabrous. — Fig. 1.

*Cynoglossum birkinshawii* is a very distinctive species known from only three collections, all from the southern and western slopes of the Tsaratanana massif. It is quite distinctive among the Malagasy species in having very large nutlets (c. 5 mm broad), which lack glochidia on the surface and have the spines on the marginal wing that lack barbs at the apex. The nutlets of *C. birkinshawii* are very similar to those of *C. tsaratananense*, which occurs in the same area, although the two species differ significantly in leaf morphology and size. *Cynoglossum birkinshawii* is also a much more diminutive plant, with an unbranched or once-branched inflorescence and quite small leaves. Although these are the only two Malagasy species with completely glabrous nutlets, there are great differences in vegetative morphology between them. *Cynoglossum birkinshawii* occurs 550-900 m below *C. tsaratanense*, yet appears very consistent in its diminutive habit of growth and much smaller leaves, which strongly supports their recognition as distinct species. However, both are known from few collections and further investigation in the field will be necessary to understand their relationships.

This species is named in honor of Christopher BIRKINSHAW, my friend and research colleague who has collected extensively in Madagascar and contributed so much to the development of many young Malagasy botanists.

**DISTRIBUTION.** — *Cynoglossum birkinshawii* is known only from the Tsaratanana massif (Fig. 2) where it grows on the margins of ephemeral lakes from 1700-2050 m in elevation.

**CONSERVATION STATUS.** — Provisional IUCN Red List Category: Endangered (EN B1ab(i-iv) + 2ab(i-iv)). *Cynoglossum birkinshawii* is known from only two populations within the Réserve Naturelle de Tsaratanana.

2. Cynoglossum cernuum Baker

J. Linn. Soc. Bot. 20: 211 (1884). — Type: Baron 2033, Madagascar, central Madagascar, fl., fr., s. date (holo-, K!; iso-, P!).


Perennial herb, forming a rosette, from a woody taproot 3-6(-15) mm in diam.; stems erect, with sparse, fine, appressed hairs or glabrous. Basal leaves with blades linear or less commonly narrowly elliptic, 1.5-15.0 cm long, 2-5(-17) mm wide, the apex acute, the base attenuate, the margin usually entire, rarely unevenly serrate, the adaxial surface evenly strigose, the hairs fine, the abaxial surface unevenly strigose, more densely so towards the margin, the midrib impressed on the adaxial surface; petioles on the basal leaves 2-5.2 cm long, glabrous or nearly so; cauline leaves sessile; blades lanceolate to oblanceolate to linear, 1.5-5.0 cm long, 2-12 mm wide, the apex acute to acuminate, the base attenuate.

Inflorescences terminal, the stems usually branched multiple times into multi-flowered cymes; the flowers bisexual, borne on slender pedicels 1-1.5 mm long; sepals ovate, 1.5-1.7 mm long, 0.5-0.8 mm wide, acute at the apex, evenly strigillose or with only a few scattered appressed hairs; corolla blue, campanulate, the tube 2.2 mm long, with raised, papillate faucal appendages, the lobes widely depressed ovate, c. 3 mm long, 2 mm wide; anthers borne just beneath the faucal appendages, c. 1 mm long, the filaments c. 1 mm long, glabrous; ovary less than 2 mm tall, the style 1.0-1.5 mm long, the stigma capitulate.

Fruits 3-6(-8) mm broad; nutlets depressed ovoid, 1.5-2 mm broad, the margin with a wing crested with glochidiate spines, the dorsal surface more or less glabrous or with a few scattered glochidia or a sparse median row of glochidia.

The type of Cynoglossum discolor (Baron 1898) is incomplete material and difficult to assign with complete certainty. The leaves and general appearance of the plant are suggestive of C. cernuum and the few very immature nutlets on the holotype at K suggest that when mature they will lack glochidiate spines on the dorsal surface.

DISTRIBUTION. — Cynoglossum cernuum is known from upland regions in central and southern Madagascar (Fig. 4) where it occurs from 1500-2200 m in elevation. It is also known from the Mascarenes.

CONSERVATION STATUS. — Provisional IUCN Red List Category: Data Deficient (DD). Although Cynoglossum cernuum has a wide distribution within Madagascar, it has not been collected for nearly 50 years, and efforts to locate historical populations will therefore be necessary to document its present conservation status.


Annual or biennial herb, the taproot 1–8 mm in diam.; stems erect, to c. 1 m tall, with sparse to moderate, appressed to spreading pubescence. Basal leaves in an evident rosette or smaller plants apparently immediately erect and lacking a basal rosette; basal leaf blades elliptic, 3.5–10(-18) cm long, 1.5–5.5 cm wide, the apex acute, the base cuneate, the margin entire, the adaxial surface strigillose to strigose, the abaxial surface sparsely to densely strigillose, more prominently so on the midrib, the venation brochidodromous, the midrib impressed on the adaxial surface, the tertiary venation mostly obscure; petioles 7-30 (-70) mm long, stiff pubescent; cauline leaf blades elliptic to lanceolate or oblanceolate, 1.5-9.5 cm long, 0.3-3.5 cm wide, the apex acute or less commonly obtuse, the base cuneate, the margin entire, indument and venation similar to the basal leaves, sessile or on petioles to 4 cm long, sparsely to moderately stiff pubescent. 

Inflorescences terminal, once to several times dichotomously branched cymes, the branches strigillose; flowers on pedicels 1-7 mm long, bisexual; sepals narrowly ovate, 1.2-1.6 mm long, 0.4-0.7 mm wide, the apex acute to obtuse, strigillose; corolla blue, campanulate, the tube c. 1 mm long, with 5 saccate, granular faucal appendages, the lobes widely ovate, c. 1 mm long, 1 mm wide; anthers borne just beneath the faucal appendages, c. 0.5 mm long, sessile or nearly so; ovary less than 1 mm tall, style c. 0.5 mm long, stigma capitate.

Fruits 4.5-5.5 mm broad; nutlets ovoid, 2-3 mm broad, margin with a prominent, raised glochidiate wing, the dorsal surface evenly glochidiate.

*Cynoglossum lanceolatum* is extremely variable. The plants range in size from 20 cm tall with stems arising from sparse basal rosettes that appear to have flowered in their first year, to more robust biennials more than 1 m tall, with more or less every imaginable intermediate represented among the available specimens. Despite this vegetative variability, all the specimens assigned to *C. lanceolatum* have nutlets that are consistently evenly glochidiate, range in size from 1.5-3.0 mm, and have a small to prominent raised marginal crest.

**Distribution.** — *Cynoglossum lanceolatum* is a wide-ranging species that is common throughout parts of Africa and Asia. In Madagascar, *C. lanceolatum* is widespread and sometimes locally abundant in disturbed, open habitats, primarily in upland areas (Fig. 4), where it occurs from (400-)800-1800 m in elevation. Three populations have been recorded from along the east coast (although their label data are questionable and it is not clear whether the species really occurs in these areas).

**Conservation status.** — Provisional IUCN Red List Category: Least Concern (LC). *Cynoglossum lanceolatum* is a widespread species in many warm parts of the Old World, and is weedy and common in many parts of Madagascar, where it seems to persist well in disturbed habitats.

**Material examined.** — MADAGASCAR: *Académie Malgache s.n.*, Prov. Antananarivo, Tananarive, 18°55'S, 47°32'E, fl., fr., Sep. 1905 (P!); Alleizette s.n.,
Perrier de la Bâthie 3810, Prov. Toamasina, Réserve Naturelle de Madia, 14°55'S, 49°05'E, fl., fr., 20 Oct. 1922 (P!); *Cynoglossum* (Boraginaceae) in Madagascar

4. Cynoglossum lowryanum J.S. Mill., sp. nov.

_Haec species inter congeneros madagascarienses quoad nuculas dorsaliter pluminusve uniformiter glochidiatas atque folia margine non integra ad Cynoglossum monophlebium maxime accedit, sed ab eo foliis inferioribus in rosulam basalem dispositis e basi obtusa rotundatae secul petiolum per 5-10 mm abrupte decurrentibus margine minute erosae undulatisve distinguitur._

**TYPUS.** — _Perrier de la Bâthie 2206_, Madagascar, Prov. Toamasina, bassin du l’Onive-Mangoro, Forêt d’Andasibe, 1400 m, 18°56’S, 48°25’E, fl., fr., Nov. 1911 (holo-, P!).

Annual? herb with a slightly woody taproot 3-4 mm in diam.; stems erect, 50-80 cm tall, nearly glabrous with only a few scattered, thin hairs. Basal leaves in a loose rosette; blades ovate, 2.5-3.5 cm long, 1.8-2.2 cm wide, the apex acuminate, the base obtuse to rounded and then abruptly decurrent along the petiole for 5-10 mm, the margin nearly entire, minutely erose to undulate with magnification, the adaxial surface strigose, the abaxial surface sparsely strigose, the venation brochidodromous, the midrib impressed on both surfaces, the tertiary venation obscure; petioles 2.5-4 cm long, sparsely pubescent; the lower cauline leaves on petioles to 2 cm long, the upper sessile; blades ovate to elliptic, 2-5 cm long, 0.9-2.6 cm wide, the apex acute to acuminate, the base obtuse to acute and abruptly and evidently decurrent along the petiole (if present), the margin minutely erose, the indument and venation similar to those of the basal leaves.

Inflorescences terminal, sparsely-branched cymes with even-spaced flowers, the branches strigose; flowers bisexual, borne on pedicels 3-10(-22) mm long; sepals 2-2.5 mm long, 1-1.2 mm wide, the apex acute, strigillose; corolla blue, campanulate, the tube c. 1.5 mm long, with 5 saccate, slightly granular faucal appendages, the lobes widely ovate, c. 1.5 mm long, 1.5 mm wide; anthers borne just beneath the faucal appendages, c. 0.8 mm long, sessile or nearly so; ovary less than 1 mm tall, style c. 1 mm long, stigma capitate.

Fruits c. 5 mm broad; nutlets ovoid, c. 2.5 mm broad, margin with a raised glochidial wing, the dorsal surface with glochidia in a median line and a few scattered glochidia between the median line and margin. — Fig. 3.

_Cynoglossum lowryanum_ is puzzling in that it occurs near Andasibe, a relatively well-collected locality, but has only been collected once, nearly a hundred years ago. Yet it is a very distinctive species in its growth habit, the shape and margin of its leaves, and in having nutlets with glochidia concentrated along the marginal ridges. Although _Perrier de la Bâthie_ described this plant as annual on the label of the type, it appears to have a substantially thickened root.

The species is named in honor of my friend and fellow botanist, Porter P. Lowry II, who has contributed greatly to our understanding of the botany of Madagascar and has provided much encouragement for those working on the flora of Madagascar.

**DISTRIBUTION.** — _Cynoglossum lowryanum_ is known only from the type collection from Andasibe (Fig. 4) made at 1400 m in elevation.

**CONSERVATION STATUS.** — Provisional IUCN Red List Category: Critically Endangered (CR B1ab(i-iv) + 2ab(i-iv)). _Cynoglossum lowryanum_ has not been collected since 1911 and it is questionable whether this species still survives.

5. Cynoglossum monophlebium Baker


Perennial herb, lacking an evident rosette, from a woody taproot (apparently sometimes flowering in the first year and lacking the taproot at that stage); stems erect, with a few scattered siliceous hairs or glabrous. Leaves alternate, those at the base larger, but otherwise not morphologically different from the cauline leaves; blades oblanceolate to linear, 2.5-5(-7.5) cm long, 2.5-10 (-15) mm wide, the apex obtuse to rounded, the base clasping, the margin unevenly serrate, sometimes minutely so, or undulate, the adaxial surface moderately to sparsely strigillose, sometimes unevenly so, the hairs thin, the abaxial surface sparsely to moderately strigose, more densely so
Figs. 3. — *Cynoglossum lowryanum* J.S.Mill.: A, flowering plant; B, flower; C, nutlets. *Perrier de la Bâthie* 2206 (P).
on the midrib, the hairs thicker than those on the adaxial surface; midrib impressed on the adaxial surface, the secondary venation obscure.

Inflorescences terminal, the stems usually branched multiple times into multi-flowered cymes; flowers bisexual, borne on slender pedicels 0.5-4 mm long; sepals ovate, 1.3-1.5 mm long, 0.5-0.6 mm wide, acute at the apex, evenly strigillose; corolla blue, campanulate, the tube c. 1.3 mm long, with small papillate, saccate faucal appendages, the lobes ovate to widely ovate, 1.5 mm long, 1.5-2 mm wide; anthers borne just beneath the faucal appendages, 0.5 mm long, nearly sessile; ovary c. 0.3 mm tall, style 0.3-0.5 mm long, the stigma capitellate.

Fruits 3-4 mm broad; nutlets ovoid, 1.5-2 mm broad, the margin with a glochidiate wing, the dorsal surface evenly glochidiate.

This is a very distinctive species, in its perennial, non-rosette growth habit, nearly glabrous stems, distinctive leaves with odd, uneven serration, very small flowers, and uniformly glochidiate fruits.

**Distribution.** — *Cynoglossum monophlebium* is restricted to south-central Madagascar (Fig. 4), where it occurs on the massif at Ankaratra and also near Ihosy, from 1400-2300 m in elevation.

**Conservation Status.** — Provisional IUCN Red List Category: Vulnerable (VU B1ab(i-iv)). *Cynoglossum monophlebium* has a restricted distribution within central Madagascar but appears not to be uncommon where it does occur.

**Cynoglossum tsaratananense** J.S.Mill.: A, flowering plant; B, upper portion of inflorescence; C, flower; D, nutlets. *Perrier de la Bâthie* 16465 (MO).
Antananarivo, flanc W de l’Ankaratra, entre Ambatofotsy et le Tsiafajavona, 2000-2300 m, 19°21’S, 47°15’E, fl., 27 Nov. 1912 (P!).

6. Cynoglossum tsaratananense J.S. Mill., sp. nov.

_Haec species inter congeneros madagascarienses quoad nuculas dorsaliter glabras 4-5 mm latas atque fructum in diam. 7-10 mm ad Cynoglossum birkinshawii maxime accedit, sed ab eo foliorum basalium laminis anguste ellipticis usque lanceolatis 11-17(-20) cm longis apice acutis usque leviter acuminatis atque petiolis 10-20 cm longis distinguitur._

_TYPUS._ — _Perrier de la Bâthie 16465_, Madagascar, Prov. Antsiranana, massif de Tsaratanana, près des eaux, 2600 m, 13°57’S, 48°52’E, fl., fr., Apr. 1929 (holo-, P!; iso-, MO!, P!).

Perennial herb from a woody taproot 3-5 mm in diam.; stems erect to 55 cm, with scattered, thin, appressed to erect hairs; basal leaves clustered in a loose rosette of 5-10, blades narrowly elliptic to lanceolate, 11-17(-20) cm long, 2.5-5.5 cm wide, the apex acute to slightly acuminate, the base cuneate to attenuate, the margin entire, the adaxial surface with scattered appressed hairs, the abaxial surface with short, appressed hairs or nearly glabrous, but evenly strigose on the midrib; venation brochidodromous, the midrib impressed on the adaxial surface; secondary and tertiary veins visible on the abaxial surface; petioles 10-20 cm long, canalicate on the adaxial surface, glabrous or with scattered hairs; cauline leaves alternate, sessile, blades lanceolate to ovate, 3.5-8 cm long, 1-2.5 cm wide, the apex acute to obtuse, the base obtuse to clasping, the margin entire.

Inflorescences terminal, the stems usually branched multiple times into multi-flowered cymes; flowers bisexual, borne on pedicels 2-6 mm long; sepalis ovate, 2-2.5 mm long, 1-1.3 mm wide, acute to obtuse at the apex, sparsely to moderately strigillose; corolla blue, campanulate, the tube 2-2.5 mm long, with 5 saccate granular faucal appendages, the lobes widely depressed ovate, 1.5-2 mm long; anthers borne just beneath the faucal appen-

dages, c. 1 mm long, sessile or nearly so; ovary less than 1 mm tall, style c. 1 mm long, stigma capitate.

Fruits 7-10 mm broad; nutlets ovoid, 4-5 mm broad, margin with an entire wing, the dorsal surface glabrous, glochidia completely absent. — Fig. 5.

**Distribution.** — _Cynoglossum tsaratananense_ is known only from the type collection made at 2600 m on Tsaratanana in north-central Madagascar (Fig. 4).

**Conservation Status.** — Provisional IUCN Red List Category: Critically Endangered (CR B1ab(i-iv) + 2ab(i-iv)). _Cynoglossum tsaratananense_ has been collected only once, and not since 1929, and it is questionable whether this species still survives, although its single known locality is within a protected area.

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