

Enhancing Germination of Stored Adlai (*Coix lacryma-jobi*) Seeds Using Black Soldier Fly Frass Tea as an Organic Biofertilizer

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INTRODUCTION & AIM

Food security remains a persistent challenge in the Philippines, driven by population growth, climate variability, soil degradation, and a heavy reliance on traditional staples such as rice and corn (Philippine Statistics Authority [PSA], 2023). Amidst the increasing global and national demand for nutritious, resilient, and sustainable food sources, the lens shift to underutilized crops such as adlai (*Coix lacryma-jobi*; a nutrient-dense cereal crop rich in carbohydrates and dietary fiber, with potential to serve as an alternative staple in local diets and a buffer against rice shortages (Barroga et al., 2017). Despite its agronomic promise, adlai remains marginalized in mainstream agriculture due in part to its seed dormancy, which hinders consistent germination and widespread adoption (Ganal et al., 2021).

This study aims to address this gap by evaluating the potential of frass tea as a natural treatment to overcome seed dormancy in Adlai. To evaluate the effect of Black Soldier Fly frass on breaking seed dormancy was the general objective of the study.

Specifically, it aimed

- To assess the germination rate and time of dormant seeds treated with BSF frass.
- To determine the optimal concentration of BSF frass for dormancy breaking.

METHOD

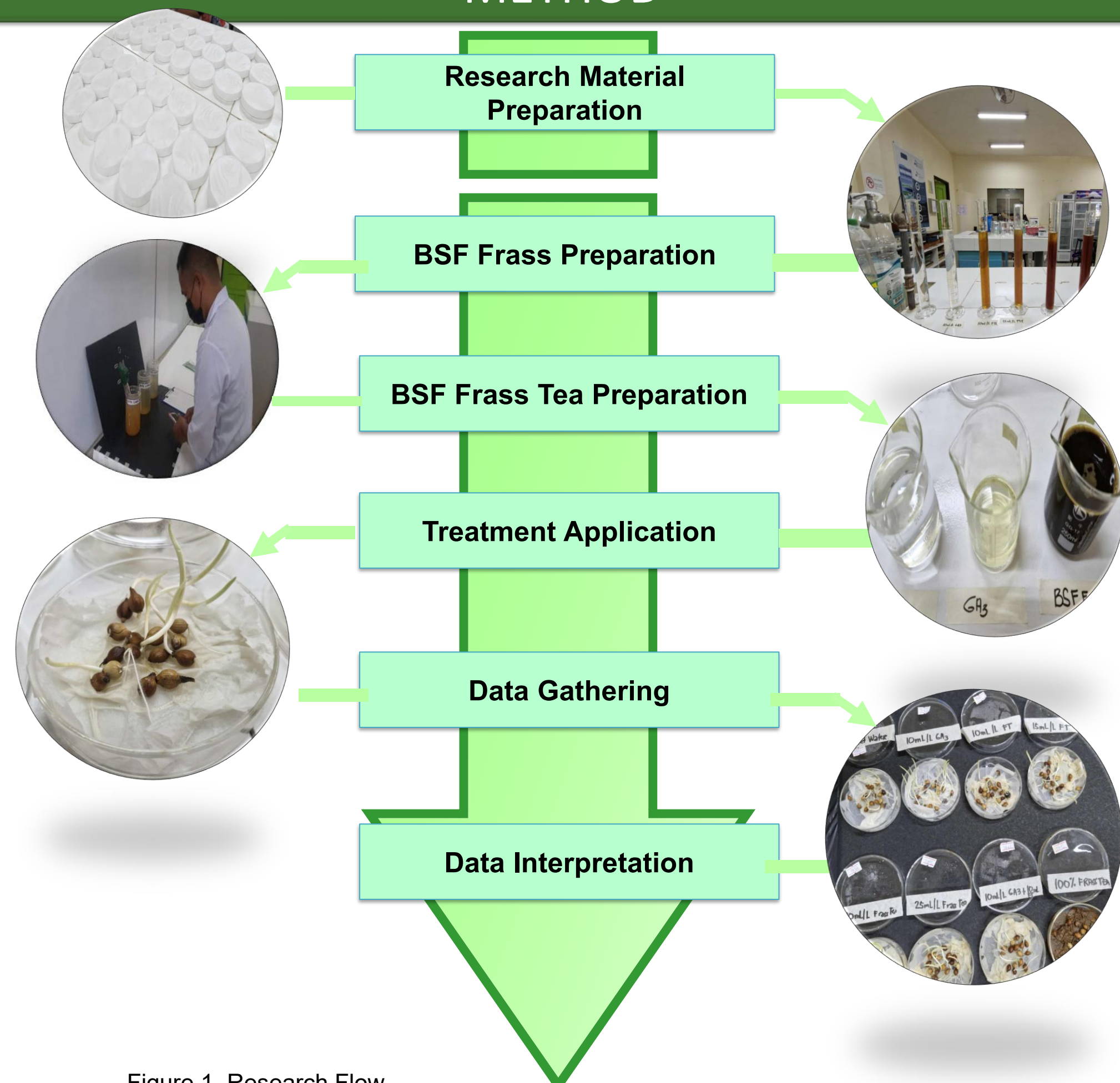


Figure 1. Research Flow

RESULTS & DISCUSSION

Table 1. pH Level of different treatment used

Treatment	pH Level
T1 – Distilled water	7.0
T2 – 10 ml/L GA ₃ solution	6.50
T3 – 10 ml/L BSF FT	5.92
T4 – 15 ml/L BSF FT	5.72
T5 – 20 ml/L BSF FT	5.53
T6 – 25 ml/L BSF FT	5.41
T7 – 10mL/L BSF FT + GA ₃	6.30
T8 – Undiluted BSF FT	4.45

- ✓ Initial pH level of BSF FT ranging from 4.45 (T8 –undiluted) – 5.92 (T3 – 10mL/L of water)
- ✓ Combination of synthetic application has a pH of 6.50 and combination among treatment got 6.30 respectively (Table 1).
- ✓ pH level plays a crucial role in seed germination.

RESULTS & DISCUSSION

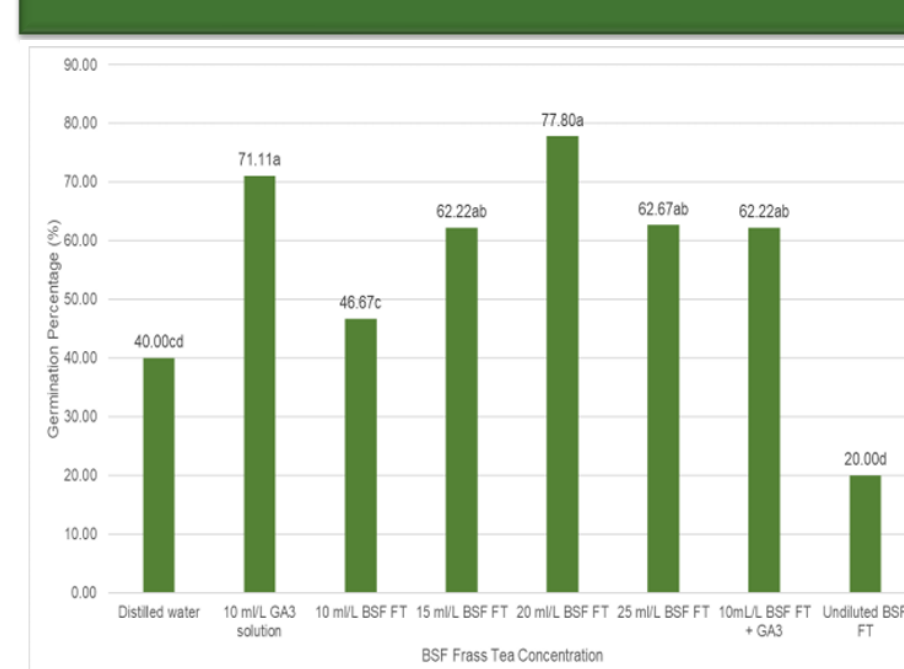


Figure 2. Germination Percentage

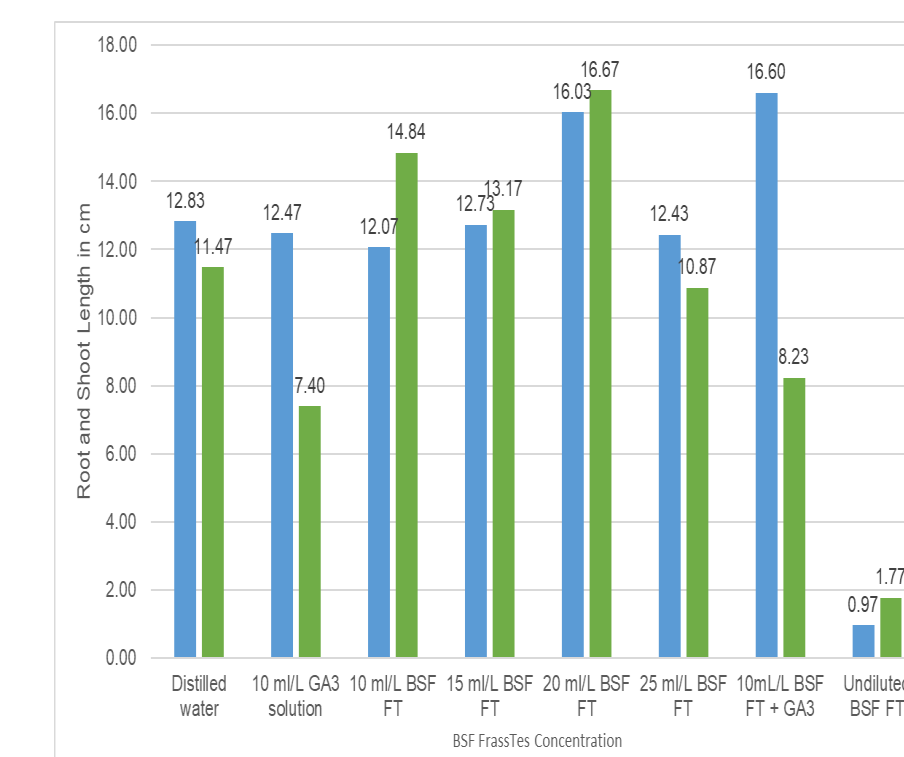


Figure 3. Root and Shoot Length in cm

- ✓ 20mL/L of water (T5) gave the highest germination rate of 77.80% comparable to 71.11% of synthetic application (T2) in Fig 2.
- ✓ Lowest germination rate was on T8 undiluted (pure) BSF FT with only 20%.

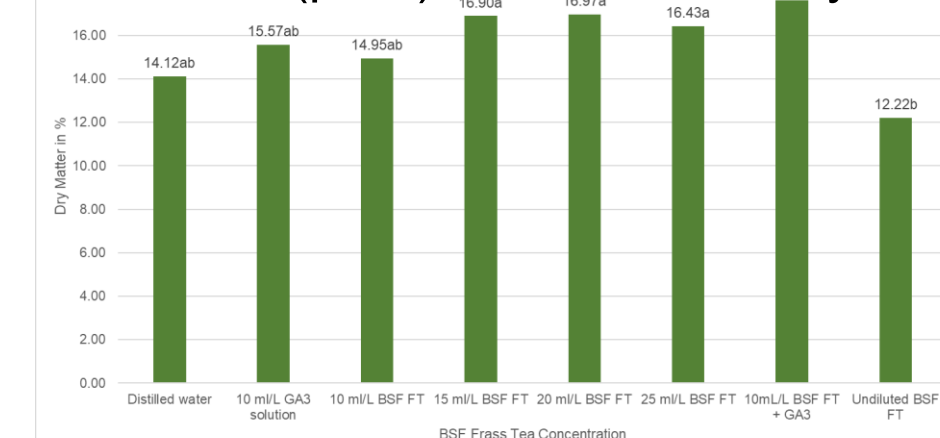


Figure 4. Dry Matter Content

- ✓ 20mL/L of water (T5) gave the highest root and shoot length in cm (Fig 3) with 16.67 cm roots length and 16.03cm shoot length and heaviest dry matter content of 17.63% (Fig 4) respectively.
- ✓ Application of synthetic (GA₃) and its combination posted only 12.47cm root length and 7.40cm shoot length with only 15.57 DM.
- ✓ Undiluted BSF FT rank lowest both root and shoot length and in DM parameters.

CONCLUSION

- ❑ BSF Frass Tea (BSF FT) could be an alternative source for seed germination enhancer in adlai (*Coix lacryma jobi*) stored seeds.
- ❑ 20mL/L of water is the optimum concentration for best result in all parameters.
- ❑ Undiluted BSF FT with highest pH level hinders seed germination in *C. lacryma jobi* seeds.
- ❑ pH level is a crucial aspect of seed germination; essential nutrient also plays a pivotal role.

FUTURE WORK / REFERENCES

- Barroga, A. J., Medrano, M. A., & Valdez, R. (2017). *Adlai (Coix lacryma-jobi L.): A traditional staple crop with a promising future*. Bureau of Agricultural Research, Department of Agriculture.
- Ganal, J. S., Soriano, A. N., & Dela Cruz, R. T. (2021). Germination and dormancy-breaking treatment of Adlai (*Coix lacryma-jobi* L.) seeds. *International Journal of Agricultural Technology*, 17(5), 2045–2054.
- Philippine Statistics Authority. (2023). *Food security statistics of the Philippines*. <https://psa.gov.ph>