Evaluation of entomopathogenic fungi isolates for control of sweetpotato weevils (*Cylas formicarius* Fab.)

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Introduction

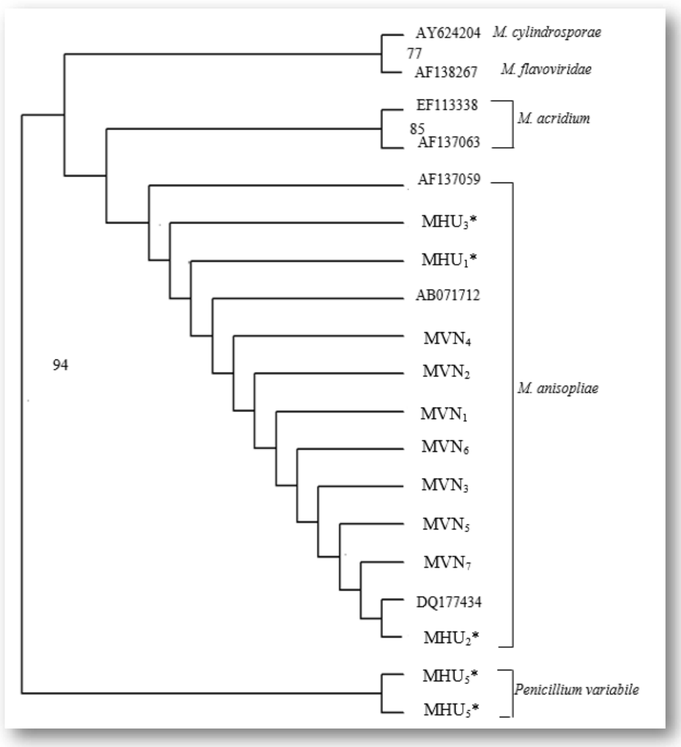
- The *Cylas formicarius* Fab. is the most serious pest around the world, as well as being a quarantine pest (Reddy at el. (2012). The *Metarhizium anisopliae* is being developed for the control of pest species (Wang et al., 2005).
- **Objective**: Five strains of entomopathogenic fungi from a molecular point of view and evaluate the pathogenic effect of these strains on adult *Cylas formicarius* Fab.

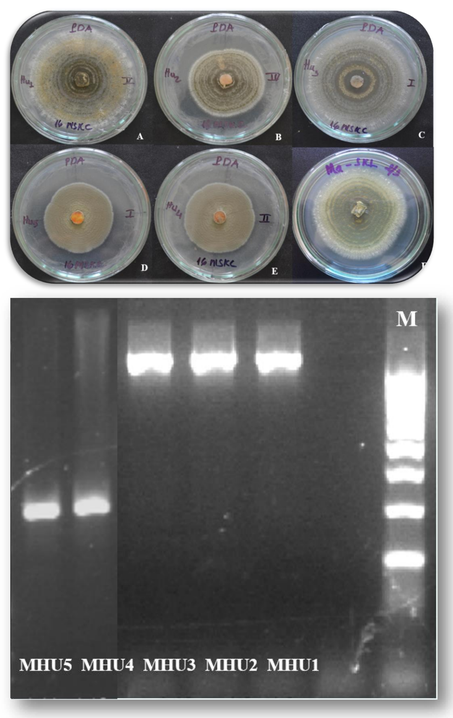
Materials and Methods

- **Isolates identification**: Using sequencing of the ITS-5.8S rDNA region for the identification at a species level.
- **Design tests on virulence**: Completely randomized designed with 5 treatments, 3 replication, 30 adults/treatment. Sprayed 5 ml spore suspensions (1 x 10^8 conidia/ml)/.
- **Parameters and statistical analysis**: Abbott (1925) was used for correction, BLAST and tree view, General linear model (GLM) of SPSS. 16 was used.

Results

- The ITS - rDNA region sequencing: MHU_1, MHU_2 and MHU_3 isolates belong to the clade of *Metarhizium anisopliae* with 99% - 100% similarly. Two isolates MHU_4 and MHU_5 showed a high degree of similarity with *Penicillium variabil*e (99%)





- Four isolates *M. anisopliae*-MHU_1, MHU_2, MHU_3 and MVN_1 reached 100% mortality rate as the same the rate of colony growth on death sweetpotato weevils adults at 10 days after treatment.

Table 2. Emergence of fungi isolates from the host

Isolates	6th DAI	8th DAI	10th DAI
MHU_1	15.2 bc	84.4 b	100.0 a
MHU_2	18.9 b	96.7 ab	100.0 a
MHU_3	26.7 b	92.2 ab	100.0 a
MVN_1	86.7 a	100.0 a	100.0 a
MHU_4	0.0 c	0.0 c	0.0 b
MHU_5	0.0 c	0.0 c	0.0 b
CV (%)	14.9	15.6	6.3
P value	*	**	**

The same capital letters indicate no significant different for the mean value (Ducan, p<0.05); DAI: day after inoculation

Results

- At 6 days after treatment, two *M. anisopliae*-MHU_1 and MHU_3 isolates were highly virulence on sweet potato weevils adults with the mortalities 92.5% and 94.2%, respectively, and same the virulence degree of *M. anisopliae*-MVN_1 isolate (100% mortality rate).

Table 1. Comparing mortalities of *Cylas formicarius* Fab. aldults infected by different isolates

Isolates	Mortality (%)			
	4th DAI	6th DAI	8th DAI	10th DAI
MHU_1	46.7 a	92.5 a	98.8 ab	100 a
MHU_2	17.8 b	83.3 b	91.7 b	100 a
MHU_3	44.4 a	94.1 a	96.4 ab	100 a
MVN_1	54.4 a	100.0 a	100.0 a	100 a
MHU_4	3.3 c	3.3 c	3.3 c	3.3 c
MHU_5	2.2 c	2.2 c	2.2 c	2.2 c
CV (%)	23.24	11.61	10.65	5.10
P value	**	**	**	**

The same capital letters indicate no significant different for the mean value (Ducan, p<0.01); DAC: day after inoculation

Conclusion

- Three isolates MHU_1, MHU_2 and MHU_3 were *Metarhizium anisopliae* and MHU_1, MHU_3 isolates have great potential as biological control agents against sweetpotato weevils.
- Two isolates *MH_4* and *MH_5* isolates *were Penicillium variabile* and not pathogenic to *Cylas formicarius.*

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