Note

ROOTING PERFORMANCE FROM LEAF PETIOLES OF ACCESSIONS AND HYBRIDS OF WILD *ARACHIS* SPECIES

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ABSTRACT: The genus *Arachis* has 69 species, the majority native to Brazil. *Arachis* spp. seedling root tips have been used to obtain dividing cells for cytological preparations. Several wild species produce small amounts of seeds and consequently few root meristems, making the cytogenetic characterization very difficult. The purpose of this study was to evaluate the rooting capacity of several wild species of *Arachis* using the detached leaves technique for obtaining roots from petioles. One hundred and thirty accessions and 27 interspecific hybrids were studied. Three evaluations were performed at 15, 31, and 49 days after planting. Leaf rooting observed in the wild species confirmed the great genetic variability typical of the *Arachis* genus, indicating that the number of days interferes with the rooting percentage. The *Arachis* Section presented the highest rate of rooting leaves. The *Caulorrhizae* Section showed the same pattern observed in the *Erectoides* Section. Accessions from *Heteranthae, Trierectoides*, *Extranervosae,* and *Rhizomatosae* Sections did not differ among each other. Differences were not observed in *Erectoides* Section when compared to *Rhizomatosae* and *Extranervosae* Sections. The number and morphology of roots obtained through this technique were promising to be used on cytological preparations.
Key words: cytology, germplasm

ENRAIZAMENTO DE PECÍOLOS DE FOLHAS DE ESPÉCIES SILVESTRES E HÍBRIDOS DE *ARACHIS*

RESUMO: O gênero *Arachis* possui 69 espécies, sendo a maioria nativa do Brasil. Ápices radiculares de plântulas têm sido usados para a obtenção de células em divisão. Diversas espécies silvestres produzem pouca quantidade de sementes, o que dificulta a obtenção de meristemas para preparações citológicas. O objetivo deste trabalho foi avaliar a capacidade de enraizamento de diversas espécies silvestres de *Arachis,* usando a técnica de folhas destacadas para a obtenção de raízes a partir de pecíolos. Foram avaliados 130 acessos e 27 híbridos interespecíficos aos 15, 31 e 49 dias após o plantio. A formação de raízes a partir de folhas observada em espécies silvestres confirmou a ampla variabilidade genética típica do gênero *Arachis*, indicando que o número de dias também interfere na porcentagem de enraizamento. A Secção *Arachis* apresentou a maior taxa de enraizamento de folhas e a Secção *Caulorrhizae* apresentou o mesmo padrão da Secção *Erectoides*. Acessos pertencentes às Secções *Heteranthae*, *Trierectoides*, *Extranervosae* e *Rhizomatosae* não diferiram com relação à porcentagem de enraizamento. A Secção *Erectoides* apresentou comportamento similar ao das Secções *Rhizomatosae* e *Extranervosae*. A quantidade e morfologia de raízes obtidas por meio dessa técnica mostraram-se promissoras para uso em preparações citológicas.
Palavras-chave: citologia, germoplasma

INTRODUCTION

Although plant researchers know the importance of plant genetic resources, the limited use of germplasm banks accessions is a reality around the world. Two alternatives have been emphasized for increasing the use of available accessions: pre-breeding programs and organization of core collections (Frankel & Brown, 1984; Brown, 1989; Vilela-Morales et al., 1997; Nass, 2001).

The genus *Arachis* has 69 species (Krapovickas & Gregory, 1994), the majority of them of Brazilian occurrence. Several wild species of the genus show interesting characteristics for groundnut genetic improvement (*Arachis hypogaea* L.), to be used as forage, ornamental, as well as for erosion control. Several of them are more pest resistant than the cultivated groundnut (Stalker & Moss, 1987; Fávero et al., 2001).

Chromosome number and morphological observations are important for species characterization and germplasm bank organization. Root tips of seedlings have been used for obtaining division cells to allow investigation based on mitotic characterization of *Arachis* species (Stalker,1991; Lavia, 1998). Several wild species produce small amounts of seeds in their natural habitat or even in germplasm banks, making the work on cytogenetic characterization very difficult. Usually, root tips are obtained from cuttings. However, this technique sometimes demands a long time to produce results. To overcome this difficulty, petioles rooting and callus productions through *in vitro* culture have been used (Nakano et al., 1999; Shibli et al., 2001). The detached leaves technique has been used in phytopathological characterization of accessions (Subrahmanyam & Moss, 1983), and in molecular studies of root development (Brown & Mangat, 1970). A petiole-rooting technique to obtain root tips was described by Blomgren et al. (1988) in soybean, which also shows chromosomes in mitosis from root tips developed in detached petioles. This technique can also be used in cases of seed unavailability and/or unfeasibility of the cutting alternative.

Fávero et al. (2004) showed that for some interspecific hybrids of Section *Arachis*, the detached leaf technique presented in this work may be used to produce root in sufficient amount and quality to be used in cytological preparations.

Our objective was to evaluate the rooting capacity of several wild species of *Arachis* using a detached leaf technique to obtain roots from petioles.

MATERIAL AND METHODS

One hundred and thirty accessions and 27 interspecific hybrids belonging to the *Arachis* Germplasm Bank of Embrapa Genetic Resources and Biotechnology - Cenargen (Brasília, Brazil) were used.

From each accession, four new totally expanded leaves were collected, placed in plastic bags and stored in a refrigerator. Petioles were treated with 0.4% naphthalene acetic acid rooting hormone (NAA) powder and leaves were immediately placed in cells of polystyrene trays containing vegetable substratum (Plantmax®). The trays were covered with transparent plastic bags for humidity maintenance and transferred to the greenhouse in shadow conditions, with an average temperature of 24ºC. The substrate was watered every two days. Accessions were evaluated in a completely randomized block design with four replications. The evaluations were performed at 15, 31, and 49 days after planting. In each evaluation, accessions were classified as rooted, non-rooted and dead leaves. The statistical analysis was made using PROCREG of the Statistical Analysis System (SAS). The chi-square and t tests were used to verify the rooting differences among Sections as well as to identify which Sections were different from each other. The Nemenyi test of non parametric multiple comparison was used to verify differences among the earliest and the latest rooting accessions.

RESULTS AND DISCUSSION

The leaf petioles rooting observed in wild *Arachis* species (Figure 1) confirms the great variability displayed by the genus. Great differences ($P < 0.01$) among genotypes were observed.

Species of all Sections were evaluated, except *Trisseminatae* Section. During the first evaluation (15 days) 26 accessions (16.25%) rooted in at least one replication. During the second (31 days) and on the third (49 days) evaluations, root development was observed in 103 (64.40%) and in 126 (78.75%) accessions, respectively.

Root induction frequencies for each accession are presented in Table 1. The Nemenyi test (a non parametric test of multiple comparisons, type Tukey) was done and it was verified that there was no cluster, unless for those that had the same results. Consequently, all accessions that had different rooting were also different for the Nemenyi test. Accessions V 9923 (*A. sp.*) and Wi 1302-2 (*A. cruziana*) rooted within 15 days in four and three replications, respectively, being considered the earliest accessions among the evaluated materials. Accession V 13774 (*A. aff. diogoi*) leaves died in all replications, indicating that this methodology may not be appropriate. After the third evaluation, leaves of 34 accessions (21.25%) did not root or died. Such accessions will be revaluated using another methodology.

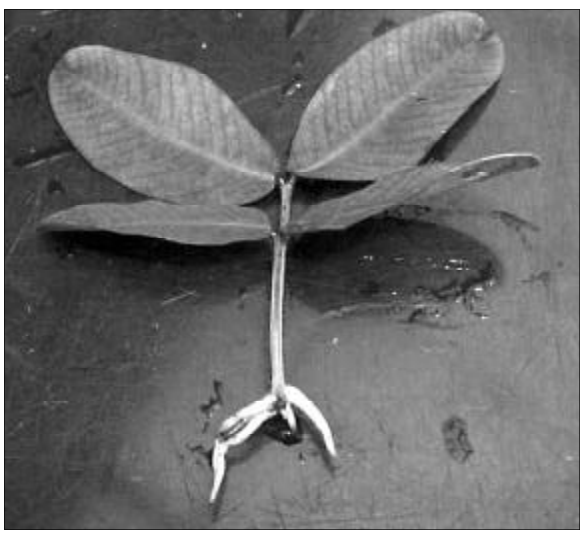

Figure 1 - Rooted leaves of *A. pintoi* accession V 13330.

Table 1 - Root induction in wild *Arachis* species leaves. Accessions code, species, sections and percentage of rooted leaves at 15, 31, and 49 days after planting.

Accessions[δ]	BRA*	Species	Section	Rooted leaves (%) 15	31	49
				days		
VSW 9923	022926	*A. aff. hoehnei*	*Arachis*	100	100	100
WiSVg 1302-2	036919	*A. cruziana*	*Arachis*	75	100	100
K 9484 x GKP 10017	039489	*A. batizocoi x A. cardenasii*	*Arachis*	50	100	100
KG 30006 X VSPmSv 13710	039624	*A. hoehnei x A. aff. simpsonii*	*Arachis*	50	100	100
VOfSv 14682	038555	*A. praecox*	*Arachis*	50	100	100
VSW 9955	022811	*A. decora*	*Arachis*	50	100	100
VSPmSv 13736	033766	*A. kuhlmannii*	*Arachis*	25	100	100
VOfSv 14703	038628	*A. kuhlmannii*	*Arachis*	25	100	100
WMv 648	034151	*A. decora*	*Arachis*	25	100	100
VPzVaW 13211	030635	*A. pintoi*	*Caulorrhizae*	25	100	100
W 34	015253	*A. pintoi*	*Caulorrhizae*	25	100	100
VSGr 6330	012521	*A. diogoi*	*Arachis*	0	100	100
K 9484 x V 13250	039497	*A. batizocoi x A. kempff-mercadoi*	*Arachis*	0	100	100
KG 30006 x VSGr 6325	039608	*A. hoehnei x A. helodes*	*Arachis*	0	100	100
KGPScS 30076 x VGoMrOv 12812	039543	*A. ipaënsis x A. villosa*	*Arachis*	0	100	100
Mdi 1538	037397	*A. hypogaea*	*Arachis*	0	100	100
V 12549	030716	*A. hypogaea*	*Arachis*	0	100	100
V 13250	030643	*A. kempff-mercadoi*	*Arachis*	0	100	100
Of 121	039462	*A. hypogaea*	*Arachis*	0	100	100
VSGr 6389 x VGaRoSv 12488	039594	*A. aff. magna x A. stenosperma*	*Arachis*	0	100	100
SvPzHn 3809	035904	*A. paraguariensis*	*Erectoides*	0	100	100
VRcSv 14636	037940	*A. tuberosa*	*Trierectoides*	0	100	100
K 9484 X VNvEv14167	039527	*A. batizocoi x A. duranensis*	*Arachis*	50	75	100
VOfSv 14724	033839	*A. magna*	*Arachis*	25	75	100
VMl 13414	015598	*A. pintoi*	*Caulorrhizae*	0	75	100
VSPmSv 13751 x GKP 10017	039586	*A. magna x A. cardenasii*	*Arachis*	25	50	100
VSGr 6389 x VGoMrOv 12812	039616	*A.aff. magna x A.villosa*	*Arachis*	0	50	100
VGaRoSv 12548	030708	*A. hypogaea*	*Arachis*	0	50	100
VSPmSv 13751 x Lm 3	039551	*A magna x A. stenosperma*	*Arachis*	0	50	100
VSPmSv 13779	033871	*A. kuhlmannii*	*Arachis*	0	50	100
VRcSgSv 13570 x VRcSgSv 13589	039004	*A. lignosa x A.* sp.	*Procumbentes*	0	50	100
Of 99	039454	*A. villosulicarpa*	*Extranervosae*	0	25	100
VRGeSv 7677 x VRcSgSv 13589	039021	*A. paraguariensis x A.* sp.	*Erectoides*	0	25	100
VSW 9917	022818	*A. kretschmeri*	*Procumbentes*	0	25	100
VMiSv 10229	023001	*A. stenosperma*	*Arachis*	0	0	100
VSGr 6389 x VNvEv 14167	039519	*A. aff. magna x A. duranensis*	*Arachis*	25	50	75
VSgSv 13383	031607	*A. dardani*	*Heteranthae*	25	50	75
Cv. Tatu	011606	*A. hypogaea*	*Arachis*	25	25	75
VPmSv 13023	030058	*A. palustris*	*Arachis*	25	75	75
VOfSv 14715	012645	*A. kuhlmannii*	*Arachis*	25	75	75
VPz 13330	030333	*A. pintoi*	*Caulorrhizae*	25	75	75
GKP 10017	013404	*A. cardenasii*	*Arachis*	0	75	75
KG 30006 x GKP 10017	039641	*A. hoehnei x A. cardenasii*	*Arachis*	0	75	75
Pa s/no	036900	*A. helodes*	*Arachis*	0	75	75
VOfSv 14691	038571	*A. kuhlmannii*	*Arachis*	0	75	75
VOfSv 14714	038661	*A. kuhlmannii*	*Arachis*	0	75	75
Vp 5000	039144	*A. diogoi*	*Arachis*	0	75	75
WAe 903	035122	*A. pintoi*	*Caulorrhizae*	0	75	75
V 13643	033375	*A. pintoi*	*Caulorrhizae*	0	75	75
Of 109	037664	*A. hypogaea*	*Arachis*	0	50	75
VSPmSv 13710	033685	*A. aff. simpsonii*	*Arachis*	0	50	75
VSGr 6389 x VPoBi 9401	039560	*A.aff. magna x A.aff. diogoi*	*Arachis*	0	50	75
VSGr 6389 x VSPmSv 13721	039632	*A. aff. magna x A. kuhlmannii*	*Arachis*	0	50	75

Continue...

Table 1 - Continuation.

VSGr 6404	012653	*A. kuhlmannii*	*Arachis*	0	50	75
VOfSv 14692	038580	*A. kuhlmannii*	*Arachis*	0	50	75
GK 12787x Nc 1579	035068	*A. pintoi x A. repens*	*Caulorrhizae*	0	50	75
VSWSa 6791-wf	031097	*A. pintoi*	*Caulorrhizae*	0	50	75
WPn 215	032352	*A. repens*	*Caulorrhizae*	0	50	75
KGSSc 30097	036871	*A. magna*	*Arachis*	0	25	75
Of 116	039349	*A. hypogaea*	*Arachis*	0	25	75
Sv 4533	037567	*A. decora*	*Arachis*	0	25	75
K 9484 x VSGr 6325	039501	*A. batizocoi x A. helodes*	*Arachis*	0	0	75
Of 106	037630	*A. hypogaea*	*Arachis*	0	0	75
Of 126	039471	*A. hypogaea*	*Arachis*	0	0	75
V 5868	012114	*A. repens*	*Caulorrhizae*	0	0	75
K 9484	013315	*A. batizocoi*	*Arachis*	25	50	50
Mdi 1560	037401	*A. hypogaea*	*Arachis*	25	50	50
VPoJSv 10470	024937	*A. helodes*	*Arachis*	0	50	50
VOfSv 14710	038644	*A. aff. simpsonii*	*Arachis*	0	50	50
VSPmSv 13745	033782	*A. aff. simpsonii*	*Arachis*	0	50	50
VMPzW 14042	034843	*A. microsperma*	*Arachis*	0	50	50
VNvEv 14167	036200	*A. duranensis*	*Arachis*	0	50	50
VPzVaW 13167x Nc 1578	035076	*A. pintoi x A. repens*	*Caulorrhizae*	0	50	50
VPzAg 13338 x GK 12787	035025	*A. pintoi x A. pintoi*	*Caulorrhizae*	0	50	50
V 5786	012106	*A. repens*	*Caulorrhizae*	0	50	50
VRGeSv 7632	017477	*A. major*	*Erectoides*	0	50	50
VRGeSv 7614	017396	*A. archeri*	*Erectoides*	0	50	50
VVeSv 6001	012220	*A. sylvestris*	*Heteranthae*	0	50	50
GKP 10002 x VRcSgSv 13589	038881	*A. appressipila x A.* sp.	*Procumbentes*	0	50	50
KGPScS 30076 x VNvEv 14167	039535	*A. ipaënsis x A. duranensis*	*Arachis*	0	25	50
VSPmSv 13775	034002	*A. aff. diogoi*	*Arachis*	0	25	50
VSPmSv 13728	033740	*A. simpsonii*	*Arachis*	0	25	50
VLmMlApW 13468 x VPzVaW 13167	035017	*A. pintoi x A. pintoi*	*Caulorrhizae*	0	25	50
GK 12787	013251	*A. pintoi*	*Caulorrhizae*	0	25	50
Np s/ no.	037036	*A. pintoi*	*Caulorrhizae*	0	25	50
VApW 13888	034355	*A. pintoi*	*Caulorrhizae*	0	25	50
WAe 902	035114	*A. pintoi*	*Caulorrhizae*	0	25	50
SvPzHn 3781	035670	*A. aff. stenophylla*	*Erectoides*	0	25	50
VMPzW 14025	034797	*A. paraguariensis*	*Erectoides*	0	25	50
VKSSv 8910	020435	*A. aff. matiensis*	*Procumbentes*	0	25	50
VPoBi 9077 x VRcSgSv 13589	038997	*A. aff. appresipilla x A.* sp.	*Procumbentes*	0	25	50
VOfSv 14765	038806	*A. aff.magna*	*Arachis*	0	0	50
W 34b	031143	*A. pintoi*	*Caulorrhizae*	0	0	50
VMPzW 14024	034789	*A. paraguariensis*	*Erectoides*	0	0	50
VMPzW 14026	034801	*A. stenophylla*	*Erectoides*	0	0	50
SvW 3775	035530	*A.* sp.	*Procumbentes*	0	0	50
WiSVg 1291	036901	*A. aff. cruziana*	*Arachis*	25	25	25
VMPzW 13985	034606	*A. hoehnei*	*Arachis*	25	25	25
VRSv 10833	025437	*A. pusilla*	*Heteranthae*	25	25	25
V 10390	024848	*A. hermannii*	*Erectoides*	0	25	25
GK 10602	013391	*A. diogoi*	*Arachis*	0	25	25
KGPScS 30076	036234	*A. ipaënsis*	*Arachis*	0	25	25
VSPmSv 13751	033812	*A. magna*	*Arachis*	0	25	25
VSPmSv 13751 x VPoBi 9401	039578	*A. magna x A.aff. diogoi*	*Arachis*	0	25	25
VOfSv 14705	032875	*A. kuhlmannii*	*Arachis*	0	25	25
Nc 1577	029203	*A. repens*	*Caulorrhizae*	0	25	25
W 47 x W 34	037346	*A. pintoi x A. pintoi*	*Caulorrhizae*	0	25	25
VRGeSv 7677	017621	*A. paraguariensis*	*Erectoides*	0	25	25
VRSv 10969	025623	*A.* sp.	*Heteranthae*	0	25	25
VRcSgSv 13570	032808	*A. lignosa*	*Procumbentes*	0	25	25
VRcSgSv 13589	032875	*A.* sp..	*Procumbentes*	0	25	25

Continue...

Table 1 - Continuation.

Cv Tatuí	001147	*A. hypogaea*	*Arachis*	0	0	25
VCe 14773	039152	*A. stenosperma*	*Arachis*	0	0	25
VSGr 6325	012505	*A. helodes*	*Arachis*	0	0	25
VPzVaW 13167 x VSWSa 6791-wf	035041	*A. pintoi x A. pintoi*	*Caulorrhizae*	0	0	25
WPn 217	032379	*A. repens*	*Caulorrhizae*	0	0	25
VMPzW 14045	034860	*A. paraguariensis*	*Erectoides*	0	0	25
V 14625	037907	*A. paraguariensis*	*Erectoides*	0	0	25
VMSv 7303	016039	*A.* sp.	*Erectoides*	0	0	25
VRGeSv 7560	017167	*A. hermannii*	*Erectoides*	0	0	25
BwJbEgVb 4167	036935	*A. prostrata*	*Extranervosae*	0	0	25
GKP 10002	013099	*A. appressipila*	*Procumbentes*	0	0	25
VRcSgSv 13605	032930	*A. glabrata*	*Rhizomatosae*	0	0	25
VSPmSv 13774	033863	*A. aff. diogoi*	*Arachis*	0	0	0
KG 30034	039055	*A. kuhlmannii*	*Arachis*	0	0	0
EkZb 1	031879	*A. kuhlmannii*	*Arachis*	0	0	0
VLmMlApW 13477	032018	*A. decora*	*Arachis*	0	0	0
VOa 14165	036188	*A. monticola*	*Arachis*	0	0	0
VMiIrLbGv 14316	037010	*A. villosa*	*Arachis*	0	0	0
VMb 14673	038121	*A. helodes*	*Arachis*	0	0	0
VOfSv 14743	038733	*A. aff. magna*	*Arachis*	0	0	0
VPoBi 9401	022608	*A. aff. diogoi*	*Arachis*	0	0	0
VK 12083	029157	*A. helodes*	*Arachis*	0	0	0
VSW 6740	014982	*A. pintoi*	*Caulorrhizae*	0	0	0
WDbVaBz 153	031909	*A. pintoi*	*Caulorrhizae*	0	0	0
WPn 220	032409	*A. pintoi*	*Caulorrhizae*	0	0	0
SvPzHn 3807	035882	*A. paraguariensis*	*Erectoides*	0	0	0
VPoPeJAr 8530	018988	*A. major*	*Erectoides*	0	0	0
VPzRcSgSv 13494	032531	*A. archeri*	*Erectoides*	0	0	0
VRcSgSv 13556	032794	*A. paraguariensis*	*Erectoides*	0	0	0
VMPzW 13997	032689	*A. major*	*Erectoides*	0	0	0
VMPzW 14016	034738	*A. paraguariensis*	*Erectoides*	0	0	0
VMPzW 14021	034771	*A. stenophylla*	*Erectoides*	0	0	0
VRcMmSv 14518	037770	*A. oteroi*	*Erectoides*	0	0	0
VRcMmSv 14538	037796	*A. major*	*Erectoides*	0	0	0
V 14664	038075	*A. brevipetiolata*	*Erectoides*	0	0	0
VOfSv 14683	038563	*A. lutescens*	*Extranervosae*	0	0	0
VSW 6676	014796	*A. pusilla*	*Heteranthae*	0	0	0
SvPzHn 3818	035971	*A.* sp.	*Procumbentes*	0	0	0
VRcMmSv 14555	037818	*A. cf. kretschmeri*	*Procumbentes*	0	0	0
VPoBi 9060	022721	*A. appresipilla*	*Procumbentes*	0	0	0
SvPzHn 3782	035688	*A.* sp.	*Rhizomatosae*	0	0	0
VApW 13940	034380	*A. tuberosa*	*Trierectoides*	0	0	0
VRcSv 14632	037923	*A. tuberosa*	*Trierectoides*	0	0	0
Ag 2	031895	*A. pintoi*	*Caulorrhizae*	0	0	0
VMPzW 14044	034851	*A.* sp.	*Procumbentes*	0	0	0
VMPzW 14050	032875	*A.* sp.	*Procumbentes*	0	0	0

[δ]Collectors:

Ae= A.Amaral, Ag= P.Argel, Ap= A. P. S. Peñaloza, Ar= W. A. Archer, Bi= L. B. Bianchetti, Bw= B. Walter, Bz= M.R.Bertozo, Ce= C. Marino Db= M.Dib Bechara, Eg= [Inst. nº, EMGOPA], Ek= E.Kornelius, Ev= A. Echeverry, G= W. C. Gregory, Ga= M. L. Galgaro, Ge= M. A. N. Gerin, Go= K.E.Gomes, Gr= A. Gripp, Gv= F.R.Galvani, Hn= R. Heyn, Ir= B.E.Irgang, J= L. Jank, Jb= J.B.Pereira, K= A. Krapovickas, Lb= L.R.M.Baptista, Lm= L. Monçato, M= J. P. Moss, Mi= S.T.S.Miotto, Ml= M.A.P.Oliveira, Mm= M.D.Moraes, Ml= M.A.P.Oliveira, Mr= C.O.C.Moraes, Mv= M.Vinicius M. Martins, Nc= N.M.S.Costa, Np= N.B.Perez, Nv= L.Novara, Oa= O.Ahumada, Of= F. O. Freitas, Ov= J. C. Oliveira, P= J. R. Pietralli, Pa= P. Alvin, Pe= M. I. Penteado, Pm= R. N. Pittmann, Pn= P.Pinheiro, Po= A. Pott, Pz= E. Pizarro, R= V. R. Rao, Rc= R.C.Oliveira, Ro= D. M. S. Rocha, S = C. E. Simpson, Sa= H. T. Stalker, Sc= A. Schinini, Sg= A. K. Singh, Sv= G. P. Silva, V = J. F. M. Valls, Va= S. E. S. Valente, Vb= S.M.Verboonen, Ve= R. F. A.. Veiga, Vg= I.Vargas, Vp= V.Pott, W = W. L. Werneck, Wi= D. E. Williams, Zb= J.L.Zoby.

*Brazilian accession code

Table 2 - Number of accessions in each Section, percentage of rooted leaves at the end of the experiment (0-100%) and total of rooted leaf rates (%) at 15, 31 and 49 days after planting for different *Arachis* Sections.

Section	No.	0	25	50	75	100	Rooted leaves (%)		
							15	31	49
		%					days		
Arachis	79	10	10	11	22	26	9.3	47.8	63.9
Caulorrhizae	27	4	4	9	7	3	3.7	33.3	50.9
Erectoides	24	10	6	6	0	2	0.0	13.5	27.1
Extranervosae	3	1	1	0	0	1	0.0	8.3	41.7
Heteranthae	5	1	2	1	1	0	10.0	30.0	35.0
Procumbentes	14	5	3	4	0	2	0.0	16.7	33.9
Rhizomatosae	2	1	1	0	0	0	0.0	0.0	12.5
Trierectoides	3	2	0	0	0	1	0.0	33.3	33.3

Distinct performance among Sections were observed concerning rooting leaves (Table 2). The *Arachis* Section presented the highest precocity, showing the highest rate of rooting leaves among the Sections studied, concentrating the largest frequencies between 15 and 31 days. The *Erectoides*, *Extranervosae*, *Rhizomatosae* and *Procumbentes* Sections displayed the latest or non-rooting rates. The *Caulorrhizae, Heteranthae* and *Trierectoides* Sections displayed intermediate rooting rates, concentrated in 31 days. For most of the sections, petiole rooting initiated on the average at day 31. Most of the leaves did not root or died.

The chi-square test ($P < 0.0001$) indicated that petiole rooting is a genotype dependent process, suggesting that there is a genetic factor associated to this characteristic. Section *Arachis* displayed the largest rooting ratio, and it is different from the other Sections by the t test. Induction of roots in accessions from *Caulorrhizae* Section was not different from *Erectoides* Section. This result is due to their similar distributions, which differ basically in the number of accessions with 75% of rooting. Due to the low degrees of freedom associated to the other sections, these could not be efficiently discriminated. The *Heteranthae*, *Trierectoides*, *Extranervosae* and *Rhizomatosae* Sections did not differ from each other. Differences were not observed in the *Erectoides* Section when compared to the *Rhizomatosae* and *Extranervosae* Sections.

Rios et al. (1994) obtained detached leaf rooting from several species, using vermiculite as substratum, including 16 different legume genus, sunflower (*Helianthus annuus*), colza (*Brassica campestris*) and forage turnip (*Brassica napus*). Leaves of common bean (*Phaseolus vulgaris*), faba bean (*Vicia faba*) and cowpea (*Vigna unguiculata*) presented the best rooting performance among all species.

In conclusion, the use of detached leaves allows high efficiency for the production of roots in several species of the genus *Arachis*, with an average rooting rate of 78.75% in 49 days. The amount and morphology of the roots produced through this technique were promising and could be tested for cytological preparations, which demands a high amount of roots. Other aspects that may be mentioned are the short time required to obtain roots and the easy handling of them.

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