

Adaptability of *Sphaerodes mycoparasitica* on anamorph and teleomorph related to its mycoparasitic-polyphagous lifestyle

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INTRODUCTION

- *Fusarium* spp., are the major cause of Fusarium head blight (FHB), also known as scab disease, of small grain cereals including wheat, barley, oats, rye, and corn. FHB results in reduction of crop production and grain quality¹⁻³.
- *Sphaerodes mycoparasitica* Vujan. was isolated from wheat and other crops associated with *Fusarium* spp. This mycoparasite showed the suppression of *Fusarium* growth and the change in the ascospore germination pattern which indicates the host compatibility of the mycoparasite⁴ and ⁵.

OBJECTIVES

- Examination of host compatibility of *S. mycoparasitica* and its mitosporic adaptability by applying multiple paper disc assays and assessing by microscopy
- Evaluation of the effect of *Fusarium* filtrates on ascomata formation of *S. mycoparasitica* on modified slide culture assays

EXPERIMENTAL

Mycoparasite
• *Sphaerodes mycoparasitica* Vujan. SMCD 2220-01

Host
Diverse *Fusarium* strains

- SMCD 2242
- SMCD 2241
- SMCD 2139
- SMCD 2243
- SMCD 2244
- SMCD 2910
- SMCD 2248
- SMCD 2134
- SMCD 2423
- SMCD 2246
- SMCD 2401
- SMCD 2402

Multiple paper disc assay

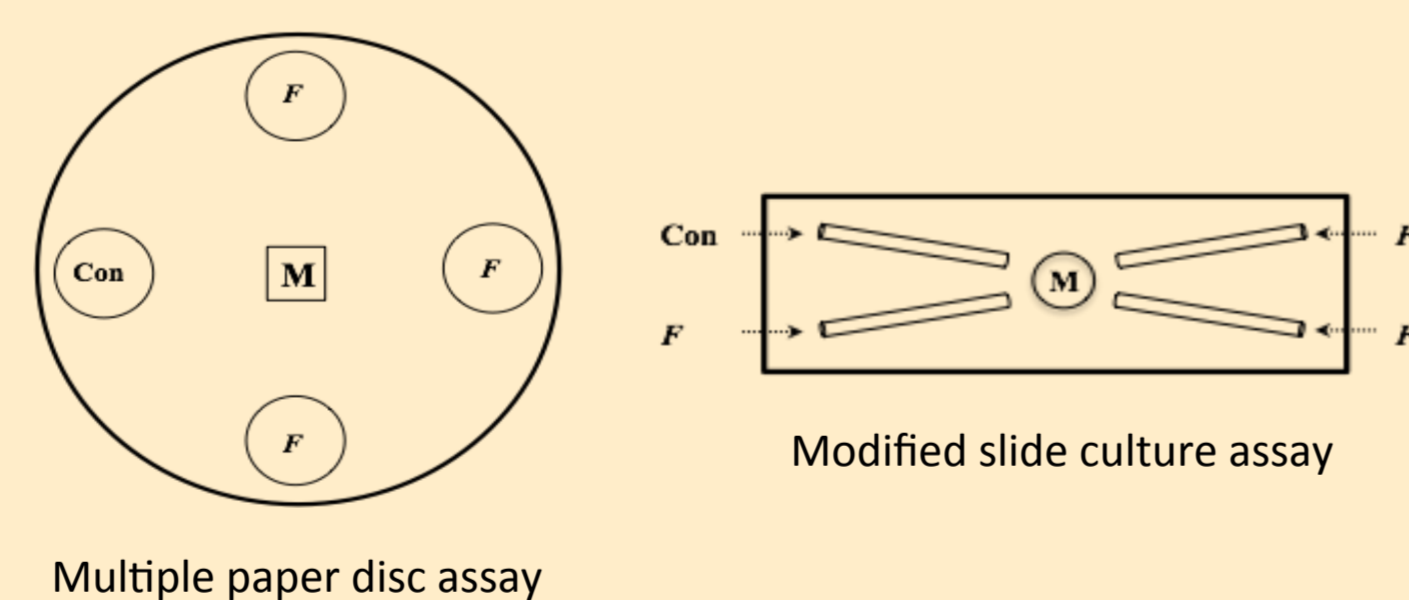
- Non-adapted and adapted mycoparasite to *F.* filtrates were inoculated in the center of PDA.
- Each *F.* filtrate was spotted on the paper disc surrounding the inoculated mycoparasite.
- Four types of combinations of *F.* filtrates were grouped based on taxonomic classification and mycotoxin production.
- Radial growth of the mycoparasite was measured after 1 week incubation at 23 °C in the dark.

Fungal growth

- Mycoparasite and *Fusarium* hosts were grown on PDA at 23 °C in the dark for 1 week.
- *F.* filtrates were prepared from 2 weeks-old *F.* cultures (PDB) through filtering.

Adaptation⁶

- Adaptation procedure was conducted for 15 days.
- *Fusarium* filtrate was used for the nutrients for adapted mycoparasite. PDB was used for non-adapted mycoparasite.



Modified slide culture assay

- Capillary tubes including each *F.* filtrate were placed on the slide culture (water agar).
- Non-adapted mycoparasite was inoculated on the center of the slide culture.
- Ascomata formation was evaluated after 1 month incubation at 23 °C in the dark.

REFERENCES

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RESULTS

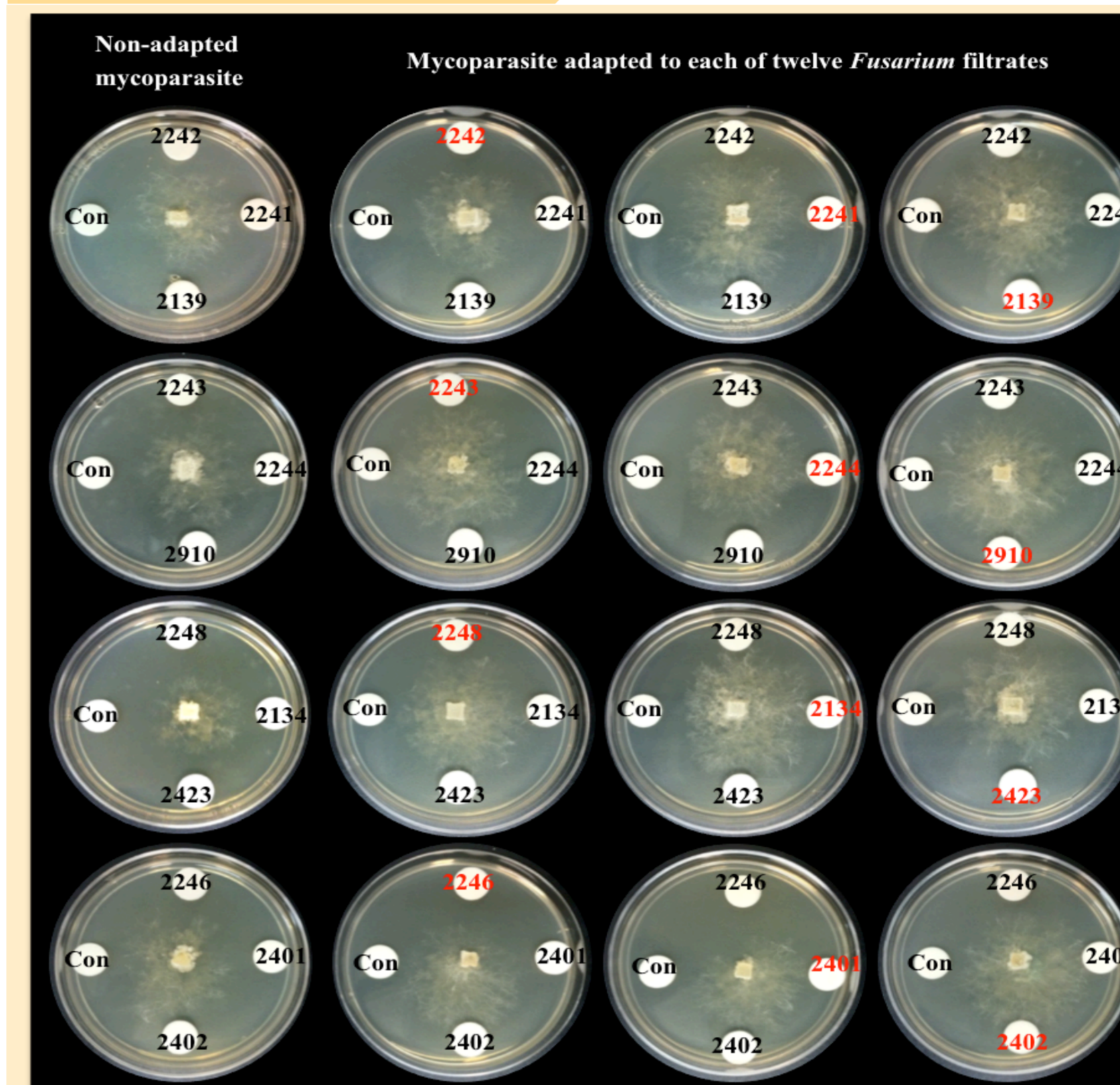


Figure 1. The hyphal growth of non-adapted and adapted mycoparasites to twelve *Fusarium* filtrates on multiple paper disc assay.

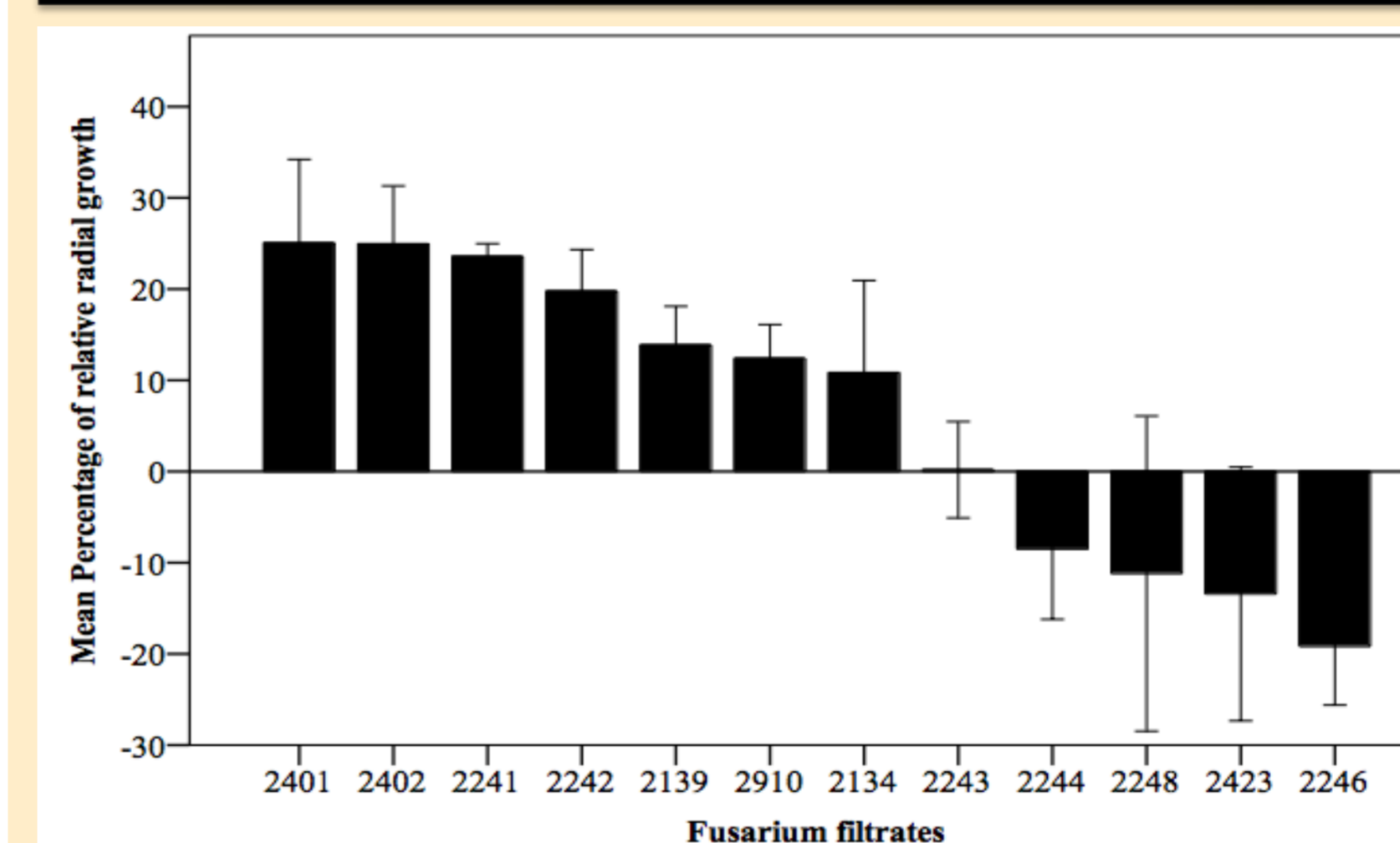


Figure 2. The relative host compatibility of mycoparasite based on mean percentage of relative radial growth of mycoparasite towards each of twelve *Fusarium* filtrates

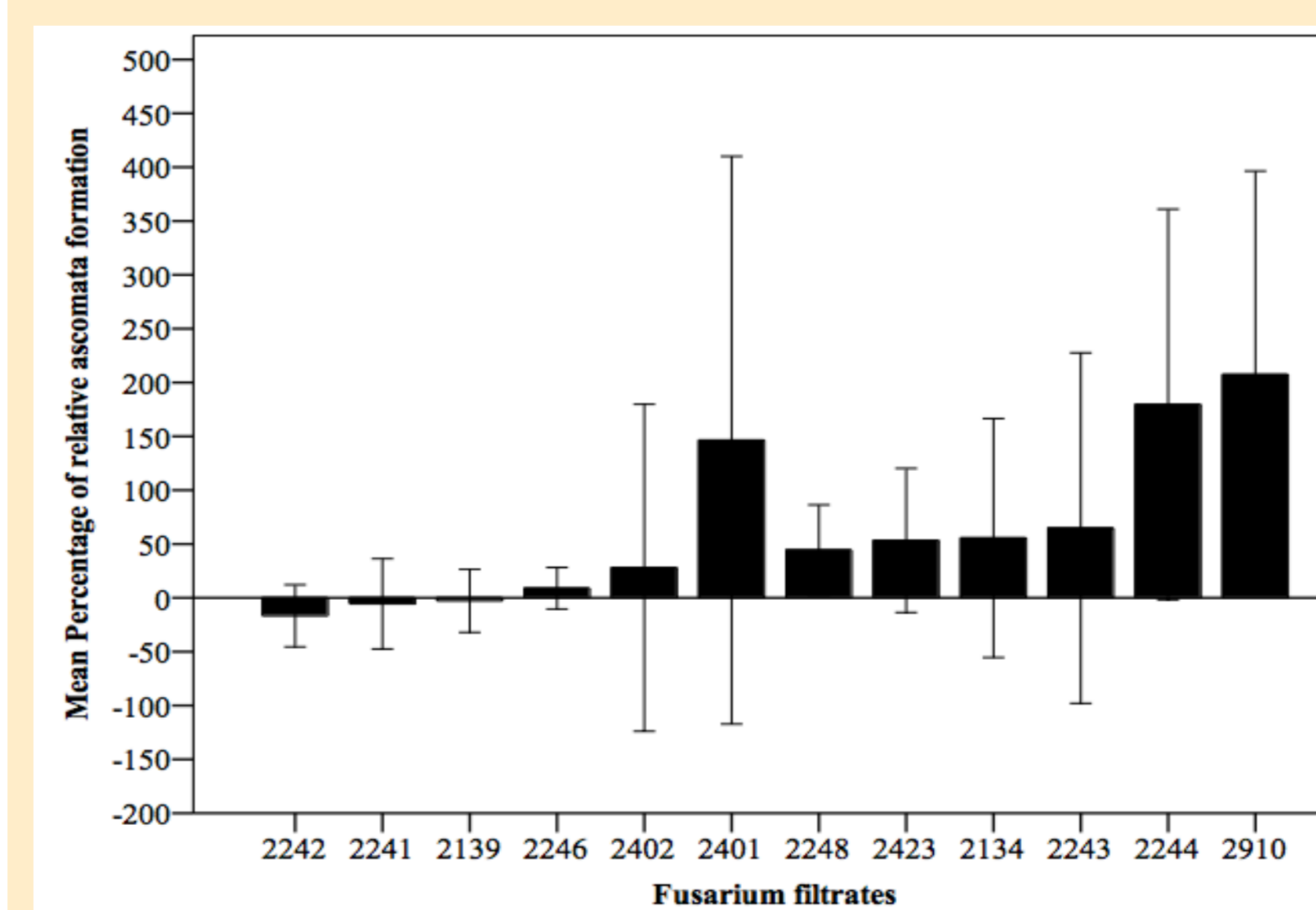


Figure 3. The relative ascomata formation of mycoparasite affected by twelve different *Fusarium* filtrates based on the modified slide culture assay

SUMMARY AND CONCLUSIONS

- *S. mycoparasitica* showed polyphagous lifestyle with different level of host compatibility under multiple paper disc assays.
- Differences in adaptability observed in anamorph (hyphal growth) and teleomorph (production of ascomata) are affected by *Fusarium* hosts.
- Although the mechanism of mycoparasitism is still unknown; it seems that secondary metabolites in particular mycotoxins produced by *Fusarium* species are related to the the level of mycoparasitism.
- Mycoparasite efficacy was characterized by diphasic interactions through biotrophic and antagonistic activities.