

How to remove *Pratylenchus penetrans* by using Marigold

Kobe High School Science course, Grade 1 Takuto Ikeda Go Ishiharada Jo Sugawa

Tomoya Tanaka Yusuke Fukuhara Koki Motomura

Introduction

Recently, the damage to the crops by nematodes is reported to be a serious problem. So, we thought that we can use marigold to make an eco-friendly way that is effective against nematodes. Researching the differences by marigold parts, we could make eco-friendly agricultural chemicals which can remove nematodes.

Pratylenchus Penetrans

A species of nematode. It occurs in temperate regions worldwide, regions between the subtropics and the polar circles. It is an animal that inhabits the root of a wide variety of plants and results in killing the plants. (We call *Pratylenchus penetrans* simply "Pp") In our experience we used Pp produced by NARO.



Figure1:Pp

Hypothesis

Much effective substance is in the root because Pp inhabit in the ground.

Method

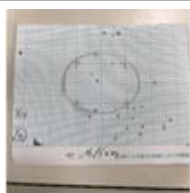


Figure 2 :
Position of Pp



Figure 3 :
The photograph of experiment

- Concentration of agar is set by 2.0%
1. Divide marigold to 4 parts; root, leaf, stalk, flower.
 2. Mash them by using a pestle and mortar.
 3. Make five agar plates.
 4. Put them on each four plates. We also make another one plate without marigold.
 5. Set the standard on 15mm from the center of agars.
 6. We put Pp on four points on the standard on each plates.

Result

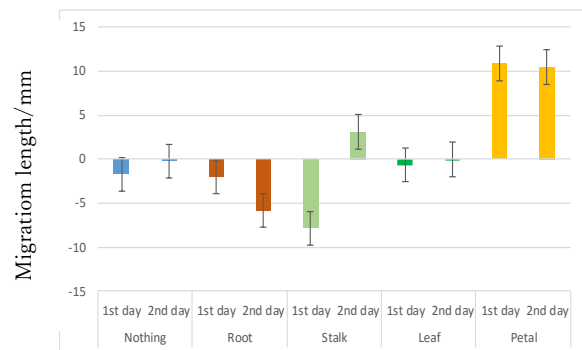


Figure4: Migration length

Root: It attracted Pp.

Stalk: It attracted Pp once, but Pp spread as time passed.

Leaf: It attracted Pp.

Flower: It did not attract Pp.

(Pp were alive for two days on all agar.)

Consideration

All parts did not kill Pp at all. Flower kept Pp away from itself, but the others didn't. Therefore in order to keep Pp away from grown plants, we thought we should blend flower of marigold with soil. Because, however, some researchers assert that root can exterminate Pp, Pp may die by eating or touching the root.

Reflection · Prospect

We couldn't study difference of effect by amounts of marigold. There are a few frequencies of the observation and an observation period also seems to have been short. We would like to change the condition and check more with considering these points. Finally, we would like to establish the best way of Pp extermination.

Reference

Takayuki Mizukubo/ Kazuyoshi Futai (2014)
"NEMATOLOGICAL EXPERIMENTATION" Kyoto University Press
Data by Dr. Iwahori in faculty of agriculture at Ryukoku University
対抗植物、天敵微生物等を利用した線虫防除技術,
https://www.naro.affrc.go.jp.training/files/2005_1-06.pdf,
(2018/01/26 last visit)