Application of Luminescent Mushroom "Sirin Rassamee" (*Neonothopanus nambi* Speg.) for Controlling of Root - Knot Nematode (*Meloidogyne incognita* Chitwood) in Chilli

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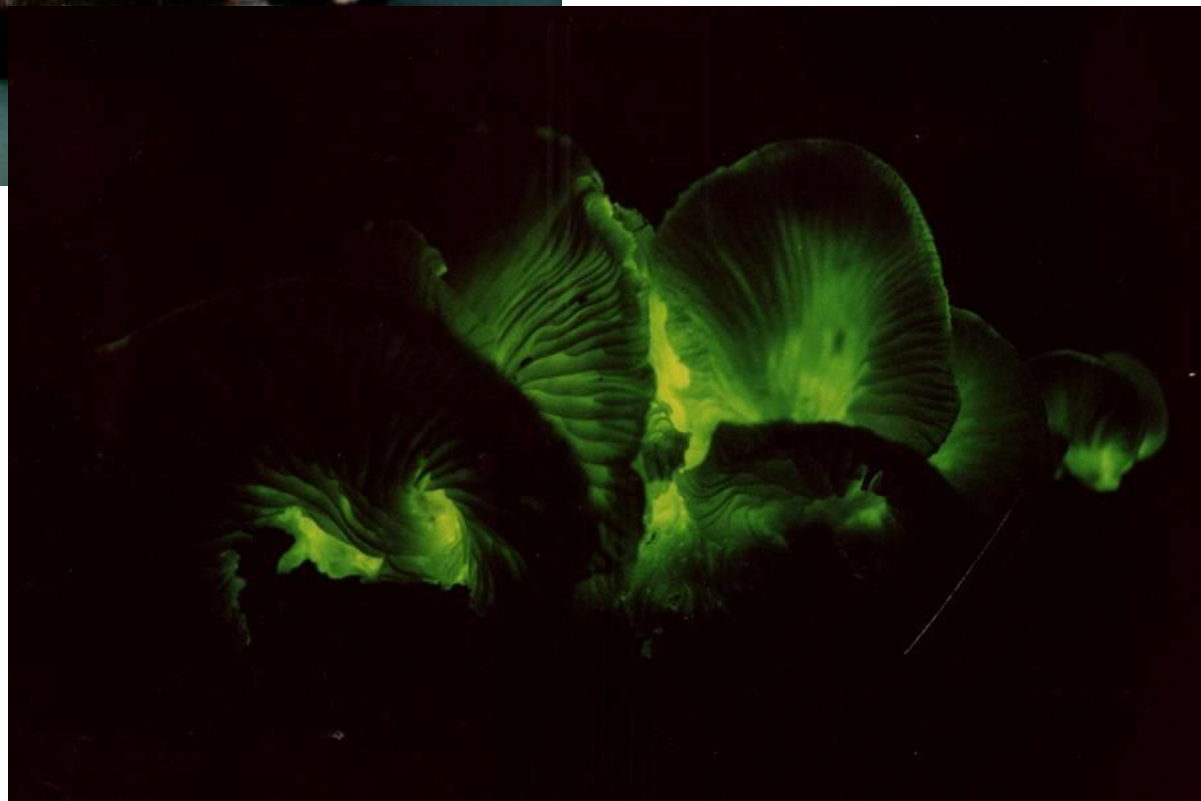


Luminescent Mushroom

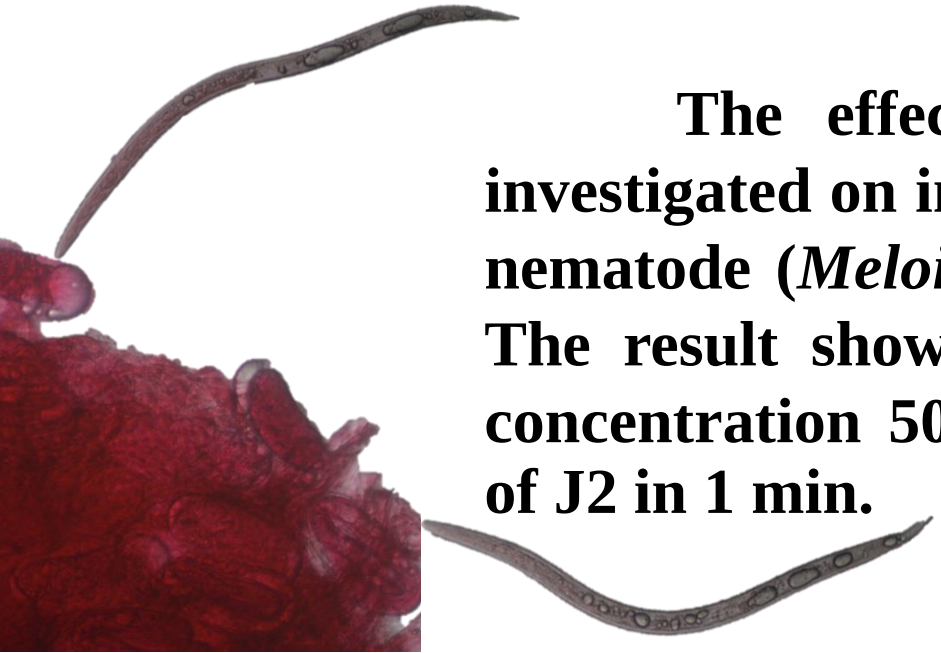
Luminescent Mushroom "Sirin Rassamee"

"Neonothopanus nambi"

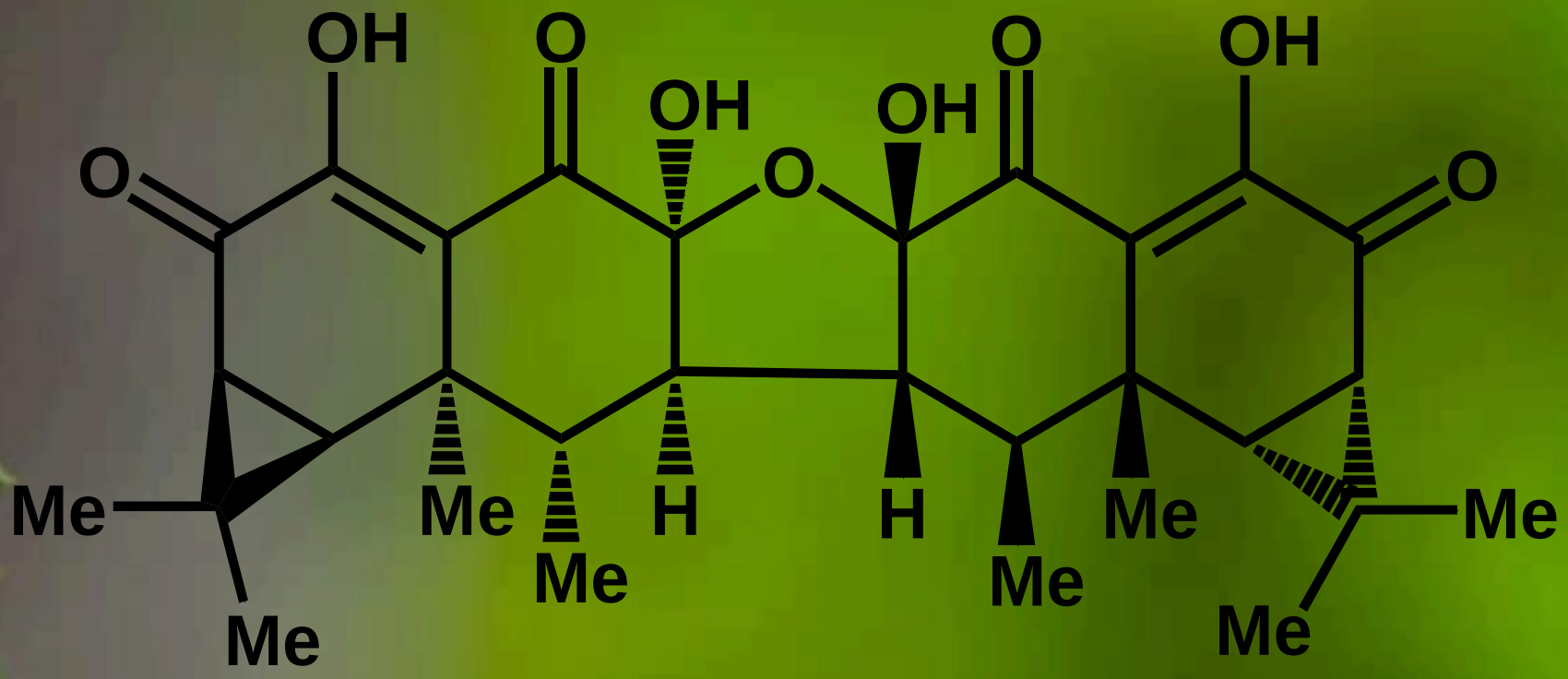
Weerasak Saksirirat

Applications of Luminescent Mushroom

Bua-art (2007) The initial extraction and isolation of bioactive compound was done by using Thin Layer Chromatography (TLC). An interesting bioactive compound was found on several layers on TLC.



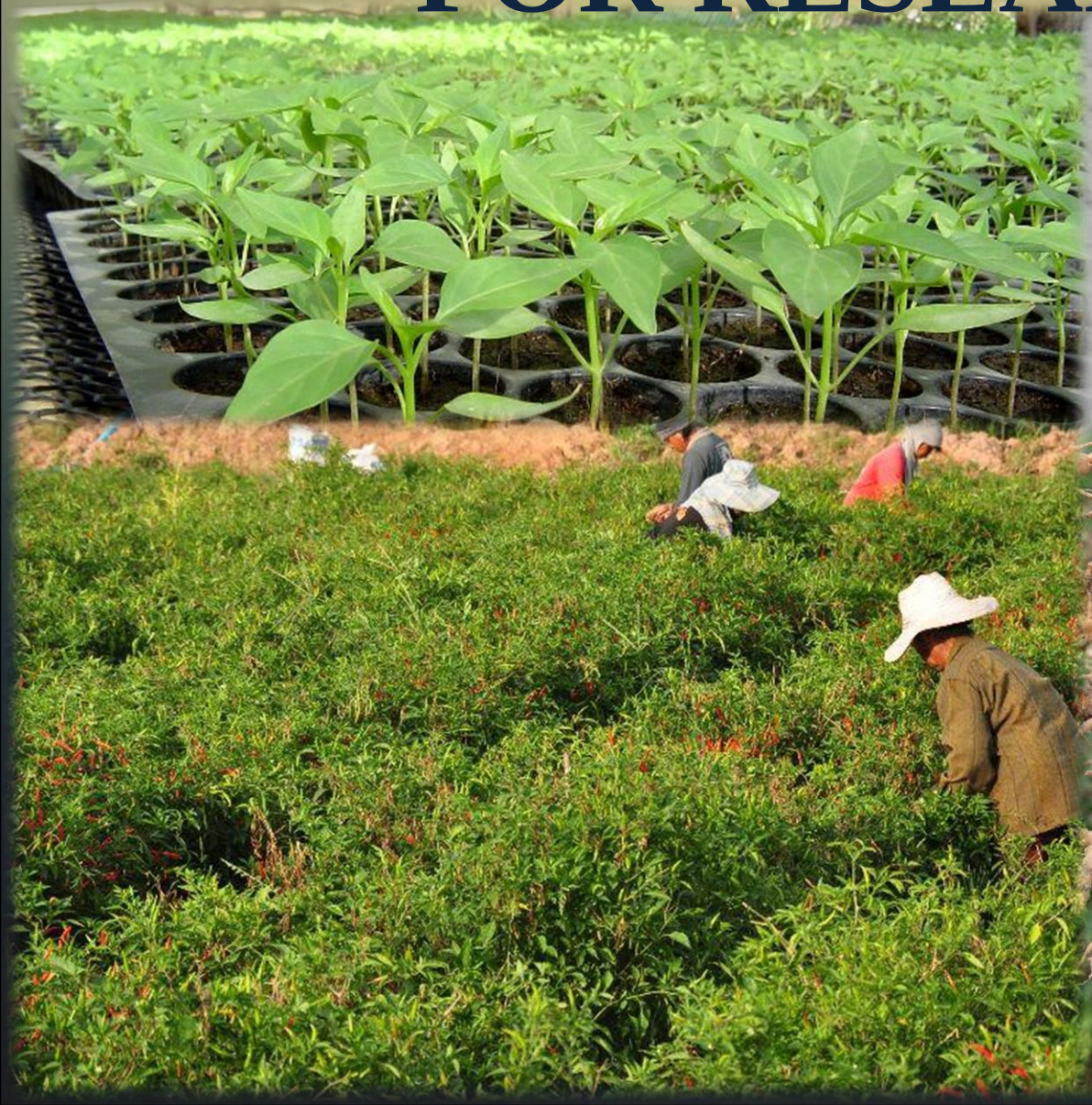
The effect of bioactive compound was investigated on infectious larvae (J2) of root-knot nematode (*Meloidogyne incognita*) in laboratory. The result showed that bioactive compound at concentration 500 mg/l caused 100 % mortality of J2 in 1 min.



Aurisin A

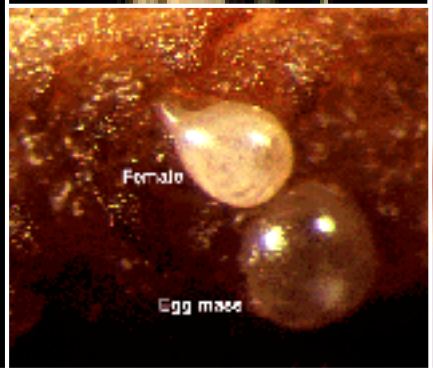
Fig. 1 A chemical structure of bioactive compound aurisin A obtained from *Neonothopanus nambi* isolates PW2

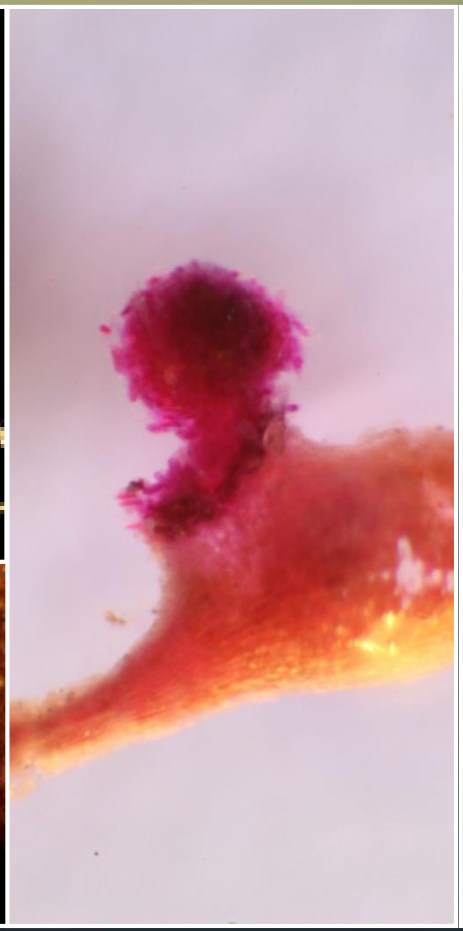
SOURCES OF PROBLEMS FOR RESEARCH



Root knot nematode :

Meloidogyne incognita Chitwood





Control of Root-Knot Nematodes

- Tillage
- Flooding
- Crop rotation
- Chemicals

Objectives:

study is to apply the luminescent mushroom to control root-knot disease of chilli caused by *Meloidogyne incognita* in farmer field




In pots

Spawn of 10, 20, 30, 40 and 50 g/plant were infested in chili plants grown in pots. Galling percentage was evaluate on 45 days after treated with spawn. The result indicated that all rate of spawn suppressed root galling. In particular, the treatment of 10 g/plant reduced significantly 84.6% (galling index 12.40%). While in control and chemical treatments, galling indexes were 75.60 and 60%, respectively.

In Block

The high potential of biological control agent was at 10 gram/plant that gave the lowest percentage of root galling (11.25%). when compared to the control treatment (inoculation with root-knot nematode only) which was 72.25%.

Materials and Methods

Experiment comprised 4 treatments, 5 replications and using randomized complete block design (RCB)

Treatment 1 : using spawn 10g/plant
Treatment 2 : using sunn hemp + spawn 10g /plant
Treatment 3 : using sunn hemp
Treatment 4 : control

Materials and Methods

Target area

Sunn hemp
(*Crotalaria juncea*)
5 kg /rai

Initial population

Size 3.5 x 5.5 m, distance 30x50 cm

Isolates
PW2

Spawn of *Neonothopanus nambi*

Planting chilli

Recording after 90 days treated

- plant height (cm)
- fresh fruit weight (Kg)
- percent root galling; corresponding to a scale proposed by Kinloch (1990) where

0 = no galls
1 = very small galls
2 = <25% very small galls
3 = 25–50% small and large galls
4 = 50–75% small and large galls
5 = >75% small and large galls

RESULTS

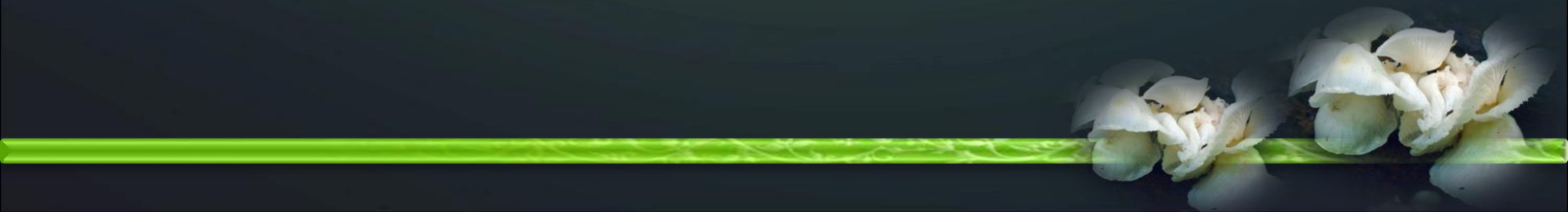


Table 1 Effect of mycelium from spawn of *Neonothopanus nambi* on percent root galling, plant height and Yield of chili variety Haurue were evaluated at 90 days after treatment

Treatment	Root galling (%)	Height (cm)	Fresh fruit weight (kg)
using spawn 10g/plant	2.36 a	84.25 a	4.70 a
using sunn hemp with spawn 10g /plant	2.45 a	72.80 b	4.12 ab
using sunn hemp	57.50 b	63.99 c	3.70 b
control	88.00 c	59.55 c	2.66 c
F-test	**	**	**
C.V.(%)	28.07	8.97	12.43

using spawn 10g/plant

using sunn hemp with spawn 10g /plant

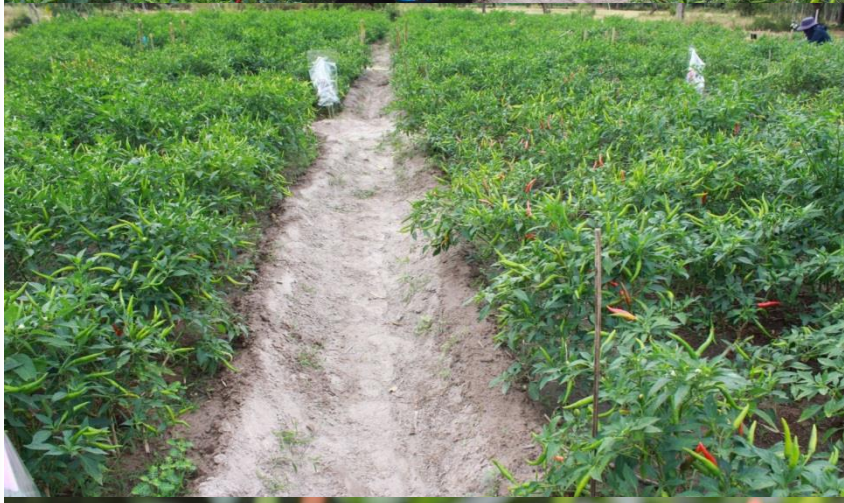
using sunn hemp

Control

Control


using spawn 10g/plant


TRADE MARK



Conclusions

- spawn 10g /plant reduced root gall of 2.36 and 2.45% , respectively, and significant different ($P<0.01$) to using only sunn hemp and control treatment (No use of luminescent mushroom and sunn hemp with root galling scores of 57.50 and 88%, respectively.

- using spawn 10g/plant provided the highest plant of 84.25 cm. The second height obtained from using sunn hemp with mushroom spawn (10g/plant) expressed plant height of 72.80 cm., which significantly different ($P<0.01$) with using only sunn hemp and control treatment (63.99 and 59.55 cm., respectively).

- For fresh fruit weight, using mushroom spawn (10g/plant) was the best method gave rise to high yield of chilli fresh fruits 4.70 kg. However, it was not significantly different with using sunn hemp plus spawn (4.12 kg), but significant to control treatment (2.66 kg).

Conclusions

- Bioactive compound from *N. nambi* for biological control plant parasitic nematode, *M. incognita* without adverse effect on beneficial organisms.

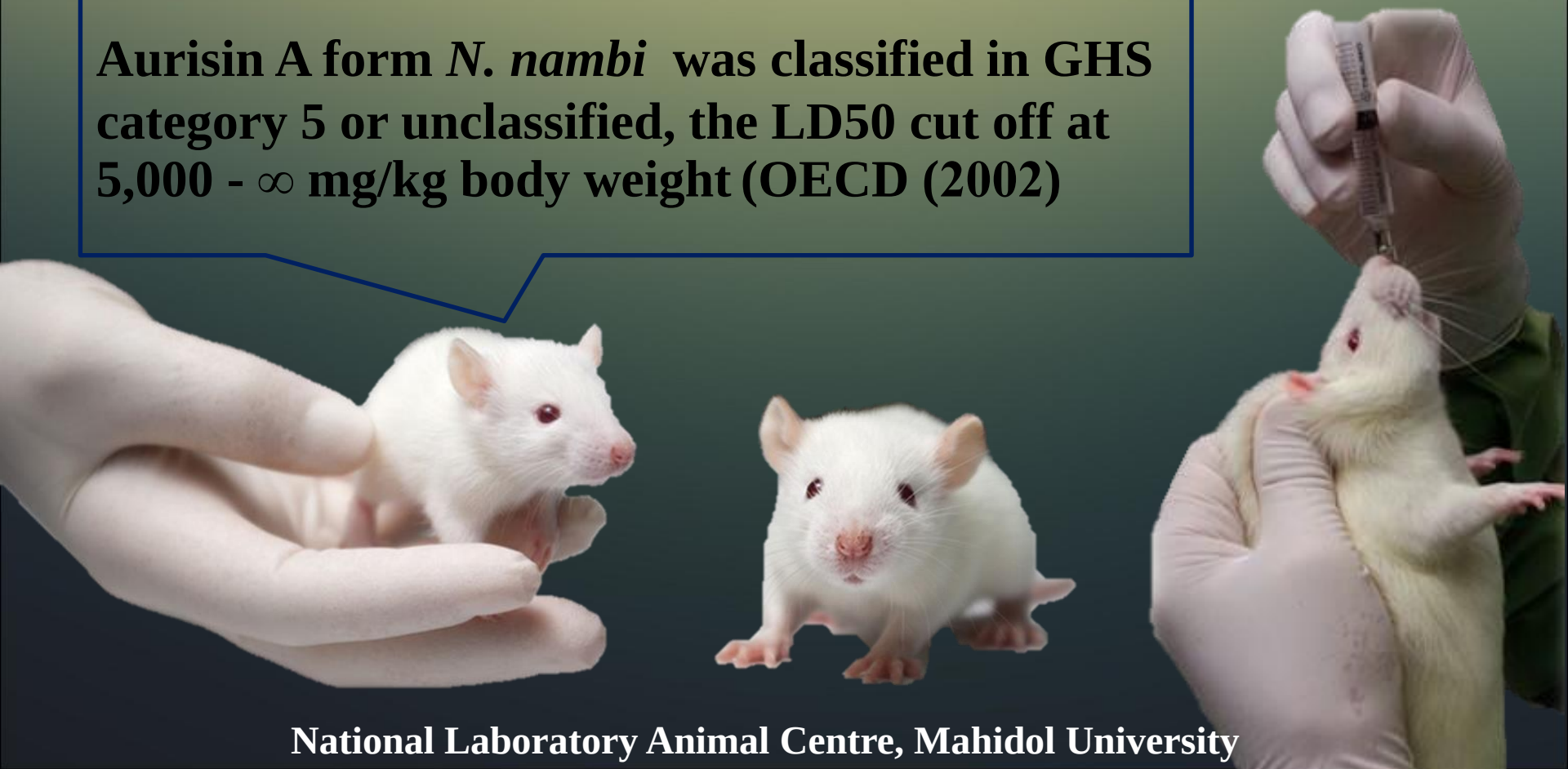
- Safety

Acute Oral Toxicity of Aurisin A in Wistar rats

(OECD Guidelines for the testing of chemicals 423)

NSTDA

Aurisin A form *N. nambi* was classified in GHS category 5 or unclassified, the LD50 cut off at 5,000 - ∞ mg/kg body weight (OECD (2002)



National Laboratory Animal Centre, Mahidol University


Cocoons
Juvenile
Earthworms


T1=10g


T2=20g


T3=30g

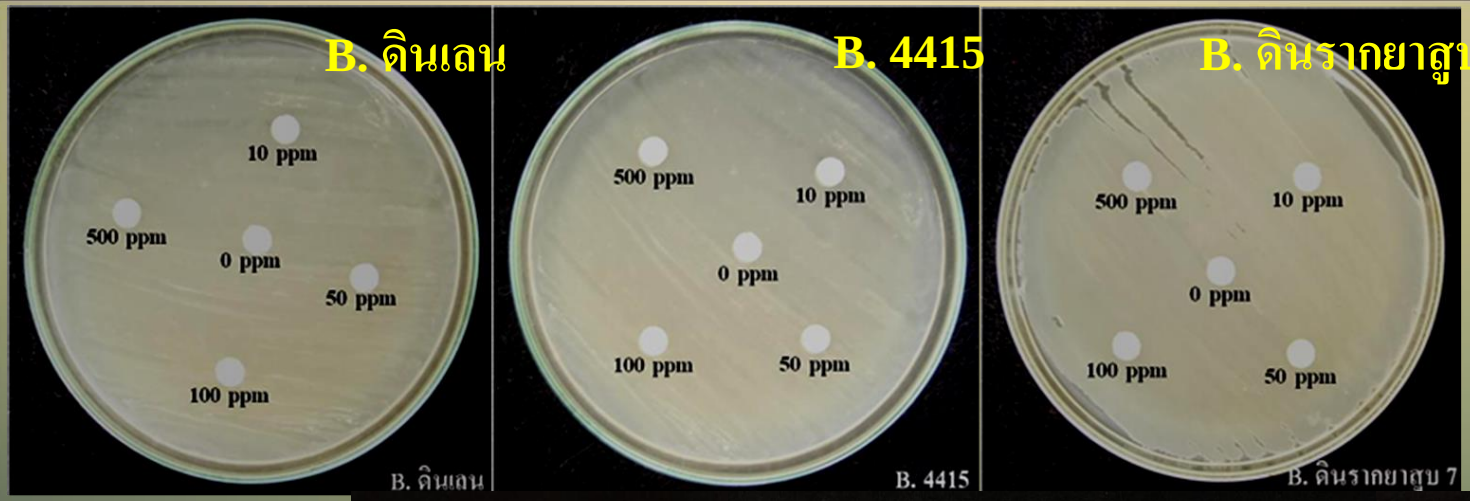

T4=40g


T5=50g


T6=100g


T7=Control


T7=Control


B. ดินเลน
10 ppm
500 ppm
0 ppm
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B. ดินเลน
B. 4415
500 ppm
10 ppm
0 ppm
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50 ppm
B. 4415
B. ดินรากยาสูบ
500 ppm
10 ppm
0 ppm
100 ppm
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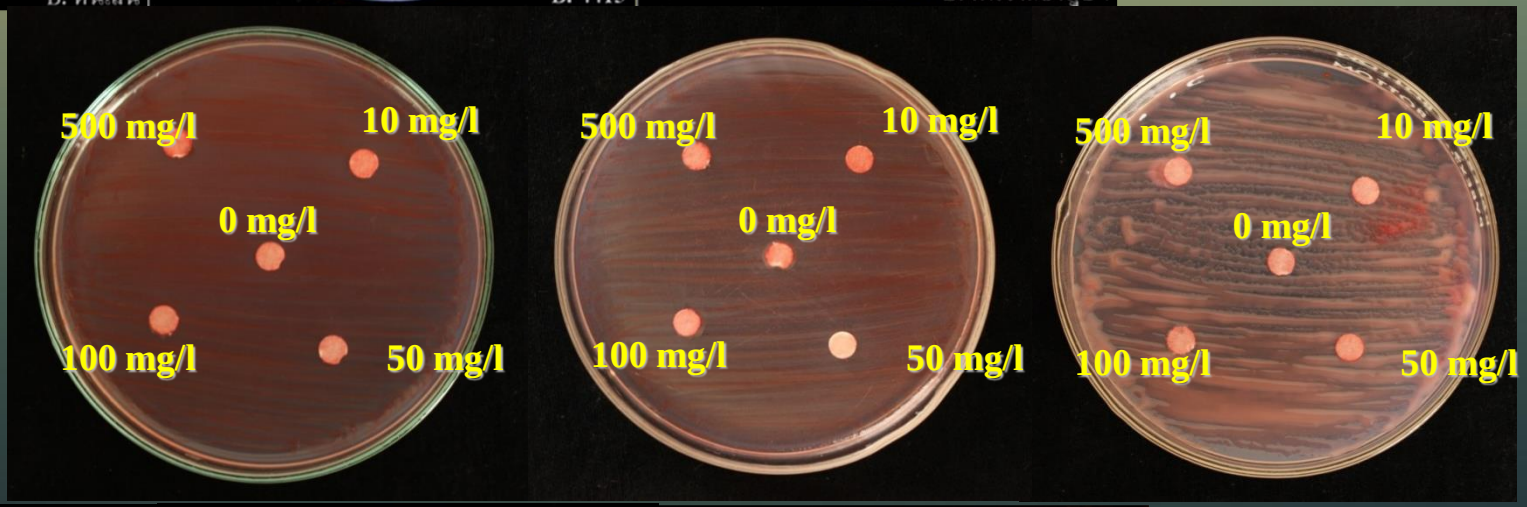
B. ดินรากยาสูบ 7


500 mg/l
10 mg/l
0 mg/l
100 mg/l
50 mg/l
500 mg/l
10 mg/l
0 mg/l
100 mg/l
50 mg/l
500 mg/l
10 mg/l
0 mg/l
100 mg/l
50 mg/l


T85
T13
T14

Potato

Potato

CASSAVa


Cassava


15:38

Acknowledgements

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NSTDA

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Assoc. Prof. Dr. Weerasak Saksirirat


Thank you

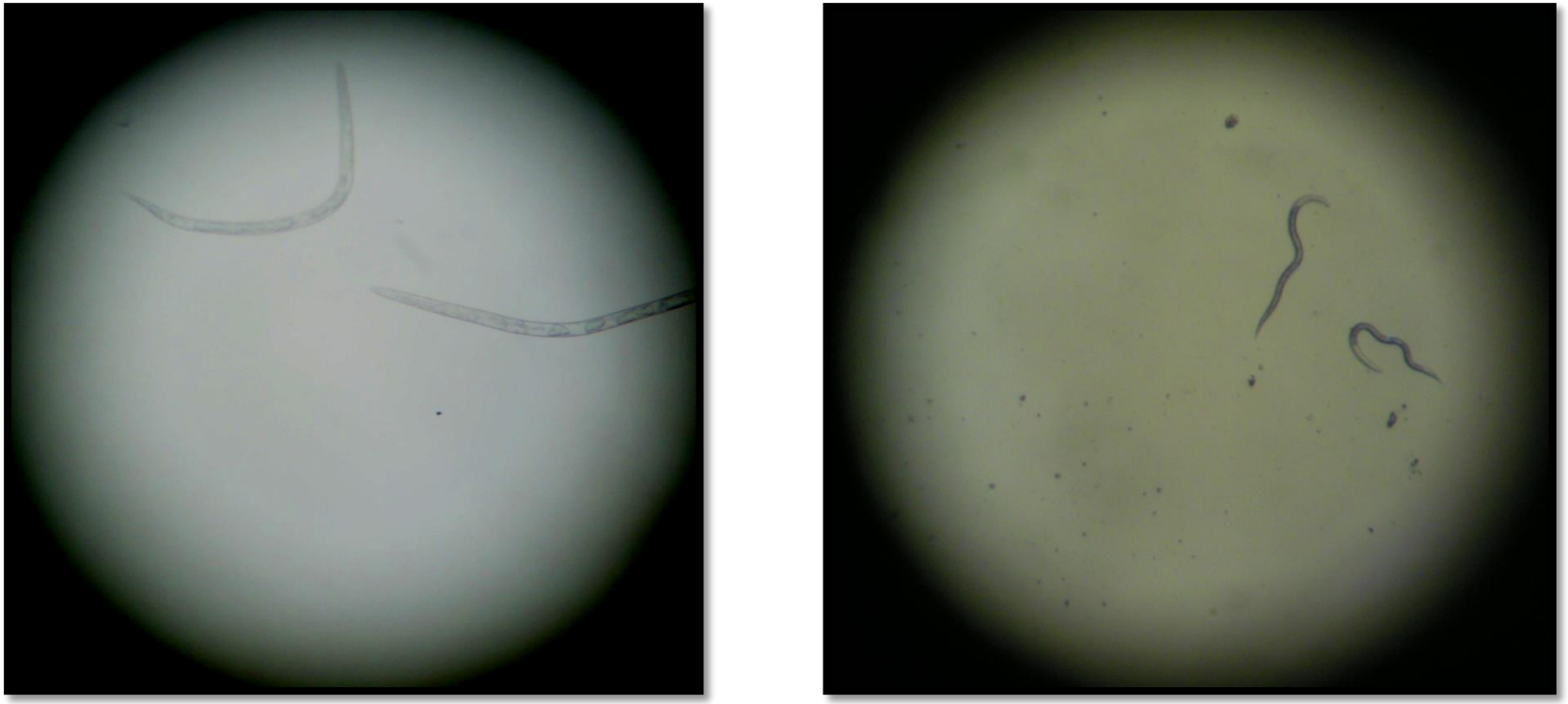

Figure 2 Infective larvae of *S. carpocapsae* are still alive after 260 hours treated with aurisin A.

V_Steiner\PIC_0041OK.AVI

Figure 1 Video of *Meloidogyne incognita* (J2) at 60 second after treated with 500 mg/l of aurisin A

Figure 2 (Continues) Video of *Meloidogyne incognita* (J2) after treated with 500 mg/l of aurisin A