The Use Of Antifreeze Proteins in Cold Survival

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ABSTRACT

This study explores the cryopreservation potential of *Tenebrio Molitor* antifreeze proteins (*Tm*AFPs). The researchers employ a novel ice-affinity purification protocol to obtain pure AFPs with freezing prevention abilities up to -6°C [1]. The process included homogenizing the mealworms and subsequent purification steps, resulting in reduction in impurities, and the production of *Tm*AFP. The purified AFPs hold great promise for optimizing existing cryopreservation techniques for cells, tissues, and organs

ANTIFREEZE PROTEINS

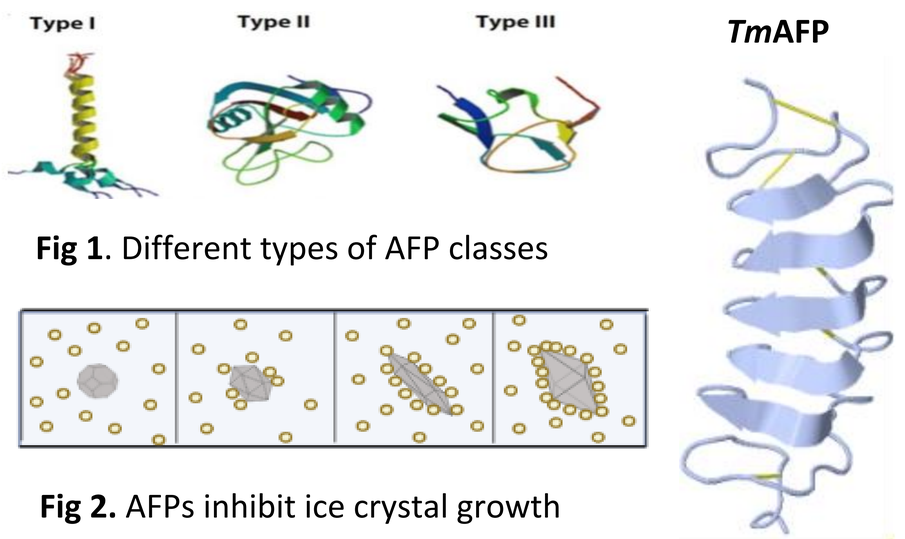

Fig 1. Different types of AFP classes

Fig 2. AFPs inhibit ice crystal growth

METHODS

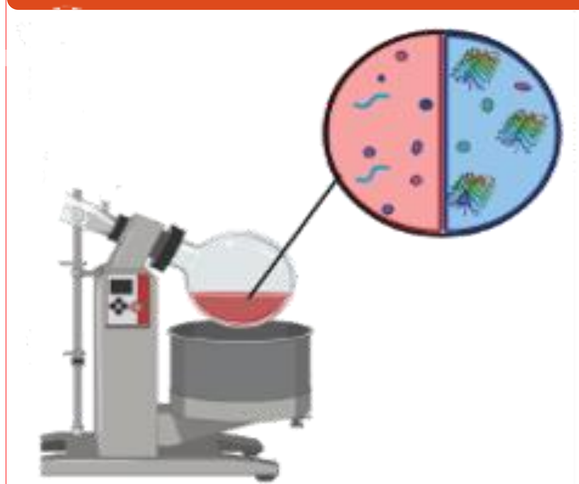

Fig 3. Protein isolation by rotary ice affinity purification

RESULTS

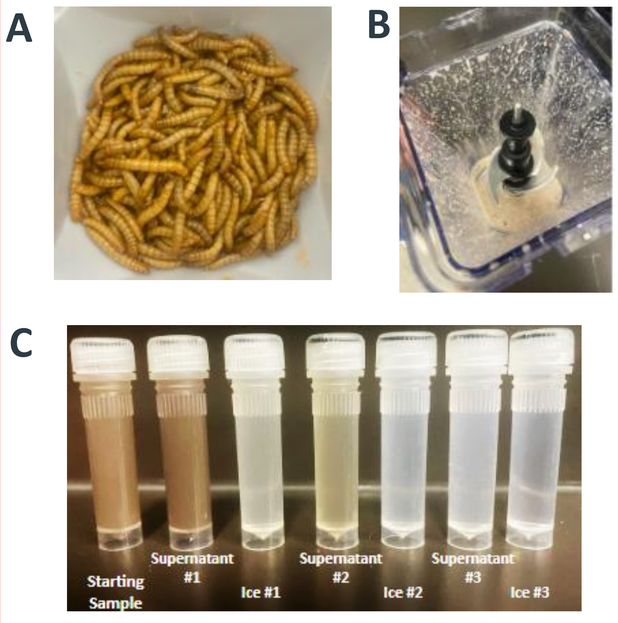

Fig 4. Purification A) Yellow Mealworms B) homogenizing C) Grandaunt of Purification

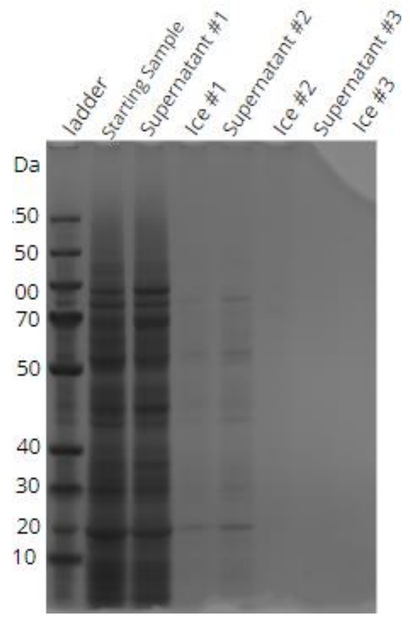

Fig 5. Coomassie blue-stained SDS-PAGE

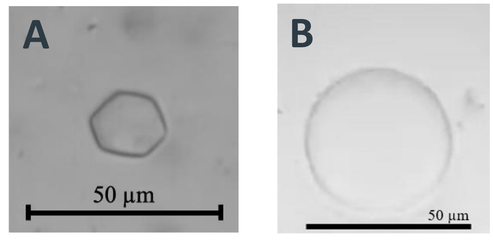

Fig 6. Ice Shaping A) *Tm*AFP B) water

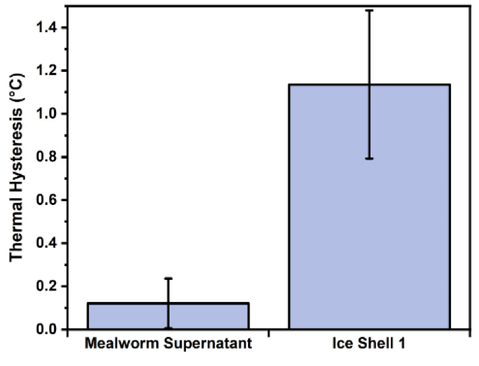

Fig 7. *Tm*AFP antifreeze activity

CONCLUSION

- Successfully purification of *Tm*AFP from mealworms via ice affinity purification
- Determination of purification yield needs additional testing, e.g. Bradford Assay.

REFERENCES

[1] Tomalty, H. E., Graham, L. A., Eves, R., Gruneberg, A. K., & Davies, P. (2019). Laboratory-Scale Isolation of Insect Antifreeze Protein for Cryobiology . *Biomolecules*, *9*(5),

ACKNOWLEDGMENT

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