

First Record of the Genus *Tinocallis* Matsumura (Hemiptera: Aphididae) on *Lagerstromia speciosa* in Laos

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라오스에서 미기록속 *Tinocallis* Matsumura (노린재목: 진딧물과) 보고

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ABSTRACT: The genus *Tinocallis* Matsumura, 1919 is one of the large genera of the subfamily Calaphidinae with 19 species worldwide. From recent expeditions in Laos, we recognized the heavy infestation of *Tinocallis himalayensis* Ghosh, Ghosh & Raychaudhuri, 1971, which is new record in Laos, on Queen's crape-myrtle, *Lagerstroemia speciosa* (Lythraceae). In this paper, the diagnosis and illustrations for the alate viviparous female are provided with the images of live aphids and damage on host plant.

Key words: Laos, *Tinocallis himalayensis*, *Lagerstroemia*, New record

초 록: *Tinocallis* Matsumura 속은 전세계 19종이 포함되는 비교적 큰 속이다. 본 연구에서는 최근 라오스에서 바나바 (부채꽃과: 배롱나무속)에 심각한 피해를 주는 알락진딧물 일종, *Tinocallis himalayensis* Ghosh, Ghosh & Raychaudhuri, 1971를 처음으로 발견하여 보고한다. 유사형 처녀생식세대의 암컷 형태, 생태 및 피해 사진을 함께 제시하였다.

검색어: 라오스, 느티나무알락진딧물, 바나바, 미기록종

The genus *Tinocallis* Matsumura, 1919 (Hemiptera: Aphididae: Calaphidinae) includes 19 species of 4 subgenera, *Eotinocallis* Quednau, 2003, *Orientinocallis* Quednau, 2003, *Sappocallis* Matsumura, 1919 and *Tinocallis* Matsumura, 1919 (Favret, 2016; Quednau 2001) in the world. *Tinocallis* species have been described throughout Asia and Eastern Europe (Blackman & Eastop, 2016), among which *T. saltans* (Nevsky, 1929), *T. takachihoensis* Higuchi, 1972, *T. ulmiparvifoliae* Matsumura, 1919 and *T. zerkowae* Takahashi, 1919 have caused economic damages on ornamental trees, by invading into Western Europe, North America and Australia (Blackman & Eastop, 2016; d'Acier et al., 2010). It has been known that *Tinocallis* spp.

take monoecious and holocyclic lifecycle on various host-plants belonging to the Betulaceae, Fabaceae, Lythraceae, Juglandaceae, Sapindaceae, Sonneratiaceae and Ulmaceae (Quednau, 2003).

In this study, the genus *Tinocallis* is reported for the first time from Laos, based on the specimen of *Tinocallis himalayensis* Ghosh, Ghosh & Raychaudhuri, 1971. Currently, this species has been described from Bangladesh, India, Malaya, Singapore and Thailand (Gosh et al., 1971; Danielsson & Robinson 1978; Blackman & Eastop, 2016). In Laos, this species caused severe damages on Queen's crape-myrtle, *Lagerstroemia speciosa* (Lythraceae), which has been widely cultivated as an ornamental plant and a folk medicine in tropical region throughout Southeast Asia such as Cambodia, China, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam (Orwa

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et al., 2009; Wahi et al., 1982). *Sarucallis kahawaluokalani* Kirkaldy 1907, the other famous aphid pest on *Lagerstroemia* spp., has been invaded into foreign countries such as Africa, Europe and America (Yovkova, 2011). Since *Lagerstroemia* spp. from Southeast Asia are steadily exported to many countries, it is worth to study on the relatively little known pest, *T. himalayensis*. In this paper, a diagnostic note, biometric data and illustrations are given for the alate viviparous female.

Materials and Methods

Tinocallis himalayensis samples were collected in Laos from 2013 to 2014. Samples were preserved in 90% ethanol for a month, and then mounted in Canada balsam, following the method of Blackman & Eastop (2000) and Martin (1983). Illustrations for the species were taken by a digital camera attached to the microscope (Leica 400B, Leica Microsystems, Germany) at a resolution of 600 dpi. Measurements for each specimen are taken from the digital images by using image analysis software (Active measure ver. 3.0.3 from Mitani Co. Ltd, Japan). All specimens were preserved in the College of Agriculture and Life sciences, Seoul National University Korea (CALs).

Abbreviations used for diagnosis are: Ant.I, Ant.II, Ant.III, Ant.IV, Ant.V and Ant.VIb, antennal segments I, II, III, IV, V and base of VI, respectively; PT, processus terminalis; BDAnt.III, basal diameter of antennal segment III; AbdT.I, AbdT.II, AbdT.III, AbdT.IV, abdominal tergite I-IV; 2HT, second segment of hind tarsus; HFM, hind femur; HTB, hind tibiae; SIPH, siphunculus; SIPH-bw, basal width of SIPH; URS, ultimate rostral segment; URS-bw, basal width of URS; Cauda-bw, basal width of Cauda.

Results and Discussion

Taxonomy

Genus *Tinocallis* Matsumura, 1919

Tinocallis Matsumura, 1919: 100.

Type species: *Tinocallis ulmiparvifoliae* Matsumura, 1919: 101.

Diagnosis. Head vertex with 4 pointed setae, mostly shorter

than BDAnt.III, median tubercle on frons well developed; Antennae six segmented with pointed setae, shorter than BDAnt.III, secondary sensoria narrow elliptical or of slit-like annular form without ciliate margins; Pronotum always with two anterior and two posterior spinal setae, spinal setae on wart- or finger-like processes in some species; Wing veins sometimes with black pigmentations; Abdominal margin with single pairs of setae, those on tergites I-IV often on wart- or finger-like processes, marginal setae on tergite V-VII not on processes; SIPH cylindrical, truncated; Cauda knobbed, anal plate bilobate.

Tinocallis (Orientinocallis) himalayensis Gosh, Ghosh & Raychaudhuri, 1971 (Fig. 1-2; Table 1)

Tinocallis himalayensis Gosh, Ghosh & Raychaudhuri, 1971: 218.

Tinocallis khonkaenensis Danielsson & Robinson, 1978: 101.

Tinocallis (Tinocallis) himalayensis Remaudière & Remaudière, 1997; Quednau, 2001.

Tinocallis (Orienticallis) himalayensis Quednau, 2003; Favret, 2016.

Materials examined. 5 alate viviparous female, Morning market, Vientiane, Laos, 22.xii.2013, on *Lagerstroemia speciosa* (Lythraceae), Y. Lee (CALs); 5 alate viviparous female, Singha road, Viangchan, Vientiane, Laos, 22.xii.2013, on *L. speciosa* (Lythraceae), Y. Lee (CALs); 5 alate viviparous female, Banna village forest, Phou khao khouay National Biodiversity Conservation Area, Thaphabath, Bolikhamsai, Laos, 24.xii.2013, on *L. speciosa* (Lythraceae), Y. Lee (CALs); 5 alate viviparous female, 9.ii.2014, Lane Xang street, Vientiane, Laos, on *L. speciosa* (Lythraceae), S. Lee (CALs).

Host plant. Previously described on *Peltophorum fleragineum* (Leguminosae) and *Duabanga sonneratioides* in India (Chakrabarti, 1998), the species severely attacked *Lagerstroemia speciosa* in Laos (this study) and Thailand (Danielsson & Robinson, 1978).

Distribution. Laos, Bangladesh, India, Malaya, Singapore and Thailand.

Diagnosis. Head vertex with three pairs of processes. Ant.III with 7-9 elliptical secondary rhinaria which are barely occupying basal half (Fig. 2K); Subcosta and branches of media bordered



Fig. 1. *Tinocallis himalayensis* (A-C) in life and damaged host-plant (D) (A, alate viviparous female of *T. himalayensis*; B, alatoid nymph of *T. himalayensis*; C, colony of *T. himalayensis*; D, honeydew covered host-plant, *Lagerstroemia speciosa*).

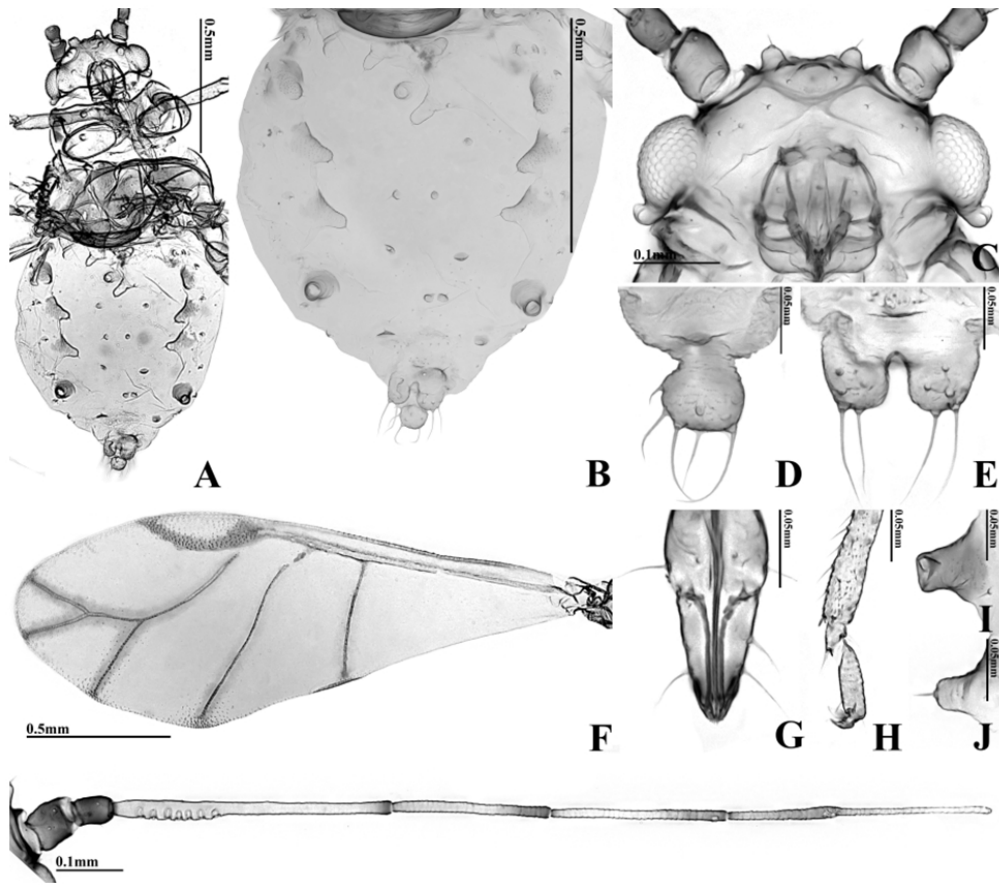


Fig. 2. Alate viviparous female of *T. himalayensis* (A, body; B, abdominal dorsum; C, head; D, cauda; E, anal plate; F, fore wing; G, URS; H, 2HT; I, SIPH; J, abdominal marginal tubercle on AbdT.VI; K, Antenna).

Table 1. Biometric data of *Tinocallis himalyensis* from Laos (alate viviparous female, $n = 20$)

Characters	Body part	Average	Range	
Length (mm)	Body length	1.63	1.47-1.77	
	Whole Antennae	1.45	1.34-1.63	
	Ant.I	0.07	0.06-0.08	
	Ant.II	0.07	0.06-0.07	
	Ant.III	0.43	0.38-0.50	
	Ant.IV	0.23	0.21-0.27	
	Ant.V	0.25	0.23-0.28	
	Ant.VIb	0.17	0.15-0.20	
	PT	0.22	0.21-0.24	
	URS	0.09	0.08-0.09	
	HFM	0.42	0.36-0.44	
	HTB	0.64	0.57-0.67	
	2HT	0.09	0.08-0.09	
	SIPH	0.05	0.05-0.06	
	Cauda	0.10	0.09-0.11	
	No. of setae on	Setae on Ant.III	0.01	
Marginal processes on AbdT.IV		0.06	0.06-0.07	
Ant.I		3	3-4	
Ant.II		3	2-4	
Ant.III		7	6-8	
URS		6		
Cauda knob		7		
Each anal plate		9		
No. of rhinaria on		Ant.III	8	7-9
		Head dorsum	6	
No. of spinal processes on	Pronotum	4		
	Mesonotum	2		
	AbdT.I	2		
	AbdT.II	2		
	Whole Antenna / body	0.89	0.84-0.94	
Ratio (times)	PT / Ant.VIb	1.27	1.17-1.40	
	PT / Ant.III	0.51	0.48-0.58	
	URS / URS-bw	1.64	1.50-1.80	
	URS / 2HT	1.05	1.00-1.13	
	URS / Ant.VIb	0.51	0.42-0.60	
	SIPH / SIPH-bw	0.79	0.71-0.86	
	SIPH / body	0.03	0.03-0.04	
	SIPH / Ant.III	0.12	0.10-0.16	
	SIPH / HFM	0.13	0.11-0.17	
	SIPH / cauda	0.54	0.45-0.67	
	Cauda / Cauda-bw	0.86	0.75-1.00	
	Setae on Ant.III / Ant.IIIBD	0.50		

Abbreviations are explained in materials and methods. Blank cells in the range column means that all measurements were identical.

with brown pigments, radial sector weakly developed or absent (Fig. 2F). AbdT.I and II with pair of finger-like processes with one spinal seta on each tip (Fig. 2B), AbdT.III-VIII with low, wart like processes, marginal processes on AbdT. I and IV dark sclerotic with one marginal seta (Fig. 2J).

Remarks. This species can be easily distinguished from

congeneric species by having unique brown pigments on fore wings. The life cycle of this species is unclear. In India and Thailand, apterous oviparae were collected together with alate viviparae in December (Blackman & Eastop, 2016). However, we only found alate viviparous females in Laos. In the almost every urban area in Laos, we found a heavy infestation of this

species on *Lagerstroemia speciosa*. On a heavily infested plant, black sooty molds were occurred.

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