

An unusual new epiphytic species of *Eulophia* (Orchidaceae) from southeastern Madagascar

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ABSTRACT

Eulophia epiphytica, endemic to southeastern Madagascar and one of only two known epiphytic species in the genus, is newly described. It has only been found growing on *Elaeis* and *Raphia* palms neither native in the region. It is considered to be critically endangered according to the latest IUCN Red List criteria.

KEY WORDS

Eulophia,
Orchidaceae,
Madagascar.

RÉSUMÉ

Une exceptionnelle nouvelle espèce épiphyte d'Eulophia (Orchidaceae) du sud-est de Madagascar.

Eulophia epiphytica, endémique du sud-est de Madagascar, une des deux seules espèces épiphytes connues dans ce genre, est décrite. Elle croît sur des palmiers des genres *Elaeis* et *Raphia* non indigènes de cette région. D'après les derniers critères de la Liste Rouge de l'IUCN cette espèce est gravement menacée d'extinction.

MOTS CLÉS

Eulophia,
Orchidaceae,
Madagascar.

We found a strange epiphytic orchid with *Eulophia*-like flowers but with branching stems that lacked pseudobulbs while collecting in southeastern Madagascar in 1995. An herbarium and a living collection were made and the latter flowered at the Royal Botanic Gardens, Kew in May 2001 and again in April 2002. Leaf material was collected and the DNA extracted. Analysis of the DNA indicates that this unusual orchid is sister to all other *Eulophia* species (including *Oeceoclades*) that have been sampled (PRIDGEON, CRIBB & THOMAS, in press); to maintain monophyly, it seems likely that the circumscription of *Eulophia* will be expanded as a result of this work to include *Oeceoclades*. Further work is needed to assess whether this unusual orchid deserves recognition in its own genus. However, for the time being, we also include it in *Eulophia* while recognising that it is basal in that clade.

***Eulophia epiphytica* P.J. Cribb, D. Du Puy & Bosser, sp. nov.**

Affinis *Eulophiae palmicolae* H. Perrier *sed pseudobulbis carentibus caulibus cylindratis non dilatatis pendulis ramosis vaginibus obtectis, foliis pluribus linearibus distichis, inflorescentiis lateralibus pendentibus quam foliis brevioribus flores 2-9 ferentibus, sepalis petalisque acutis viridibus vel luteo-viridibus, lobo medio labelli emarginato et calcare brevioris 2 mm longo distinguenda.*

TYPUS. — *Du Puy, Cribb, Andriantiana & Ranaivijaona M857*, Madagascar, Toliara Province, 7 km N of Taolanaro, Ampasinahampoana, 7 Feb. 1995, cult. Kew 15 May 2001 (holo-, K!; iso-, P!, TAN!).

A large epiphytic herb with pendent or trailing branching cylindrical stems, up to 1.5 m long, 0.7 cm in diam., leafy in upper part and partly covered by acute papery sheaths up to 2.7 cm long in lower half. Leaves 28-32, thin, flexible, linear, acute, 10-25 cm long, 1-1.2 cm wide, articulated with 1.5-3 cm long whitish sheaths at the base. Inflorescences several per stem, lateral, 2-9-flowered, arcuate to pendent; peduncle 3-7 cm long, almost covered by short acute sheathing sterile bracts; rachis 1-4 cm long; bracts lanceolate, acute, 3-8 mm long.

Flowers spreading, distinctively fragrant, c. 3-3.5 cm broad, with green or yellowish green sepals and petals, lip white turning pale yellow with age, marked on the base of the midlobe with purple veins, side lobes green with dark purple veins; pedicel and ovary 2.1-2.7 cm long. Dorsal sepal elliptic, acute, 2.2-2.4 cm long, 0.7-0.8 cm wide. Lateral sepals spreading, oblong-elliptic, acute, 2.5-2.7 cm long, 0.7-0.75 cm wide. Petals slightly obliquely elliptic, acute, apically slightly recurved, 1.8-2.3 cm long, 0.8-0.9 cm wide. Lip 3-lobed, shortly spurred at the base, 1.8-2 cm long, 1.6-1.8 cm wide; side lobes erect, obliquely oblong, rounded and slightly recurved in front; midlobe transversely oblong, slightly emarginate, slightly recurved in front, 8 mm long, 14 mm wide; callus of three to five ridges on disc, coalescing towards the base, two or four outer keels erose in front, with outer veins of midlobe also erose-papillose; spur shortly conical-cylindrical, 2 mm long. Column slightly sinuous, 8.5-9 mm long, foot 2 mm long; anther cap with a distinct terminal knob; pollinia 2, deeply porose, stipe short, fleshy, viscidium semilunate. — Fig. 1.

HABITAT. — Epiphytic on *Elaeis guineensis*, *Raphia farinifera* and probably also on *Dypsis* palm trees, climbing amongst leaf bases on trunk of palm; sea level-100 m.

IUCN CONSERVATION STATUS. — Critically endangered (CR). Based upon IUCN Red List criteria A1a, c; B1; 2c, e; C2b.

Eulophia epiphytica is a very distinctive orchid. The only other epiphytic species of *Eulophia* is the Madagascan *E. palmicola* H. Perrier but that species has three- or four-leaved pseudobulbous stems on a short rhizome, long erect inflorescences as long as the leaves and flowers with apiculate sepals and petals, a lip with a 2-ridged callus at the base, a shortly apiculate midlobe and a 4 mm long spur. The type of *Eulophia palmicola* (*Perrier de la Bathie* 18893, P!) was collected in southeast Madagascar between Manambovo Riv. and Menarandra Riv., growing on the palm *Ravenea xerophila* Jum.

Eulophia epiphytica is apparently very restricted in its distribution in the southeast corner of the island, not far from Taolanaro



Fig 1. — *Eulophia epiphytica*. A, habit; B, C, flower, front and dorsal views; D, flower side view with nearest lateral sepal and petal removed; E, dorsal sepal; F, lateral sepal; G, petal; H, lip; I, column, ovary and bract; J, column ventral view; K, column apex with anther hinged back; L, anther and pollinia; M, habit on *Elaeis guineensis*; N, pollinia. All drawn by Olivier WHALLEY from the type collection.

(Ft. Dauphin) where it is most frequently seen on oil palms, *Elaeis guineensis* and on raffia palms, *Raphia farinifera*. The avenue of oil palms where the type collection was made is next to a swampy plantation of *Raphia farinifera*. *Eulophia epiphytica* grows on both palms in the immediate area. The reference in DU PUY et al. (1999) to *Eulophia palmicola* being found on *Raphia* refers rather to this species. *Raphia farinifera* is almost certainly an introduction from tropical Africa, being always found growing near villages or in plantations in Madagascar (DRANSFIELD & BEENTJE 1995). Oil palm is also an introduction in this area but may be native elsewhere in Madagascar (DRANSFIELD, pers. comm.). The orchid grows with the bases of its stems running through the leaf bases of the palms with the leafy stems of the orchid hanging in a curtain from all around the palm stem. Its natural host cannot be *Ravenia xerophila*, the palm that hosts *E. palmicola*, which is rare, reduced to about 65 mature trees and only grows in the dry spiny Didieriaceae/*Euphorbia* forests on laterite and gneiss between 200 and 700 m elevation (DRANSFIELD & BEENTJE 1995). That is a much drier habitat and well removed from the type locality of *E. epiphytica*.

John DRANSFIELD (pers. comm.) suggests that *Beccariophoenix madagascariensis* Jum. & H. Perrier and *Dypsis fibrosa* (Wright) Beentje & J. Dransf., both found in suitable habitats nearby, might be searched for the orchid. The crown of the former may be a suitable habitat for the orchid but we have examined all of the trees in the southern population which is slightly north of the type locality of *E. epiphytica* and this orchid was not found there. *Dypsis fibrosa* is a known host of other epiphytic orchids and is a widespread species. In the region it can be found in littoral and lowland peat-swamp forests on white sand. It seems the likeliest native host for the orchid. Another possibility is that it might grow on *Pandanus*, a host elsewhere for orchids.

Conservation status

The only known population, and a large one, of this extraordinary orchid grows in a swampy

Raphia and oil palm plantation abutting the main road not far north of Taolanaro (Ft. Dauphin). Unfortunately, most of the plantation was destroyed due to development in the mid 1990s and only a few palms survive along the roadside. The orchid survives there but in very reduced circumstances, probably less than 100 plants. It is a showy species and it has only ever been found in the type locality. Its possible native host trees are *Beccariopsis madagascariensis*, itself a critically endangered species (DRANSFIELD & BEENTJE 1995), and *Dypsis fibrosa*, which is more widespread and not threatened. Nevertheless, *E. epiphytica* has not, to date, been found growing on either palm. When the 2000 IUCN Red List criteria (HILTON-TAYLOR 2000) are applied, the evidence suggests strongly that *Eulophia epiphytica* is critically endangered in the wild.

Seedlings have been raised for the joint Parc Tsimbazaza/RBG Kew Madagascan Endangered Orchid Project. The survival of the seedlings sent back to Madagascar is unknown but a number of plants grown from seed survive in Kew's living orchid collection.

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REFERENCES

- DRANSFIELD J. & BEENTJE H. 1995. — *The Palms of Madagascar*. Royal Botanic Gardens, Kew and the International Palm Society.
- DU PUY D., CRIBB P.J., BOSSER J., HERMANS J. & HERMANS C. 1999. — *The Orchids of Madagascar. Checklist and Annotated Bibliography*. Royal Botanic Gardens, Kew.
- HILTON-TAYLOR C. (compiler) 2000. — *2000 IUCN Red List of Threatened Species*. IUCN, Gland Switzerland and Cambridge, England.

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