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LIST OF ABBREVIATIONS

| | |
|-----------------|---------------------------------------|
| bp | base pair |
| <i>ca.</i> | About, approximately |
| cm | centimeter |
| CCD | Colony Collapse Disorder |
| cm ² | square centimeter |
| °C | degree Celsius |
| DNA | deoxyribonucleic acid |
| DWV | Deformed Wing Virus |
| e.g. | For example |
| g | gram |
| h | hour |
| i.e. | That is/ it is |
| <i>in vitro</i> | in glass, in Petri dish |
| <i>in vivo</i> | with in the living |
| kg | kilogram |
| L3 | Third instar larva |
| L5 | Fifth instar larva |
| l./L | liter |
| Lat. | Latitude |
| Long. | Longitude |
| mg | milligram |
| ml | milliliter |
| mm | millimeter |
| min | minute |
| ND | no data available |
| NR | non- reproduction or non-reproductive |
| N/A or n/a | non-available |
| PCR | polymerase chain reaction |

| | |
|----------------------|----------------------------------|
| pers. obs. | personal observations |
| P ₁ | parent |
| R | reproductive |
| <i>r</i> | reproductive strategies |
| %RH | relative humidity percentage |
| RHB | Russian honey bee |
| s | second |
| SE | South East Asia |
| sp. | Species (singular) |
| spp. | Species (plural) |
| <i>sensu stricto</i> | in the narrow sense |
| UV | Ultraviolet |
| via | by way of, through |
| <i>vice versa</i> | conversely, the other way around |
| vs. or <i>vs.</i> | Versus |
| <i>viz.</i> | Videlicet, as follow |
| vol. | Volume |

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ข้อความแห่งการริเริ่ม

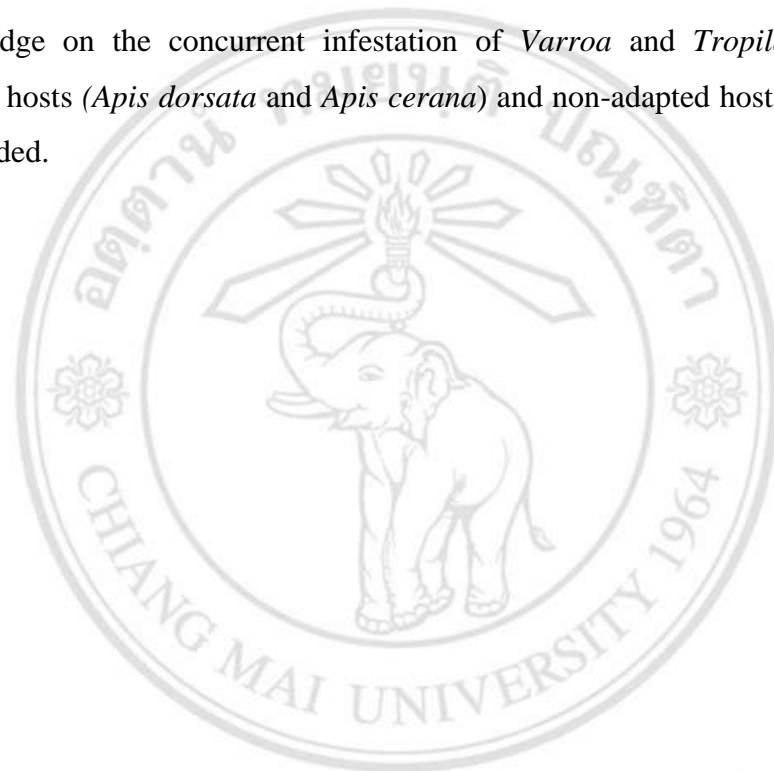
- 1) วิทยานิพนธ์เล่มนี้ได้ศึกษาพลวัตประชากรของไรวาร์ริว และไรทรอปปีลิแลปส์ ตามฤดูกาล ในผึ้งพันธุ์ ในประเทศไทย ปริมาณการเข้าทำลายของไรทั้งสองชนิดสามารถนำไปสู่การพัฒนาปรับปรุงการจัดการการเลี้ยงผึ้งพันธุ์เพื่อป้องกันกำจัดการรุกรานของไรศัตรูผึ้งในประเทศไทย
- 2) องค์ความรู้ในแง่ของการรุกรานร่วมของไรวาร์ริว และไรทรอปปีลิแลปส์ในผึ้งอาศัยพื้นถิ่น (ผึ้งหลวงและผึ้งโพรง) และในผึ้งอาศัยต่างถิ่น (ผึ้งพันธุ์) ได้ถูกนำเสนอไว้ในวิทยานิพนธ์เล่มนี้



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STATEMENT OF ORIGINALITY

- 1) Population dynamics of *Varroa* and *Tropilaelaps* related to seasonality in *Apis mellifera* in Thailand were studied. Such information may lead to the development of revised *A. mellifera* management techniques against acarine brood parasites.
- 2) Knowledge on the concurrent infestation of *Varroa* and *Tropilaelaps* in the adapted hosts (*Apis dorsata* and *Apis cerana*) and non-adapted host (*A. mellifera*) is provided.



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