



## New Record of *Dolichoderus sibiricus* Emery, 1889 (Hymenoptera, Formicidae), from Kinmen County, Taiwan

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### ABSTRACT

This new record of *Dolichoderus sibiricus* Emery, 1889 is based on five individuals of the worker caste collected in Kinmen County, Taiwan. This paper redescribes the worker caste of *D. sibiricus*, and outlines the characteristics that distinguish *D. sibiricus* and *D. thoracicus* (Smith, 1860).

**Key words:** Dolichoderinae, Palearctic Region, new record species, Formicidae, arboreal species

The ant genus *Dolichoderus* Lund, 1831 is a diverse ant genus in the subfamily Dolichoderinae. *Dolichoderus* is widely distributed in Asia, Australia, Europe, North America, and South America (Shattuck, 1992). To date, *Dolichoderus* includes 131 species, 19 subspecies, and 50 fossil species considered valid (AntCat, 2017).

At least 264 ant species have been recorded in Taiwan (Terayama, 2009). However, only one species of *Dolichoderus*, *D. thoracicus* (Smith, 1860), has been recorded by Forel (1912). Moreover, at least 38 ant species have been recorded in Kinmen County (Tung *et al.*, 2008), but *Dolichoderus* has not been reported in Kinmen County.

In this paper, we report a new record of *D. sibiricus* Emery, 1889 based on five individuals of the worker caste collected from Jinning and

Lieyu Townships, Kinmen County. This newly recorded species was formerly considered a subspecies of a European species, *D. quadripunctatus* (Linnaeus, 1771), and was raised to the species level by Yasumatsu (1962). To date, *D. sibiricus* has five synonyms and is widely distributed in the Palearctic Region (Yasumatsu, 1941; 1962). The worker caste of this species is monomorphic and they usually inhabit the edges of forests.

We used a Leica M205C (Wetzlar, Germany) dissecting microscope with an ocular micrometer for recording measurements. All measurements are presented in millimeters and rounded to the nearest 0.01 mm. The specimen images were captured using a Panasonic DMC-GH4 digital camera (Osaka, Japan). The extended focus montage images were obtained using a Helicon Focus 5.3 (Helicon Soft Ltd.

2012).

The following standard measurements and indices were defined based on the study of Shattuck and Marsden (2013): HL, maximum head length; HW, maximum head width; EL, maximum eye length; SL, scape length; ML, mesosomal length; MTL, maximum midtibia length; PronW, maximum pronotum width; PronI, pronotal index; CI, cephalic index; EI, eye index; and SI, scape index. The morphological terminologies, sculptures, and pilosity inclinations were described based on previous works by Fisher and Bolton (2016), Harris (1979), and Wilson (1955), respectively.

All specimens were pinned; three specimens (one from Jinning Township and two from Lieyu Township) were deposited at National Changhua University of Education, Changhua County, Taiwan, and two specimens (one from Jinning Township and one from Lieyu Township) were deposited in the National Museum of Natural Science, Taichung City, Taiwan.

### ***Dolichoderus sibiricus* Emery, 1889**

*Dolichoderus quadripunctatus* subsp. *sibiricus*  
Emery, 1889: 442.

*Dolichoderus sibiricus* (Emery): Yasumatsu,  
1962: 96.

### **Synonymous listing**

*Dolichoderus sinensis* Wheeler, 1921: 111. Syn.  
under *Dolichoderus sibiricus*: Yasumatsu,  
1962: 96.

*Dolichoderus sinensis* var. *atriceps* Wheeler,  
1928: 29. Syn. under *Dolichoderus sibiricus*:  
Yasumatsu, 1962: 96.

*Dolichoderus quadripunctatus* subsp. *yoshiokae*  
Wheeler, 1933: 67. Syn. under *Dolichoderus*  
*quadripunctatus* subsp. *sibiricus*: Yasumatsu,  
1941: 182.

*Dolichoderus abietis* Kono & Sugihara, 1939: 12.  
Syn. under *Dolichoderus quadripunctatus*  
subsp. *sibiricus*: Yasumatsu, 1941: 182.

*Dolichoderus quadripunctatus* subsp. *japonicus*  
Yoshioka, 1939: 70. Syn. under *Dolichoderus*  
*quadripunctatus* subsp. *sibiricus*: Yasumatsu,  
1941: 182.

### **Material examined**

Two workers, pinned. TAIWAN: Kinmen  
County, Jinning Township, 24°25'51"N / 118°21'  
14"E, 23m, 17.viii.2016, C. L. Lee col., hand

collecting (on the trunk); three workers,  
TAIWAN: Kinmen County, Lieyu Township,  
24°25'17"N / 118°13'39"E, 6m, 20.iii.2016, W. L.  
Lin col., hand collecting (on the trunk).

### **Redescription**

Measurements (n=5): HL: 0.92~0.96 mm,  
HW: 0.92~0.98 mm, EL: 0.26~0.28 mm, SL:  
0.75~0.82 mm, ML: 1.20~1.32 mm, MTL: 0.64~  
0.68 mm, PronW: 0.57~0.64 mm, PronI: 62~68,  
CI: 98~100, EI: 28~30, SI: 81~84.

In anterior full-face view, frontal carinae  
long, surpassing mid-length of the head. Frontal  
lobes separated by posteromedian portion of  
clypeus. Clypeal anterior margin smooth,  
depressed in central part of clypeal anterior  
margin. Antenna 12 antennomeres. Antennal  
scrobe absent. Compound eyes present and  
apparent.

In lateral view, mesonotum round and dome  
shaped, promesonotal suture and metanotal  
groove present and apparent. Propodeum with a  
pair of angles in dorsolateral sides.

In anterior full-face view, sculptures of head,  
mesosoma, and petiole imbricate-foveolate,  
with numerous and deep punctate sculptures;  
clypeus rugulose, with two pairs of long erect  
pilosity on the clypeal anterior margin, and  
short erect pilosity on anterior and median area  
of clypeus; thorax scabriculous in lateral view,  
and densely foveolate in dorsal view. Mandibles  
with moderate long, erect pilosities on the  
dorsal face.

Head, thorax, and petiole deep red in color,  
gaster black, with two pairs of separated yellow  
spots on tergite of the first and second gastral  
segments.

### **Diagnosis**

Yasumatsu (1962) concluded that the East  
Asiatic species *D. sibiricus* can be separated  
from the European *D. quadripunctatus* by its  
numerous distinct punctures on the head. In  
Taiwan, *D. sibiricus* is the only *Dolichoderus*  
species identified in Kinmen County, whereas *D.*  
*thoracicus* is the only recorded *Dolichoderus*  
species in Taiwan Island. *D. sibiricus* can be  
distinguished from *D. thoracicus* based on the  
following characteristics:

1. The head, mesosoma, and petiole imbricate-foveolate sculptured.
2. The head, thorax, and petiole deep red in

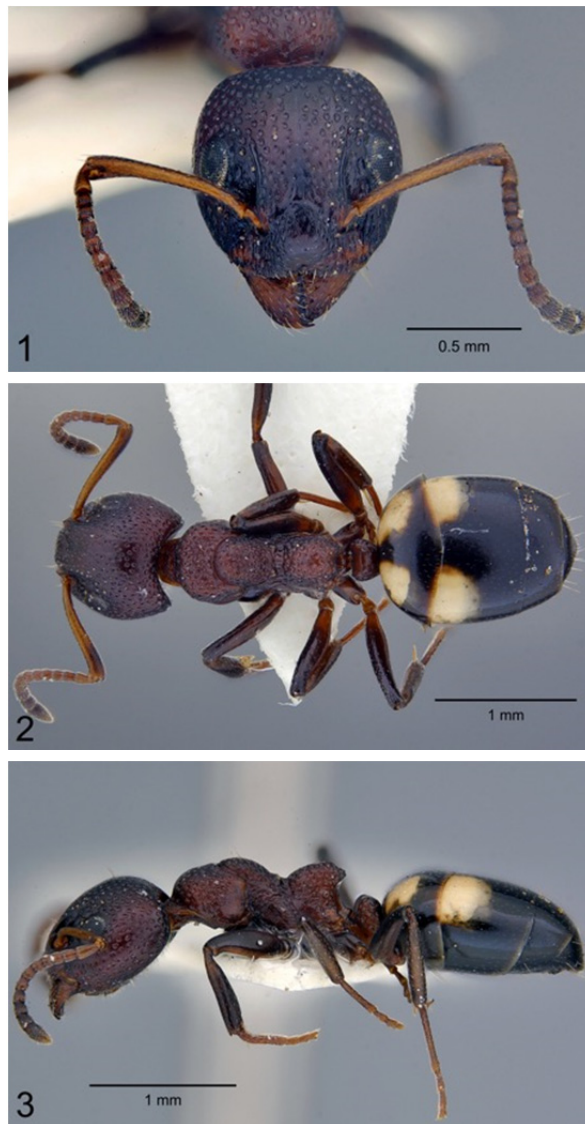


Fig. 1-3 *Dolichoderus sibiricus* Emery, 1889 (worker). 1. Head in anterior full-face view; 2. Dorsal view; 3. Lateral view (photographer: F. C. Hsu).

color; gaster black with two pairs of yellow spots on the tergites of the first and second gastral segments.

### Distribution

*D. sibiricus* is widely distributed in the Palearctic Region, including Russia (Siberia), Mongolia, China (Anhui, Fujian, Gansu, Guangdong, Guangxi, Henan, Hong Kong, Hubei, Hunan, Jiangxi, Shaanxi, Xinjiang, and Zhejiang), the Korean Peninsula (North and South Korea), Japan (Hokkaido, Honshu, Shikoku, Kyushu, and Yakushima), and Taiwan.

### Discussion

*D. sibiricus* has been recorded in Fujian

Province, China, and is considered a native species there. Nevertheless, despite being an active ant species that can be easily observed, this species has not been observed during previous ant surveys in Kinmen County, Taiwan (Tung *et al.*, 2008; Huang *et al.*, unpublished data). Although we lack direct evidence to confirm *D. sibiricus* as an exotic species, we assume that this species was introduced in Kinmen County due to increasing human commerce and trade with China in the past decade.

Information on the ecology of *D. sibiricus* is limited. In Japan, *D. sibiricus* is arboreal, nesting in dead branches and decayed woods and foraging along tree trunks. Their nuptial flights usually occur in September and October.

The winged reproductive castes emerge from the nests in the afternoon and engage in flight until dawn (Terayama *et al.*, 2014). In Kinmen, according to the observations of Mr. Wei-Lun Lin (personal communication), *D. sibiricus* nests under the bark of *Koelreuteria elegans* in Lieyu Township, which is consistent with the observations in Japan. This species may have the potential to influence terrestrial and arboreal ecosystems, as its relative *D. thoracicus* has increasingly infested human environments in central Taiwan Island. *D. thoracicus* invades indoor and outdoor areas associated with human activity by establishing spreading routes on water pipes and wires, which severely reduce the quality of human life (Lin *et al.*, 2017). However, the impacts of this species on the local ant communities and natural environment remain unclear and warrant further research.

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# 臺灣金門縣新紀錄種西伯利亞琉璃蟻 (*Dolichoderus sibiricus* Emery, 1889) (膜翅目：蟻科)

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## 摘 要

本研究利用採集自臺灣金門縣的五隻工蟻階級個體，發表一新紀錄種螞蟻，西伯利亞琉璃蟻 *Dolichoderus sibiricus* Emery, 1889。本文另重新描述西伯利亞琉璃蟻之工蟻的形態特徵，亦提供與另一種臺灣產琉璃蟻屬之疣胸琉璃蟻 *D. thoracicus* (Smith, 1860) 之間的形態差異診斷。

**關鍵詞：**琉璃蟻亞科、古北區、新紀錄種、蟻科、樹棲性物種