
Morpho-anatomy of subterranean systems of herbaceous-undershrub and arboreous species, emphasizing the origin of shoot buds

Adriana Hissae Hayashi

Abstract

External and internal morphology studies of subterranean systems are extremely important to the identification of their structural origin because they allow the correct use of the terminology, which is frequently misused. The occurrence of bud-forming subterranean systems is strictly related to the survival of species in unfavorable environmental conditions, favoring shoot regeneration and/or the vegetative propagation of plants. This knowledge enables suitable management of these species in disturbed areas and the vegetative propagation of economically interesting species. In view of this, the present study aimed at: (1) studying the origin of buds on root cuttings of the forest tree species *Esenbeckia febrifuga* (St. Hil.) Juss. ex Mart. (Rutaceae), *Inga laurina* (Sw.) Willd. (Mimosaceae) and *Bauhinia forficata* Link (Caesalpiniaceae) to verify their reparative or additional origin; (2) inducing bud formation on root systems through shoot cutting or lateral roots girdling or sectioning of the forest tree species *Esenbeckia febrifuga* (St. Hil.) Juss. ex Mart. (Rutaceae) and *Hymenaea courbaril* L. (Caesalpiniaceae) to understand possible induction factors; (3) characterizing the structural origin of bud-forming subterranean systems of the herbaceous-undershrub species *Baccharis subdentata* DC., *Eupatorium maximilianii* Schrad. ex DC., *E. squalidum* DC., *Lucilia lycopodioides* (Less.) S.E. Freire, *Vernonia brevifolia* Less., *V. grandiflora* Less., *V. herbacea* (Vell.) Rusby and *V. platensis* (Spreng.) Less. (Asteraceae) from the Cerrado to define the correct terminology for these systems, besides identifying the buds origin. Results showed that buds formed on root cuttings of the three tree species studied are reparative, as they are exogenous and formed from callus or from phloematic parenchyma proliferation with no bud vascular traces being observed in the secondary xylem. Fragments of *Bauhinia forficata* root bark also form reparative buds from healing phellogen formed in callus in the bark's inner side. In the attempt of bud induction on root systems, *Hymenaea courbaril* did not respond to any of the induction tests, while *Esenbeckia febrifuga* roots formed suckers when the shoot was cut or roots were sectioned and isolated from the original plant. The study of bud-forming subterranean systems of species from the Cerrado evidenced the occurrence of xylopodium in *Baccharis subdentata*, *Eupatorium maximilianii*, *E. squalidum*

and *Vernonia grandiflora*, tuberous root in *Vernonia brevifolia* and rhizophores in *Lucilia lycopodioides*, *Vernonia herbacea* and *V. platensis*. Buds in these species have different initiation sites and can either be of axillary origin or originated from the vascular cambium, the proliferated pericycle or the cortical parenchyma proliferation.

Key-words: Cerrado, rhizophore, root cutting, tuberous root, vegetative propagation, xylopodium.

FICHA CATALOGRÁFICA:
BIBLIOTECA DO INSTITUTO DE BIOLOGIA
UNICAMP

Hayashi, Adriana Hissae
Morfo-anatomia de sistemas subterrâneos de espécies herbáceo-subarbustivas e arbóreas, enfatizando a origem das gemas caulinares / Adriana Hissae Hayashi
.-Campinas, SP: [s.n.], 2003.

H323m

Orientadora: Beatriz Appezzato-da-Glória
Tese (Doutorado) - Universidade Estadual de
Campinas. Instituto de Biologia.

1. Biologia vegetal. 2. Raízes. 3. Gemas. I.
Appezzato-da Glória, Beatriz. II. Universidade
Estadual de Campinas. Instituto de Biologia. III.
Título.