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Rearing performance of Black Soldier Fly (*H.illucens*) on food waste under ambient weather conditions of Pakistan and Indonesia

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Black Soldier Fly Larvae (BSFL) is a promising solution for food waste valorization, that makes more than 30% of the municipal solid waste in Pakistan.The country lacked scientific base-line data on BSFL behavior under ambient weather conditions which is crucial to design facilities and SOPs for BSFL farming.

- For the first time in Pakistan, rearing performance of BSF at all life stages was investigated under ambient weather conditions of a semi-arid region.
- Experiments performed at Pakistan's first research facility established by Dr.Saleha Mahmood.

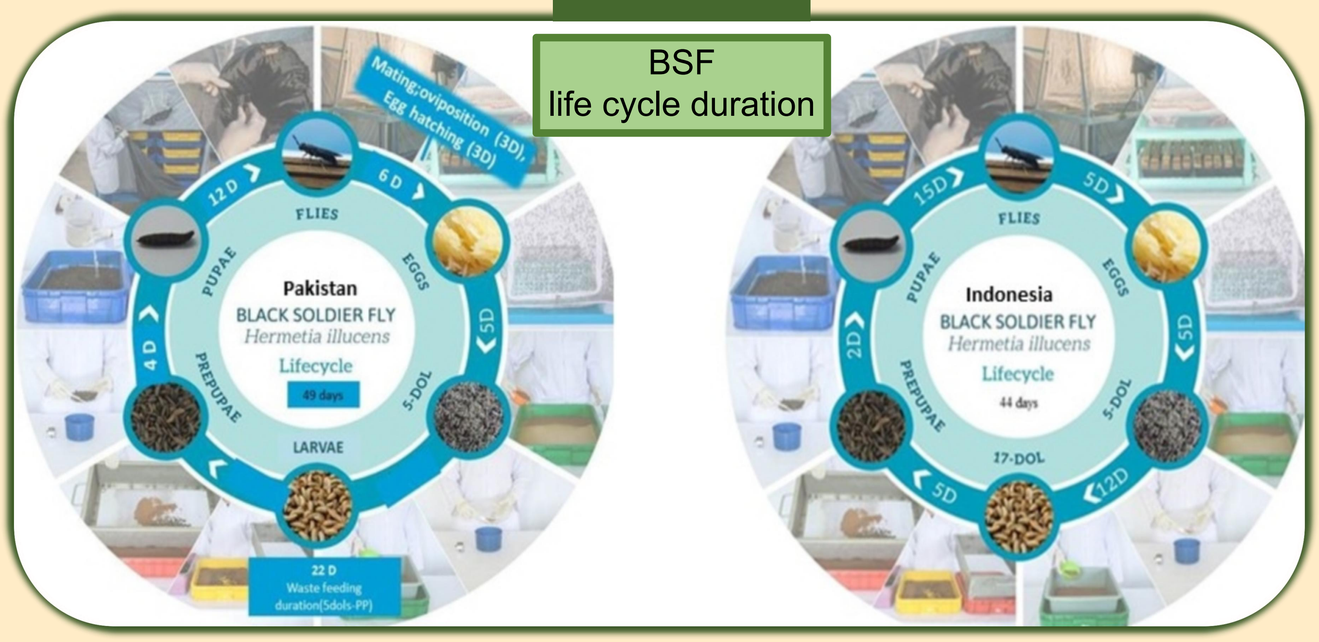
KPIs: Fly emergence rate, BSFL hatching rate, Survival rate, life cycle duration, waste weight,volume and thickness reduction, 50% waste reduction

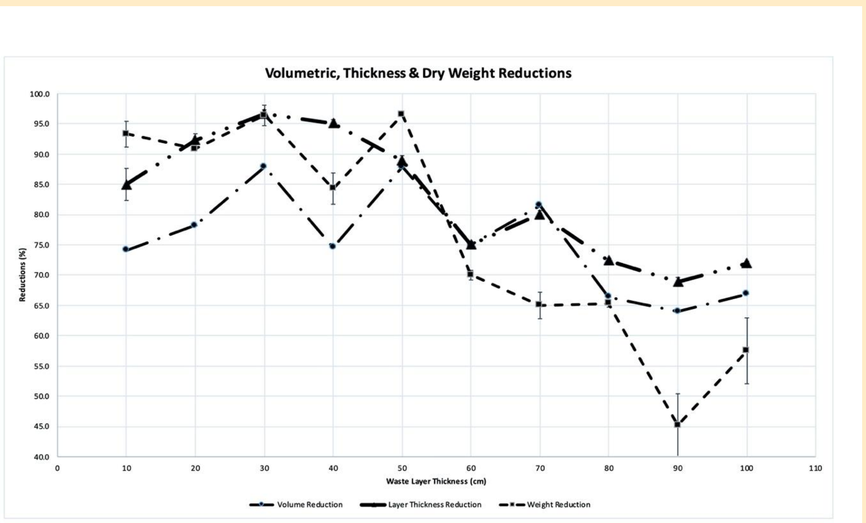
Duration: 12 month including site design and construction; establishing stabilized BSF population

Substrate: Fruit & vegetable market waste

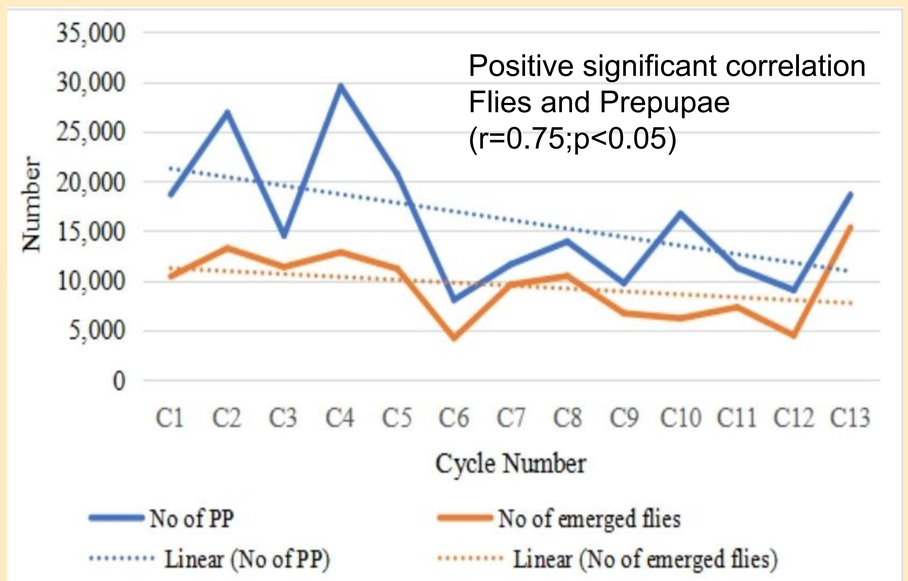
Findings were compared with BSF rearing performance under ideal weather conditions of a EAWAG-FORWARD project site in Indonesia to highlight life stages requiring special attention.

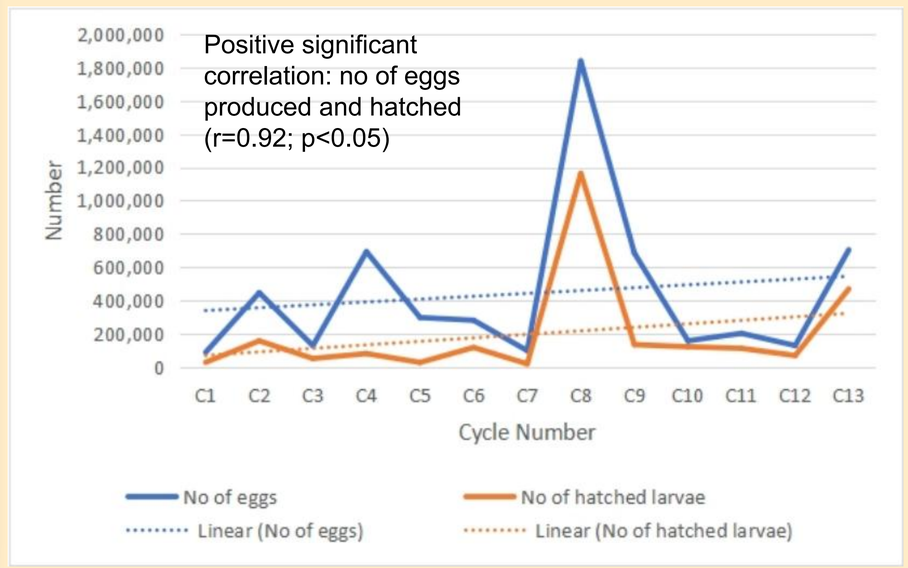
RESULTS





BSF Rearing KPI's (%)	BSF Facility	
	Pakistan	Indonesia
Fly emergence rate (%)	58.8	82.4
Larvae hatching rate (%)	44.5	59.2
Survival rate (%)	91.4	70





KEY TAKEAWAYS:

- ✓ Longer life cycle (49 days) under semi-arid ambient conditions of Pakistan, lower BSF emergence and hatching rates as compared to favorable conditions in Indonesia.
- ✓ BSF tolerated semi-arid conditions of Pakistan and completed all life cycles under observation.
- ✓ It is mainly the nursery stage requiring controlled conditions for sustainable rearing operations.
- ✓ Feeding till prepupae stage may result in higher survival rates contrary to fixed feeding duration
- ✓ Emptying one dark cage at a time can ensure flies of same age but may result in small no of eggs due to less density.
- ✓ Layering technique can reduce space foot print by 5 times through increased feeding layer thickness to 50 cm against widely practiced10 cm with significant food waste reductions.
- ✓ Low-tech setup established for this study is replicable with minimum investment especially for low and middle income countries, supporting local BSF farming