

## 75 F 5 7 H 9 F = N 5 u Ç C ' 9 ' C F ÷ 9 A ' DAS ANGIOSPERMAS

### META

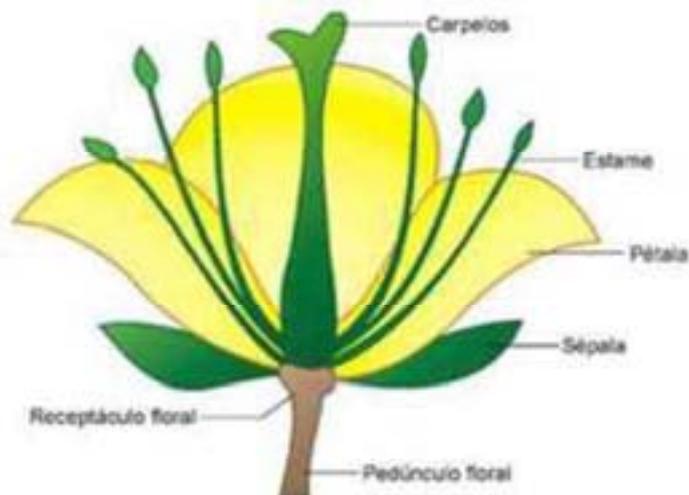
Apresentar as Angiospermas com especial destaque para as novidades evolutivas estreadas por este grupo por sua riqueza e diversidade.

### OBJETIVOS

Identificar as principais características morfológicas e anatômicas das angiospermas, bem como suas novidades evolutivas em relação aos outros grupos de plantas vasculares.

### DFv!F9EI -GHCg

Gimnospermas



C f [ U b ] n U - c X U c f X Y U b [ ] c g I y f a U  
(Fonte: <http://www.sobiologia.com.br>)

=B HFC 8I uÈC

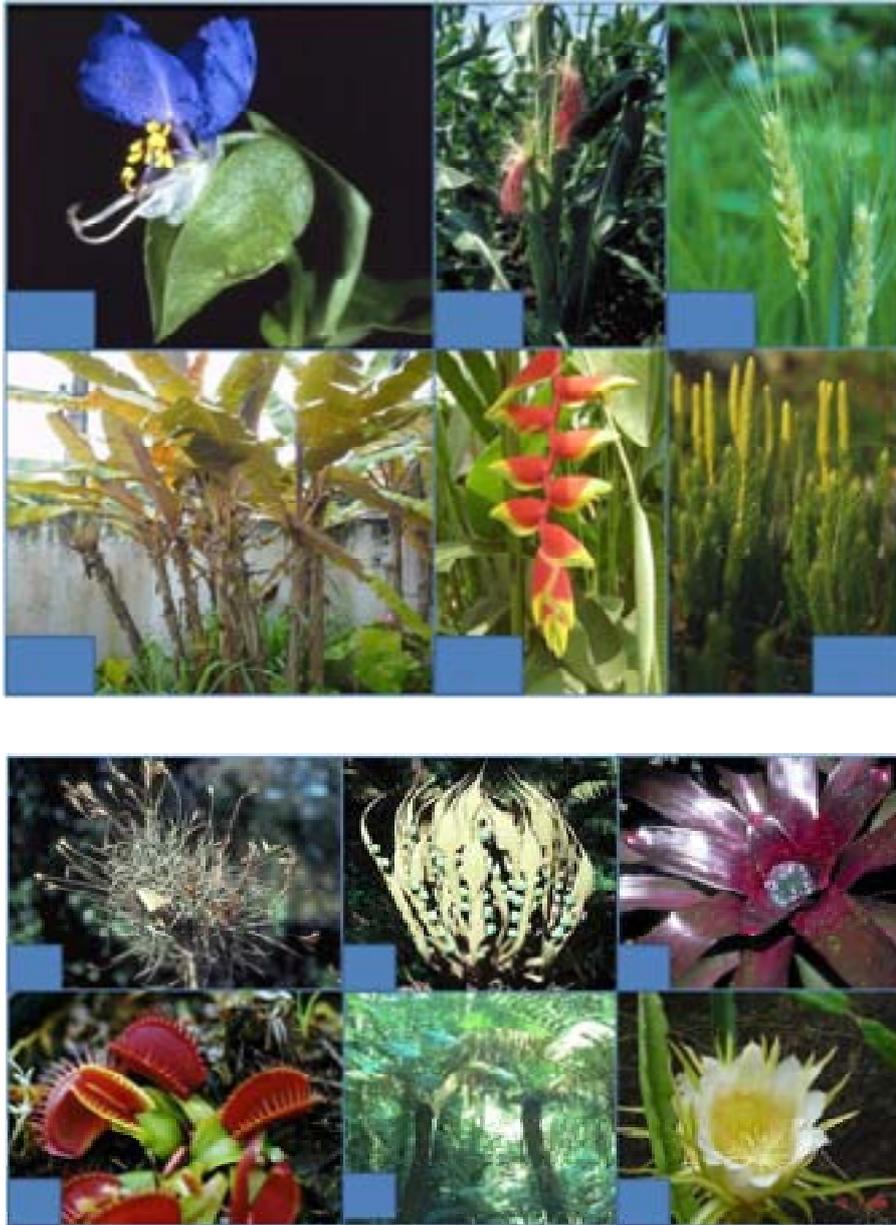


5 df]a Y]fUdY[ i b]Uei Y]fYa cg]YgcbXf]bYg]Wd]i `c]zei Yei Y]Ya cg ei Yj cW]hb\UYa `a Ybh]zei YUg]WY fUg]i ]bhY`

C `EI 9A `GÈC `5G`5B ; =C GD9FA 5G3

J cW]Wbg]i Y]YgcbXf]Ug]UdY[ i b]UWa ZW]XU]J] Ua cg]di l Uf` dYUa Ya C]E]B]E i Ug]Ugd`U]h]gei Yj cW]Ya V]fUei U]Xc `U]Yg]UdY[ i b]U]B 5ei YUg]Xc `W]X]U]bc `X]j cW]a Yga c`"" J cW]g]U]Yei Ug]Ug]W]U]M]g]W]g que um vegetal precisa ter para pertencer ao grupo das Angiospermas? J]Ua cg]Y] Y]V]U]f i a `dci W]Ua Ya C]E]L]B]B cg]Y] Ya d`cg]U]U]c `a Ufei Y]i a ` Î ] `b]ei Y]Y]gei Yj cW]L]W]Uei Y]Y]d]f]Y]g]b]U]g]5]b] ]cg]Y]fa Ug`





5g5bl]cgdYfa UgfKc [fY]c Ub[ Y]cb'1 Íj UgzfYd]YbM' YgdYfa U1`  
 ÎgYa YbM' LZcfa Ua`i a`[fi dc'a cbcU'fh]W'Xj Yfg'ei Ubr'{'a cfZc`c[ ]U  
 Y]a dcfh]b]UYW'Q]WZUfa`XYdceg] ]f'[fubXY]a dcfh]b]UYWb' a ]W'  
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Ygei W]f'g' U]a d]f]U]j U]a dcf]h]b]W]b]U]b]X'gf]U]U]a Yb]h]W]J

HU'W]a c'ei Uei Yf'ci hfc [ fi dc'a cbc'U'f]h]W]Z]g'5b] ]cg]Y]fa UY]f]l]á !  
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XY]d]ca cf]U]g]ei Y{g'X]U]b]Y]á YX]g]h]b]i Y]a 'XYci hfc]g] [ fi d]cg] Y] Y]U]g'"G-c'  
Y]g' %L]Udf]Y]b, UX]Y]cf]Y]g'&L]cg'Y]h]á Y]g'W]a 'X] U]g]h]W]g'U]h]f]U]g'W]M]i a U  
W]a 'Xc]g]a ]M]c]g]lcf]b] ]cg' E]c [ U]á Y]d]E]h' a U]g]W] ]bc'f]Y]X] n]Xc' h]f]bi W]M]Xc/  
(L]UZ]c]fa U~c'XY'W]d]Y]cg'Y]Z]i h]c/) E]cg'Q]ei `cg'W]a 'Xc]g]h]i a Yb]c]g'\*E]c'  
[ U]á Y]d]E]h' Z]á ]b] ]bc'f]Y]X] n]Xc' ; !bi W]M]Xc'+L]UZ]c]fa U~c'XY'Y]b]X]cg]Y]fa UY, E]  
cg'Y]á Yb]c]g'XY]i V]c W]j U]X]c]g'5' [i a U]g'XY]g]g]g]U]d]ca cf]U]g]Y]c' i h]j U]á Yb]h]Y'  
g]b]i 'U]f]Y]g]a cX]U]M]f]U]á ]g'Y]á ' ]b\U] Y]bg'd]f]h]W]U]f]Y]g'Xc' [ fi dc"

J Y]U]á cg]U] cf]U]EX]H\U]K]á Yb]h]Z]W]M]i a UX]g]g]U]W]f]U]M]f]g]h]W]g'd]Y]M]  
liares das Magnoliophytas.



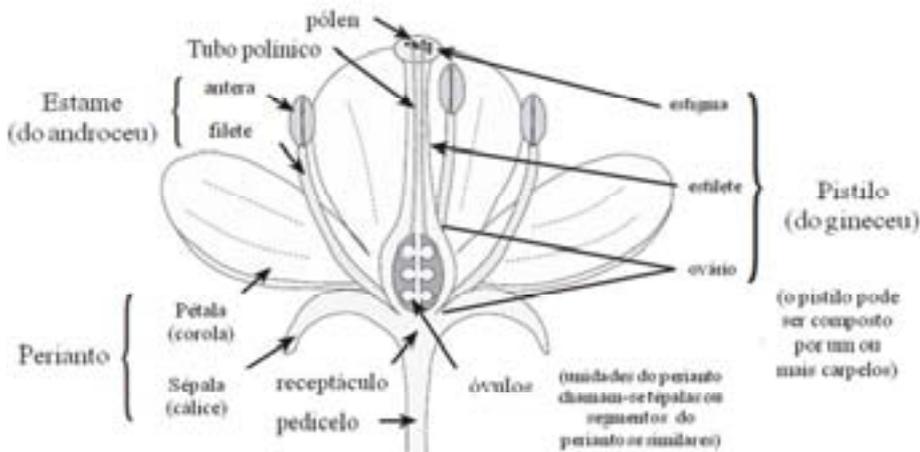
A FLOR

9a VcfUdcggUgY`dYbgf`bc`WbW]lc`XY`Ucf`Wa c`XY`Z`W`Y`b`h`b`X`!  
 mento, se considerarmos essa estrutura como um eixo reprodutivo curto  
 Wa`Ygdcf`CE`cgU`fY`UXc`g`U`i`bg`[`fi`dcg`XY`[`ja`bcg`Yfa`Ug`flg`;  
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 j`Y`Y`H`"5`g`Ucf`Yg`g`~c`f`La`cg`U`h`La`Y`b`h`Y`a`c`X`U`M`X`c`g`d`c`f`h`U`X`c`U`d`b`X`W`g`  
 f`d`Y`f`]`U`b`c`z`U`b`X`f`c`W`M`Y`[`]`b`Y`W`L`Y`a`i`a`Y`[`c`z`c`f`Y`W`d`z`W`c`z`ei`Y`d`c`X`Y`c`i`b`~c`  
 g`f`g`g`b`h`U`X`c`d`c`f`i`a`U`U`g`h`z`c`d`Y`X`W`c`"G`U`c`f`][`Ya`X`z`!`g`Y`Y`f`U`a`Y`b`h`Y`b`U`  
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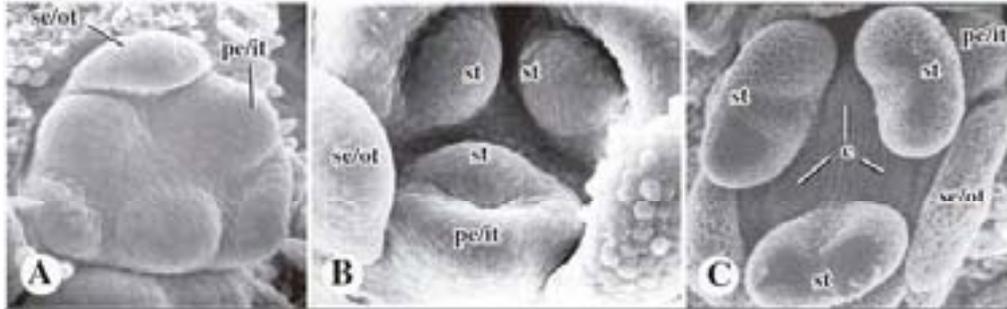
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 f`[`Y`f`U`a`Y`b`h`Z`c`h`c`g`]`b`h`h`W`Z`Y`b`ei`U`b`c`U`W`f`c`U`d`f`Y`g`b`h`U`W`f`Y`g`X`Z`f`Y`b`W`X`L`g`  
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 [`La`c`d`f`U`L`c`i`b`~c`f`X`U`g`d`U`#`X`U`d`f`U`U`z`U`b`X`U`e`i`Y`b`c`d`f`a`CE`X`c`X`c`  
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 g`[`i`f`"E`"9`b`ei`U`b`c`c`[`]`b`Y`W`M`f`U`d`c`f`~c`Z`a`]`b`]`b`U`X`U`U`c`f`z`W`a`d`c`g`U`d`c`f`  
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 U`c`f`Y`g`d`c`X`a`W`b`h`f`Y`g`g`U`g`f`g`d`f`h`g`f`d`Y`f`]`U`b`c`z`U`b`X`f`c`W`M`Y`[`]`b`Y`W`M`L`z`g`Y`X`c`  
 W`La`U`L`g`W`a`d`Y`U`z`c`i`b`~c`z`Y`b`h`c`g`c`f`Y`W`b`W`X`L`g`W`a`c`]`b`W`a`d`Y`U`g`"



: ]i fU%â` 9gei Ya UX`i a UÛcf`": CB H9. ffUXi n]Xc` XYLGA DCC Bz&SS\*"

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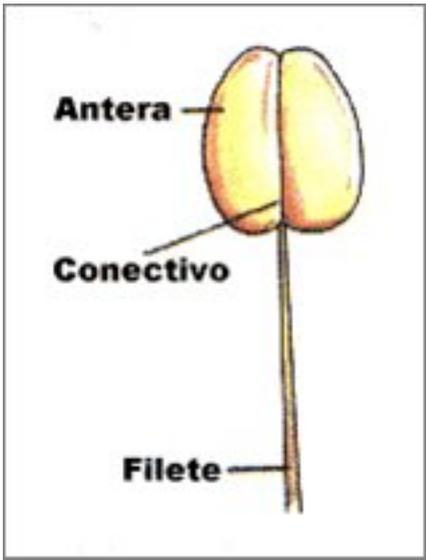


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9bfYU]brcz WbgX]fUXc \ca c`c ]Ug Yb]fY Ug d]f]h]g U'cfU]gZ] YggU h]fa ]bc`c ]Uf]h]f]U]brc ] W]W]Y]Wfc U]z]U]b]X]c]W] Y ]b]Y]M]L]X]j Y]g]f' U]gg a ]X]U]Wa W]h]U]W] h]Y]U]a Y]g]i Xc]g]U'c ]Y]b]f]h]W]g]d]f]U]e]i Y]g]a ]U]f]X]L]X]Y' Z]b]W]c]b]U]Y]a c]f]Zc C]E]W]b~c]g]Y]U]W]b]Z] b]X]X]U]W]a \ca c`c ]Ug'5' Wfc U]z] por exemplo, teve origem independente em diversos grupos, podendo h]f]g]Y]c]f] ]b]U]Xc X]L]g]g]d]U]g]c]i X]Y]g]h]La Y]g]Y]g]h]f]Y]g'

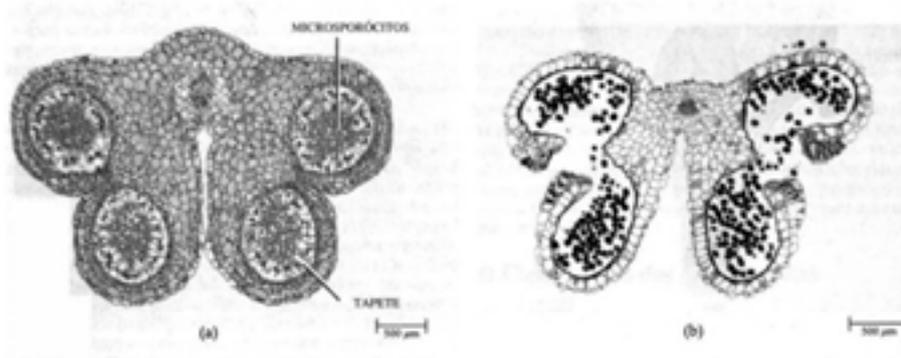
C]g]Y]g]h]La Y]g]Y]c' ]U]a Y]h]C]E]h' a U]g]W' ]bc'

C' Yg]La Y'f' ]b]h]f]d]f]Y]U]Xc' W]a c' a ]W]c]g]d]c]f]C]E'cg' a c]X]U]W]Xc]g]d]c]f]h]U]Xc' a ]W]c]g]d]c]f] ]b] ]c]g]e]i Y]d]f]c]X]i n]Y]a' a ]W]c]g]d]c]f]c]g]z]e]i Y]g]Y]X]g]Y]bj c] j Y]f~c' Y]a' ]f~c]g]X]Y'd]C]E]b'' v' Wbg]h]i Xc' d]c]f]i a U]L]g]h]f]e' U'Y]h]L]Y]i a U]b]h]f]U' Y]g]U' h]a U]f]W]a d]c]g]U]d]c]f]X]i U]g]h]Y]M]g' ]U]L]g]d]c]f]i a W' ]b]Y]M]j c]z]e]i Y]d]c]X]Y]g]f' Y]l' d]U]b]X]Xc' f]z]c]fa U]b]Xc' U]d. b]X]W]g]L' c]i b~c]z]Y]W]b]h]f' Xc' ]g]g]U]W]g]d]c' ]b]W]g]f]a ]W]c]g]d]c]f] ]b] ]c]g]L' W]X]U' B] U]a U]i f]X]L]X]Z]c' d]f' X]Y]g]U]W]g]d]c' ]b]W]g]X]Y]W]X]U' h]W]g]Y]X]g]Y]bj c] j Y]Y]a' i a U' ]b]W]V]a U]f]U]Y]c' d]C]E]b' f' X]g]d]Y]g'c' d]c]f' a W]b]g]a c]g]Y]g]d]W]U]W]g'



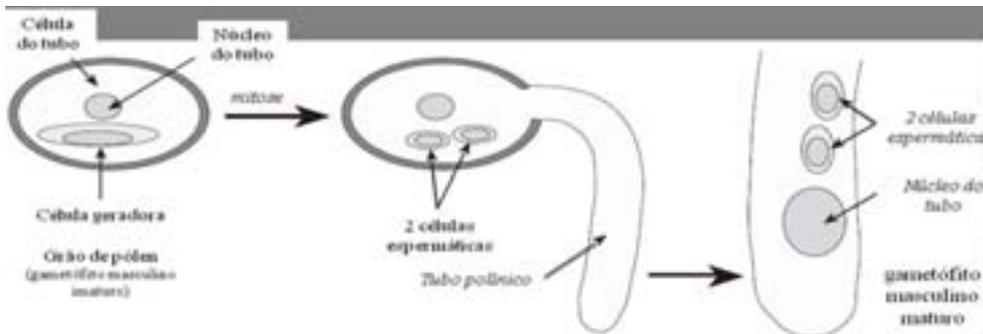
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: ]i fU' ]'9g]fi h]f]U]Xc' Y]g]h]La Y' : CBH9. ## portalsaofrancisco.com.br



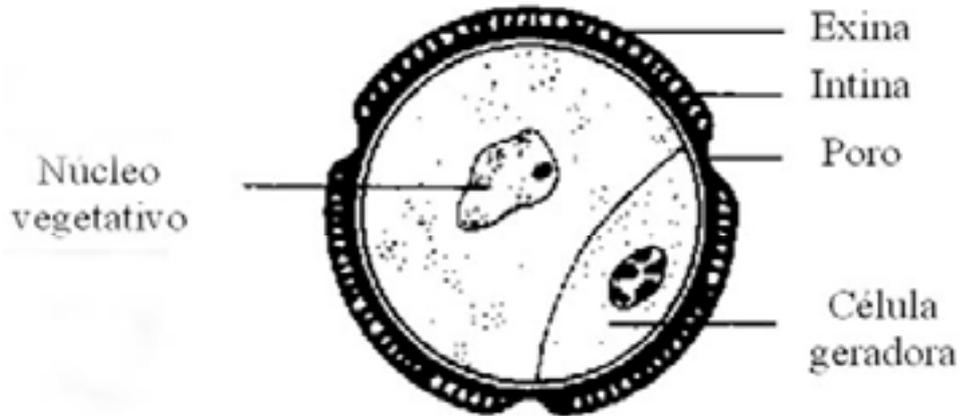
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: ][i fU) ` : Ua`YCE`c`a`UgW]bc`X]gUb[ ]cg]Yfa`Ug`8`Yg]b`c`j`]a`Yb`c`Xc`[Ua`YCE`c`a`UgW]bc`U`dU]h`f`XYi`a`[f-c`XYdCEb` : CBH9. f]fU]i`n]Xc`X]L`G=A`D`G`C`B`z`&S\$`"

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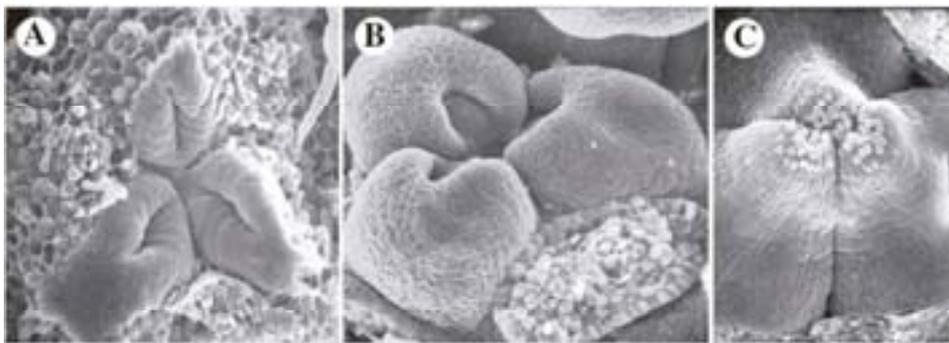


: ]i fU\*Í '9dfi h fUXYi a 'f-c XYdCEB": CBH9. ffUX n]Xc XL:69@#/ < 9A G@9Fz&SS"

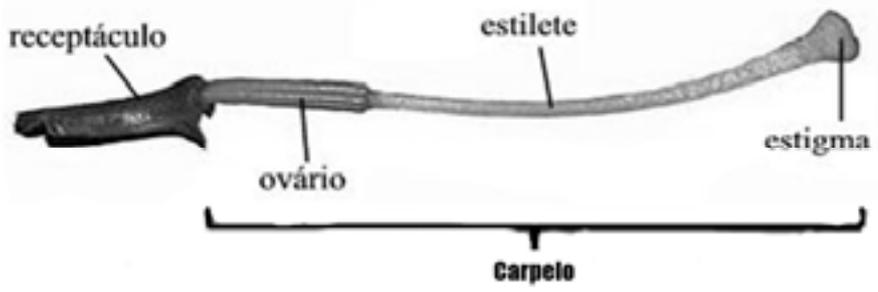
C [f-c XYdCEB X]gUb] ]cgdYfa Ug[ Yfa ]bUgga 'ei YybfUYa Wb]Uc' Wa Ug dYfZYg] a z]Wt'Wa 'c hi Vc dc ]b]W' hfUgcbXc UdUfYXc' dCEB Y'Y UbXc UVYi 'UYgYfa z]W]a GfY Uc 'Gfi 'czWbX], ~c Wb\YXU Wa c ]bZbc[ Ua ]UC hi Vc Ybhc UfUj YgUcghMXcgXc Yg] a UYWfdYc Y UWb, Uc Gfi 'czhfUgZf]bXc Xi UgYi 'UgYgYfa z]WgXfY]a Yb]bc Gfi 'c"

5: CFA 5uÈC '89 '75FD9@C G'9 'G9I ' **DESENVOLVIMENTO NOS FRUTOS**

C [ ]bYm 'fWa dcgc dYc Wb] bhc XYWfdYcgXUÚcf" C WfdYc' f ]b]fdYUc Wa c 'c'a Y] UgcUfU] ]Zfc X]gUb] ]cgdYfa Ug] a UYgfi h fU [ YfUa Yb]Z]WUXei Yb] 'cVUc Gfi 'c Wa d'Y]a Yb]UfYb]gYa U] i bg [ . bYfcgc WfdYc gYUfYbUa U] f]XUX'9 YWa i a Yb]f'Wa dcgc dYc' cj z]czYg] YhZ\Ug]zei YdcXYci 'b-c YgUf dYfYb]hZ'Yg] a U



: ]i fU+Í 'C WfdYczi a U]dca cfUg X]gUb] ]cgdYfa Ug' 5!7"9 Yfca ]Wc[ fUUXc X]g]bj c] ja Yb]c' Xc WfdYc"5": cfa U~c ]b]WU XYhf. gWfdYcgY ]Xb]W]Xc X]g]bj c] ja Yb]c Wb]X d]W]Xc"6" Yg]z[ ]c' ]b]fa X]z]c XYX]g]bj c] ja Yb]c" C Vg]fj Yc Wb]Uc 'UhfU Yb]fYcg WfdYcg"7" Yg]z[ ]c' a U] fcZ]Wa' W]UWfdYc Z]WUXc YZ' g-c Yb]fYWfdYcgUXUWb]hgdfUUZ'fa U~c XYi a [ ]b]Ym 'gb]Wfd]W'f]l]g]c' composto). FONTE: Simpson, 2006.



: ][i fU, Î 9gfi h fU] YUx` WfdYc": CBH9.kkk"WgblHã Uf]UWã "Vf##"Ubl] cgdYfa Ug`la

9ggUygfi h fUQ` WfdYcQf] bhfdYUxUWã i a` a` Y] UgdcfCE`c` Wb! Xi d]WXczXY] Xc` {` dfYgb, UXYga Yf]UXcfgj] YbfU`Yj YbU`~c`ga ]U`U Zc` \Ug` 7Yfhg`dUfhg`Xc` a` Y] UgdcfCE`c` a` cX]UWx` Xygbc] Ya` hWXcg` XYfYWd, ~c` Xc` dCEb`fhg][ a` ULYh` Vc` dc` ]b]W`fhg]`YhE"

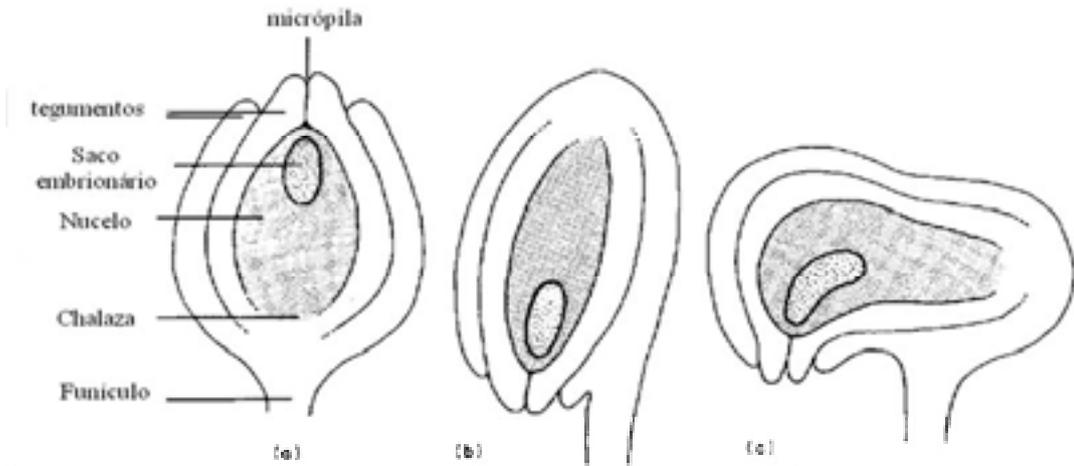
5` XdYbXf` Xc` b`a` Yfc` XY`WfdYcg` Yg` UZ` g-c` Yghg` dcXYã` gYf` UdcWfd]Wg` fWfdYcg` Xgg` WUXcg` ci` gbWfd]Wg` fWfdYcg` Z` gcbUXcg` Yc` d]g]` c` dcXY` gY` ga` d` Yg` fWã` WfdYc` • b]W`Lci` Wã` dcg` fWã` a` Ug` de um carpelo).

C` hfa` c` d]g]` c` YWfdYc` g-c` U] i a` Ugj` Ynygi` h]` nUXcg` dUfUXyg]` bUf` Ug` Ygfi` h` fUg` WbhfUg` XUÛc` ei` YWbhã` cg` Qei` `cg` C` WfdYc` fUi` b]XUX` Vzg]W`Xc` [ ]bYm` "E` i` UbXc` cg` WfdYcg` b-c` g-c` Z` bX]Xcg` cg` hfa` cg` g-c` Yei` j] UYbhg` Yc` d]g]` c` f` ga` d` Yg` YbfYUbc` z` gYcg` WfdYcg` g-c` Z` bX]Xcg` Y` Wbg]` h` i` a` U` • b]Wi` b]XUX` z` c` d]g]` c` f` Wã` dcg` Ycg` hfa` cg` b-c` g-c` equivalentes (Judd et al. 2008).

v` UdUfhf` Xc` WfdYc` ei` Yc` Zi` hc` gY` Xygbc]` Yz` \Uj` YbXc` \c` YZi` hc` g` Wã` X]ZfYbhg` a` Wb]ga` cg` XY` XgdYfg` c` XY` gYã` Ybhg` C` Zi` hc` f` Ybhc` Zcfa` Ux` dYc` fh]` c]` z]` cf]`ã` Ux` fcf]`ã` Ugei` Uei` Y` hVXc` UX]VcbU` Yg` U` Zcfa` U`~c` [ YUã` Ybh` c` WffYUd]` c` Xygbc]` ]ã` Ybhc` XUgã` YbhY`

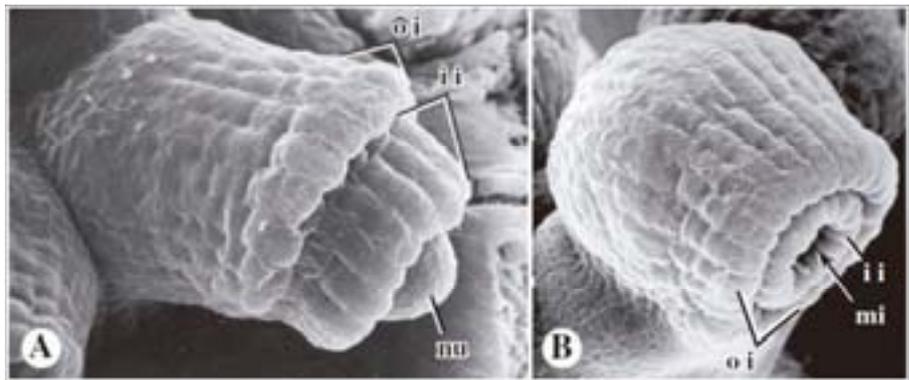
C` è` JI` @C` 6=H9; I` A` 9B` H58C` žC` ; 5A` 9Hê` :` =HC` ` :` 9A` =B` =B` C` 9` 5` :` CFA` 5uÈC` 8C` 9B` 8C` GD9FA` 5`

C` CEi` c` X]g`Ub]` ]cgdYfa` Ug` X]ZfYbhã` Ybh`Xc` ei` YUWbhWVWã` cg` Xã` Ug` [ fi` dcg` XY` d` Ub]` g` f` UcbfCE]` Wzci` gY` UZYg` c` ZYi` a` U]bj` Yfg` c` XY` %` Ss` Yg` Uã` ]WCE]` U` c` W]` nU` gY` dfCE]ã` UXU` \Ug` YXYg` g` Yb]U` ~c` Xc` CEi` c` fZ` b]M` cE`



- Ì H]dcgXYÇEi `c`fLcfc]W'fñá ; ja bcdYfa Uç' fLUbchÇE]W'fñá `5b] ]cgYfa Uç' fñW  
Wá d]chÇE]W': CBH9. fñUX n]Xc XL69@/ ` 9A C@9Mz&SS`

5`fa `Xggz`bUg`a Ubc`]ÇE]Ug`Xc]g`h]i`a Ybhc`Ybj`c]j`Ya `c`ÇEi`c`z  
Lá Vcg`d]f]h]M]U]b]Xc`XUZ`fa U`~`Xc`d]c]f`c`XY`Yb]f]U]X]c`h`i`Vc`d]c`b]W]Z]U  
a ]M]ÇE]U`9a Vcf]Ucg`Vb]Z]M]c]g]Y`c`i`h]j`cg`XY`i`a`ÇEi`c`V]h]i`a`Yb]X]c`b`c`  
Yg]Y]U`a`W]f]c]g]f]Y`j]X]b]h]Y]U]d]f]h]M]U`~`c`X]g]g]Y]g]h]M]X]c]g]z`Y]b]c`W]U]Y]g]M]X]c]g]z`  
b]U]Z]fa U`~`Xc`f]Y`Y]g]h]a`Y]b]c`X]U]g]Y]a`Y]b]h]Y`9a`U`[i`b]g`[f]i`d]c]g]Z`[X]Y]M]U]X]U  
U]d]Y]X]U]g]W]b]X]z]f]U]X]Y`i`a`X]g]g]Y]g]h]i`a`Y]b]c]g]z`W]a`c`Y]a`U`[i`a`U]g`D]c]U]Y]g`  
fa`c]b]c`W]h]g]Y]5]g]h]f]X]U]g]f]M`X]W]h]g`



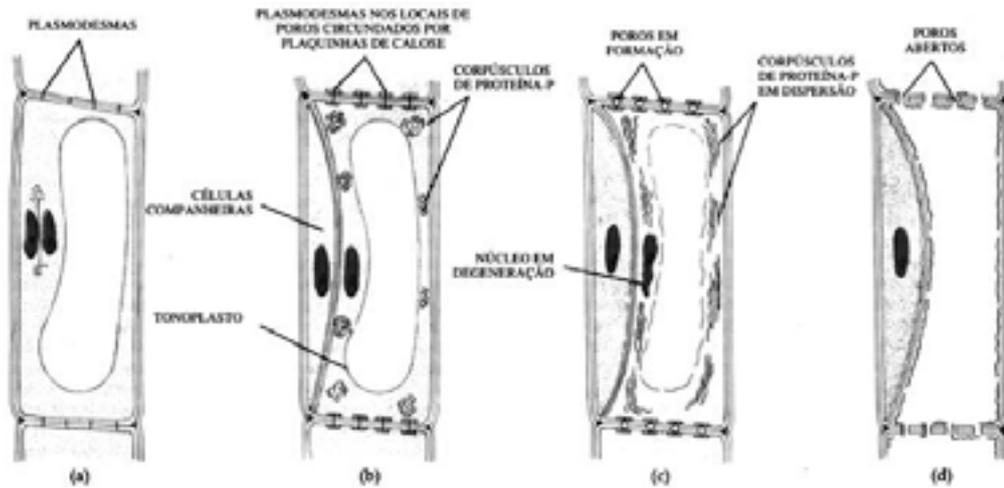
: ]i]f]U]S]I`è`j]i`c`V]h]i`a`Y]b]X]c`5`ÇEi`c`]a`U]i`f]c]Z]Y`j]X]b]W]b]X]c`U]Z]fa U`~`Xc`h]i`a`Y]b]c`]b]!  
h]f]b]c`f]j]L]Y]Y]h]f]b]c`f]t`j]Z]Lá`Vcg`W]g]W]b]X]c`U`f]Y]X]c]f`X]c`b]i`W]c`f]b]i`L6`è`j]i`c`Y]a`Y]g]z`[c]d]c]g]h]f]c]f`XY`  
X]g]Y]b]j`c]j`ja`Y]b]c]z`W]a`c`c]g]X]c]g]h]i`a`Y]b]c]g]Y]U]a`]M]ÇE]U`f]a`j]Z]fa`U]X]U': CBH9. G-A DCC B z&SS`



OS ELEMENTOS DE TUBO CRIVADOS

C gYYa YbhcgXYh Vc Wj Uxcgg-c Wfi UYgdWJ]nXLgbc hUbgdcfHY XYUi WYgdYUd'UbHUYI W gj Ug XLg UbhCEHg' 7UXUYa Ybhc XYh Vc Wj Uxc' d'cgj ]i a Uci 'a Ug Wfi Ug Wa dU\YfUgYi a Ugff]YXYd'UWg crivadas principalmente localizadas em suas extremidades.

5gWfi Ug Wa dU\YfUgXZfYa XLgWfi UgUMi a ]bcgUg dfYgbhg bUg [ ]a bcdYfa Ug dcf' gYfa 'cf]] ]bzf]Ug XUa Yga UWfi Ua ~Yei Ycg YYa YbhcgXYh Vc Wj UxcgYgdUgWfi Ugd'cgj Ya i a WcdUg UXbgc Y i a 'b•Wt' d'fcYa ]bYhY'9bei Ubc'cgYYa YbhcgXYh Vc Wj UxcgUbxU ei Yj ]j cgbUa Uif]XUXZb-c' d'cgj Ya 'ei Uei Yf'b•Wt'ci UdYbUgU]i bg j Ygf] ]cgXc'a Yga c"



: ]]i fU% Ì 8 ]ZfYbWJ-c XYi a YYa Ybhc XYh Vc Wj Uxc" fLUWYi Ua ~Yg-ZYbXc Xj ]g-c" fMWA c fYg 'UXc' XUXj ]g-czg-c Z'fa Uxcgc YYa Ybhc XYh Vc Wj Uxc Yi a UWfi UWa dU\YfU' fM'c b•Wt' Xc YYa Ybhc XY h Vc Wj Uxc XY] YbYUYcgdcfcg'Wa Y lã UZ'fa Uf]g' fM'B Ua Uif]XUXYc YYa Ybhc XYh Vc Wj Uxc b-c' d'cgj ]b•Wt'ci j UWc'c": CBH9. fLXLdUX' XMF5J 9B 'YhU" 88%

5DCA CF: =5G'9 CI HF 5G'75F 57H9F aGH=75G'85G'  
5B; =C GD9FA 5G '69B 9: a7 =CG'9JC @I H=JCG

C g f] ]a Ybhc XUÛcf'YgYgdWJ]nU ~c XLgdUfhg'ÛcfUgWa ]bci 'Ya i a Ugff]YXYa Wb]ga cgXYdc ]b]nU ~c" 8 YgXYUwbX], ~c VgU\ ]dch]f]W XYdc ]b]nU ~c dcf Wgci fcg' WbX], " Yga UgYgdWJ]nU XLgXYdc ]b]nU ~c dcf ]bgYcgZU YgYa cfM] cg'ci 'a Yga c UfYX, ~c ÛcfU YdYfXUXj Yf]Wcg WfUMf]g]WgXYÛcfYgdc ]b]nU XLgdYc j Ybhc'ci 'dYUz]i U

5g]ja Hã Vfa zYUW'cbUx'!gYWa UYgdWJ]nU ~c ÛcfUzcgYgHã Yg Y[ ]ã YfUgZã ]b]bcgYa UgW ]bcgYj c i #Uã dUfU[ Ufubhf'c g Wgc XUdc!

]b]nU ~c`Yc fzd[Xc XgYbj c`j ]a Ybhc`Xc`Ya Vf]-c/dYfa ]hbXc`c`g`f[ ]a Ybhc` de angiospermas com curto ciclo de vida, como as ervas bi-aneais. Assim Wa`c`UXi`d`UZWbXU ~c`YUWbgYe`Ybh`Zcfa U ~c`Xc`YbXc`gdYfa Uzei`Y`gYfj`YWa`c`Zc`bhY`df]a`z[ ]UXY`bi`h[ ]Ybhg`dUfUc`Ya`Vf]-c`"

9j`c`i`hj`Ua`YbhZ`c`XgYbj`c`j`]a`Ybhc`Xc`WfdYc`g[ ]b]UWi`Xc`lg`]a`!`dcf]Ubhg`dUg`gdUfUg`d`UbHg`5`Y`l`gh`bWUXY`g`Vg[ ]bWg`ei`Y]b]Va`c`WYg`Ma`Ybhc`Xc`h`i`Vc`dc`]b]W`bc`Yg[ ]a`UYg[ ]Y`Y`dcgg[ ]]nci`c`Wbhc`Y`gY`Yhj`c`XYZ`WbXU`~c`/YgU]b]V],`~c`dc`XY`c`WffY`f`h`bhc`ei`UbXc`d`CEb`XY`ci`hUg`Yg`f`WYg`UWb,`Ua`c`Yg[ ]a`Uci`YbhY`]bXj`X`cg`]bW`a`dUj`Yg`XY`i`a`Ua`Yga`UYg`f`WY`5`fa`XYdf`cj`Y`f`a`YWb]ga`cg`XY`Xg`dYfg`c`Xcg`Xg`Wb!`Xbhg`UfU`fg`XU`Zcfa`U`~c`XY`XZ`f`Ybhg`h`dcg`XY`Zi`hc`g`"

C`i`hUg`]bcj`U`"`Yg`XUg`Ub[ ]cgdYfa`Ug`UbXU`ei`Yb`~c`dcgg`]a`gY`WUW`h[ ]nU`XUg`Wa`c`Udca`cfU`Ug`Xc`[ ]fi`dcZ`g`c`]a`dcf]Ubhg`dUfUc`gY`g`Wgg`U`XU`dU`h]c`5`Y`l`gh`bWUXY`Y`Ya`Ybhc`g`XY`j`Ug`c`Ya`U`[ ]i`a`Ug`Ub[ ]cgdYfa`Ug`c]a`nU`f`Ua`c`hUg`c`f`h`XY`g`c`i`hc`g`Y`z[ ]i`U`5`Yg`fi`h`f`UX`j`Yfg`U`W`XU`Xc`g`h`dcg`XY`f`U`Yg`Z`W`Yg`Y`Z`~c`Ug`b`~c`f`Yb`W`b`h`U`X`U`Ya`b`Yb`i`a`c`i`h`c`[ ]fi`dc`j`Y`YU`Z`Ug`]a`Wa`c`cg`X`Z`f`Ybhg`h`dcg`XY`dc`]b]nU`~c`Y`X`g`Y`fg`c`Y`l`gh`b`h`g`"

Essas novidades evolutivas estreadas pelas angiospermas simbolizam i`a`Ug`f`]Y`XY`U`X`U`h`U`"`Yg`ei`Y`d`ch`b`W`U`]nci`c`g`Wgg`Xc`[ ]fi`dc`Y`j`X`b`h` nos dias atuais por sua riqueza e diversidade.

ORIGEM

7fYzWc`]bZf]cfZ%`S`a`]`"Yg`XY`Ubcg`Ufzg`

8YUwfXc`Wa`Y`j`X`b`W`U`g`Z`g`Y`g`c`dcgg`]Y`Ub`W`g`f`U`X`U`g`5`b[ ]cgdYf!

mas deveria possuir os seguintes caracteres:

!`DCEb`a`cbcgg`W`Xc`

- Folhas simples

!`DUf`~c`]ffY`i`U`f`XY`b`Y`fj`U`~c`f`Y`h`W`U`X`U`d`]b`X`U`

5g`5b[ ]cgdYfa`Ug`dcgg`Ya`i`a`Ucf][ ]Ya`a`cbc`U`f`h`W`W`a`V`Ug`Y`Ya`

bcj`Y`g`]b`U`dca`cf`U`U`g`

%`9`Ya`Ybhc`g`XY`h`Vc`W]j`U`Xc`Y`Y`fi`U`g`Wa`d`U`b`Y`f`U`g`X`f`j`U`X`g`X`L`ga`Y`ga`U`g`

V`fi`U`g`]b`]W`U`g`

&";`f`~c`XY`d`CEb`W`a`Y`W`]b`U`W`i`a`Y`U`X`U`W`a`U`X`U`X`c`d`f`Z`W`i`a`Y`U`Y`h`c`L`

'`"9`g`]a`Y`g`Wa`Xc`]g`d`U`f`Y`g`U`h`f`U`g`X`Y`g`U`W`g`dc`]b]W`g`

("9b`X`ch`Y`M`c`~c`]dc`X`f`a`U`b`U`b`h`f`U`

)";`Ua`Y`CE`h`c`a`U`g`W`]bc`W`a`U`d`Y`b`U`g`"V`fi`U`g`

\*`"7`U`f`d`Y`c`Z`W`U`X`c`W`a`f`Y`[ ]~c`Y`g[ ]a`z`h`W`cb`X`Y`c`W`ff`Y`U`[ ]Y`fa`]b`U`~c`Xc`

[ ]f`~c`XY`d`CEb`

+`"DU`f`Y`X`Y`Xc`a`Y`z`g`c`f`c`U`b`U`g`Ya`Y`g`d`c`f`c`d`c`Y`b]b`U`

,`";`Ua`Y`CE`h`c`Z`a`]b]bc`W`a`+`U`%`V`fi`U`g`g`Ya`U`fei`Y`[ ]b]cg`

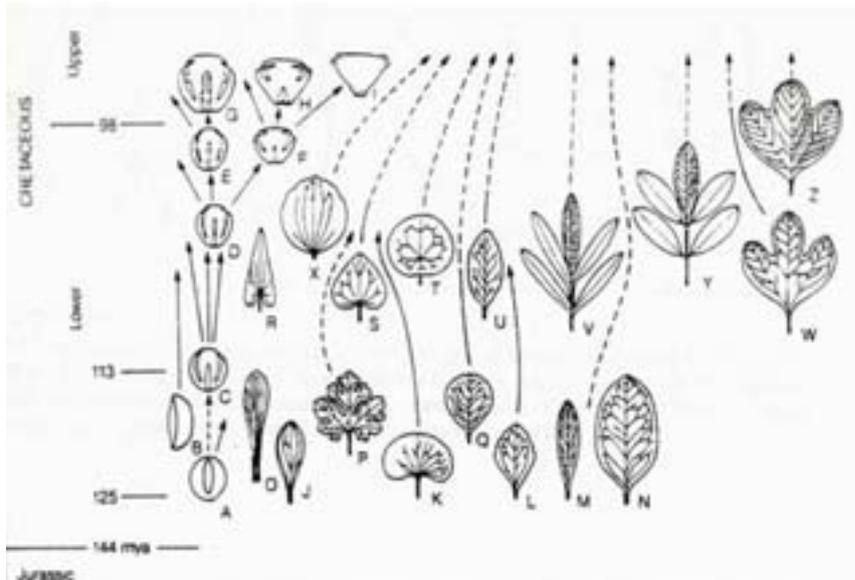
-`"8`i`d`UZ`W`b`X`U`~c`z`U`g`W`X`U`{`Z`cfa`U`~c`Xc`YbXc`gdYfa`U`

EI 5@'C 'DFCJ ãJ 9@; FI DC '5B 79GHF 5@'

9a 'ei YfdcWY`cW hflgY]Lã `cf][ ]bUXc Ugd]a YfUg5b] ]cglYfa Ug3  
 DUFUfygcbXf`UYgUdyf[i bHJdcXYa cg`Ub, Uf`a ~c`XU ]bhYdfYU  
 , ~c`Xc`fY] ]gfc`ZEG]`" GUYa cgei YcgA Y] UCEgYgffYb`czZc` \Ug`ÚcfYgž  
 Zi hcg`YfLã` `Ui bXUhg`bc`7fYzWc` ]bZf]cf`z`Udfcl ]a UXLã YbhY%)`  
 a ]`" Yg`XYUbcg`Ufzgz`fdcW6UffYa ]UbZ`YfUA Ygnc ]W1 bHã YbhY`Wa`  
 UdfYXca ]b]bWUXYZEGYgXYj z]cgl]fi dcgXY; ]a bcdYfa UgYDhf]XCE  
 Úhg`Bc`7fYzWc`g`dY]cf`f`\$`a ]`" Yg`XYUbcg`UfzgLcg'a Y] UCEgYgXY  
 5b] ]cglYfa Ug`z`ÚWfLã` Xca ]bUhg`

A ]McZEGYgffCEYbL/bc`WmzWc` ]bZf]cf`c`fY] ]gfc`YfUa i ]hc`f]W`fLã`  
 ei UbH]X]YXj Yfg]X]Y`C`g]f~cg]b]UdfYh fUXcgUbH]W]X]ã`cgl]UdfYh!  
 fUXcg`DEYbH] ]dcfUXc`Ydc` ]dcfUXc`fhdcgUHLã` YbhYg]W]U]nUXc`XYU[ i a Ug  
 Zã`f]Ug]ha` bchj`Y`U`g`bW]bc`7fYzWc`=bZf]cfz`g`UdYfYW]Xc`Vã` a Ug  
 HfX]z`g]bXc`Wbg]X]fUXc`gždcf]Ubcz`Vcbg]bX]W]Xc`fYg`XY`Úc] ]b]U`

GUYa cghã`Vfa`ei YUg`Zc` \Ug`gla`d`Yg`UbH]W]X]ã` Ug`Wa`dcgUg`bc`  
 tempo, o que pode ser observado no diagrama a seguir:



: ]i fU% `!`Gt` .bW]g a U]nUXY]hdcgXYdCEbYZc` \UgXY5b] ]cglYfa UgXc`7fYzWc`

d`Yg]ca CEÚM35`Úcf`a Ugdf]a ]hj`U3  
 8 i Ug`hYcf]Ug`Wb]U]h]bhYg`g`c`j`Y]W]UX]Ugž

HYcf]UXc`dgY`XUbc`Ì`K`Y]hg]b`f]`\$`S`+L`

8 YUW]Xc`Wa`Yg`U]hYcf]Ug`ÚcfYgd`Yei`YbUgž`b]gg]Y`i`Ug`YU`bYa`CE`Úg`  
 XY]j`UX]g`XY`Yg]fi`h`fUg`fydfc`Xi`hj`Ug`i`b]gg]Y`i`Ugž`[ ]a`bcd]f]fa` ]Mgž`h]j`Yn`  
 ga` ]UfYg`Ugž;`bYU`Yg`g]f]Lã` Ug`ÚcfYg`a`Ug`df]a` ]hj`Ug`9`g]Ug`ÚcfYg`h]f]Lã`  
 gYcf][ ]bUXc`dcf`fY] , ~c`XYi`a`UYg]fi`h`fUYg]fcV]Uf`a`i`h]U`U`J`

5g'ÚcfYg'dYei YbUg'gla d'Yg'XWbUg'YUbYa CE'Ug'XYU|i a Ug'XW!  
 h'YX bYUg'XUg'WUg'Y< Ua Ua Y]XU'gYbg'`7fcbei ]ghfC'fXa` : UUYg'  
 ã [ `UbXUYg'Anf]WYg'7Ug'Uf]bUYg' {g'j YnYg'W'Yhj Ua Ybh'WUa UXg'  
 5a Ybh'ZfUY'XUg'D]dYfUY'fj WUg'YA U|bc`]]XU'gYbg'`7fcbei ]g'f'g-c`  
 os representantes das angiospermas que possuem todos esses caracteres.

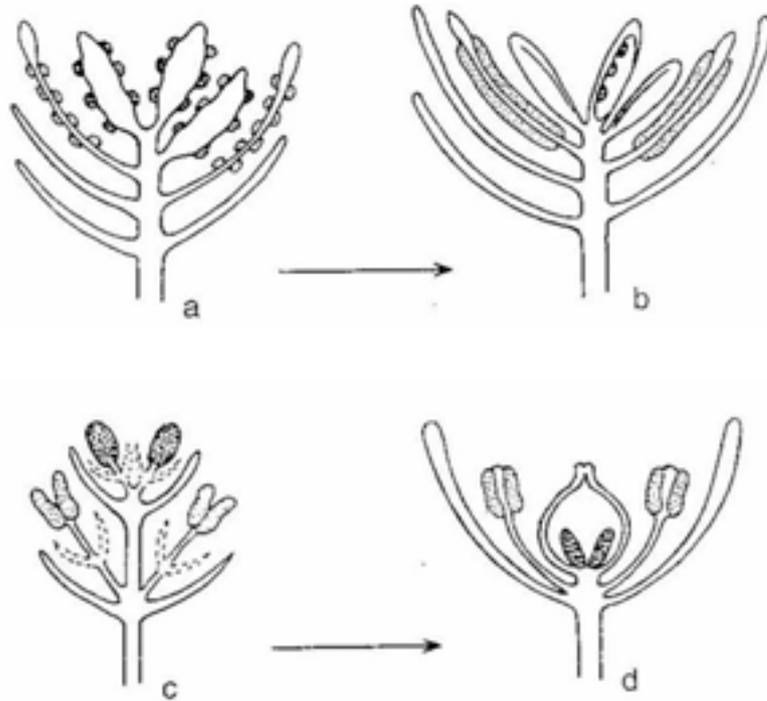


: ]i fU%`Í D]dY'j YfUW' n'

H'cf]U5bhc'gfcV]f'Í`5fVf' /`DU' ]b'f% S+L  
 9g'UH'cf]Udfj`..:UXf]j U~c`XUg'5b] ]cgdYfa Ug'Uduhf'XYi a`Yg'  
 h'CE]c`i b]U ]U"8 YUW'fXc`Wa`UH'cf]U5bhc'gfcV]f'zUg'ÚcfYg'df]a ]hj Ug'  
 possuem numerosas partes livres no perianto; androceu e gineceu, todos  
 Y'g'Xg'f]M`f'cg'Yg'd]fUUX'La Ybh'g'VfYi a`fYWdzW'c Ucb]UXc/dY]Ubc`  
 j ]g'cg'Ydc`]b]nU~c`Yb'ca CE'U'5gd'UbUg' ]j Ybh'g'XUcfXa`A U|bc`]UYg'  
 WffYg'dcbXa`UYgh'Ydfch'CE'c`XY'Úcf'df]a ]hj U



: ]i fU%`Í`A U|bc`]U]fUbx]ÚcfU



: ]]i fU% '! Hxc]Ug UhfUj] Ug dUfUcf]] Ya 'XUÛcf" UV" Hxc]U5blcgfcV]Uf" WX" Hxc]UXc' DgM Xlbc" G]Hg]bX]Wá hfUgZfa U -c/Ug]i gfu" Yg]bX]Wá WbX]Ucg{ df]a YfUUb] ]cg]Yfa U

E I 5@'C 'DC GGa 9@'5B 79GHF 5@'85G'  
**ANGIOSPERMAS?**

De acordo com as pesquisas divulgadas na atualidade, dentre os [ fi dcgXYd UbUgZc •b]W'ei YdcXf]Uhf X]Xc'cf]] Ya 'Ug5b] ]cg]Yfa Ug g-c Ug: ]a bcd]Yfa Ug'A Yga c Uga dUfU]gg hf UWbh]W]Xc' g]f]UbW]ggf]U i a UWa V]bU -c 'XYW]U]M]Yg'

; ]a bcd]Yfa UY] 'Wa V]bU -c 'XYW]U]M]Yg' f]gZ] ]c 'z' U]b, U]c 'XY f]X] , -c 'Xc' [Ua Y]U]c 'Za ]b]bc 'YU]Zfa U -c 'XYg]a Ybh]g'.

Dentre as Gimnospermas o grupo que foi cogitado como ancestral das 5b] ]cg]Yfa Ug'fc X]gD]bcdg]XU] '9gY] fi dc' d]cgg ] Yg]f]U]c]gZ]a ]b]bcg Z]fa U]c]gdcf' Yg]Wá Ug'cf]] ]b]U]g'dYU]Z] g-c 'XY'a Y] U]g]cfcU'cg'Yflá cg W]hc]g'8 YU]W]Xc' Wa Ug]U]z ]g]g'Yg]Y] fi dc b-c d]cgg ] b]U]ei Yg]Yd]U]Y, U Wa 'i a 'a Y] U]g]cfcU'c' h]d]W"° 9g]c 'Zc]fU]XYW] ]U] -c 'Wa c' Ub]W]g]U]g das Angiospermas!



*Pinus edulis*



*Sequoia sempervirens*



*Araucaria cunninghamii*



*Cupressus lusitanica*

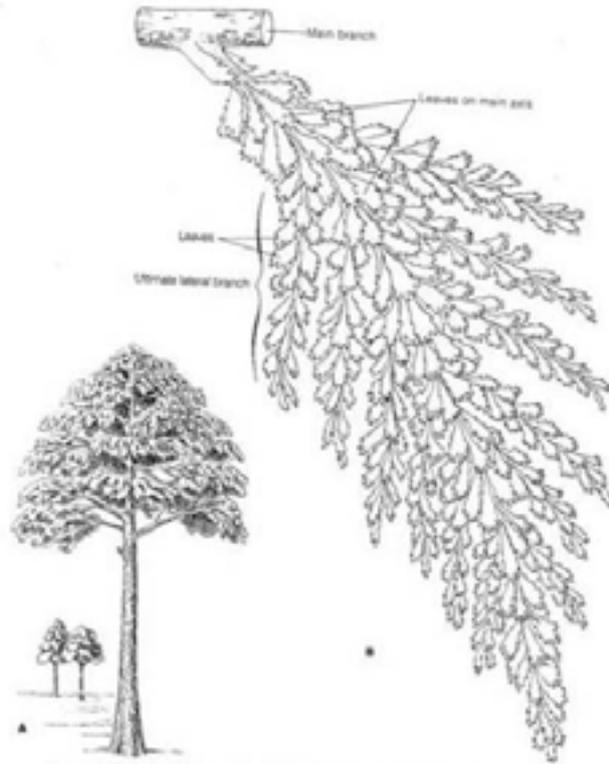
: ][i fU% Ì FYdfYgbHbhgXYD]bcdgXU

Ci hfc`[ fi dc`UbU]gXc`Zc]`c`XUg`7mWXc]Xcd`nhUÌ`6YbbYh]HUYg`  
Ì`Yg]fCV]cg`Wa`a`Y]Ug]cfcUcg`Ya`[Mc]g]cfcUcg`Cm]g`fydfYgbHbhg`  
dcgg`Ya`ÛcfYg`a`bcV]bUg]fWbX], ~c`ei`YgY`1`[Uhf`g]Xc`WfUWf]g]W`  
XUg]ÛcfYg]XUg]df]a`[hj`Ug]A`U]bc`]cd`nhUÌ`hcf]U]b]c]g]f]V]U]L`DYc`Z]h`XY`  
dcf]h]f`a`Y]Ug]cfcUcg]a`i`[lc`Yg]f]W]U]n]Xc]g]g]f]U]a`dfcj`zj`Y`ei`Y]hj`Ygg]Ya`  
cf][]b]U]Xc`W]d]Ycg]f]X]Ya`c]Xc`Ub]z`c`[c]z]U]g]Vc`g]g]d]c]f]h]U]Xc]f]U]g]XY]C]e]`cg]Ya`  
7U]h]c]b]U]Y]g]g]c`h]a`V]fa`a`i`[lc`Yg]f]W]U]n]X]U]g]`



: ][i fU% Ì`6YbbYh]HUYg`: cb]h]c`h]d]##k]k]k`d]Y]U]c]X]m]b]Y]Y]X] #a`i`f]U]#f]U]g]W]f]M]h]h]a`

5 g@h]bcdh]f]XUg]Dh]Xcg]Ya Uyg] Zcf]a Wbg]Xf]Ug]Ubw]f]Ug dch]b]WUg]Gf]La 'bi a Yfc]g]Ug]a c]X]U]M" Yg]b]W]g]z]f]Ug]d]f]U]W]b]j]Y]h]f' qualquer Pteridosperma conhecida em uma Angiosperma. De acordo com HU \HU b Y7fcb]ei ]gh] X]h]Xcg]g]f]i dc]g]X]Y; ]a bc]d]Ya U]W]b] \W]X]g]z' apenas as Pteridospermas apresentavam caracteres mais primitivos que as primeiras Angiospermas.



: ]i fU&S] F]W]b]f]i, -c XY5fWUc]d]h]f]g

E I 5@'C 'DC G]a] 9@'5B 79GHF 5@'85G'  
**ANGIOSPERMAS?**

; b]Y]U]g] Zcf]a 'g]f]La Ybh]W]b]g]X]f]U]g]Wa c' dc]g]j] Yg]U]b]W]f]U]g das Magnoliophyta devido a compartilharem com este grupo os seguintes caracteres:

- ! 'Df]Y]b, UX]Y]Ya Ybh]g]X]Y]j] U]g] 'bc' 'Yb'c' g]W]b]X]z]f]c
- ! '8 c]g]W]h]f]X]cb]Y]g
- Sifonogamia
- ! 'B Y]j] U] -c f]Y]W]U]X]U]g]Zc' \U]g



*Gnetum gnemon*



*Ephedra*



*Welwitschiamirabilis*

: ][i fU%î`9l Ya d`c XYfdrygbbhgXY; bYUYg`

5dYgf`XYU[i a UgWf]WgUYghYfdY]c U[ fUbxYa Ucf]UXLgUbz`]gYg  
Úc[ Yb]f]WgbU• hã UXfWUha`cV]Xc`z]j cfYgcbXYc`[ fi dc! ]fa ~c`XUg`  
A U]bc`]cd`nUf; bYUYg`

7f]Wg`

Ì`cf][ Ya`XcgYYa`Yb]cgXYj Ug`b~c`hf]U\ca`c`c[ ]Yb]fYcg`Xc`]g[ fi dcg/  
; bYUYg` d`UWgXYdYz`fU`~c`cf][ ]bUXLgUdUfh`f`XYa`cX]UW`" YgXY`  
dcb]i U`" YgUfYc`UXLgVfW`UfYg`f]d]Wg`XUg`Wb]ZfUg`/

A U]bc`]cd`nUf` d`UWg`Zfa`UXLg`dcf`Xgg`i, ~c`XYdUfYXg`XchUXLg`  
XYdcb]i U`" YgYgWUf]Zfa`Yg`

7CB 7@I GÈC

5[ cfUj Ua cgfYgdcbXf Ug'dYf[i bhUgZ]hUgbc`]bMè`Xc`Wdth`c3C`  
 ei Ya`g-c`Ug`Ub[ ]cglYfa Ug35c`dYbdf`gVfYU[i bg`Yi Ya d'cg`XY`5b[ ]c!  
 glYfa Ugj cWXYj Yhf`Ya VfUc`XUa Ub[i YfUzXc`Wt YfzcZ]Uj YnX]gVfc!  
 a f]Ug`YXYa Ug'd`Ub]hUg`Zi hZ]Ug`YcfbLà Yb]Ug`ei YYg]Là cg`Ya`Wb]hUc`  
 Ya`bcgg`W]h]Ubc`"GYUhfya cgi a Uubz`]gYa UgUWfUXUg`VfYc`ei YYg]Ug`  
 d`Ub]hUg`hà`Ya`Wa`i a`]fYa`cgbcg`X]dUf`Wà`UWbX],`~`YggYbWU`dUfU`  
 i a`fYdfYgYb]h]XY5b[ ]cglYfa Ug`UdfYgYb, UXYUcf`"HcXcgcg`Yi Ya d'cg`  
 W]UXc`g`dfcXi`nYa`UcfYg`Dcf`YgY`a`chj`c`Ug`5b[ ]cglYfa Ug`dcXà`gYf`  
 hLà`Vfa`WUà`UX]g`XY: UbYfU]Là`Ug`Ya`Ui`g-c`UdfYgYb, UXYg]UYgfi`hi`fU`  
 dYW`]Uf`Zcfa`UXUfj`fgXUYgdYWU]nU`~`XYfLà`cgU]hLà`YbhYa`cX]U]M]Xc`g`  
 dcf]h]bXc`Ud.`bX]Wg`f]h]f]U]b]c]z]U]b]Xc]W]`Y[ ]b]Y]M`E`C`g`f[ ]a`Yb]c`XU]Ucf`Y`  
 Yg]d]WU]nU`~`X]g`dU]h]g`Ucf`Ug`W`a`]bci`Ya`i a`Ugff]YXYa`YW]g]a`cg`XY`  
 dc`]b]nU`~`"5`g]g]a`hLà`Vfa`z`fYU]W]c]b]U]b]Xc]!`gY`Wà`U`Yg]d]WU]nU`~`Ucf`Uz`  
 cg`Yg]hLà`Yg`Y[ ]Là`Y]Ug`Zà`]b]bcg`Y`a`UgW]bcg`Yj`c`i`fLà`dUfU[ ]fU]b]h]f`c`  
 g`Wgg`XUdc`]b]nU`~`Yc`fzd]Xc`X]g]b]j`c]j`]a`Yb]c`Xc`Ya`Vf]-c/dYfa`]h]b]Xc`  
 o surgimento de angiospermas com curto ciclo de vida, como as ervas  
 V]!`Ubi`Ug`5`g]g]a`Wà`c`UX`d`UZ]M]b]XU`~`YU]W]bg]Yé`Yb]h]Zcfa`U`~`Xc`  
 Yb]Xc]glYfa`Uzei`Yg]f]j`YWà`c`Zc]b]h]d]f]a`z]f]U]X]Y]bi`h]f]Y]b]h]g]d]U]f]Uc`Ya`Vf]-c`"  
 Essas novidades evolutivas estreadas pelas angiospermas simbolizam uma  
 gff]YXYU]U]d]hU`"Ygei`Ydch]b]WU]nU]mci`c`g`Wgg`Xc`[`fi`dc`Yj`]X]b]h]bcg]X]Ug`  
 atuais por sua riqueza e diversidade.



RESUMO

5g5b[ ]cglYfa Ug`Zcfa`Là`i a`[`fi`dc`a`cbcU`f]h]W`X]j`Yfgc`ei`U]b]c`{`  
 a`cfZc`c[ ]U]Y]a`dcf]h]b]W]U]Y]W]U]E]M]W]U]fa`XYdcgg`]fYa`[`f]U]b]XY]a`dcf]h]b]W]U`  
 YWb`a`]W]7ca`a`Ug`XY`&`+"SS`Yg]d]W]g]Z]g]a`c`X]g]f]M]`X]Ug`dcf`dfU]W]M`  
 a`Yb]h]h]c`Xcgcg`YWgg]g]h]a`Ug`YWà`d`"Ya`Ua`Ucf`dU]h]Y`X]Ug`d`Ub]h]Ug]`YfXYg`  
 h]f]Yg]f]Yg`Yg]d]Yfa`U]d]U]h]g`H]U`Wà`c`ei`Uei`Yf`ci`h]c`[`fi`dc`a`cbcU`f]h]W]Z]Ug`  
 5b[ ]cglYfa`U]f]hLà`Vfa`Wb`Y]M]X]Ug`Wà`c`A`U]bc`]cd`n]h]Uci`5`b]h]cd`n]h]L`  
 d]cgg`Ya`i a`Ugff]YXY`U]d]ca`cfU]Ug`ei`YUg`X]U]b]Ya`Y`X]g]h]b]i`Ya`X]Y`ci`h]fcg`  
 [`fi`dc]g]`Y`]Y]Ug`G`c`YUg`%`L`UdfYgYb, UXYUcfYg`&`Ecg`Yg]hLà`Yg`Wà`X`Ug`  
 h]W]g`U]h]f]Ug`W]U]i`a`UWà`Xc]g]a`]M]c]g]d]c]f]b[ ]c]g`E`c`[`Là`Y]U]E]h`a`U]g]M`  
 `]bc`f]Y]X`n]Xc`h]f]b]i`W]U]Xc`/(`EUZcfa`U`~`XYW]d]Ycg`Y`Zi`h]c`/) `Ecg`E]i`c`g`  
 Wà`Xc]g]h]i`a`Yb]c]g`\*`E`c`[`Là`Y]U]E]h`Zà`]b]bc`f]Y]X`n]Xc`,`!`bi`W]U]Xc`/+`E`  
 UZcfa`U`~`XY`Yb]Xc]glYfa`UY,`Ecg`Y`Ya`Yb]c]g`XY`h`Vc`W]j`U]Xc`"5`[`i a`Ug`  
 X]g]g]U]d]ca`cfU]Ug`Y`c`i`h]j`Là`Yb]h]g]b]i`U]f]Y`g]a`cX]U]M]U]Là`!`gY`Ya`"]b]U`Y`bg`  
 dU]h]W]U]f]Yg`Xc`[`fi`dc`"G`Ucf][`Ya`fYa`ch]U]Xc`7`f]Y]z`W]c`]b]Z]f]c]f]z`%`\$`a`]"`Yg`  
 XYUbcg`U]f]z`"5`[`i a`Ug`d]Yf[i`bh]Ug`Wà`c`ei`U`c`d]f]c]z]j`Y`[`fi`dc`U]b]W]g]f]U`  
 3]a`ei`Y`f]dc`W]Y`c`W`h]f]g]Y`]Là`c]f][ ]b]U]Xc`Ug`d]f]a`Y]f]Ug`5b[ ]cglYfa`Ug3

E i U`hYf]UgXc U`Cf`d`Ygca CEUWBYg+c`gYbXc fygdcbX]X]gYbYgYgYbXc`  
 Xi UghYcf]UgWbU]hYhg-g-c-j Y]W/U]Xg`%Hycf]UXc`dgi`X]bhc`I`K`Yh]Y]b`  
 fl%\$+E"8 YUWfXc`Wa`YgUHycf]UgU`CfYg`dYei`YbUgi`blggY`i`UgYUBYa`CE  
 U`Ug`Xf]j`UXg`XY`Ygfi`h`fUg`fydfcXi`hj`Ug`i`blggY`i`Ug`[`ja`bcgdYfa`]Wg`  
 h]j`Yn]ga`]UfYg`Ug`;`bYU`Yg`gY]La`Ug`U`CfYg`a`Ug`df]a`]h]j`Ug`9`g]Ug`U`CfYg`  
 hf]La`g`Y'cf][`]bUXc`dcf`fYXi`~c`XYi`a`UYgfi`h`fUYg`fcV]Uf`a`i`h]U`]U`&`  
 Hycf]U5`blcgfcV]Uf`I`5`fVf`/`DU`\_`b`fl%\$+E"9`g]UHycf]UdfY`..UXYf]j`U`  
 ,`~c`X]g`5b[ ]cgdYfa`Ug`Udf]hf`XYi`a`Ygfi`CE]c`i`b]U`]U`8`YUWfXc`Wa`U`  
 hycf]U`U`b`h`g`f`c`V]Uf`Z`Ug`U`CfYg`df]a`]h]j`Ug`dcgg`Ya`bi`a`Yfcg`Ug`dUfhYg`]j`fYg`  
 bc`dYf]U`bhc`/U`bXc`W`Y`[ ]bY`W`zhc`Xcg`YYg`X]g`f]M`Xcg`Yg`f]U`U`La`YbY`  
 g`VYi`a`f`W`d`z`W`c`U`cb[ ]Xc`/dYf]U`bhc`j`]g`c`g`Y`dc`]b]nU`~c`Yb]ra`CE`U`  
 5`g`d`U`b`h`g`j`j`Y`b`h`g`X`U`c`f`X`Y`a`A`U`bc`]U`Y`g`W`f`f`Y`g`d`c`b`X`Y`a`U`Y`g`Y`d`f`c`h`  
 XY`U`c`f`d`f]a`]h]j`U`8`Y`b`f`Y`c`g`[ ]fi`dcg`XY`;`ja`bcgdYfa`Ug`Yg`i`X]Xc`Wa`c`dcg`  
 g]Y`U`b`W`g`f]U`X]g`5b[ ]cgdYfa`Ug`U`Y`b`U`g`;`bYU`Yg`dYfa`U`b`W`W`a`c`c`a`Ug`  
 dfcj`zj`Y`"5`dYg`f`XYU[ ]i`a`Ug`W`h`W`g`U`Y`g`Y`f`Y`g`M]h`U[ ]f`U`b`XY`a`U`cf]U`X]g`  
 U`b`z`]g`Y`U`c[ ]Y`b`f]W`g`b`U`•`h]a`U`X`W`U`h]a`c`V`h`Xc`z`f`j`c`f`Y`g`c`b`X`Y`c`[ ]fi`dc`!  
 ]fa`~c`X]g`A`U`bc`]cd`n]U`f`;`bYU`Yg`<sup>ooooo</sup>

ATIVIDADES



- %": UUi a U`]g]U`Wa`%\$`bca`Yg`X]g`5b[ ]cgdYfa`Ug`ei`Y`j`c`W`W`b`W`  
 J`Yf]U`ei`Y`U`f]j`f`g`X]U`]b`h`f`b`Y`h`U`U`c`f`X`Y`g`g`]b`X]j`X`i`cg`d`f`U`W`b`U`fa`U`f`g`Y`Y`g`  
 realmente pertencem ao grupo das Angiospermas.  
 &"9`g`M`Y`U`a`•`g`W`A`U`h`b`U`X`Y`;`Y`f`U`X`c`5`n`j`Y`X`c`"7`ca`d`Y`h`U`Y`h`U`X`La`•`g`W`  
 g`Y`z`X]g`d`c`b]M]`n]U`U`b`U`d`U`h`z`c`fa`U`a`cc`X`Y`W`a`c`b`ca`Y`X]g`U`C`f`Y`g`W`U`U`g`  
 dYc`W`b`h`c`"9`a`g`[ ]i`]X`U`Z`U`i`a`U`d`Y`g`e`i`]g`U`b`U`]b`h`f`b`Y`h`g`V`Y`U`Z`La`[ ]U`  
 V`ch`b]W`{`ei`U`d`Y`h`b`W`Y`g`g`U`g`d`U`b`h`g`W`U`U`g`Y`e`i`U`c`b`ca`Y`W`b`h`U`W`X`Y`U`g`  
 3. Cite as novidades evolutivas apresentadas pelas Angiospermas.  
 ("E`i`U`g`U`g`X]`U`g`h`c`f]U`g`g`V`Y`U`U`C`f`d`Y`g`ca`CEUW`B`  
 5. Cite os grupos que foram considerados ancestrais das Angiospermas e  
 cgdf]b]U`U`g`U`f[ ]i`a`Y`b`h`c`g`e`i`Y`f`Y`Z`h`f`U`a`Y`g`U`]d`C`h`Y`  
 \*""7]h`c`[ ]fi`dc`ei`Y`f`W`b`g`X]f`U`X`c`W`a`c`c`a`U`g`d`f`c`j`z`j`Y`U`b`W`g`f]U`X]g`5b[ ]  
 [ ]c`g`d`Y`fa`U`g`W`a`W`a`c`U`g`W`U`W`f`g]W`g`e`i`Y`c`g`X`c`g`[ ]fi`dc`g`W`a`d`U`f]`U`a`"



DF ê L=A 5 '5I @5

B UdfE]a UU `U]fYa çg Ygi Xlf UUh`]W~c` WffYU Xcg bca Yg XY  
d`Uhhg` 5dfYbXfYa çg U|i a Uç fY] flç YfWwa YbXU" Yç gY]i ]Xç dYçg  
Ygi X]çggYa `6çh b]WJG]ghYa z]WJY'9Wt'b' a ]WJ

F9: 9F â B 7=5G

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