

Chapter 188

Viability of Sucupira-Branca (*Pterodon emarginatus* VOGEL.) seeds collected directly from the mother tree and on the soil

  <https://doi.org/10.56238/devopinterscie-188>

Sebastião Marcos Silva Valentim

Master in Genetics and Plant Improvement from the University of the State of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. Bolsista CAPES- Brasil. E-mail: sebastiao.valentim@unemat.br

Petterson Baptista da Luz

PhD in Agronomy (Production and Technology of Seeds) by the Universidade Estadual Paulista Júlio de Mesquita Filho. Via de acesso Prof. Paulo Donato Castellane s/n – Jaboticabal/SP – CEP: 14884-900. Professor da Universidade do Estado de Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. E-mail: petterson@unemat.br

Elaidy Laura Oliveira Cardoso

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. Bolsista PIBIC CNPq- Brasil. E-mail: elaidy.laura@unemat.br

Gabriel Moretto

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. Bolsista FAPEMAT- Brasil. E-mail: Gabriel.m@unemat.br

Antônio Carlos Silva Moreira

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. E-mail: antonio.moreira@unemat.br

Anna Júlia Cardoso Amaral

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. E-mail: anna.amaral@unemat.br

Bruna Samy de Oliveira Miranda

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT. E-mail: bruna.samy.miranda@unemat.br

Loryane Ribeiro Freire

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT.

E-mail: loryane.freire@unemat.br

Karina Leite de Oliveira

Graduating in Agronomic Engineering from the State University of Mato Grosso. Av. Santos Dumont, s/n, CEP: 78200-00, Cáceres-MT.

E-mail: Karina.leite@unemat.br

ABSTRACT

The species *Pterodon emarginatus* Vogel., popularly known as Sucupira-Branca, is a tree belonging to the Fabaceae family and is widely distributed in the Cerrado Biome. Its fruits are widely used in the fight against rheumatism, and diabetes and are mainly used in the treatment of inflammations, its wood is resistant and can be used in constructions, in addition, the species has the potential for reforestation actions. The objective of this work was to evaluate the viability of Sucupira-Branca seeds collected directly from the mother tree and on the ground, in a transition region between the Cerrado Biome and the Amazon Forest in Cáceres-MT. To carry out the study, 1,200 Sucupira-Branca fruits were collected, of which 600 were collected directly from the mother tree and the other 600 were collected on the soil located below it. The fruits were opened and the viability of their seeds was evaluated qualitatively and visually, analyzing whether they were whole, without imperfections, and with normal color (light brown), where the number of viable and non-viable seeds of the fruits was counted. Fruits collected both directly from the parent tree and those that were on the ground so that it could analyze whether there is a difference in the viability of the seeds collected in both places. In total, 1,200 seeds were evaluated, of which, of the 600 seeds collected on the ground, only 160 were viable, and of the 600 collected directly from the mother tree, 285 were viable, 125 more seeds than those collected on the ground. Because of this, we can see that the simple act of not opening the Sucupira-Branca fruits to remove the seed before planting, which is very common, may be linked to the low germination rate of the species, as this attribute may be related to the viability of its seeds,

which is also very low. The characteristic can only be evaluated through the opening of the fruits. We can conclude that a factor that is connected with the low viability of the seeds and possibly also with the low germination is the place where they are collected, which, because of the results found, we can observe

that the collection of the Sucupira-Branca fruits carried out directly from the matrix tree presents greater seed viability, and may also present a higher germination rate.

Keywords: Faveiro, Native species, Seed analysis.

1 INTRODUCTION

The species *Pterodon emarginatus* Vogel., popularly known as Sucupira-branca or Faveiro, is a tree belonging to the Fabaceae family and is widely distributed in the Cerrado Biome, is considered one of the most beautiful trees in Central Brazil (WORLD WILDLIFE FUND- WWF, 2020).

It is a species that has trees up to 15 m high and 60 cm DBH (measured at 1.30 m from the ground), with a trunk that can reach a maximum of 5 m and a crown that has terminal branches that are hairy and gray (CARVALHO, 2010). Its fruits are samara-like, containing bitter oil in the central region and only one seed per fruit (INSTITUTO BRASILEIRO DE FLORESTAS-IBF, 2020).

Sucupira-Branca wood has a yellowish color, is hard, resistant to attack by xylophages, and has a high natural resistance to decay (RIZZINI, 1971), and can be used for construction of structures in general and the manufacture of furniture in the furniture industry (RIZZINI, 1971). VALE et al., 2011).

Another natural resource that the species makes available, being the most exploited, is the use of its fruits in natural medicine, in which the oil present inside is aromatic and used in the fight against rheumatism, and diabetes and mainly used in the treatment of inflammation (SANTOS et al., 2010), in which, after the discovery of the new Coronavirus pandemic in 2019, the use of natural products such as the fruit of Sucupira-Branca in Brazil had a great participation in the prevention and reduction of symptoms and complications caused by disease (RODRIGUES; MARTINAZZO, 2022).

In addition, the species is widely used for reforestation, environmental preservation, urban afforestation, and landscaping (IBF, 2020), where its use in landscaping is due to the architecture of its crown and the beauty of its flowering (WWF, 2020).

Despite the numerous uses that Sucupira-Branca has, the species has been showing a reduction in the number of individuals in the natural habitat and is even included in the list of endangered plants in the state of São Paulo (WWF, 2020), which, this is occurring due to disorderly commercial exploitation, as well as the occurrence of low seed germination (SANTOS; MENDONÇA, 2010).

In this way, studies focused on the production of seedlings of the species in nurseries are of great importance to reduce the risk of extinction of the same and for the creation of silvicultural planting, aiming at the sustainable use of its natural resources, being the analysis of quality of seeds of species fundamental to this process, where research covering the subject has grown significantly in recent years (FRÉ, 2010).

With that in mind, the objective of this work was to evaluate the viability of Sucupira-Branca seeds collected directly from the matrix tree and on the ground, in a transition region between the Cerrado Biome and the Amazon Forest in Cáceres-MT.

2 METHODOLOGY

A coleta foi realizada no Instituto Federal de Educação, Ciência e Tecnologia de Mato Grosso-IFMT campus Cáceres, com a colaboração dos acadêmicos do Curso Superior em Engenharia Florestal.

Para a realização do estudo foram coletados 1.200 frutos de Sucupira-branca (figura 1), no qual, 600 foram coletados diretamente da árvore matriz (figura 2) com o auxílio de um podão e os outros 600 coletados sobre o solo localizado abaixo da árvore matriz.

Figure 1: Fruits of Sucupira-branca (*Pterodon emarginatus* VOGEL.)



Figure 2: Matrix where the fruits were collected



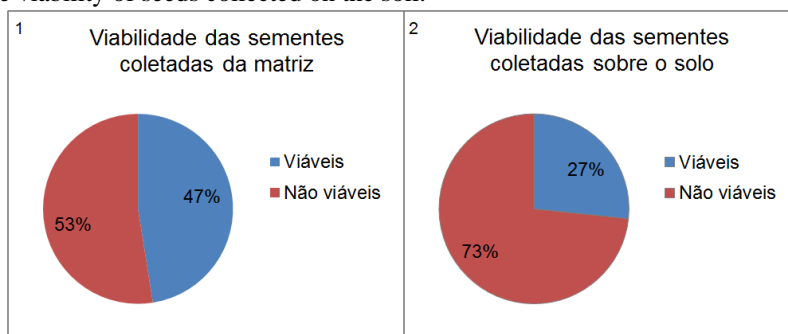
The fruits were opened using pruning pliers, in which the viability of their seeds was evaluated qualitatively and visually, analyzing whether they were whole, without imperfections, and with a normal color (light brown), where it was counted. if the number of viable and non-viable seeds of the fruits collected both directly from the matrix tree and those that were on the ground, so that it could analyze whether there is a difference in the viability of the seeds collected in both places.

3 RESULTS AND DISCUSSION

In total, 1,200 seeds were evaluated (1,200 open fruits), in which, of the 600 seeds collected directly from the parent tree, only 285 were viable (fit for planting) (graph 1), and of the 600 collected on the ground, only 160 (graph 2). Adding a total of 445 viable seeds.

Graph 1: Percent viability of seeds collected directly from the parent tree.

Graph 2: Percentage of the viability of seeds collected on the soil.



Subtitle: viable
not viable

Through the results, we can see that the Sucupira-Branca seeds have low viability, in which the low germination rate of the species may be related to this attribute (MATOS et al., 2007).

In many cases, the seeds are planted without opening the fruits, that is, they are sown inside the fruit, an act that may also be related to low germination (SANTOS; MENDONÇA, 2010), because in addition to the impermeability of the tegument prevent seed contact with oxygen and water (MATOS et al., 2007), without opening there is no way to assess whether the seeds are viable or not. And in terms of the results obtained, more than half of the seeds were not viable, demonstrating the importance of opening the fruits to carry out the planting for the production of Sucupira-Branca seedlings.

Another factor that we can relate to the low germination is the seed collection site, where through the results of the present work, it is possible to notice that the seeds that were collected directly from the mother tree presented greater viability (20% more) concerning the collected on the ground, in which, generally, the fruits collected are those that are on the ground, as the species is a medium and large tree (WWF, 2020), a characteristic that makes it difficult to collect directly from the matrix.

In addition, because the fruits are resistant to weathering, those that are present on the ground may not be from the current year of collection and their seeds may lose viability over time, as they are even

considered intermediate seeds, that is, it has resistance to low temperatures, but only a certain tolerance to desiccation, being intermediate between the orthodox and recalcitrant ones (COSTA, 2009).

4 CONCLUSION

Given this, we can conclude that the simple act of not opening the Sucupira-Branca fruits to remove the seed before planting may be linked to the low germination rate of the species, as this attribute may be related to the viability of its seeds, which is also very low. The characteristic can only be evaluated through the opening of the fruits.

Another factor that is linked to the low viability of the seeds and possibly also to the low germination is the place where they are collected, in which, because of the results found, we can note that the collection of Sucupira-Branca fruits carried out directly from the tree matrix presents higher seed viability, and may also present a higher germination rate.

REFERENCES

- Carvalho, p. E. R.; espécies arbóreas brasileiras. **Embrapa**, 2010.
- Costa, c. J.; armazenamento e conservação de sementes de espécies do cerrado. **Embrapa serrados**, planaltina- df, 2009.
- Fré, m. Da; avaliação da germinação, viabilidade e vigor de sementes de *calophyllum brasiliense* camb. Trabalho de conclusão de curso. Florianópolis- sc, 2010.
- Instituto brasileiro de florestas-ibf; sucupira branca. 2020. Disponível em:<<https://www.ibflorestas.org.br/lista-de-especies-nativas/sucupira-branca>> acesso em 05 out. De 2022.
- Matos, p. S.; nascimento, r. S. M.; araújo, g. P.; cerqueira, r. C.; reis, a. T. C. C.; superação de dormência tegumentar em sementes de *pterodon emarginatus* vog. (sucupira-branca). **R. Brasileira de biociências**, v. 5, p. 720-722, porto alegre- rs, 2007.
- Rizzini, c.t. árvores e madeiras úteis do brasil. **E. Blücher**, p. 139, são paulo-sp, 1971.
- Rodrigues, t. Q. J.; martinazzo, a. P.; utilização de produtos naturais na pandemia de covid-19. **Brazilian journal of development**, v.8, n.8, p. 59243-59263, curitiba- pr, 2022.
- Santos, t. M. Dos; mendonça, c. G. De; quebra de dormência de sementes de sucupira-branca. Universidade estadual de mato grosso do sul- uems, campo grande- ms, 2010.
- Santos, a. P.; zatta, d. T.; moraes, w. F.; bara, m. T. F.; ferri, p. H.; silva, m. Do r. R.; paula, j. R.; composição química, atividade antimicrobiana do óleo essencial e ocorrência de esteróides nas folhas de *pterodon emarginatus* vogel, fabaceae. **Revista brasileira de farmacognosia**, 20(6): p. 891-896, goiânia-go, 2010.
- Vale, a. T. Do; pimentel, j. W.; menezzi, c. H. S. D.; dantas, v. F. De s.; propriedades físicas e mecânicas da madeira de sucupira branca *pterodon pubescens* (benth.). **Revista científica eletrônica de engenharia florestal**. V.18, n.1, garça- sp, 2011.
- World wildlife fund-wwf; sucupira. 2020. Disponível em:<https://www.wwf.org.br/natureza_brasileira/especiais/biodiversidade/especie_do_mes/especies_cerrado/sucupira/#:~:text=com%20ampla%20distribui%3%a7%3%a3o%20no%20cerrado,belas%20%3%a1rv ores%20do%20brasil%20central> acesso em 06 out. De 2022.