Época de recolecta en Palo Morado (*Peltogyne mexicana* M.), en Acapulco Gro., México

Time of Gathering in Palo Morado (Mexican Peltogyne M.) in Acapulco Gro., Mexico.

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Resumen

En seis arboles de *Peltogyne mexicana* M. se evaluó el efecto de las fechas sobre variables de germinación, Se utilizó un diseño de bloques al azar con parcelas divididas con cinco bloques (repeticiones), en las parcelas grandes se colocaron los árboles (cinco) y en las parcelas chicas las fechas de recolecta (seis). Cada parcela pequeña tuvo cinco bolsas, estas a su vez tuvieron cinco semillas, usándose 25 semillas de cada fecha de su respectivo árbol (parcela pequeña) en cada parcela grande (fecha de recolecta). Los mejores resultados para germinación fueron para la fecha uno con un valor de 72.48% y la fecha dos con valor de 61.12%, el valor mínimo fue de 24.48 para la fecha seis. Así las semillas que se recolectan de manera temprana tienen porcentajes de germinación mayor.

Palabras clave: Peltogyne mexicana, fechas de recolecta, germinación, fechas de recolecta.

Abstract

Six trees Mexican Peltogyne M. the effect of varying dates on germination was assessed a

randomized block design with split plot with five blocks (replicates), on large plots was used trees (five) were placed on the plots and dates girls collects (six). Each plot had five small bags, these in turn had five seeds, 25 seeds of each in use date of its respective shaft (small plot) in each large plot (collection date). The best results for germination were to date one with a value of 72.48% and date two with value 61.12%, the minimum value was 24.48 for six date. So the seeds are harvested early so have higher germination rates.

Key words: Mexican Peltogyne Dates collects, germination, harvesting dates.

Date Reception: January 2013 **Acceptance Date:** April 2013

Introduction

Mexican Peltogyne Martinez (purple suit) is a timber species and is part of the floristic diversity of the state of Guerrero, which places it as one of the most biologically diverse entities, along with Oaxaca, Chiapas and Veracruz (Conabio, 2013) . Currently tropical forests are of great importance in maintaining the diversity and global climate regulation including environmental services, however, the depletion of tropical forests has been caused by factors related to the change in land use causing fragmentation of ecosystems and their reduction to small isolated patches (Wright and Muller-Landau, 2006).

Obtaining knowledge for managing forest germplasm for restoration and reforestation is the beginning of the cycle to use resources sustainably, seeds or germplasm can be used for commercial, urban, agroforestry or catering purposes to solve problems economic, social and environmental, however, the lack of knowledge on seed production and technology in general for nursery production in many cases is zero (FAO, 2006).

The little knowledge we have of tropical species such as dates of collection growth behavior under conditions in nursery or field are some of the determining factors for the success of plantations for restoration factors. Based on the above right to know the date of this collection is the key to quality seeds and influencing the development and success of the foundation plants. Mexican P. M., this species is listed in the Official Mexican Standard

NOM 059 SEMARNAT 2010 in the category as endemic "A" (threatened) (Official Gazette 2010).

A determining factor in the future for conservation and restoration with purple bat will be sowing seeds with features that ensure their survival in the nursery and field. This is achieved by selecting the best seeds considering the collection date thereof (Montoya, 1996).

This species during the decades of the 50-60 was used by the beauty of its heartwood for the construction of ship hulls and residential buildings using its hardness and color. Just as this period coincided with the rise of tourism in Acapulco. (Martinez, 1960). So many of the residences occupied this beautiful wood to build tables, beams and doors.
This species is distributed in Acapulco in the Summit area of Llano Largo, Las Brisas, and part of the bay of Puerto Marquez, Gro; these areas with residential land use that threatens the continued existence of this species. (Mexican P. M), this representative and characteristic species of this area is currently in the Norma Oficial Mexicana 059 Secretariat of Environment and Natural Resources. (NOM 059 SEMARNAT 2010). Under the category "A" (threatened) not endemic. That is why generate basic knowledge for production and germination of seeds of this species will be useful for information, possible use, restoration and preservation of this species, because there is no or little information on nursery management and optimal collection dates (Lorenzen, 2009).

For the above, this research will provide insights into the management of seed germination and early growth, also will serve for future reforestation with purple bat. Given the scenarios that lurk permanence purple bat this research will provide knowledge for efficient collection of seed and seedling production for future restoration programs in this area and ensure the permanence of this species in order to ensure the establishment and survival of species in the field.

GENERAL PURPOSE

To determine the effect of seed collection date on physical variables and seed germination Mexican P. M.

SPECIFIC OBJECTIVES

Assess differences in physical characteristics (width, length, thickness and weight) of seeds collected at different harvesting dates.

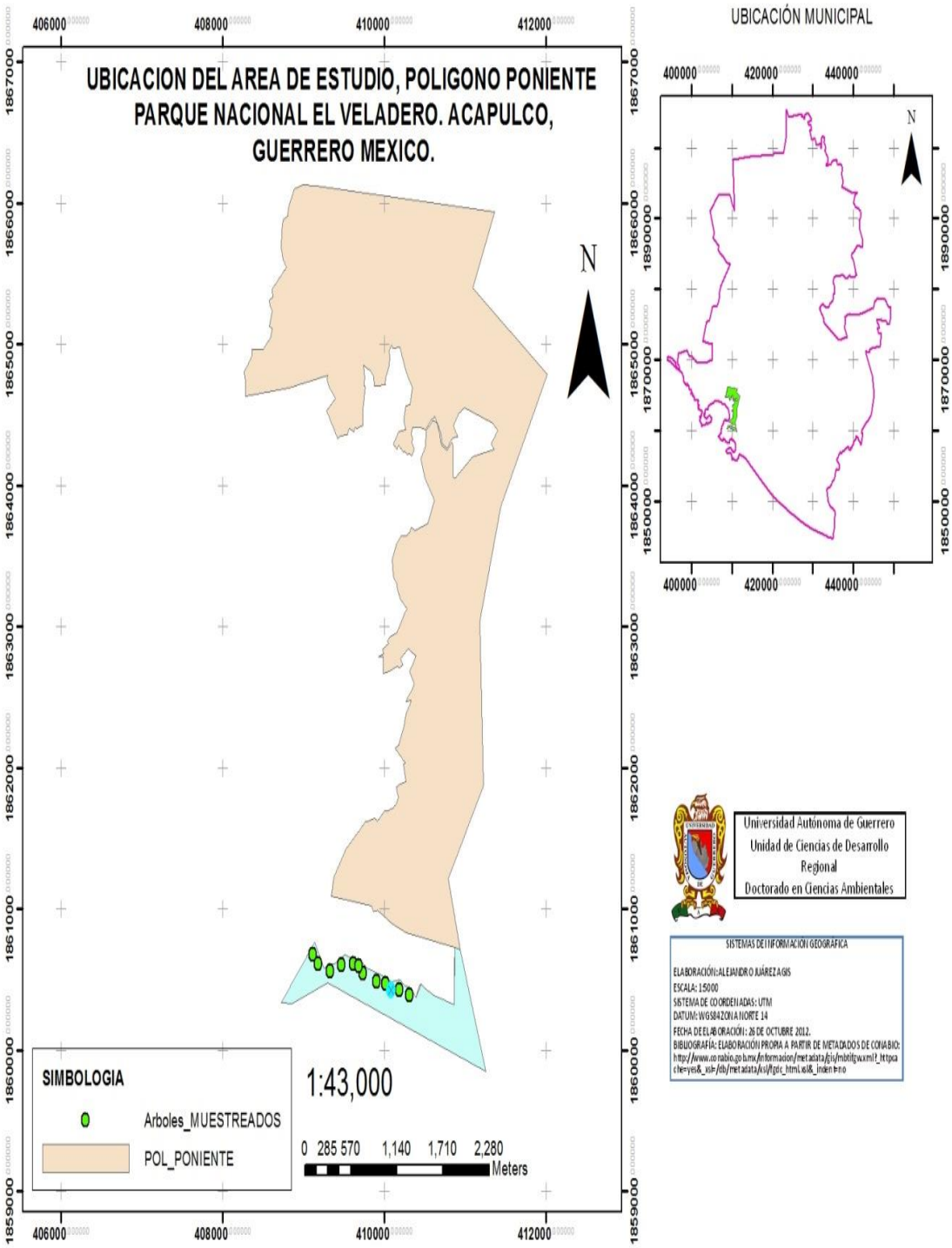
Identify the differences in effect when the collection dates in variables germination.

Check if there is a correlation between the dates of collection and variables and physical characteristics of seed germination.

Materials and methods

Location of the study area

This study was conducted in the area of Llano Largo Summit Acapulco, Gro, delimited by the geographic coordinates (UTM) to x:. 0,408,900 and: 1860770, west x: 0409029 and: 1860787, at x: 0409054 and: 1860655 northern x: 049 280 y: 1860666.



Location Woodland used in the study.

Samples

The sample consists of a population of 13 purple stick tree (P. mexicana). The trees were chosen prior tour in the area of study, 10 collections were made at different times, it is noteworthy that only five dates were used, taking into account that women were the quantities of seed needed for measurements and sowing analysis seed physical characteristics (weight, width, length and thickness) was performed by counting and measuring 50 seeds from each collection date.

Collects dates, number of seeds and trees sampled.

	Fechas de recolecta					
	5	6	7	8	9	10
	26/03/2011	02/04/2011	09/04/2011	16/04/2011	23/04/2011	30/04/2011
Árbol 1	1323	1183	933	422	280	146
Árbol 2	2440	1008	553	121	88	56
Árbol 3	386.	562	N/T	N/T	N/T	N/T
Árbol 12	1524.	2242	8844	344	127	68
Árbol 13	1221.	1080	1732	484	189	67

EXPERIMENTAL DESIGN

Block design with randomly divided plots with five blocks (replicates) in large plots was used trees (five) were placed on the plots and girls collecting dates (six). Each plot had five small bags, these in turn had five seeds, 25 seeds being used for each tree (small plot) in each large plot (collection date). Thus 750 seeds of each date and total 3,750 seeds for the entire experiment were used.

STATISTICAL ANALYSIS

Analysis of variance and Tukey comparison of means ($\alpha = 0.05$) was used using the PROC GLM procedure of SAS statistical software version 9.0 (SAS, 2002) to verify dates of the differences between measured variables. Also, with the correlation coefficient of Pearson ($\alpha = 0.05$) was used to calculate the correlations of the average values per collection date

(Juárez et al., 2006) for the length, width, thickness, seed weight and also germination variables with the variables of picking. This PROC CORR (SAS, 2002) was used.

The following statistical model (Juárez, 2006) was used to determine differences between variables and effect of tree germination and date of harvest:

Yij = M + Ai + Fi (j) + + Eij AFIJ

Where:

Yij = observation value set in the i-th tree of the jth collection date.

M = effect of the general average.

Ai = effect of the i-th tree

Fi (j) = Effect of collection date j_ésima nested in the i-th tree

AFIJ = effect of the interaction between the ith tree and jth collection date

Eij = Effect of experimental error corresponding to the error of the j-th date collected in the ith tree.

The analysis was performed with SAS package. With PROC MIXED procedures and one with GLM (Tukey) to compare means between dates deficiency was verified collects.

Analysis between dates:

Yij = M + Fi + Ai (j) + + Eij AFIJ

Where:

Yij = observation value set in the ith collection date of the j-th tree.

M = effect of the general average.

Fi = effect of the ith collection date

Ai (j) = Effect of j_ésimo tree nested in the ith collection date

FAij = effect of the interaction between the j-th date of collection and the i-th tree

Eijk = Effect of experimental error corresponding to the error of the k-th plant in the jth tree in the ith collection date

The collections were made during the period of seed production with two-month total of ten collections starting on 26 February to 30 March 2011. The trial was established on January 8, 2011 and counted every two days from planting to evaluate germination.

Results and discussion

The variables evaluated to date were collected length, width, thickness and seed weight showed significant differences ($\alpha = 0.05$), the variable weights which showed higher differences in date with a value of 0.6524 g to date one, manner contrary along the width and thickness variables showed few significant differences. Noting generally the earliest dates have heavier seeds that later dates, as well as with seeds longer occur in the first dates of collection.

Average values and standard errors for the physical characteristics of seed for the 5 dates collected.

Fechas	Largo (mm)	Ancho (mm)	Espesor (mm)	Peso (g)
1	1.9780 ±0.0057a	1.2466±0.0060a	0.3677±0.0030a	0.6524± 0.0048a
2	1.9568 ±0.0057 b	1.2376±0.0060b	0.3756±0.0025 b	0.6352±0.0048a
3	1.9776 ±0.0067a	1.2456±0.0051a	0.3772±0.0030 b	0.6411±0.0056a
4	1.9471 ±0.0067 b	1.2216±0.0051b	0.3732±0.0030 b	0.6351±0.0056a
5	1.9427 ±0.0067 b	1.2211±0.0060b	0.3722±0.0030 b	0.6281±0.0056 b
6	1.9322 ±0.0067 b	1.2196±0.0060b	0.3688±0.0025 b	0.6126±0.0056 c

† Values followed by different letter in the same column show significant difference (Tukey, $p \leq 0.05$).

For germination date with the highest percentage was the date one with a value of 72.48% and far two worth 61.12%, the minimum value was 24.48 for six date. So the seeds that are harvested early so have higher germination rates.

The date had higher mean daily germination was the relevant date number two with a maximum value of 4.07 days, with a minimum value of 1.71 days, date date, six.

Average values and standard errors for the variables of germination for the 5 dates collected.

Fechas	Capacidad germinativa (%)	Germinación media diaria (Días)
1	72.48±2.83 b	3.14±0.58a
2	61.12±2.83 b	4.07±0.58a
3	45.12±2.83a	1.71±0.58 b
4	44.16±2.83 b	2.03±0.58 b
5	25.76±2.83 d	1.71±0.58 b
6	24.48±2.83 d	2.03±0.58 b

† Values followed by different letter in the same column show significant difference (Tukey, $p \leq 0.05$).

Within the date effect significant correlations for the different variables are observed, a prominent correlation is occurring between seed weight and germination capacity, which describes the heavier seeds that germinate, so to relate dates these seeds are in dates 1 and 2, March 26 and April 2.

Other highlighting is between width and seed germination capacity, which can observe that the seeds are wider with better germination.

CORRELATION BETWEEN VARIABLES

Pearson correlation coefficients (r) calculated between variables for the characteristics of seeds and seedlings (n = 5).

	peso de semilla	ancho de semilla	**Largo de semilla**	espesor de semilla	Capacidad germinativa	germinación media diaria
peso de semilla	1.00000	0.81532¶	0.90814¶	0.12354	0.85259¶	0.35128
ancho de semilla		1.00000	0.96118§	0.22448	0.79869¶	0.44022
Largo de semilla			1.00000	0.24055	0.76715¶	0.26796
espesor de semilla				1.00000	-0.00029	-0.01617
Capacidad germinativa					1.00000	0.7526¶2
germinación media diaria						1.00000

¶ Significant $p \leq 0.05$

Regarding variable size germination, the seeds were collected in the first dates have higher percentages of germination; likewise the variables: germination, mean daily germination and germination speed also showed the highest results for first dates. This is consistent with those presented by Bridge (1995), where he made an experiment which investigates the collection date, with the moisture content and the first dates of collected proved the best in terms of germination, this being able to relate to the moisture content of the seeds, as well as the days pass the seeds they lose moisture and thereby viability with this observed that seeds with low moisture contents showed lower percentages of moisture.

Likewise Hernández (1995), analyzed the moisture Calophyllum brasiliense, Tabebuia guayacan, Terminalia amazonia and found that germination decreases as the humidity levels down the germination in seeds of these species. With this physiological maturity of

seeds purple stick is reached in the first collection dates expressed in better germination and as the seed remains longer in the tree loses moisture and viability.

Regarding the study of seeds, significant differences in the size and weight of the same for the above site, results that agree with those reported by Plancarte found (op. Cit.), Who found highly significant differences between families same site for seed weight.
This variation may be the result of isolation, population size and selection pressure, important in the genetic differentiation of populations (Wright, 1964) factors.

Interaction-date tree is a tendency to present the first dates higher germination percentages, indicating that the life of embryos affected by the permanence of the seed on the tree, so while the seeds remain longer in the tree are more exposed to environmental conditions of radiation and temperature, which affects the viability of the seeds.

Among the interaction tree-date complete germination capacity can be seen that in the same way that the seeds of the first dates are surviving longer and can be related to the permanence of the same in the shaft and also being able to assign a desired genetic traits into the parents.

Conclusion

The highest germination value corresponds to the date one with a value of 72.48% and 24.48% lower value at the date six respectively, always take seed collections for the species on first dates because they observed the best germination also on first dates highest values are observed in the variables of length (mm), width (mm), weight (g) of seed.

It is noted that trees have higher germination values in the earliest dates of harvesting, reducing germination as the seed production season progresses.

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