

# Identification of Eucalypt Seedlings on the Basis of Cotyledons Morphology

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Eucalypts show generally two opposite seed leaves of different shape and size according to the species.

In the present note a provisional key for the identification of about 80 species on the basis of seedling morphology early after germination is reported.

The main characters considered are :

- 1) Cotyledon shape, which can be suborbicular, reniform, bilobed, bifid (y shaped). In the last two types the angle formed by the two lobes is also very important.
- 2) Cotyledon size, which range from 4 to 25 mm in length and from 2 to 30 mm in width.
- 3) Shape and length of petiole.
- 4) Hypocotyl length and ratio hypocotyl to cotyledon length.

Other minor differential characters which have been considered are :

- 5) Hypocotyl and cotyledon hairness.
- 6) Colour of the two leaf sides (upper and lower).
- 7) Colour and thickness of the hypocotyl.
- 8) Venation pattern of cotyledons.
- 9) Seed leaves thickness.
- 10) Margin shape.

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An eucalypt classification based only on seed leaves characters is very difficult. It is possible however to group the most important cultivated species according to the cotyledon affinities.

The present key can be obviously considered as a tentative one. Nevertheless, it is able to give a first guidance to the nursery man.

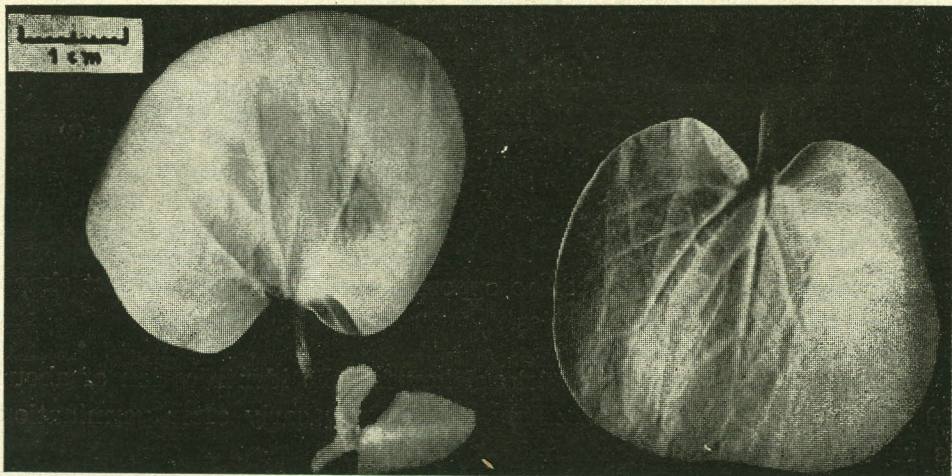


FIG. 1

*Tentative analytical key for the identification of eucalypt seedlings by means of seed-leaves morphology.*

I — Cotyledons orbicular or suborbicular.

A) Large cotyledons (wide more than 25 mm)

*ficifolia*  
*calophylla* (Fig. 1)

B) Medium cotyledons (10 to 25 mm)

1 — Hypocotyl very short and almost underground

*marginata*

1 — Hypocotyl aerial long as a longer than the cotyledons

2

2 — Cotyledons sessile or near so

*maculata* (2)

2 — Petiole 4-5 mm long

3

3 — Cots. 8 mm long

*gummifera*

3 — Cots. 12 mm long

*preissiana*

C) Small cotyledons (narrower than 10 mm)

1 — Cots. longer than 7 mm

2

1 — Cots. shorter than 6 mm

3

- 2 — Hypocotyl long as the cots. or near so *macrorrhyncha*
- 2 — Hypocotyl two times longer than the cot. *citriodora*
- 3 — Cots. 5-6 mm long. Hypocotyl 2-3 times longer than the cot. *regnans, linearis*
- 3 — Cots. 3-4 mm long. Hypocotyl slightly longer than the cot. *populnea*

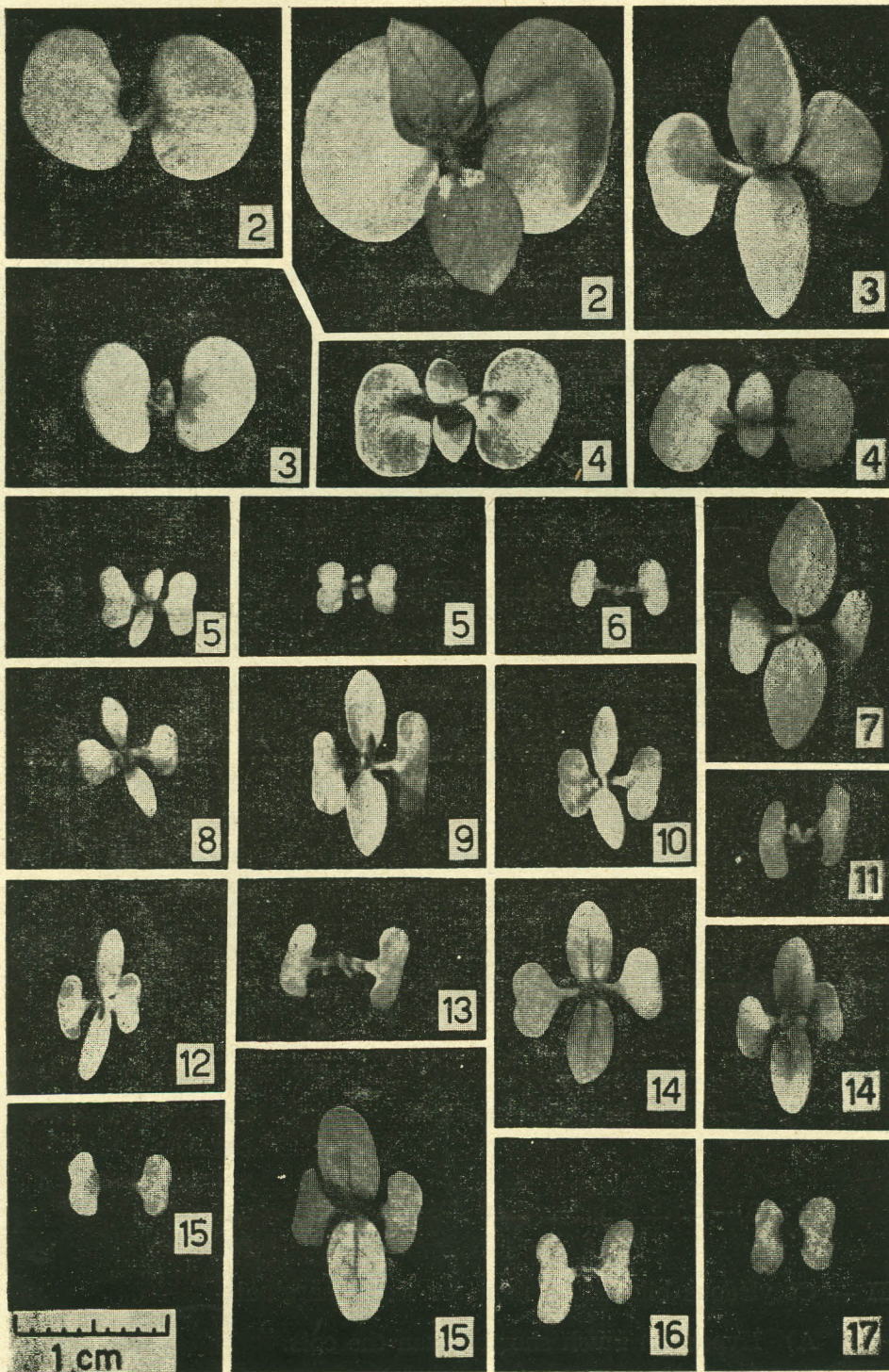
## II — Cotyledons reniform

- A) Cotyledons wide 20 mm or more *calophylla* (1)
- B) Cotyledons 10-15 mm wide
- 1 — Cots. shorter than 9 mm *pilularis*  
*gummifera*
- 1 — Cots. longer than 10 mm *erythrocorys*
- C) Cotyledons narrower than 10 mm
- 1 — Petiole very short, sometimes absent 2
- 1 — Petiole long as the cot. 3
- 2 — Hypocotyl 2-3 times longer than the cot. *obliqua* (3)  
*delegatensis*  
*linearis*  
*sieberiana* (4)  
*populnea*
- 2 — Hypocotyl long as the cot. or slightly longer *triantha*  
*scabra*  
*stellulata*
- 3 — Cots. longer than 5 mm *gomphocephala*  
*regnans*  
*macrorrhyncha*
- 3 — Cots. shorter than 4-5 mm *aggregata*  
*populnea*

## III — Cotyledons bilobed or more or less emarginate

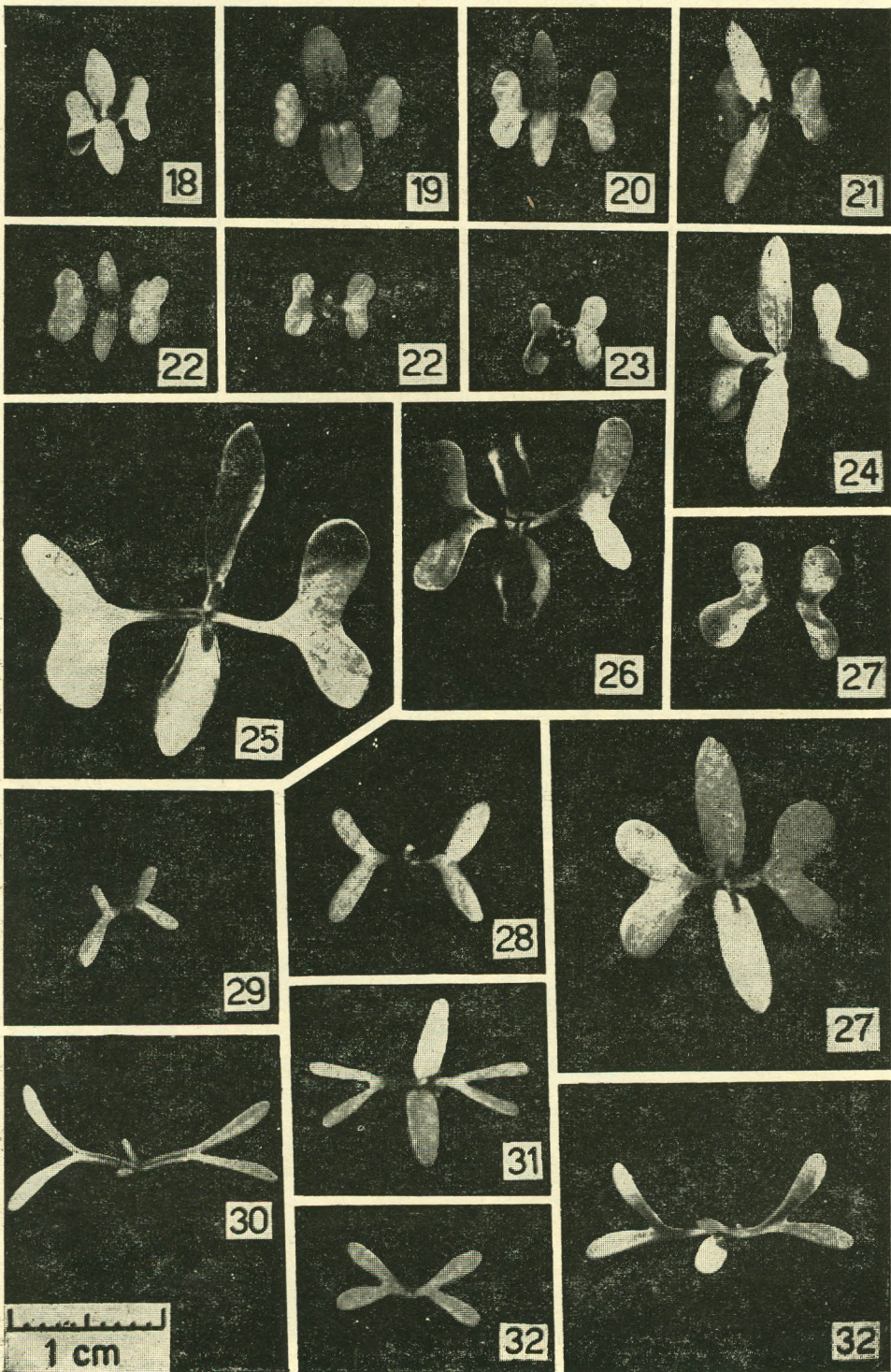
- A) Hypocotyl much shorter than the cots. ( $\frac{1}{2}$ - $\frac{1}{3}$ )
- 1 — Cots. 15-25 mm long *marginata*





- |   |                          |    |
|---|--------------------------|----|
| 1 — Cots. 7-8 mm long   | <i>pauciflora</i>        |    |
| 1 — Cots. 4 mm long   | <i>rudis</i> (5)         |    |
|   | <i>radiata</i>           |    |
| B) Hypocotyl long as or longer than the cots.   |                          |    |
| b) Cotyledon indentation absent or near so. Cots. more or less oblong (with a transverse axis).             |                          |    |
| 1 — Cots. very small (narrower than 3 mm)   | <i>melliodora</i> (6)    |    |
| 1 — Cots. 4-6 mm wide or more   |                          | 2  |
| 2 — Cots. 5 mm long   | <i>triantha</i>          |    |
| 2 — Cots. very short (2-3 mm long)  |                          | 3  |
| 3 — Hypocotyl 2 times longer than the cot. lots 3 mm long   | <i>albens</i> (7)        |    |
|   | <i>populnea</i> (8)      |    |
|   | <i>ovata</i> (9)         |    |
| 3 — Hypocotyl long as or slightly longer than the cot. cots. 2 mm long                                      | <i>bosistoana</i> (10)   |    |
|   | <i>melanophloia</i> (11) |    |
| b) Cotyledon indentation faint, but more or less evident (less than the half of the cot.). Cots. obcordate. |                          |    |
| 1 — Indentation very faint  |                          | 2  |
| 1 — Indentation faint or medium   |                          | 12 |
| 2 — Cots. very small, wide less than 3 mm   |                          | 3  |
| 2 — Cots. wider than 3 mm   |                          | 4  |
| 3 — Hypocotyl 2 times longer than the cots.   | <i>gunnii</i>            |    |
|   | <i>rubida</i> (12)       |    |
|   | <i>camaldulensis</i>     |    |
| 3 — Hypocotyl long as the cots or near so   | <i>melliodora</i>        |    |
|   | <i>tereticornis</i>      |    |
| 4 — Cots. 3-8 mm wide   |                          | 5  |
| 4 — Cots. wider than 10 mm  |                          | 11 |
| 5 — Petiole very short or near absent   |                          | 6  |





- 5 — Petiole more or less evident  
(2-5 mm long) 8
- 6 — Cots. shorter than 3 mm *albens*  
*viminalis* (13) 7
- 6 — Cots. 4 mm long
- 7 — Petiole short *amygdalina*
- 7 — Petiole near absent *camaldulensis* (14)
- 8 — Hypocotyl long as or slightly longer than the cots. *microtheca*  
*odorata*  
*tereticornis* (15)  
*blakelyi*
- 8 — Hypocotyl about 2 times longer the cots. 9
- 9 — Cots. 2-4 mm long 10
- 9 — Cots. 4-5 mm long *microcorys*
- 10 — Cots. 3-4 mm wide *sideroxylon*  
*populnea*  
*macarthurii*  
*amygdalina*  
*hemiphloia*  
*goniocalyx* (16)  
*dives*  
*siderophloia*  
*ovata*
- 10 — Cots. 6-7 mm wide *consideniana*
- 11 — Cots. 6 mm long *erythrocorys*
- 11 — Cots. 10-11 mm long *elaeophora*
- 12 — Cots. small, narrower than 4 mm *trabutii* (18)  
*punctata* (19)  
*bicolor*  
*saligna*
- 12 — Cots. large, wider than 5 mm 13
- 13 — Cots. 10 mm wide or more *saligna*  
*diversicolor*  
*longifolia*
- 13 — Cots. 7-8 mm wide *resinifera* (20)  
*maidenii*  
*botryoides*  
*polyanthemos*  
*dalrympleana*
- 13 — Cots 5-6 mm wide and 2-3 mm long 14

- 14 — Hypocotyl long as the cots. or near so *creba*
- 14 — Hypocotyl longer than the cots about 2 times 15
- 15 — Cots. glaucous *cinerea* (21)
- 15 — Cots. not glaucous *paniculata*  
*robusta* (22)  
*alba*  
*grandis* (23)
- c) Cotyledon indentation deep (more than the half of the cot.)
- 1 — Cots. shorter than 5 mm *cinerea*
- 1 — Cots. longer than 6 mm 2
- 2 — Hypocotyl long as the cots. or near so 2
- 2 — Hypocotyl 2 times longer than the cots. 4
- 3 — Cots. very narrow (3 mm) *bridgesiana* (24)
- 3 — Cots. wider (5 mm) *lehmannii*
- 4 — Petiole long as or shorter than the cot. 5
- 4 — Petiole longer than the cot. *diversicolor* (25)  
*cladocalyx* (26)
- 5 — Cotyledon lobes lanceolate *cornuta*
- 5 — Cotyledon lobes spatulate or near so *globulus* (27)  
*maidenii*  
*bicostata*

## IV — Cotyledons bifid (Y'-shaped)

- 1 — Indentation deep lobes strongly divergent (obtuse angle) *cornuta* (28)  
*lehmannii* (29)
- 1 — Indentation very deep lobes slightly divergent (right or acute angle) 3
- 2 — Hypocotyl much shorter than the cots. *pyriformis*
- 2 — Hypocotyl long as or longer than the cots. 3
- 3 — Cots. longer than 15 mm *microcarpa*



- |  |                          |   |
|--|--------------------------|---|
| 3 — Cots. shorter than 10 mm                   |                          | 4 |
| 4 — Cotyledon lobes linear or narrower         | <i>brockwayi</i> (30)    |   |
|  | <i>occidentalis</i> (31) |   |
|  | <i>oleosa</i>            |   |
| 4 — Cotyledon lobes lanceolate to subspatulate | <i>salubris</i>          |   |
|  | <i>salmonophloia</i>     |   |
|  | <i>astringens</i> (32)   |   |

IDENTIFICATION DES PLANTULES DES EUCALYPTUS SELON  
LA MORPHOLOGIE DES COTYLEDONS

*Résumé*

Les eucalyptus présentent en général deux feuilles cotylédonaire dont la forme et la dimension diffèrent selon l'espèce. Dans ce travail une clé d'identification est présentée pour environ 80 espèces, basée sur la morphologie des plantules après la germination des graines.

Les principaux caractères considérés sont : la forme du cotylédon, qui peut être suborbiculaire, réniforme, bilobé, bifide, etc.; sa dimension; la forme et la longueur du pétiole; la couleur des parties supérieure et inférieure des deux feuilles; leur épaisseur, la forme du bord, etc.

Il est difficile d'établir une classification basée seulement sur les caractères des feuilles des plantules; il est possible, cependant, par ce système, de grouper les espèces cultivées les plus importantes. Cette clé doit être considérée comme une tentative capable d'orienter le pépiniériste.

IDENTIFICATION DE LOS PLANTONES DE EUCALIPTOS CON BASE  
A LA MORFOLOGIA DE LOS COTILEDONES

*Resumen*

Los eucaliptos presentan generalmente dos hojas cotiledóneas cuya forma y tamaño difieren según la especie. En el presente trabajo se enseña una clave para la identificación de cerca de ochenta especies, basada en la morfología de los plantones tras la germinación de las semillas.

Según esta clave, deben considerarse los siguientes caracteres : la forma del cotiledón que puede ser suorbicircular, reniforme, bilobulado, bifido, etc.; tamaño del mismo; forma y longitud del peciolo; color de la parte superior y inferior de las dos hojas; espesor de las mismas; forma de la orilla; etc.

Es muy difícil establecer una clasificación basada solamente en los caracteres de las hojas de los plantones, pero es posible, sin embargo, por este sistema, agrupar las especies cultivadas más importantes. La presente clave debe considerarse como una tentativa capaz de guiar al viverista.

IDENTIFICAÇÃO DAS MUDAS DE EUCALIPTO A BASE DA MORFOLOGIA  
DOS COTILÉDONES*Resumo*

Os eucaliptos mostram, geralmente, duas folhas germinais, que, segundo a espécie, são de forma e tamanho diferentes. No presente trabalho é apresentada uma chave para identificação de cerca de oitenta espécies, baseada na morfologia das mudas logo após a germinação das sementes.

Os principais caracteres considerados são: forma do cotilédone, que pode ser suborbicular, reniforme, bilobado, bifido, etc.; tamanho do mesmo; forma e comprimento do pecíolo; cor da parte superior e inferior das duas folhas; espessura destas, forma da margem; etc.

É muito difícil uma classificação baseada apenas nos caracteres das folhas das mudas, mas é possível, entretanto, por este sistema, agrupar as mais importantes espécies cultivadas. A presente chave deve ser considerada como uma tentativa capaz de guiar o viveirista.