

INTRODUCTION

- The oriental fruit fly, *Bactrocera dorsalis* constitute the most invasive and economically important insect pest for mango production.
- Entomopathogenic nematodes (EPNs) are commonly used to control many insect pests across the world.
- Here, we investigated the use of EPNs (one *S. kandii* and two *H. taysearae* isolates) and their formulations for the biological control of *B. dorsalis* under lab and field conditions.



OBJECTIVES

Evaluate the invasion time and the nematode virulence under semi field conditions

Evaluate the persistence of indigenous EPNs in mango orchards in northern Benin

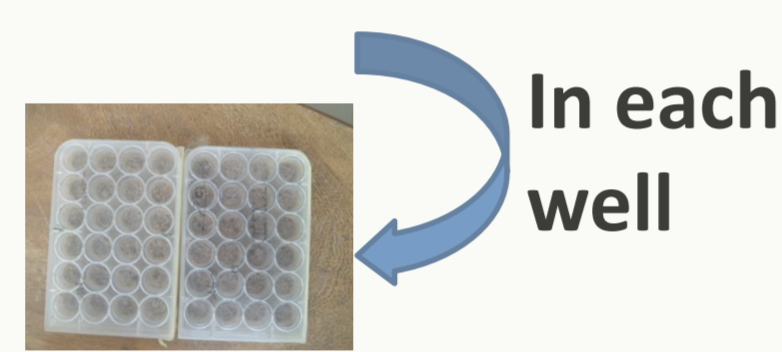
Determine the suitable formulations of EPNs to be used in biocontrol of mango fruit flies.

MATERIALS & METHODS

Invasion time and EPN virulence

- B. dorsalis* were exposed to EPNs during 2, 4, 6, 8 and 24 h, incubated at 28 °C and dissected to evaluate IJ penetration %.
- Under semi field conditions, two week-old EPN infected *Galleria mellonella* (Gm) larvae were applied in plastic pots half buried in mango field containing *B. dorsalis* L3 larvae

100IJs+ 1ml water+ 13.2g of sterile (80°C, 72 h) sand (< 2 mm)+ one *B. dorsalis* larva



EPN persistence in mango field

- EPN infected cadavers of Gm were used as EPN formulation
- 1m² plot treated with 50 infected Gm
- Modified method of Ferguson et al. (1995) to collect data



Infected Gm larvae



EPN formulations



Clay, charcoal, starch and kaolin adjuvants tested in solid and liquid formulations



Baiting method to count survived nematodes after 14 days of incubation

RESULTS

- Under lab conditions, all the three nematode isolates could penetrate insect larvae during 2 h of exposure time (Fig.1)
- Under semi field conditions, the three nematode isolates were highly pathogenic to *B. dorsalis* with *H. taysearae* Hessa1 being the most virulent (70.84% ± 10.46 [SEM] mortality. (Fig.2)
- Under Field conditions, *S. kandii* persisted in soil up to 32 weeks after nematode application whereas both *H. taysearae* persisted 30 weeks post application in the mango orchard. (Fig.3)
- In general, four weeks after nematode application, the density of infective juveniles decreased considerably and remained variable the following sampling dates. (Fig.3)
- Preliminary results show that all the three isolates survived well in the tested adjuvants with the clay-based formulation showing the better performance.

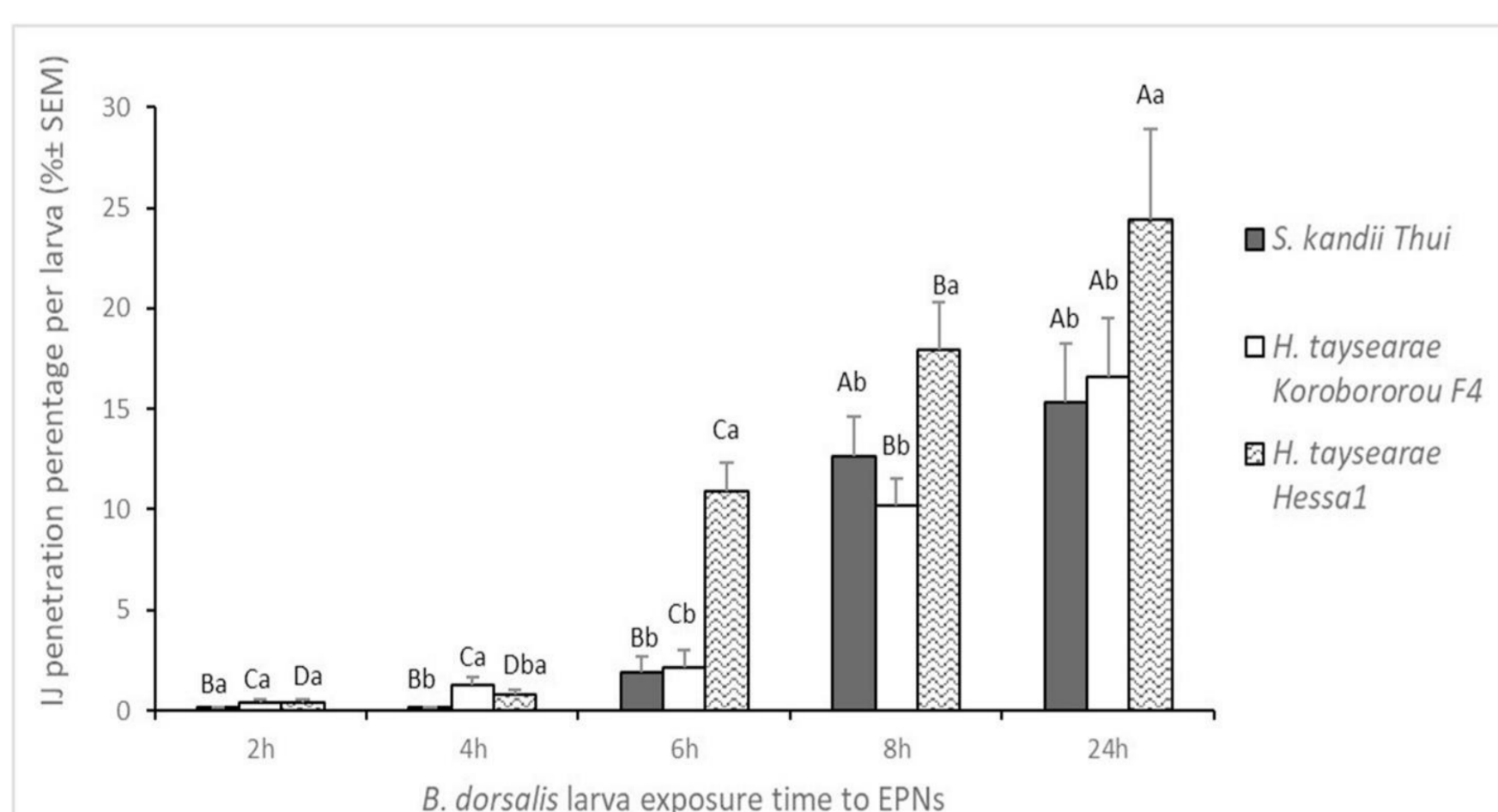


Fig. 1. Penetration percentages (% IJs of inoculated IJs ±SEM) of IJs of three different EPN isolates inside a *B. dorsalis* third instar larva

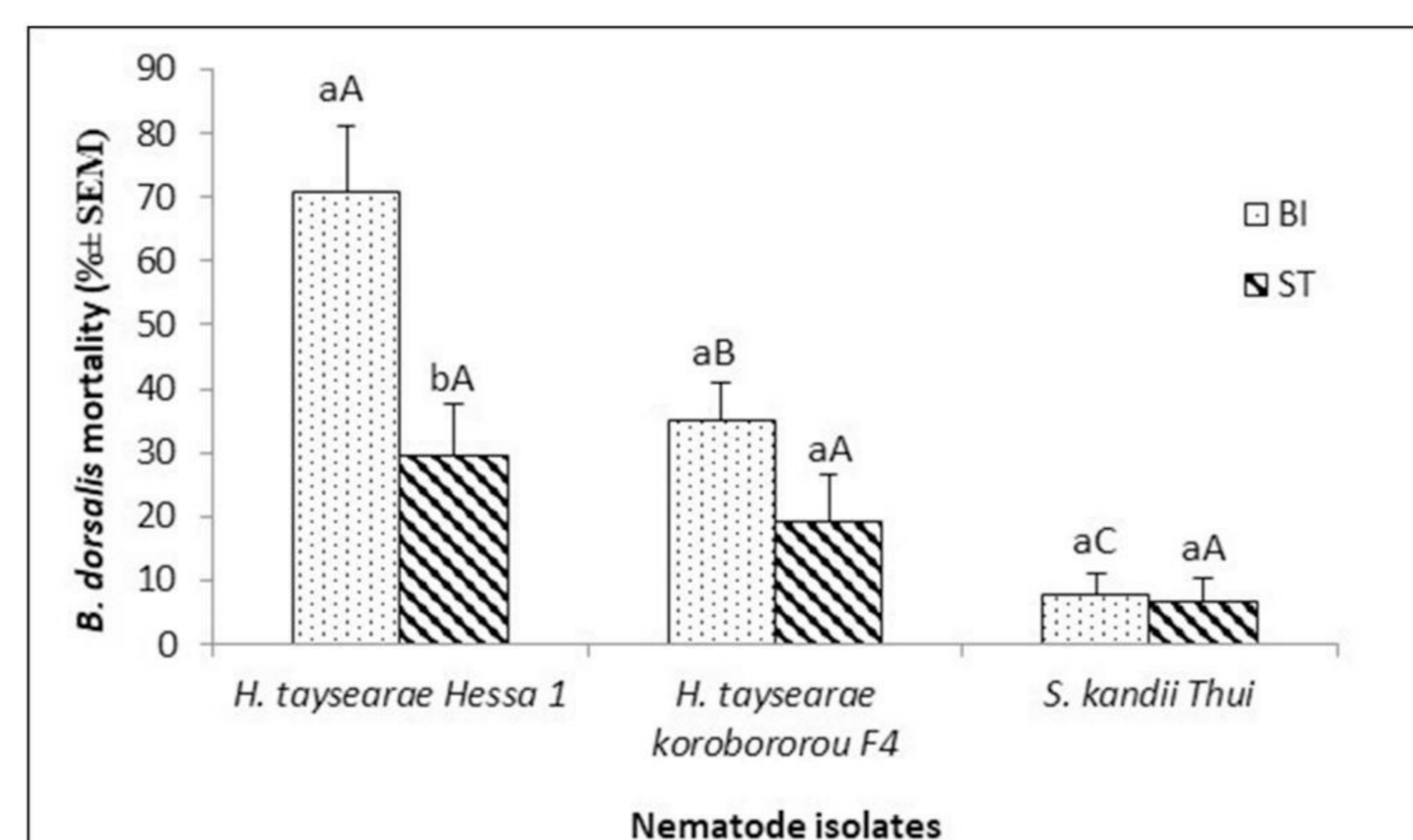


Fig. 2. Mortality (% of introduced larvae in pots ±SEM) of *B. dorsalis* insect induced by three nematode isolates. BI= EPN applied 3 days before the presence of the insects in the pots. ST= EPN applied the same time as the presence of insects in the pots.

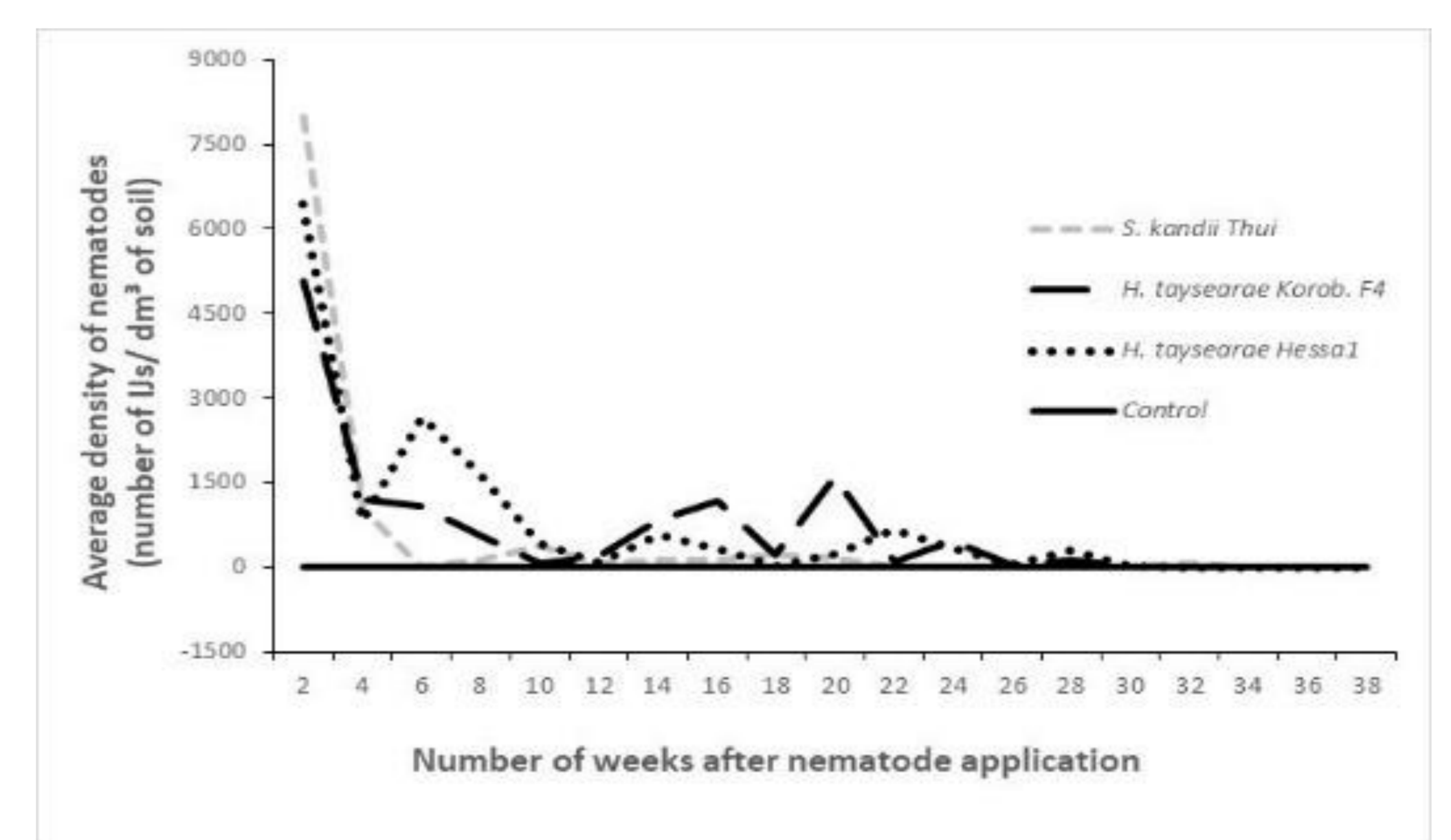


Fig.3. Persistence in the soil of three EPN Isolates in mango orchard

FUTURE PERSPECTIVES

Experiments are ongoing in the lab and glasshouse conditions to determine the suitable formulations of EPNs to be used in biocontrol of mango fruit flies.