

# The growth-form of *Euphorbia hedyotoides* N. E. Br. (syn. *E. decariana* Croiz.)

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## Resum

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S'ofereix una detallada descripció d'una peculiar forma de creixement d'*E. hedyotoides* N. E. Br. procedent del sud de Madagascar. Es situa, juntament amb *E. eliottii* Léandri, en un grup separat: el grup *E. hedyotoides*.

Mots claus: Euphorbiaceae, *Euphorbia hedyotoides*, Taxonomia, Madagascar.

## Abstract

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A detailed description is given of *Euphorbia hedyotoides* N. E. Br. from southern Madagascar with a peculiar growth-form. Together with *E. eliottii* Léandri it is placed in a separate group: the *E. hedyotoides*-group.

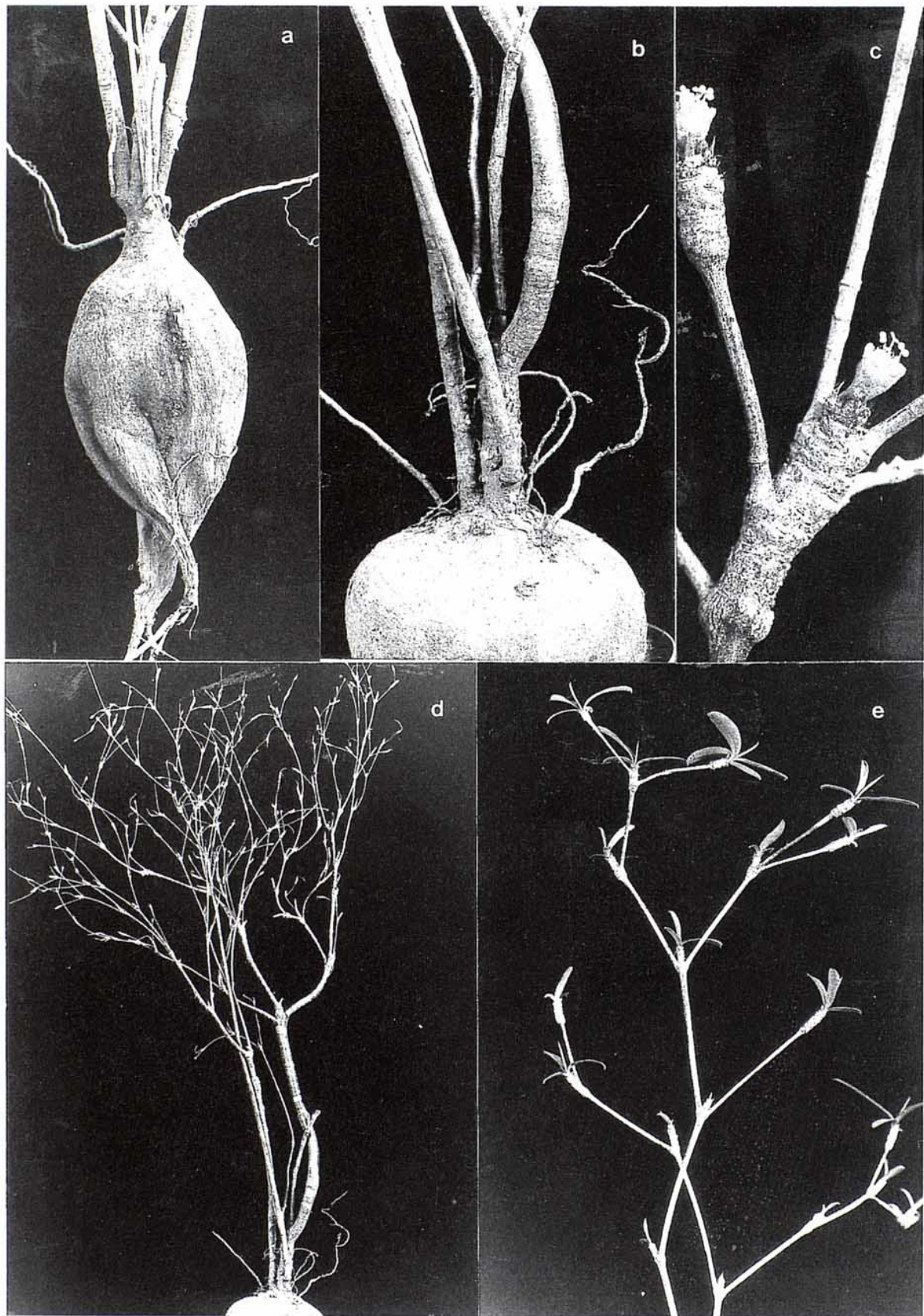
Keywords: Euphorbiaceae, *Euphorbia hedyotoides*, Taxonomy, Madagascar.

One of the most curious Euphorbias in southern Madagascar is *Euphorbia hedyotoides* N. E. Br., which is not rare in the *Didiereaceae*-bush between Amboasary and Fort Dauphin (Taolanaro). It has been described in 1934 by L. Croizat as *Euphorbia decariana*, but LÉANDRI (1962) stated that already N. E. Brown had described it in 1909 as *E. hedyotoides* so that this name is valid. *E. hedyotoides* has been cultivated as caoutchouc plant in Africa, and N. E. Brown has described it after a plant from Manbo in Amani, formerly German East Africa. It forms 1-1,5 m tall shrubs, provided with big subterranean bulbs, which can reach nearly the size of a football (Figure 1). This bulb corresponds with the hypocotyl and the swollen primary root. As in most of the bulbous Madagascan Euphorbias, also in *E. hedyotoides* heterorhizy can be observed: the bulbous tap-root serves for water storing, whilst thin, richly branched lateral roots, appearing at the upper part of the bulb, serve for water absorption; they are spreading themselves some millimeters beneath the earth surface so that they can absorb the

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**Fig. 1.**— *Euphorbia hedyotoides*: **a, b**) older plant with the bulb and the water-absorbing roots; **c**) brachyblasts with male cyathia; **d, e**) part of the branch-system, showing the differentiation into long-shoots (auxiblasts = hypopodium) and short shoots (brachyblasts).

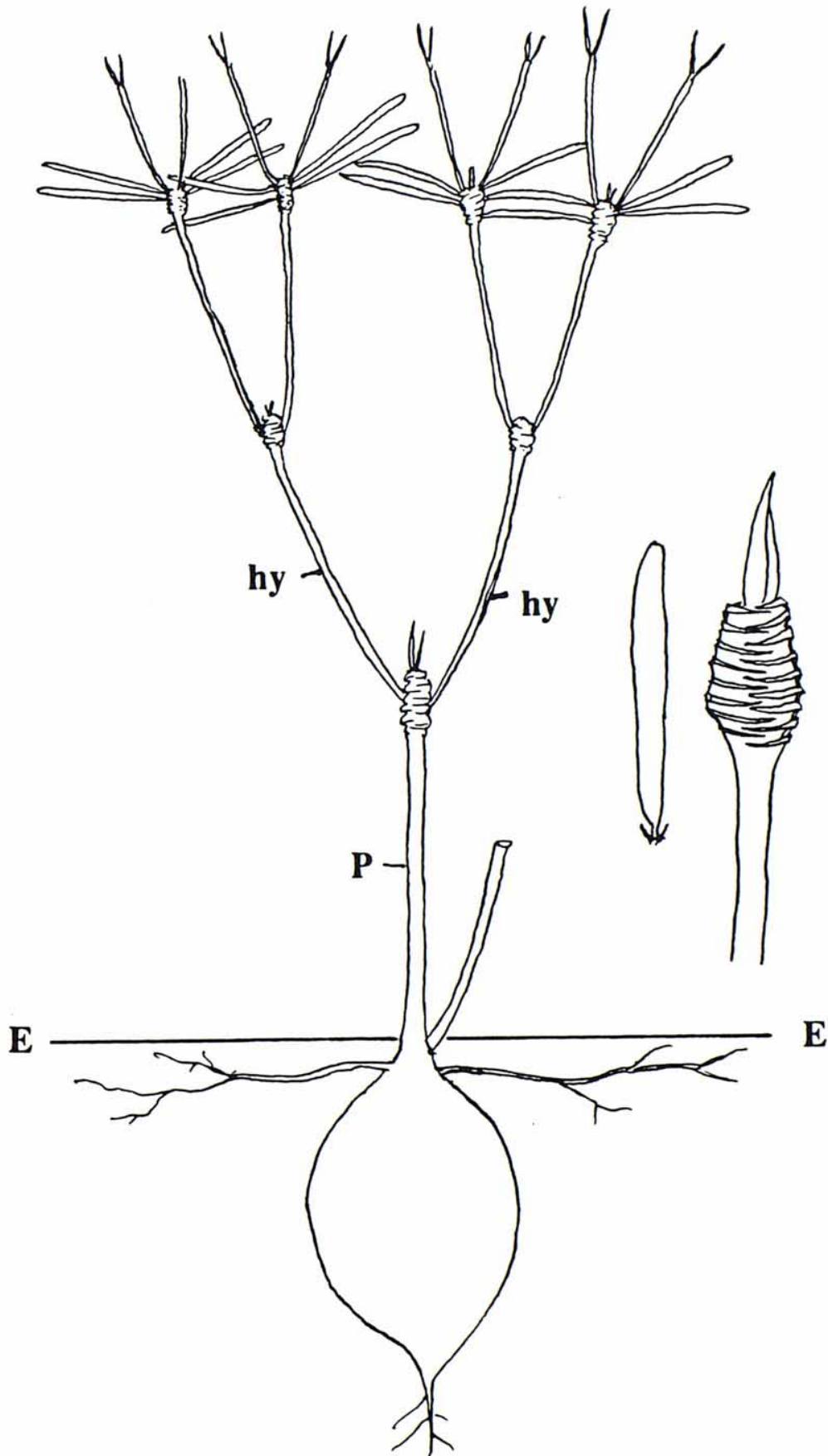
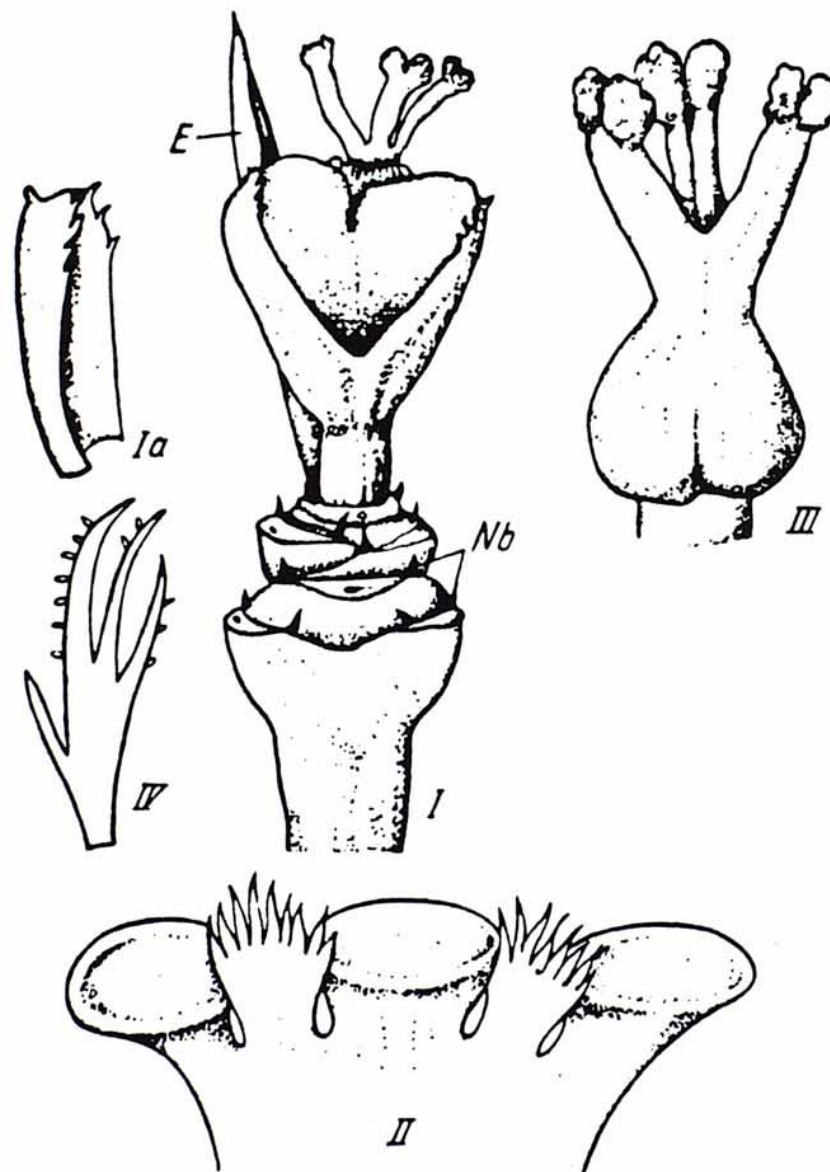


Fig. 2.— Scheme of the growth-form of *Euphorbia hedyotoides*. E, soil-surface. P, primary shoot; hy, hypopodium; right: leaf and a brachyblast.



last traces of humidity (Figures 1 and 3). In young stades the bulb elongates into the erect, primary shoot, which becomes 20-30 cm tall. Then it terminates its length-growth with some, very short internodes that means that the primary longshoot (auxiblast) is transformed into a brachyblast (shortshoot) (Figure 2), on which a rosette of mostly 5 narrow-linear, spreading, deciduous leaves is formed. In the axils of the leaves two innovations-shoots are formed, which now continue the shoot-system in a sympodial-dichasial manner (Figure 2).



**Fig. 3.**— *Euphorbia hedyotoides*. I brachyblast with a female cyathium. e, leaf of the shoot apex. Nb, stipules of deciduous leaves: Ia, cyathophyll. II, part of the involucre with the glands and the interglandular bracts. III, female flower (= ovary). IV, bracteole of the male flower-groups.

They are starting with one long internodium, the so-called hypopodium (Figure 2, hy), which can become 5-10 cm long. Like the primary shoot the hypopodia diminish their length-growth as a brachyblast with very short internodes (Figure 2). These brachyblasts are of monopodial growth; they increase in every vegetative period only some millimeters. In course of many years they can reach a length of up to 3-5 cm (Figure 1). Leaves originate only on the youngest internodes of the brachyblasts and produce in their axils 2 (-3) innovation-shoots. Since this manner of growth and branchment is repeated in every growth period, the result is a richly branched, sympodial shoot-system (Figures 1 and 2). Every innovation-branch is differentiated into a long shoot (auxiblast), consisting only of one internodium, the hypopodium, and the brachyblast part, consisting of several short internodia. The primary shoot can reach at its base a diameter of 2 cm, is strongly lignified and covered with a smooth grey-brown cork-layer. With age some more long shoots can appear at the base of the primary shoot (Figure 1); an old plant of *E. hedyotoides* is therefore a more or less regularly branched, lignified shrub with a fleshy, subterranean bulb (Figure 1a, b, d).

Some other Euphorbias, varieties of *E. hedyotoides* or possibly new species have the same manner of branchment. But these plants are still incompletely known today and more research is necessary.

*E. hedyotoides* is dioecious with male and female cyathia on different plants; occasionally both cyathia types can be observed on one plant.

The cyathia are very small, appear mostly single, seldom to 2 or 3 at the brachyblasts and take an extreme subterminal position (Figure 3), they are short petiolated and envelopped by 2 greenish bracts (= cyathophylls) (Figure 3, I), connate at the base; they are carinate, short acuminate with a hyaline margin. The involucre is very small, 2 mm high and 2 mm thick; the green glands are erect, transverse-ovate, scarcely 1 mm wide. The interglandular bracts are dentate; the ovary of the female flowers is short petiolated; the green styles are connate at the base, the globular stigmas bifid (Figure 3, III).

Although the cyathia take a lateral position, the brachyblast grows out rarely to an auxiblast; it keeps its growth as brachyblast, producing leaves and cyathia in each vegetative period.

The same type of branchment has also *E. elliotii* Léandri from the Fort Dauphin region. It is a taller shrub with greater leaves; only juvenile stades have a subterranean bulb.

*E. hedyotoides* is not easy in cultivation, because the bulb dies often off and the propagation by stem cuttings is difficult.

The systematic clarification of *E. hedyotoides* is unclear. LÉANDRI (1962) puts it into the *E. lophogona*-group together with *E. neohumbertii* and *E. viguieri*, but this doubtless is not right. We propose to put it into the own group of *E. hedyotoides*, together with *E. elliotii*. Surely in the near future more Euphorbias with the same type of branchment will be described as soon as more material is available.

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