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ISOP 2025

# Efficacy of botanical extracts against *Pomacea canaliculata* in Organic Rice Production in Vinh Long, Vietnam

Lang Canh Phu & Lang Tran Hong Ngoc

- Presenter: Lang Tran Hong Ngoc

Plant Protection Department, College of Agriculture, Can Tho University

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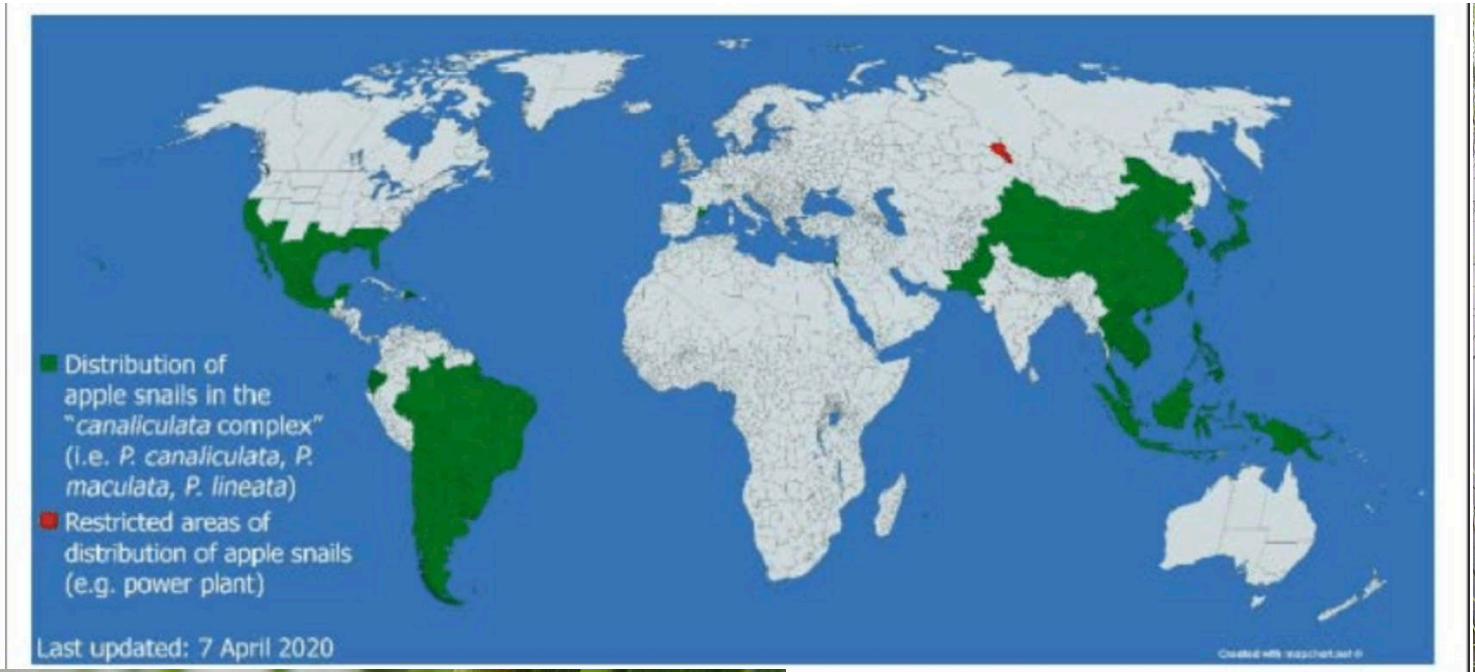
# INTRODUCTION







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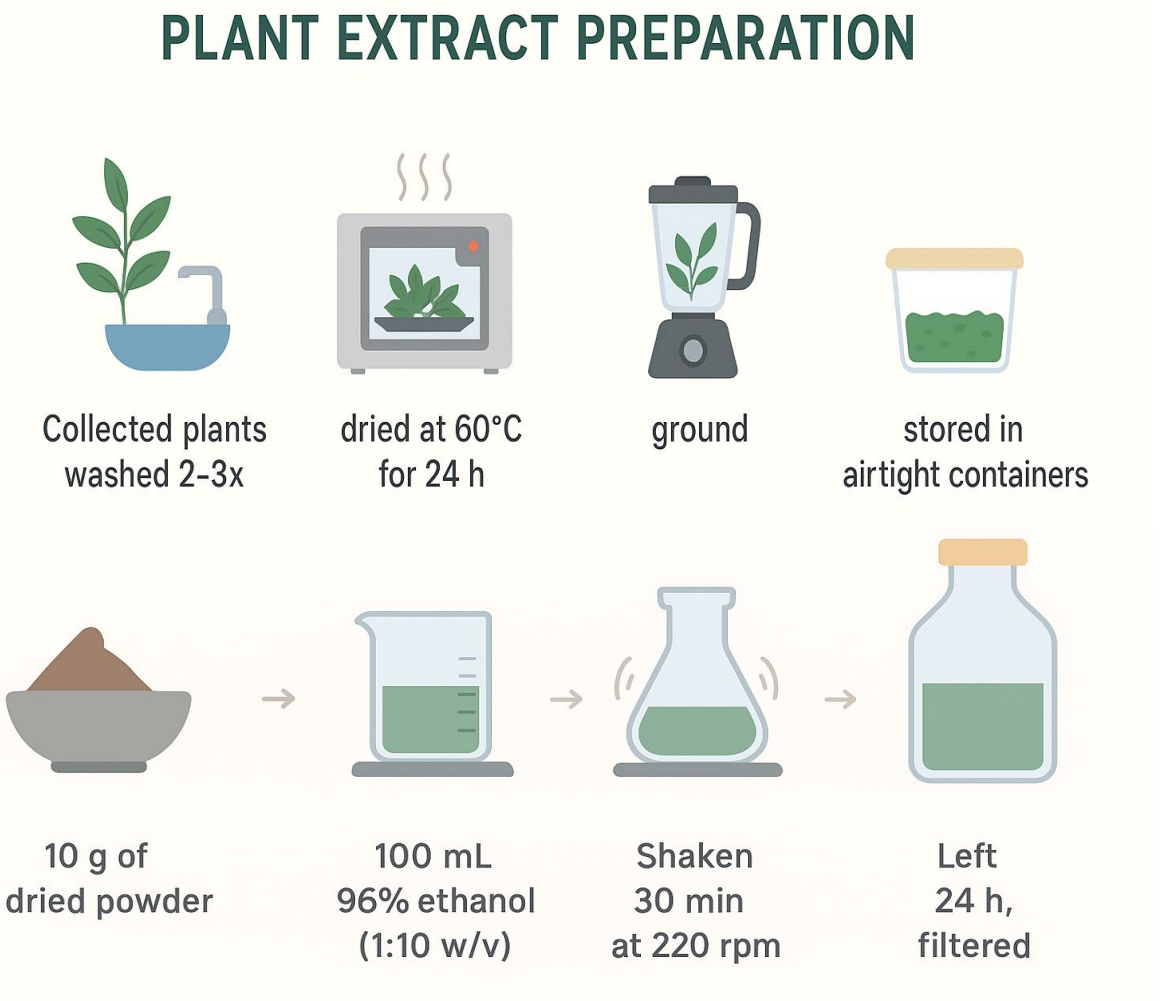
# MATERIAL AND METHOD

OrganoRice ISOP 2025

## I. Selection of some plant extracts in GAS control at under laboratory




**Experimental Design:**

**Completely randomized design**, 20 plant extracts, 3 replicates per treatment; each replicate = tray with **3 cm water + 10 snails**.

**Test and Data Analysis:**

**Observation:** Snail mortality recorded at **1 h, 8 h, 24 h, 48 h, 72 h** after treatment.

**Efficacy Calculation (Schneider–Orelli):**

$$E(\%) = \frac{B - K}{100 - K} * 100$$

B = % mortality in treatment

K = % mortality in control

**Data Analysis:** Using **MSTAT-C**

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# PLANTS USED IN THE EXPERIMENT

OrganoRice

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**Trâm ổi**
*Lantana camara*

**Neem**
*Azadirachta indica*

**Cúc Sài Đất**
*Sphagneticola calendulacea*

**Thuốc Cá**
*Derris elliptica*

**Bàm Bàm**
*Entada phaseoloides* L.

**Đinh Lăng**
*Polyscias fruticosa*

**Ngũ Gia Bì**
*Schefflera octophylla*

**Trầu**
*Piper betle* L.

**Cứt Lợn**
*Ageratum conyzoides* L.

**Me**
*Tamarindus indica* L.

**Tràm Bông Vàng**
*Acacia auriculiformis*

**Mật Gấu**
*Vernonia amygdalina* Delile

**Thân Đậu Ma**
*Neustanthus phaseoloides*

**Ổi**
*Psidium guajava* L.

**Huỳnh Anh**
*Allamanda cathartica* L.

**Trang Trắng**
*Ixora finlaysoniana* Wall.

**Lá Lốt**
*Piper lolot*

**Bảy Sắc**
*Tradescantia spathacea*

**Bàng**
*Terminalia catappa* L.

**Dã Qùy**
*Tithonia diversifolia*

# II Selection of some plant extracts in GAS control at greenhouse

**Experimental Design:**

The experiment was arranged in a completely randomized block, with five treatments: an untreated control, a molluscicide treatment, and three types of plant extracts (selected from 20 types of plant), each with four replications. Every replication consists of a tray with 100 rice plants and a 2 cm water level. Each tray includes 5 snails.

**Test and Data Analysis:**

**Observation:** Snail mortality recorded at **1 h, 8 h, 24 h, 48 h, 72 h** after treatment.

**Efficacy Calculation (Schneider–Orelli):**

$$E(\%) = \frac{B - K}{100 - K} * 100$$

B = % mortality in treatment

K = % mortality in control

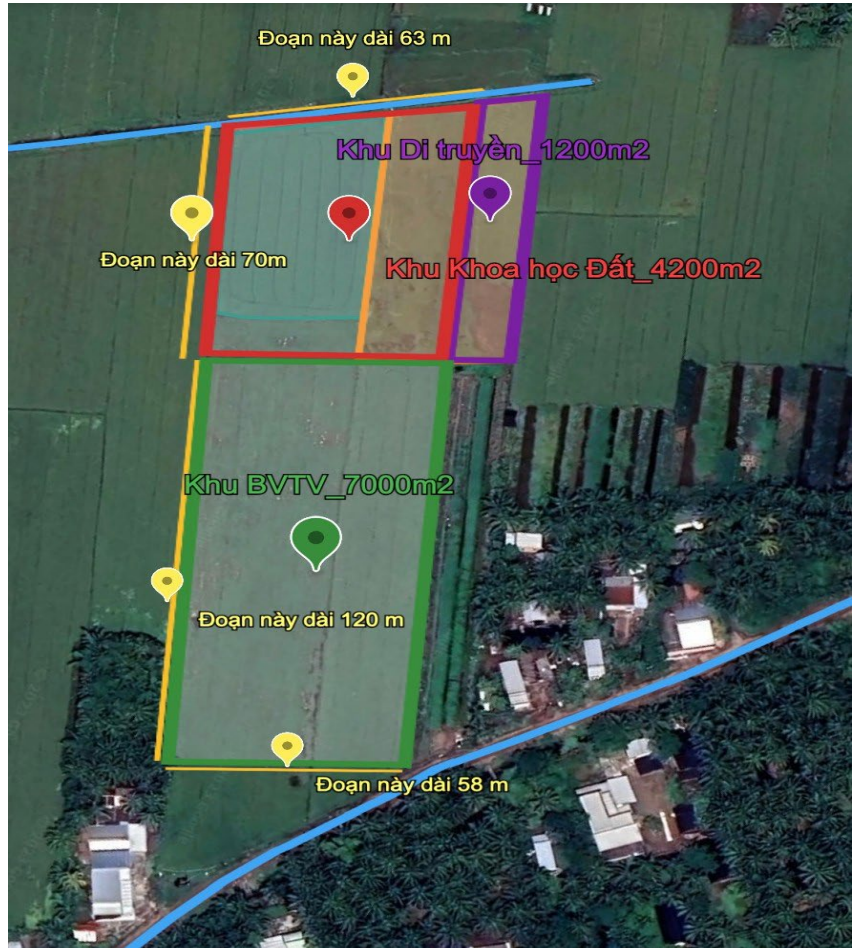
**Data Analysis:** Using **MSTAT-C**; mean comparison by **Duncan's test**.

# III. Evaluation of *Derris elliptica* effectiveness under Field Conditions

Location: Vinh Long Province

Time: On 1 DAP (the day after planting), when the water level in the field is approximately 2-3 cm, we sprayed the *D. elliptica* extract to control GAS (20kg/ha).

Data recording: recording number GAS/ $m^2$, number damaged tiller.




Rice farming at Vinh Long Province

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# RESULT

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## I. Selection of some plant extracts in GAS control at under laboratory

### Table 1: Efficacy (%) of plant extract against GAS at laboratory

| Treatment | Concentration (kg/ha) | Efficacy (%) | | | | |
|---|---|---|---|---|---|---|
| | | 1 hour | 8 hours | 24 hours | 48 hours | 72 hours |
| **Water** | | 0.00 b | 0.00 c | 0.00 c | 0.00 e | 0.00 e |
| **Radaz750wp** | 0.35 | 96.67a | 100.0 a | 100.0a | 100.0a | 100.0a |
| ***Lantana camara*** | 50 | 0.00 b | 3.33 c | 3.33 c | 10.00 d | 13.33 d |
| ***Sphagneticola calendulacea*** | 50 | 0.00 b | 0.00 c | 0.00 c | 0.00 e | 0.00 e |
| ***Entada phaseoloides*** | 50 | 0.00 b | 0.00 c | 6.67 c | 30.00 c | 40.00 c |
| ***Polyscias fruticosa*** | 50 | 0.00 b | 26.67b | 80.00b | 83.33b | 90.00b |
| ***Ageratum conyzoides*** | 50 | 0.00 b | 0.00 c | 0.00 c | 0.00 e | 0.00 e |
| **CV (%)** | | 26.03 | 16.57 | 19.48 | 9.50 | 17.34 |
| **Sig** | | ** | ** | ** | ** | ** |

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# RESULT

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## I. Selection of some plant extracts in GAS control at under laboratory

### Table 2: Efficacy (%) of plant extract against GAS at laboratory

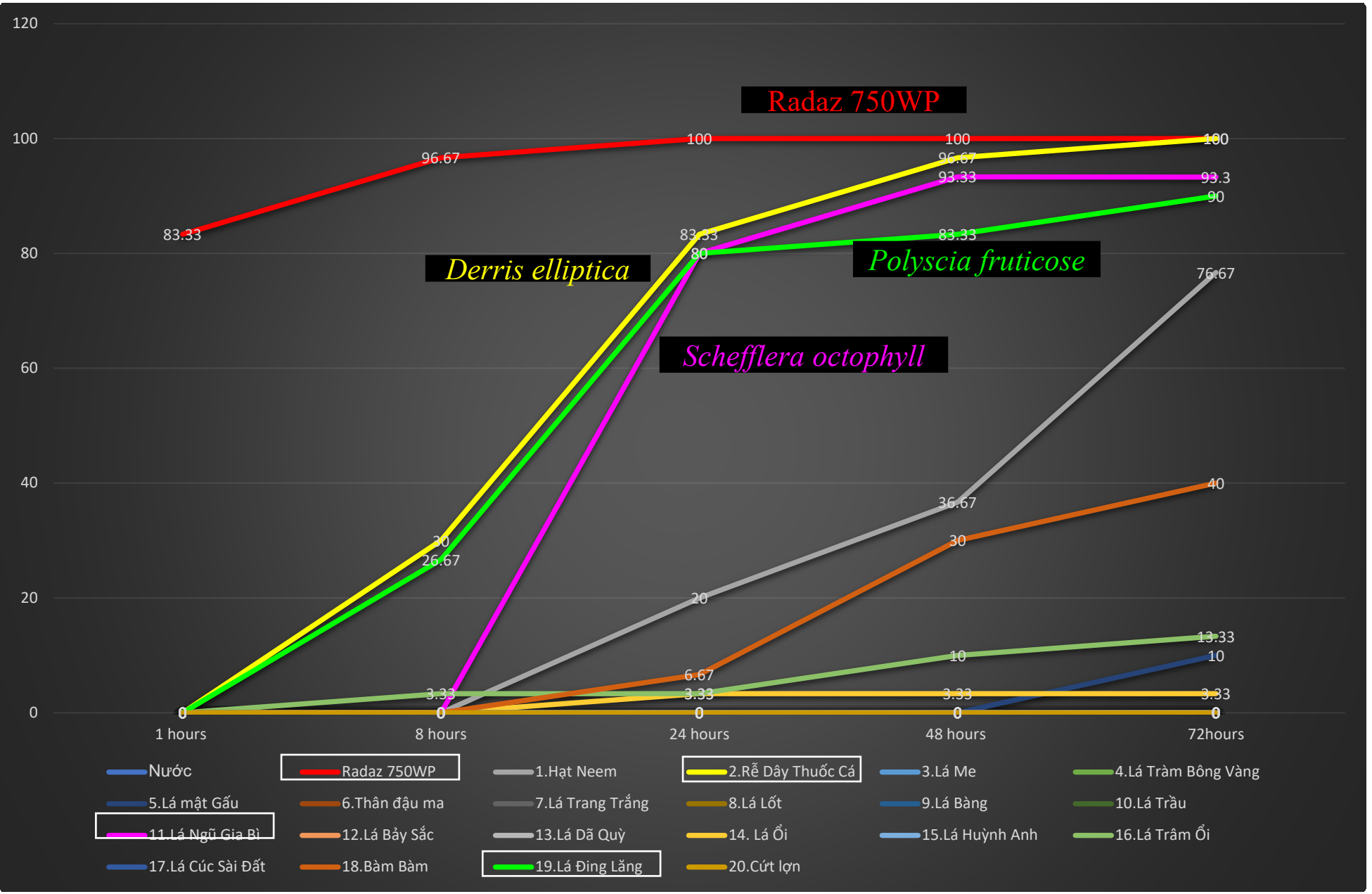
| Treatment | Concentration (kg/ha) | Efficacy (%) | | | | |
|---|---|---|---|---|---|---|
| | | 1 hour | 8 hours | 24 hours | 48 hours | 72 hours |
| **Water** | | 0.00 b | 0.00 b | 0.00 c | 0.00 c | 0.00 c |
| **Radaz 750wp** | 0.35 | 40.00a | 96.67a | 100.0a | 100.0a | 100.0a |
| ***Piper betle*** | 50 | 0.00 b | 0.00 b | 0.00 c | 0.00 c | 0.00 c |
| ***Schefflera octophylla*** | 50 | 0.00 b | 0.00 b | 80.00b | 93.33b | 93.3b |
| ***Tradescantia spathacea*** | 50 | 0.00 b | 0.00 b | 0.00 c | 0.00 c | 0.00 c |
| ***Tithonia diversifolia*** | 50 | 0.00 b | 0.00 b | 0.00 c | 0.00 c | 0.00 c |
| ***Psidium guajava*** | 50 | 0.00 b | 0.00 b | 3.33 c | 3.33 c | 3.33 c |
| ***Allamanda cathartica*** | 50 | 0.00 b | 0.00 b | 0.00 c | 0.00 c | 0.00 c |
| **CV (%)** | | 24.70 | 26.82 | 12.87 | 19.40 | 19.40 |
| **Sig** | | ** | ** | ** | ** | ** |

# RESULT

## I. Selection of some plant extracts in GAS control at under laboratory

### Table 3: Efficacy (%) of plant extract against GAS at laboratory

| Treatment | Concentration (kg/ha) | Efficacy (%) | | | | |
|---|---|---|---|---|---|---|
| | | 1 hour | 8 hours | 24 hours | 48 hours | 72 hours |
| Water | | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| Radaz 750wp | 0.35 | 83.33a | 96.67a | 100.0 a | 100.0 a | 100.0 a |
| *Azadirachta indica* | 50 | 0.00 b | 0.00 c | 20.00 c | 36.67 c | 76.67b |
| *Derris elliptica* | 50 | 0.00 b | 30.00 b | 83.33b | 96.67b | 100.0 a |
| *Tamarindus indica* | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| *Acacia auriculiformis* | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| *Vernonia amygdalina* | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 10.00 c |
| Neustanthus phaseoloides | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| Ixora finlaysoniana | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| Piper lolot | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| Terminalia catappa | 50 | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| CV (%) | | 26.41 | 22.99 | 7.25 | 15.25 | 4.41 |
| Sig | | ** | ** | ** | ** | ** |




As shown in the figure, the efficacy of *Derris elliptica, Polyscia fruticose* and *Schefflera octophylla* is high compared to the other treatments; therefore, they were used in the next experiments.

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Snail don’t eat and showed noticeable mucus excretion.

Mortality of the Golden Apple Snail (*Pomacea canaliculata*) caused by the Molluscicide Radaz 750WP and Three Effective Plant Extracts
A. Radaz 750WP. B. *Derris elliptica* Root extract . C. *Polyscia fruticose* Leaf *extract* D. *Schefflera octophylla* Leaf extract

# RESULT

## II Selection of some plant extracts in GAS control at greenhouse

### Table 4: Efficacy (%) of plant extract against GAS at greenhouse

| Treatments | Efficacy (%) | | | | |
|---|---|---|---|---|---|
| | 1 hour | 8 hours | 24 hours | 48 hours | 72 hours |
| Control | 0.00 b | 0.00 c | 0.00 d | 0.00 d | 0.00 d |
| Radaz 750WP | 45.00a | 100.0a | 100.0a | 100.0a | 100.0a |
| ***Derris elliptica*** | 0.00 b | 20.00b | 90.00b | 100.0a | 100.0a |
| *Polyscia fruticosa* | 0.00 b | 5.00 c | 35.00 c | 60.00b | 70.00b |
| *Schefflera octophylla* | 0.00 b | 0.00 c | 25.00 c | 25.00 c | 30.00 c |
| CV (%) | 59.11 | 43.02 | 37.88 | 30.47 | 31.18 |
| | ** | ** | ** | ** | ** |

Result show that all plant extract treatments have the ability to kill snails. The treatment of *Derris elliptica* was as effective as the chemical treatment with an effectiveness of 100.0%. Particularly, the treatment of *Schefflera octophylla leaf* extract showed the lowest effectiveness at 30.00%.

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# RESULT

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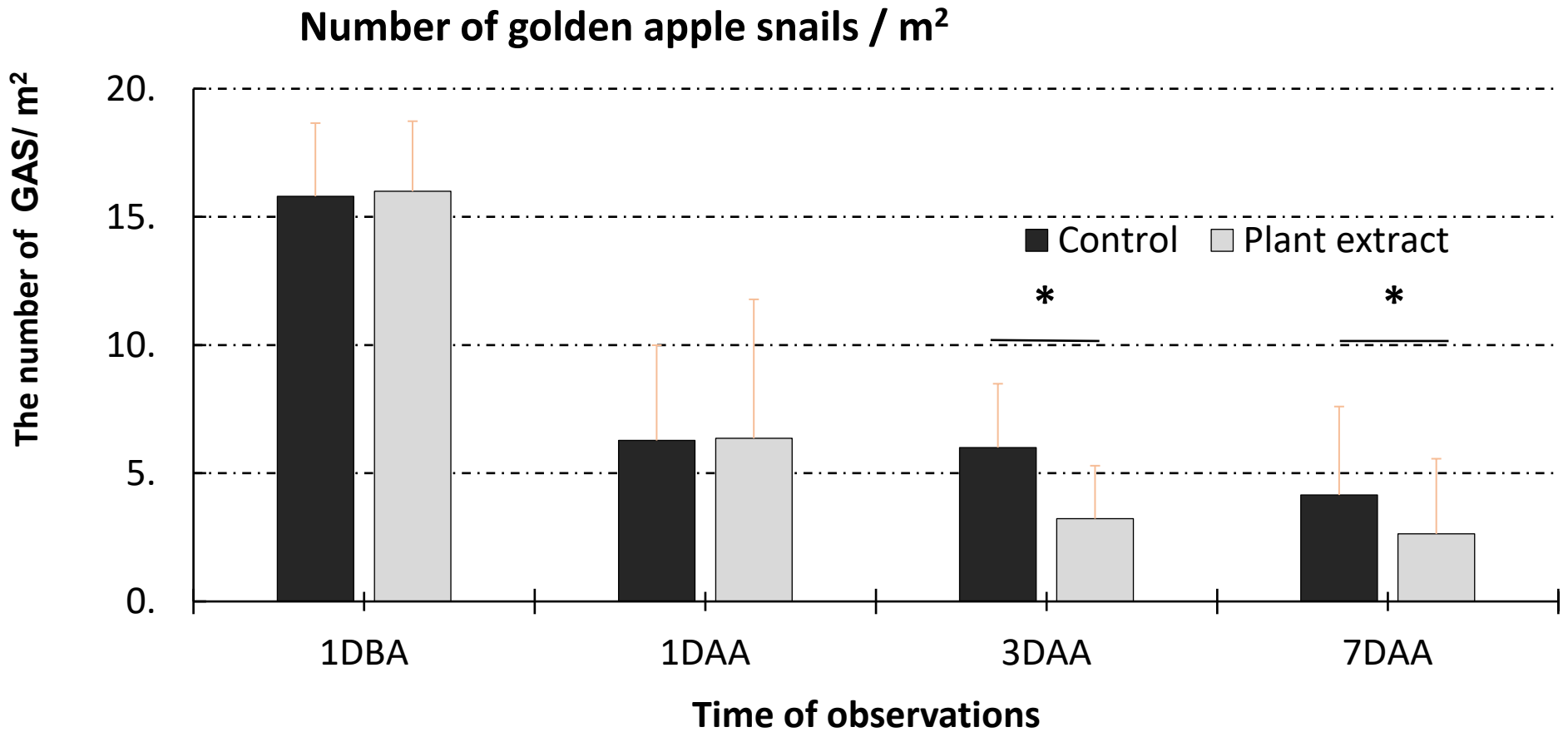


The results showed that the plant extract of the *D. elliptica* plant effectively reduced the number of snails from 1 day after application.

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# RESULT

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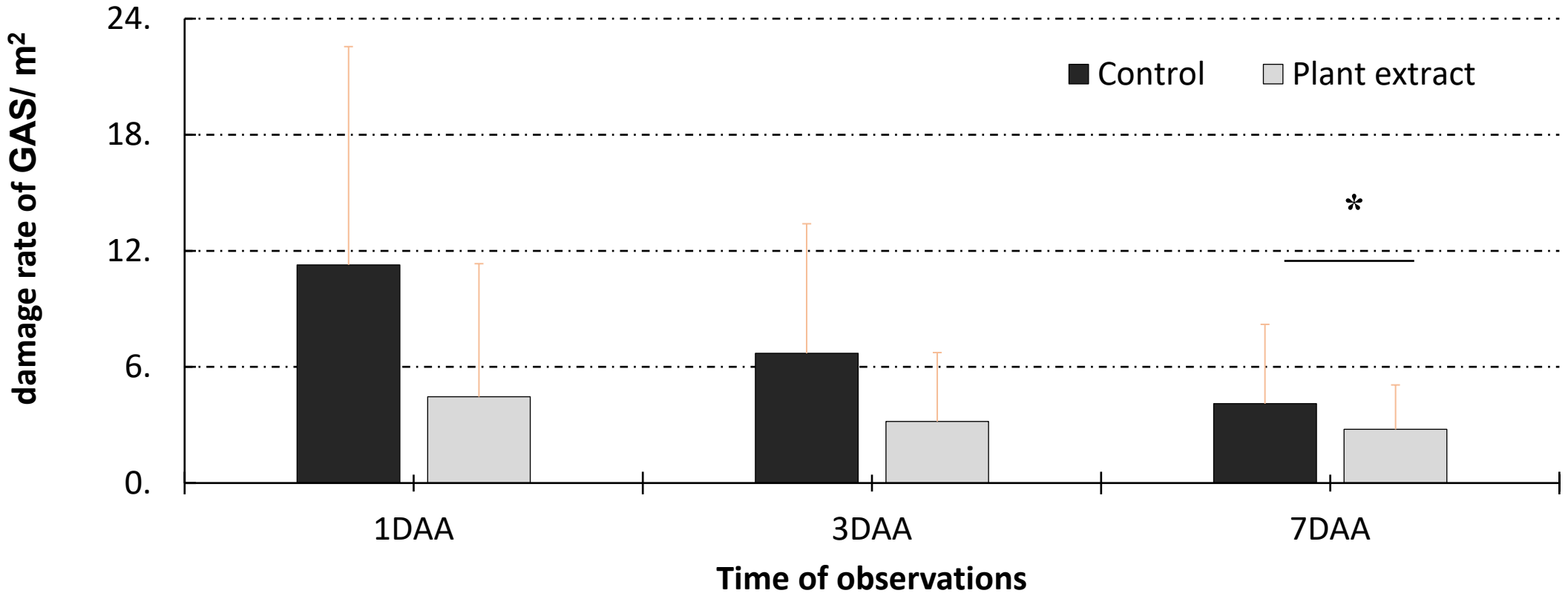
## The damage rate of golden apple snail/ $m^2$




Using hand-picking GAS and spray plant extract, the average damage rate was decreased until 7 DAA.

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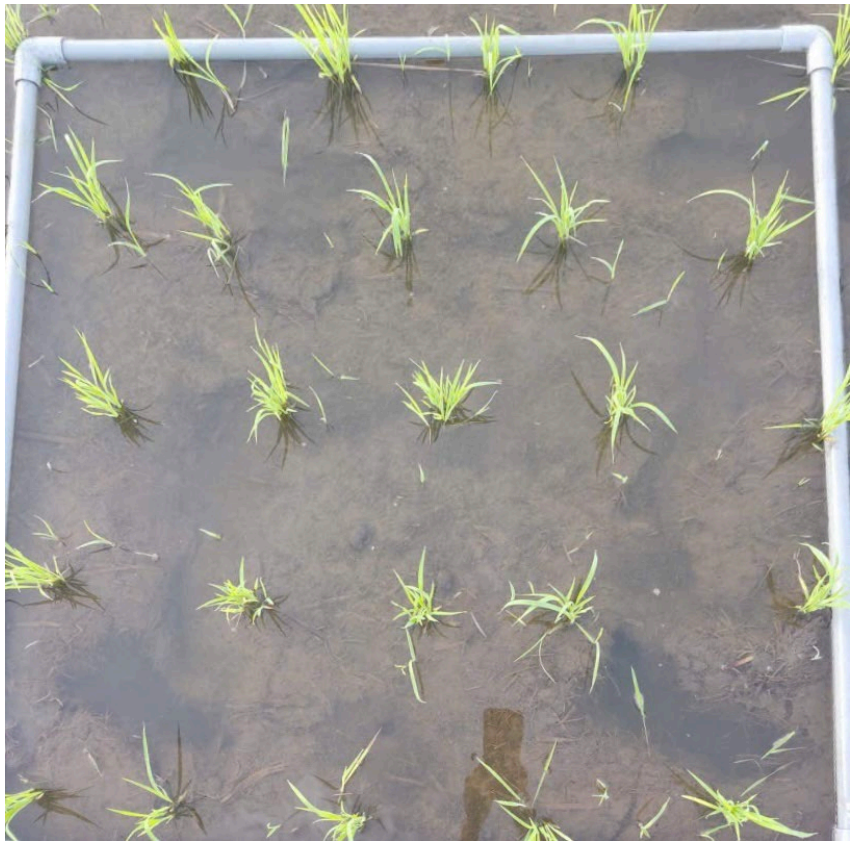

PLANT EXTRACT

CONTROL

**Snail damage per m²**

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# CONCLUSION

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- A total of 20 plant extracts were screened, with three exhibiting significant molluscicidal activity: *Derris elliptica* (roots); *Polyscias fruticosa* (leaves) and *Schefflera heptaphylla* (leaves).
- In greenhouse trials, *D. elliptica* provided complete protection of rice seedlings against *Pomacea canaliculate.*
- Field application of *D. elliptica* at 20 kg/ha, one day after transplanting, reduced snail density from 15 to 5 snails/$m^2$ within 24 hours.

# Thank you!

If you have any questions, please don’t hesitate to contact us

**Contact:**

- Lang Canh Phu Email: Lcphu@ctu.edu.vn
- Lang Tran Hong Ngoc Email: Lthngoc@ctu.edu.vn / ngochong.l@ku.th