Seabuckthorn Stem Wilt Caused by *Fusarium* spp. in China

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1. Pathogen identification
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- **Location： Seedling nursery in Qinghai province（2018）**
- **10 cultivars： SBT （*Hippophae rhamnoides* spp. *mongolica*） induced from Russia**

Mortality ＞90%

- **Location： Seedling nursery in Gansu province （2019）**
- **12cultivars： SBT induced from Russia**

Mortality >60%

- **Location： Seedling nursery in Heilongjiang province （2019）**
- **10 cultivars： SBT induced from Russia**

Mortality >70%

- **Location：Seedling nursery in Liaoning province（2019）**
- **10cultivars： SBT induced from Russia**

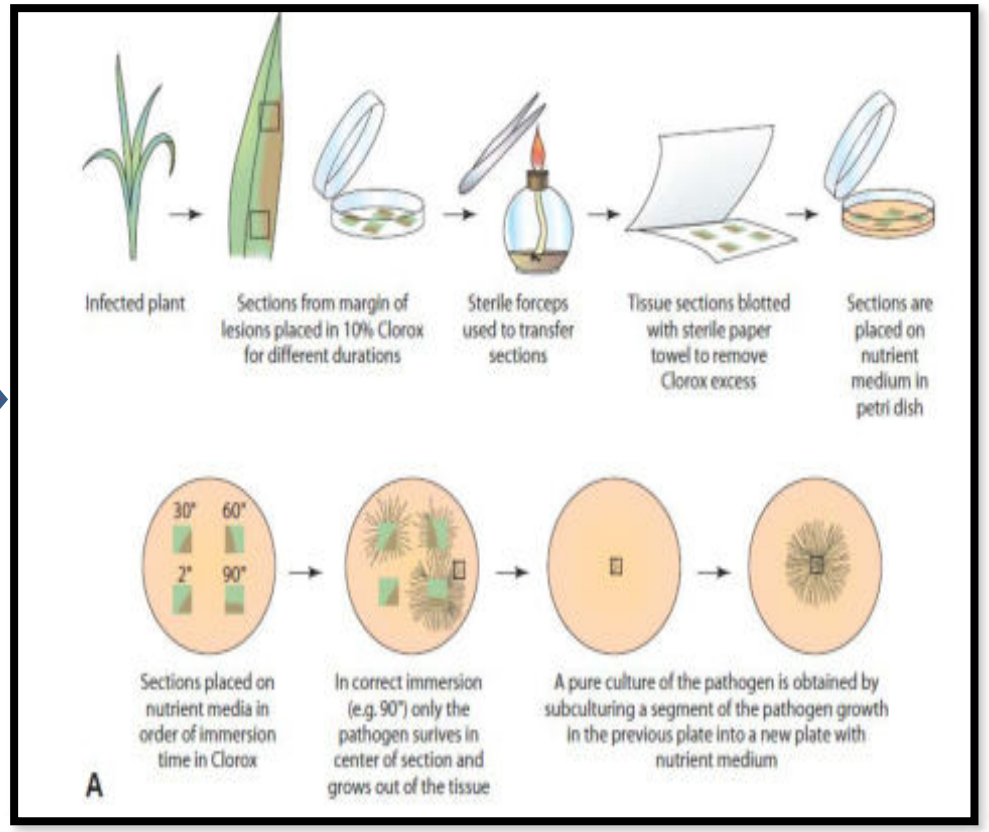
Mortality： > 60%

Xinjiang （2019）

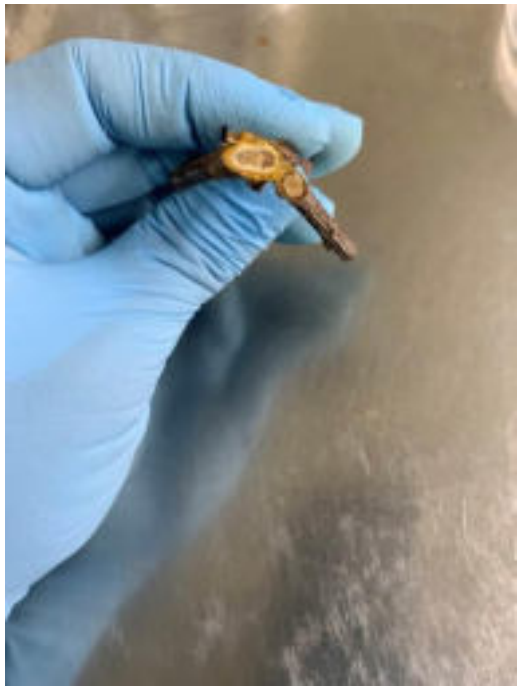
8-year-old infected trees

◆ Seabuckthorn Stem Wilt

- **The symptoms include massive chlorosis, drooping leaves and dried-up stems on infected trees.**
- **Distribution：Heilongjiang、Liaoning、Neimeng、Gansu、Xinjiang、Qinghai province.**



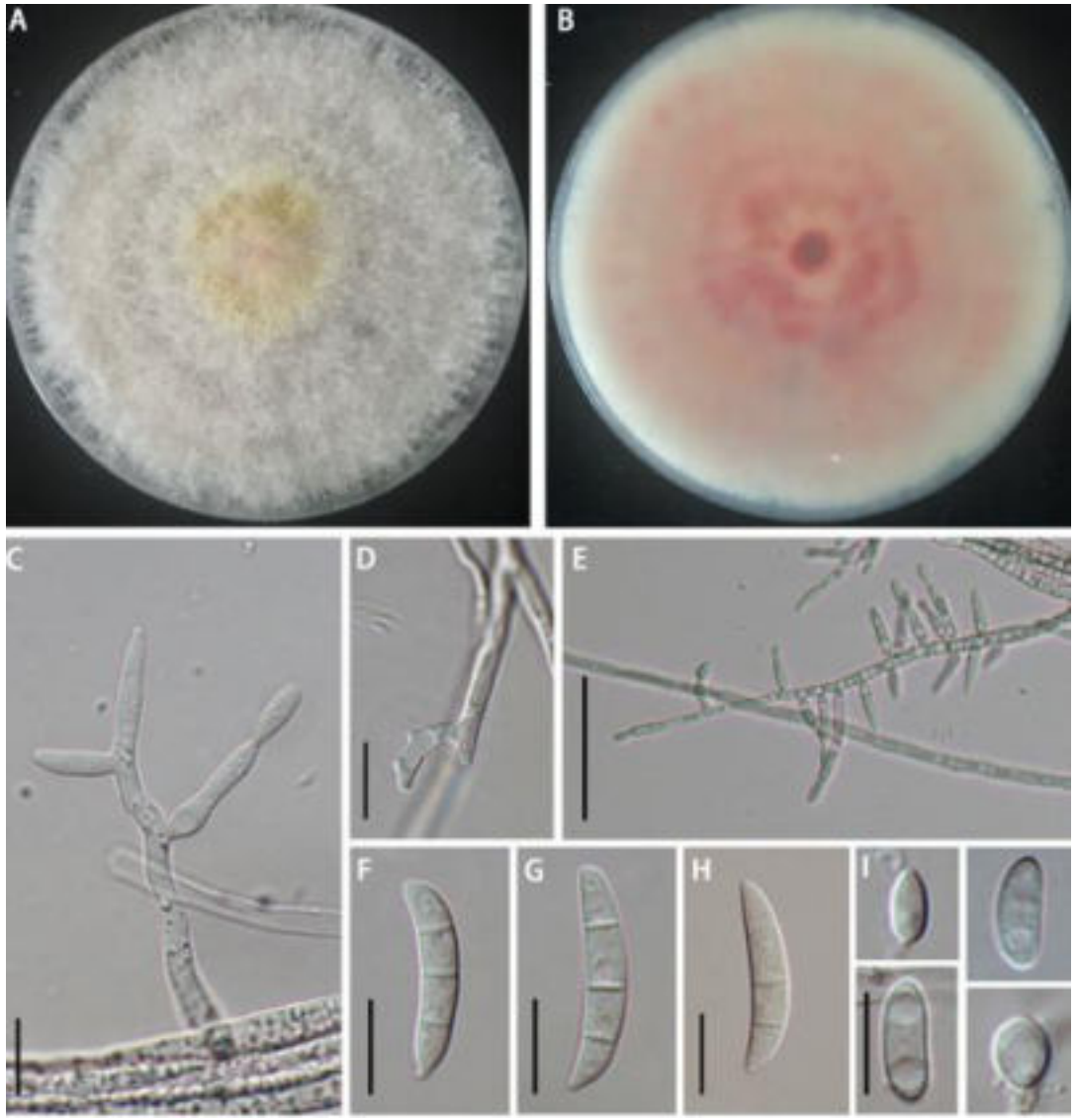
Pieces of tree roots and stems with brown discoloration in the xylem vessels were selected.

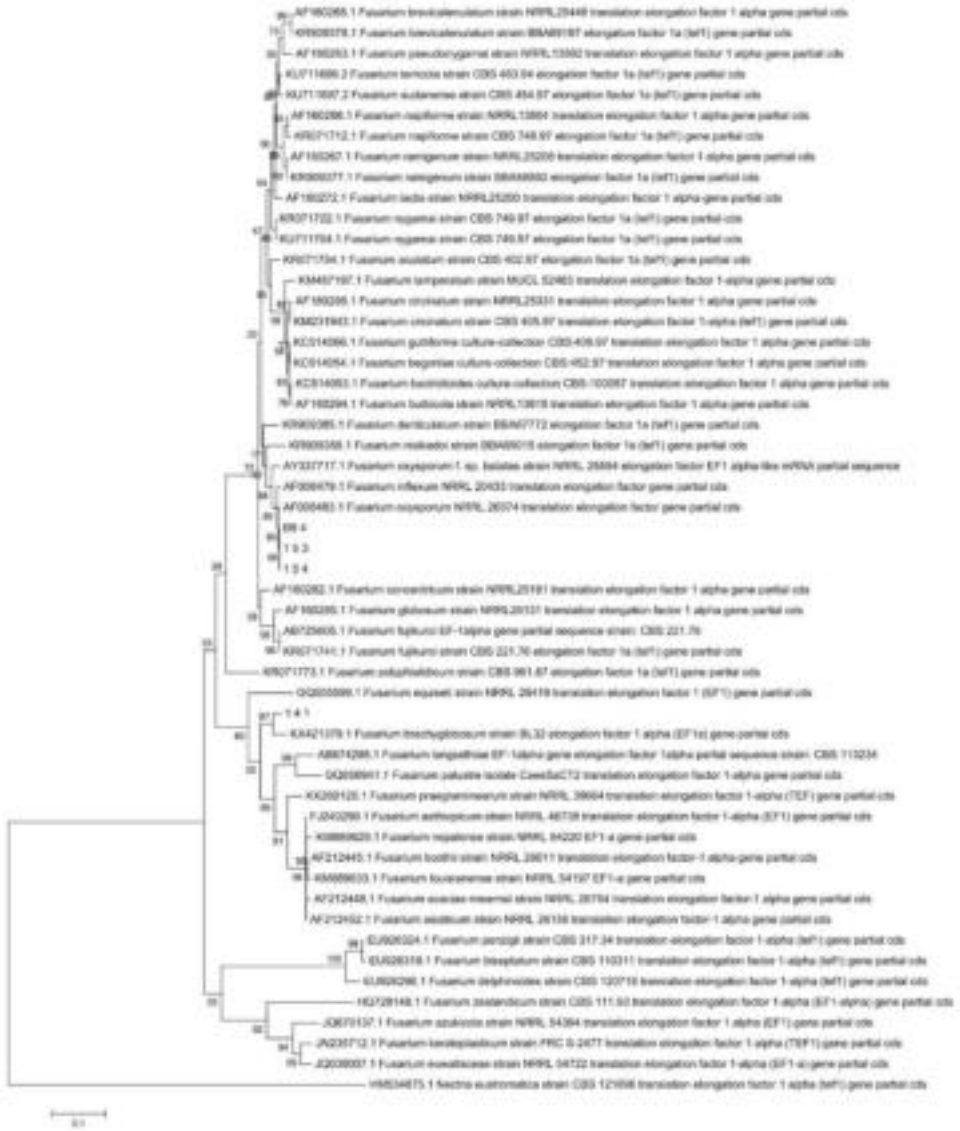


- Pathogenicity tests were performed on healthy, potted 1-year-old seabuckthorn seedlings (cv. eshi05) using three isolates in a greenhouse.

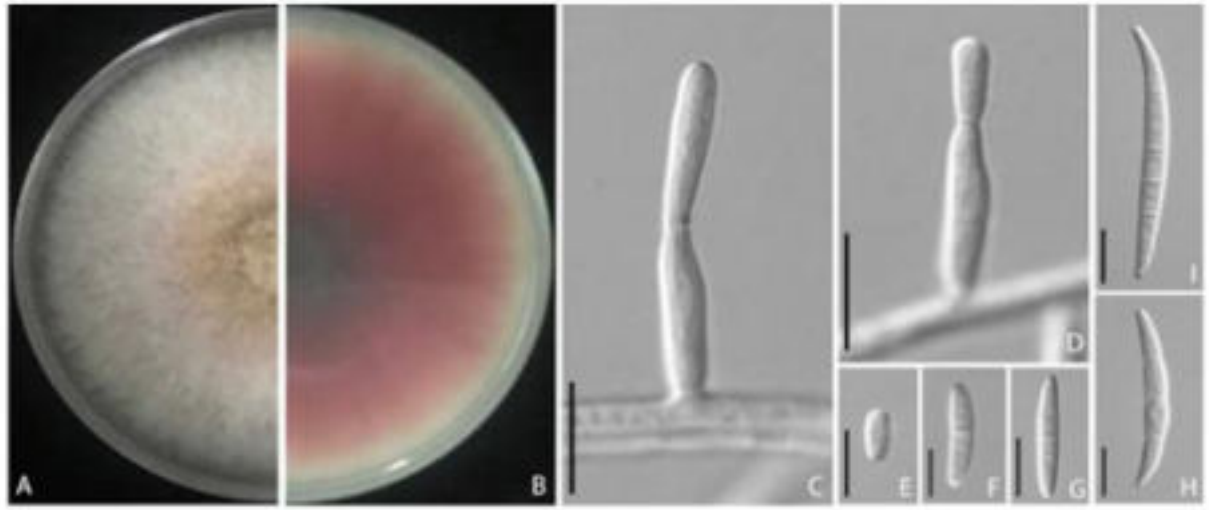
CK

Inoculated seabuckthorn





Single most-parsimonious phylogram ML-tree based on the combined analysis of EF-1a gene sequences.




First Report of Sea buckthorn Stem Wilt Caused by Fusarium proliferatum in Liaoning, China

Bo Xia, Dongwei Zhang, Yuanhua Wu, Jianzhong Hu, Yue Liang, Jianyang Hu, Yan Feng Han, and Yue Liang

Published Online: 5 Nov 2021 | https://doi.org/10.1094/PDIS-09-21-1985-PDN


First Report of Sea buckthorn Stem Wilt Caused by Fusarium sporotrichioides in Gansu, China

Bo Xia, Yue Liang, Jianzhong Hu, Xiaoling Yan, Liqiang Yin, Yue Chen, Jianyang Hu, Dongwei Zhang, and Yuanhua Wu

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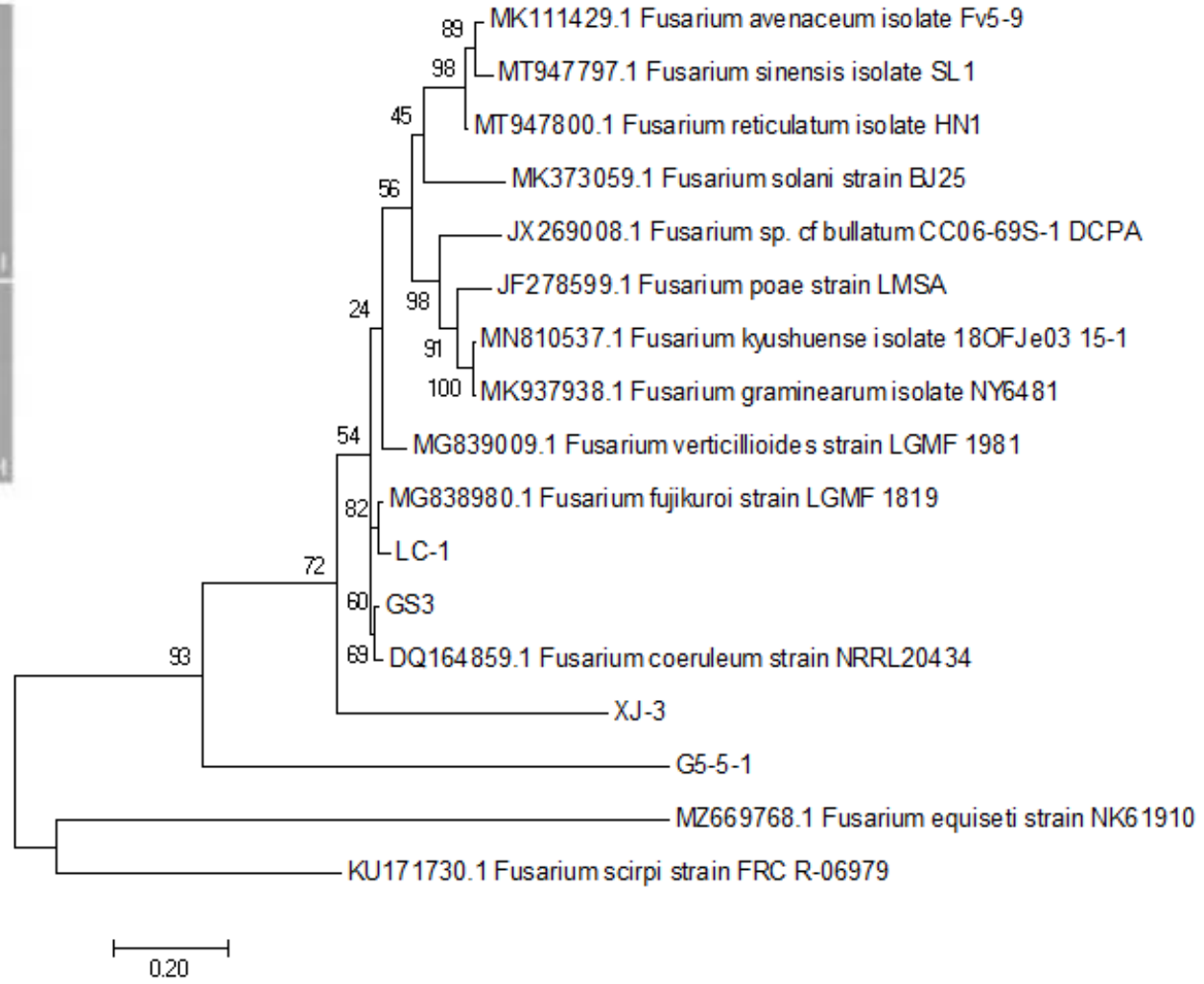


◆ Conclusion

- Seabuckthorn stem wilt is a systemic infection disease caused by ***Fusarium*** **spp.** In China.

- **Seabuckthorn stem wilt caused by *F. proliferatum* in Liaoning province, caused by *F. sporotrichioides* in Gansu province, and caused by *F. oxysporum* in Xinjiang , China.**

Disease resistance of SBT cultivars

Disease Index survey

201301

201302

201305

201308

201309

2013010

Hybrid SBT 54

Hybrid male SBT 1

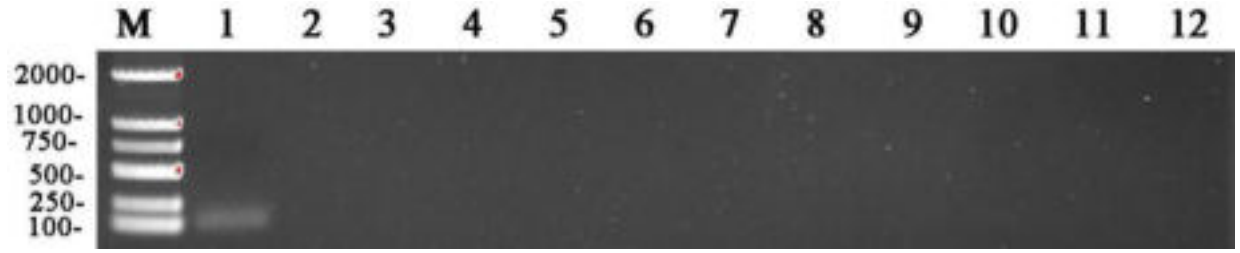
◆ Conclusion

- High resistant cultivars: native Chinese SBT (*Hippophae rhamnoides sinensis*)
- Resistant cultivars : SBT introduced from Russia (4 cultivars) ; hybrid SBT from China SBT and Russia SBT (4 cultivars)
- Middle resistant cultivars : SBT introduced from Russia (5 cultivars)
- Susceptible cultivars: SBT introduced from Russia (4 cultivars)

Construction of a quantitative detection system for seabuckthorn stem wilt

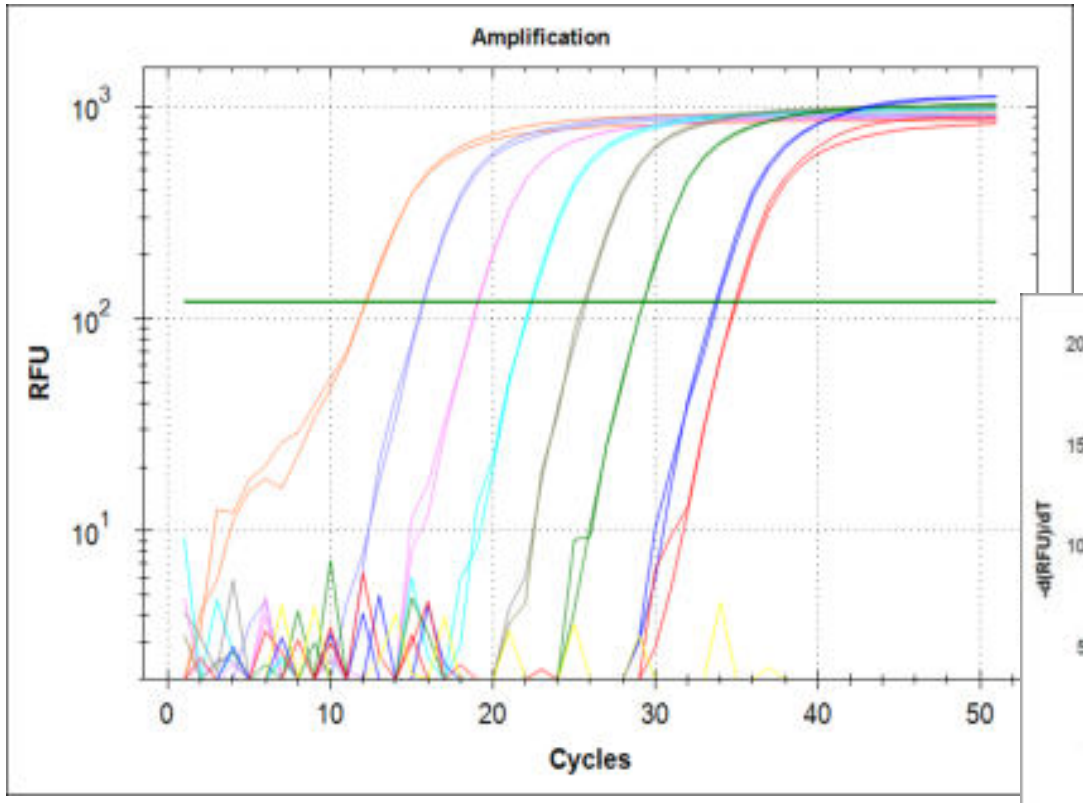
❖ Specificity and sensitivity

- ➢ONLY amplification with *F. sporotrichioides*
- ➢Soil: 10 spores/g

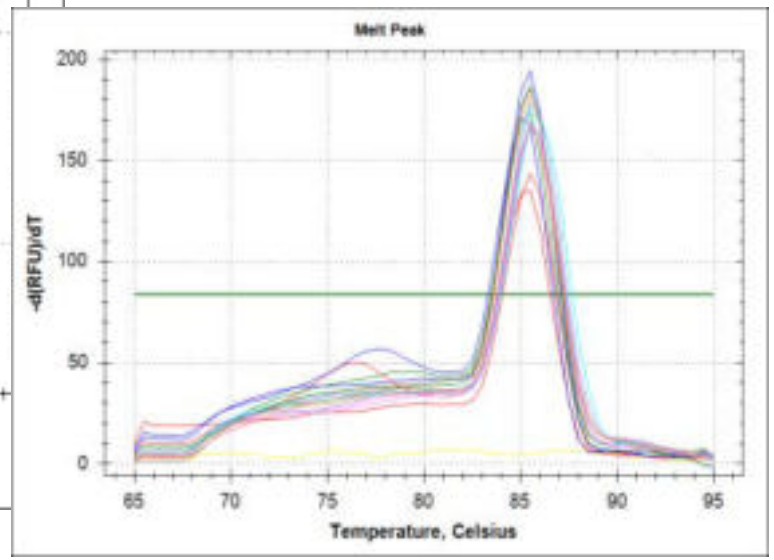


PCR Specific detection

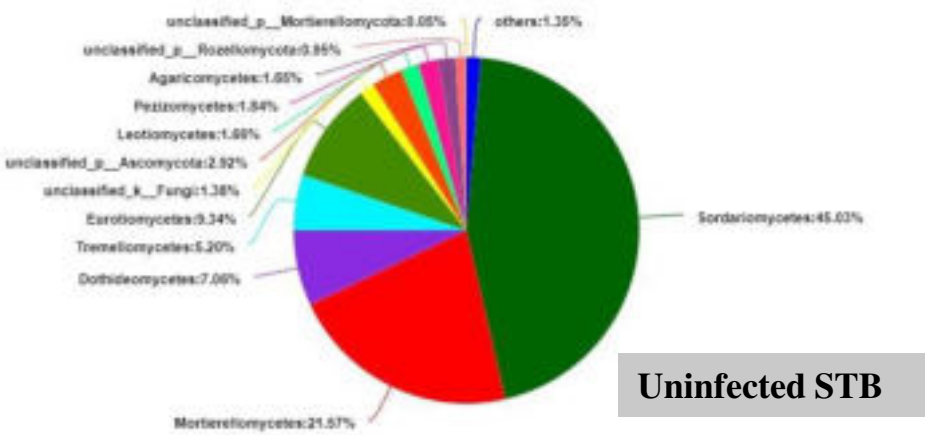
M: DL2000 DNAMarker; Lane 1–11: *F. sporotrichioides*; *Sclerotinia sclerotiorum*; *Colletotrichum sp.*; *Plasmodiophora brassicae*; *Rhizoctonia sp.*; *Fusarium oxysporum*; *Fusarium proliferatum* ; *Fusarium equisetum*; *Fusarium tricinctum*; *Gibberella sp.*; *Phomopsis cauliflorum*; 12: ddH_2O



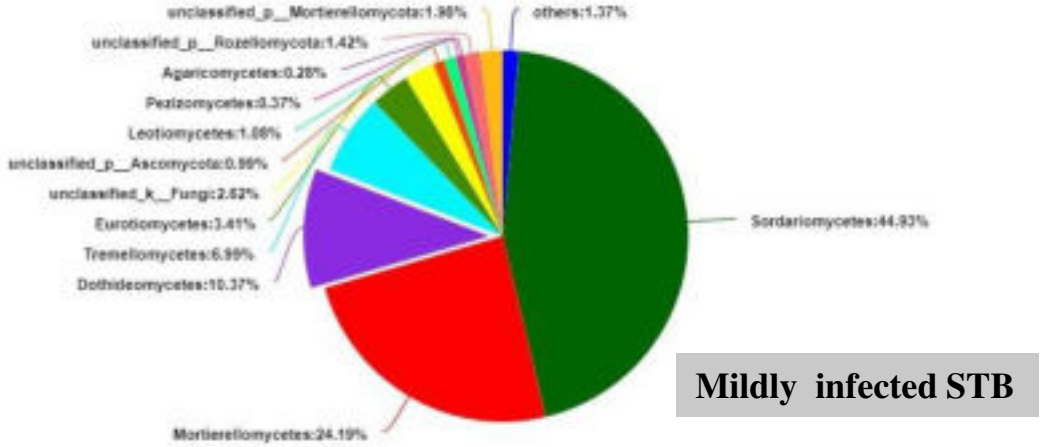
8 of gradient concentrations of resting spores in soil



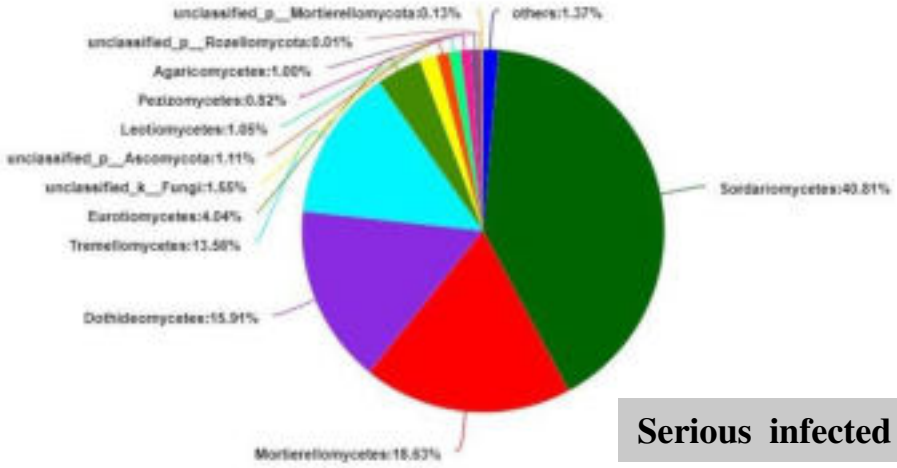
Characteristics of rhizosphere soil fungal diversity and community structure in SBT fields with different incidence of *Fuarium* Wilt by high-throughput sequencing



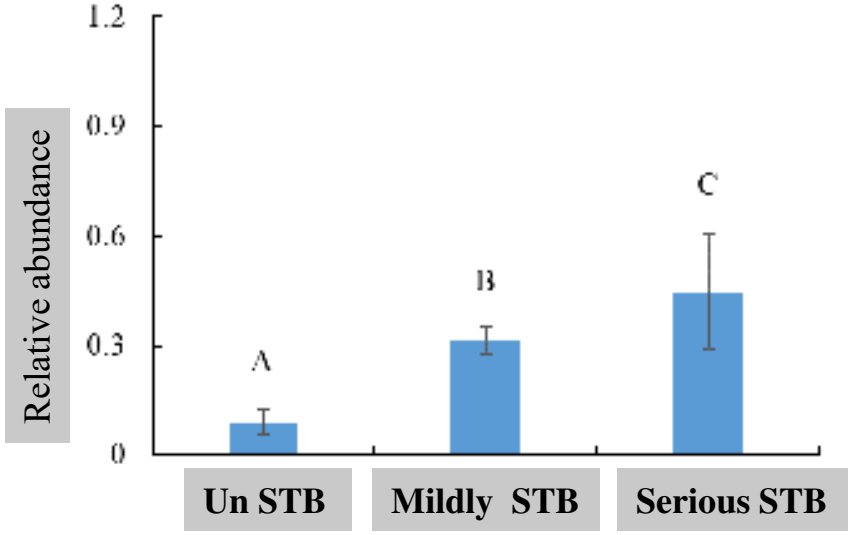
Uninfected STB



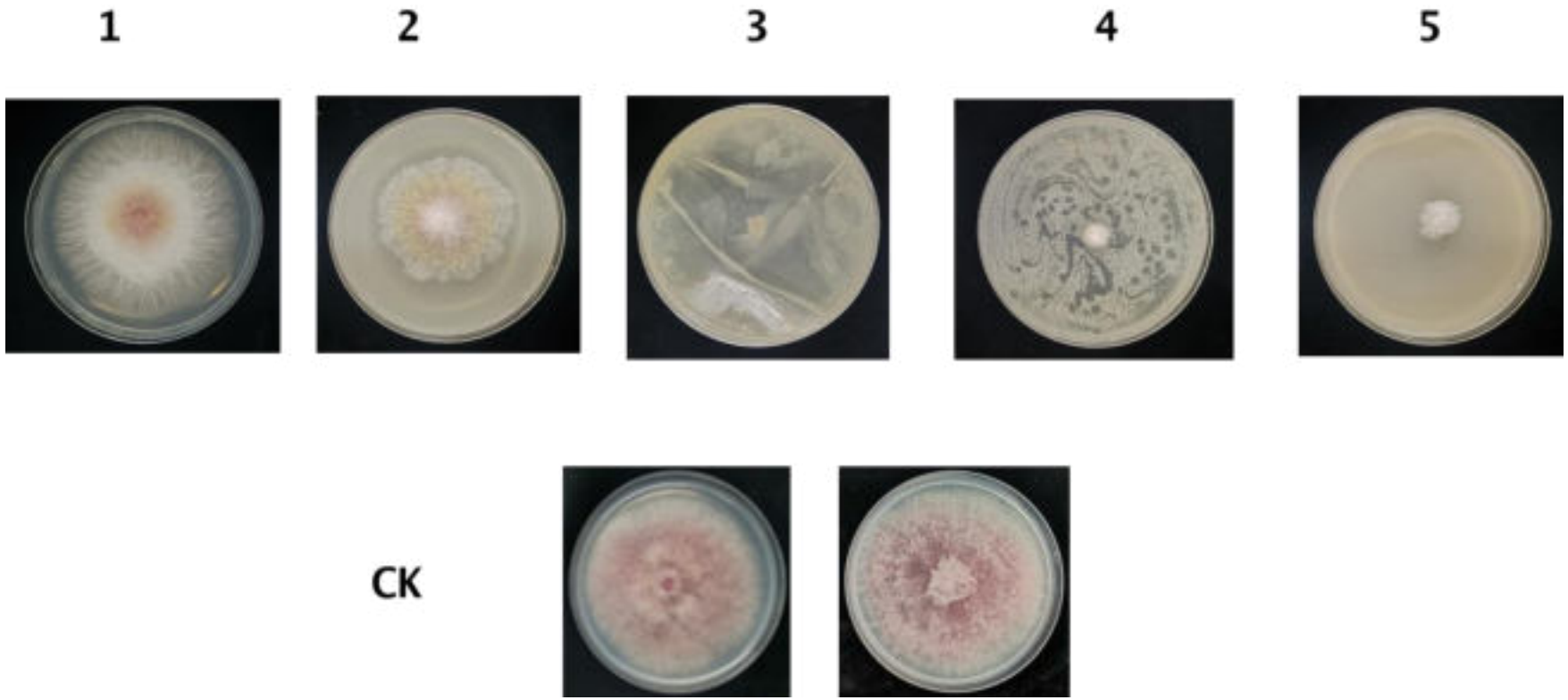
Mildly infected STB



Serious infected STB



Biological agent products screening and application



Biological agent products screening in Laboratory

•Lane 1–5: 5% Zhongsheng、 Live bacteria from sea、LV kangwei、Micro-ecological agents 、105 Billion live bacteria ; CK: *F. sporotrichioides*

Inhibition rate of different biological agent products on *F. sporotrichioides*

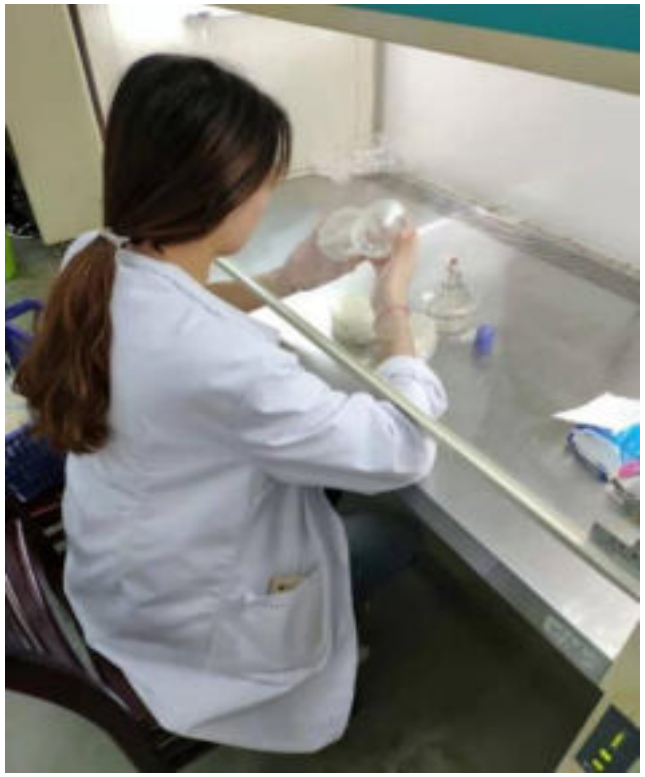
Products	Concentration （μL/mL）	Colony diameter （cm）	Inhibition rate (%)
Live bacteria from sea		3.75 ± 0.007 c	56.0 b
105 Billion live bacteria		**1.75 ± 0.006 b**	**82.6 c**
5% Zhongsheng	**0.001**	6.26 ± 0.01 d	21.8 a
LV kangwei		**0.62 ± 0.0004 a**	**97.8 d**
Micro-ecological agents		**0.53 ± 0.001 a**	**99.6 d**

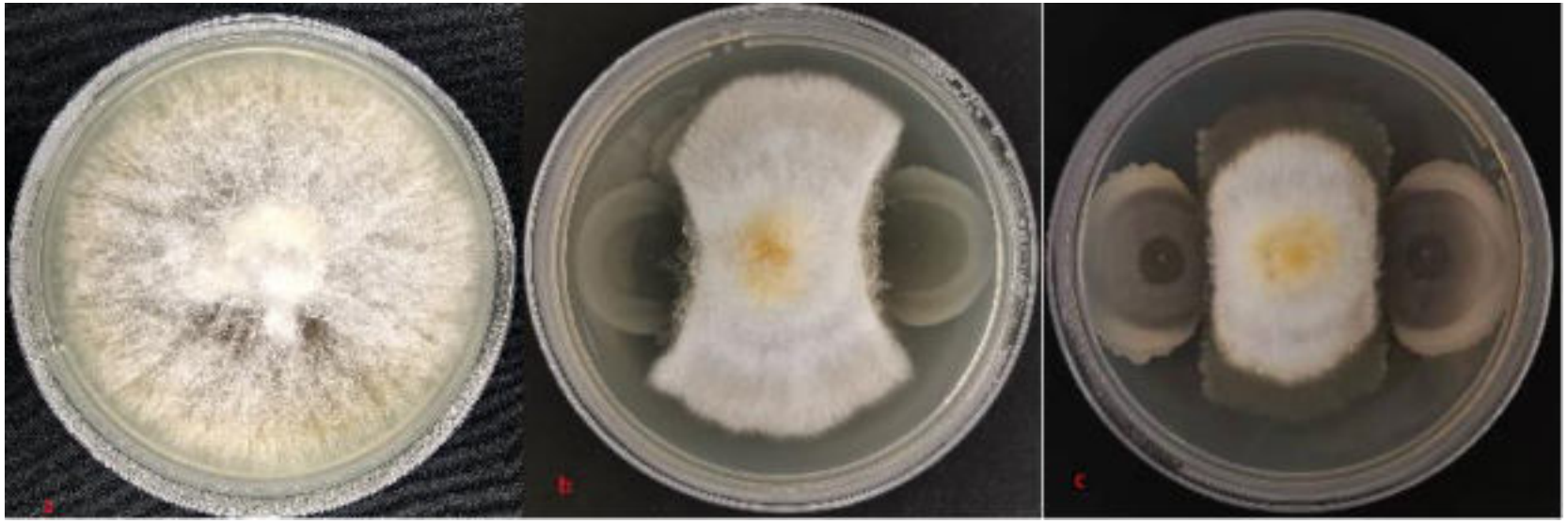
Control effect >80%

Spray 2-4 times in seedling period

Irrigating root in transplanting period，2-3 times

Biocontrol strains screening





a：CK，b：GT52-2，c：XJ-7


Thank you !