Linzer biol. Beitr.	50/1	681-685	27.7.2018

Chalybion bengalense (DAHLBOM, 1845) (Hymenoptera, Sphecidae) first reported in north Vietnam

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A b s t r a c t : *Chalybion bengalense* (DAHLBOM, 1845), a blue mud dauber wasp, is first reported in north Vietnam. Notes on its status, occurrence, distribution, and variation are also presented.

K e y w o r d s : *Chalybion bengalense*, occurrence, variation, north Vietnam, Sphecidae.

Introduction

Chalybion is a genus belonging to the family Sphecidae. The genus is largely distributed worldwide. PULAWSKI (2017) listed 47 species and 7 subspecies of the genus, most of the species occurring in the old world. The genus is divided into two subgenus, *Hemichalybion* KOHL and *Chalybion* DAHLBOM. While the subgenus *Hemichalybion* is characterred by the ventral margin of the clypeus with a broadly projecting media lobe and yellow petiole and legs, the subgenus *Chalybion* is charactered by the ventral margin of the clypeus with three or five teeth or lobes and no yellow pigments present (HENSEN 1988).

Chalybion bengalense (DAHLBOM, 1845), belonging to the subgenus *Chalybion*, is the most widespread species of the genus, from the Eastern coasts of Africa, the Sinai Peninsula, Oman and Iraq, eastward through India, China, Japan, Indonesia and Philippines, to New Guinea, Australia, and United State (MEI et al. 2012).

In Vietnam six species of the genus *Chalybion* (*C. bengalense*, *C. dolichothorax, C. japonicum, C. gracile, C. malignum,* and *C. sumatranum*) have been recorded to date (PHAM et al. 2015, PHAM & DANG 2017). *C. bengalense* is first reported in the center Vietnam by TANO & KUROKAWA (2015), and in southern Vietnam by DOLLFUSS (2016). In the present study *C. bengalense* is newly recorded for north Vietnam, and notes on its status, occurrence, distribution, and variation are also produced.

Materials and Methods

The sampling was taken in many provinces of Vietnam from 2001 to 2017, most of these being in north Vietnam with many of altitude levels and habitats. Adult specimens of *C. bengalense* were collected using insect nets and Malaise traps, and its nests were also taken using a small cut knife. No less than 80 nests of *C. bengalense* were collected and reared under laboratory conditions. Part of adult specimens of the species collected in the

field and emerged from the nests was pinned, dried, and kept in wood-made insect boxes. The remainder was kept in 70° alcohol for future studies. The name of the species was determined based on HENSEN's published account in 1988. Specimens of the present study have been deposited in the Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, Hanoi.

Abbreviations are as follows:

BMNH.....The National History Museum, London.

NP.....National Park

ZMUC .....Universitets København, Zoologisk Museum, København.

Results and Discussion

Chalybion bengalense (DAHLBOM, 1845)

Sphex violaceous FABRICIUS, 1775: 346, ♀, ♂, (as *violacea*, incorrect original termination), junior primary homonym of *Sphex violaceous* Scopoli, 1763, "lectotype: ♀, South Africa: Cape of Good Hope, ZMUC".

? *Sphex ferus* DRURY, 1782: 57, ♀, "China: no specific locality (lost)".

? *Sphex chrysis nitidulus* CHRIST, 1791: 310, sex not indicated, "incorrect original termination", (holotype or syntypes: origin not indicated (lost)).

Pelopoeus bengalense DAHLBOM, 1845: 433, ♀, ♂, "India: Bengal: no specific locality", (holotype or syntypes: ♀, Lund).

Pelopoeus convexus F. SMITH, 1876: 449, ♂, "Mascarenes: Rodriguez island", (syntypes: ♂, BMNH).

Material examined: **Vietnam**: **Hanoi**: 1♀, Lien Mac, North Tu Liem, 18.ix.2017; 1♂, Co Nhue, North Tu Liem, 19.xii.2015; 1♂, Co Nhue, North Tu Liem, 3.vii.2016; 1♀ + 1♂, Co Nhue, North Tu Liem, 18.vi.2016; 4♂♂, Co Nhue, North Tu Liem, 7.v.2016; 1♂, My Dinh, North Tu Liem, 17.xi.2015; 1♀ + 3♂♂, Red River Bank, Long Bien, 9.vii.2016; 1♂, Nghia Do, Cau Giay, 9.xii.2015; 1♂, Nghia Do, Cau Giay, 24.xii.2015; 1♀ + 3♂♂, Nghia Do, Cau Giay, 7.vii.2016; 7♀♀ + 7♂♂, Ba Vi NP, Ba Vi, 10.vii.2016; 1♀, Thuy Xuan Tien, Chuong My, 1-14.ix.2017, Malaise trap; 1♀, An Phu, My Duc, Chuong My, 5.vii.2017; 2♀♀ + 3♂♂, Mieu Mon, Dan Phuong, 2.v.2017, Phong Huy Pham; 2♂♂, Red River Bank, Long Bien, 20.ix.2016; 1♂, Red River Bank, Long Bien, 2.vi.2013, Hoa Thi Dang; 2♀♀, Hoa Lac, Thach That, 15-25.vi.2002, 15-25.vii.2002, Malaise trap; 1♀, Da Ton, Gia Lam, 4-14.v.2001, Malaise trap; 2♀♀, Da Ton, Gia Lam, 5-15.iv.2001; 3♀♀ + 2♂♂, Da Ton, Gia Lam, 22.vii-2.viii.2011, Malaise trap, Long Dang Khuat; 1♀ + 4♂♂, Lien Mac, Bac Tu Liem, 1.v.2017; 1♀, Co Nhue, Bac Tu Liem, 22.vi – 2.vii.2001, Malaise trap, Nhi Thi Nguyen. **Son La**: 3♀♀ + 1♂, Chieu village, Muong Thai, Ham Yen, 10.viii.2017, 2♀♀ + 5♂♂, Son La city, 17.v.2017, Phong Huy Pham. **Hoa Binh**: 2♀♀ + 1♂, Tan Lac, Yen Thuy, 3.viii.2017, Phong Huy Pham; 1♂, Tan Son, Mai Chau, 10-15.v.2001, Malaise trap, Long Dang Khuat. **Vinh Phuc**: 2♀♀ + 3♂♂, Me Linh Station for Biodiversity, Me Linh, 2008, Malaise trap. **Nam Dinh**: 2♀♀ + 4♂♂, Xuan Thuy NP, Xuan Thuy, 2.v.2016, Phong Huy Pham. **Ninh Binh**: 4♀♀ + 6♂♂, Gia Sinh, Gia Vien, 24.vi.2017; 10♀♀ + 13♂♂, Bich Dao, Ninh Binh city, 20.vi.2017, Phong Huy Pham. **Hai Duong**: 3♀♀ + 6♂♂, Hien Thanh, Kinh Mon, 21.vii.2016, emerged from collected nests, Duy Dinh Nguyen & Anh Thi Tu Nguyen. **Hung Yen**: 3♀♀ + 5♂♂, Hai Trieu, Tien Lu, 25.vi.2013, Linh Van Khuc. **Lao Cai**: 2♂♂, about 30 km East of Lao Cai city, near Hanoi-Laocai highway, 21.ix.2017, Phong Huy Pham. **Quang Ninh**: 1♂, Hong Ha, Uong Bi city, 26.vi.2013, Linh Van Khuc. **Bac Ninh**: 3♀♀ + 6♂♂, Tan Hong, Tu Son, 10.ii.2017, emerged from collected nests, Phong Huy Pham. **Phu Tho**: 2♀♀ + 4♂♂, Thanh Son town, Thanh Son, vi.2011, Phong Huy Pham. **Thai Binh**: 10♀♀ + 9♂♂, Hong Minh, Hung Ha, 4.vi.2016; 9♂♂, Quang Trung, Ky Ba, 10.i.2016, emerged from collected nests; 10♀♀ + 7♂♂, Hong Minh, Hung Ha, 10.vii.2017; 2♂♂, Dong Minh, Tien Hai, 12.vii.2017, Phong Huy Pham. **Thai Nguyen**: 1♂, Phu Luong, 15.vii.2017, Hoa Thi Dang. **Thanh Hoa**: 1♀ + 4♂♂, Sam Son

town, Sam Son, 20.vi.2016; Phong Huy Pham; 1♀, Thach Binh, Thach Thanh, 2.v.2016, emerged from a collected nest, Long Van Hoang. **Nghe An**: 3♂♂, Lang Sen, Kim Lien, Nam Dan, 27.vi.2017, emerged from collected nests, Phong Huy Pham. **Quang Ngai**: 1♀ + 1♂, An Binh, Ly Son, 8.viii.2017; 1♀, An Hai, Ly Son, 7.viii.2017, Hoa Thi Dang. **Dac Lak**: 2♀♀ + 2♂♂, Chu Yang Sin NP, Krong Kma, Krong Bang, 2.v.2016. **Kon Tum**: 1♀ + 1♂, Sa Thay town, Sa Thay, 3.iv.2014; 1♂, Chu Mom Ray NP, 2.iv.2014, Duong Dinh Tran.

S t a t u s : This is the type species of the genus *Chalybion*. It is the second species of the genus to have been studied minutely in Vietnam (see PHAM and DANG 2017), in fact, the first wasp to have been studied in north Vietnam. Specimens collected in my study course were found to note with *C. japonicum* (GRIBODO, 1882) and *Sceliphron madraspatanum* (FABRICIUS, 1781) in aspects of distribution.

O c c u r r e n c e : *C. bengalense* is a common domestic species in India (JAYAKAR & SPURWAY 1964). This species was firstly described by FABRICIUS in 1775 but there was a clear mislocality. DAHLBOM (1845) redescribed the insect and showed its exact locality. To before 2001, although several field trips in north Vietnam had been produced by numerous oversea legmans such as A. WEISS in 1901 at Tuyen Quang and R. VIRALIS de SALVAZA in 1924 (see HENSEN 1988), JENDEK in 1995 at Tam Dao, Vinh Phuc, PACHOLÁTKO & DEMBICKÝ in 1996 at Tam Dao, Vinh Phuc and SOLDÁN in 1984 at Hanoi (see DOLLFUSS 2016), no records of the species were documented. This leads me to suggest that whether or not *C. bengalense* is an exotic species, but the occurrence time and the manner of immigration of the species are not determined. And it is not impossible to mention the present large distribution of the wasp and miscollections of legmans.

That HENSEN (1988) took field trips in north Vietnam, Hanoi and Ha Giang, for examble, and collected only specimens of *C. japonicum* but not those of *C. bengalense* showed that at that time *C. japonicum* is a common and abundant species in north Vietnam. My data collected for a long duration from 2001 to 2017 show that although the number of specimens of the species collected is limited because of no quantification, *C. bengalense* is a common and abundant species in north Vietnam. Most of the areas of study that I took, only either the presence of *C. bengalense* or that of *C. japonicum*. It means that both species are not active at the same site. To my knowledge, in two recent decades, abundance of *C. bengalense* has limited the number of *C. janponicum* as clearly evidenced in Hanoi area, and between these two species may be to contain interactional relationships that it is really different to explain in the present study. The occurrence of *C. bengalense* is very closely related to that of *S. madraspatanum*, a common and largely distributed mud dauber wasp of the genus *Sceliphron*, because it is known as a reuser of old *S. madraspatanum* nests.

D i s t r i b u t i o n : **Vietnam**: Sai Gon, Vung Tau (DOLLFUSS 2016), Da Nang (TANO & KUROKAWA 2015), Hanoi, Thai Binh, Vinh Phuc, Nam Dinh, Son La, Hoa Binh, Ninh Binh, Thai Nguyen, Hung Yen, Quang Ninh, Bac Ninh, Lao Cai, Hai Duong, Phu Tho, Thanh Hoa, Nghe An, Quang Ngai, Kon Tum, Dac Lak. **Elsewhere**: South Africa, Tanzania, Madagasca, Mascarenes, Seychelles islands, Ethiopia, Yemen, Maldives, Socotra, Eritrea, Mozambique, Bangladesh, Iraq, Egypt, Greece, Nepal, Italy, French Polynesia, Sri Lanka, India, Burma, Malaysia, Singapore, Thailand, China, Taiwan, Japan, Volcano Island, Philippines, Borneo, Java, Indonesia, Ternate, Misool, Sulawesi, Timor,Gilbert Island, Guam Island, Lesser Sunda Island, Chagos Archipelago, Australia, United State.

Five provinces in which adult specimens of *C. bengalense* has been taken including

Thanh Hoa, Nghe An, Quang Ngai, Kon Tum, and Dac Lak are new records for the Center Vietnam.

Most of studied localities with an altitude of less than 400 m conducted at various habitats recorded the presence of *C. bengalense*. In all urban habitats *C. bengalense* occurred in abundance. It is, therefore, interesting to judge that this is an urban sphecid wasp.

V a r i a t i o n : Examination results on 268 specimens of *C. bengalense* in the present study that are compared to those of HENSEN in 1988 reveal that the wasp has the following some variations: Female forms varied 13-17 mm in length of the body, and 9.5-11.5 mm in length of forewings; male forms 8.5-15 mm in length of the body and 6.5-10 mm in length of forewings. In most of specimens examined the pedicel and the scape are blue. In a female specimen collected from Thanh Hoa, the ninth and tenth flagellomeres of an antenna are yellow and brownish yellow, respectively. In most of cases the integument is without violaceous, excepting a female specimen collected from Thanh Hoa and a male specimen collected from Hanoi (the metasoma and legs are violaceous reflections). Anterior part of the metapleuron is with finely small punctate, and posterior part of that with denser, larger punctate.

Acknowledgements

This paper is supported by Research Grant Programme, Nagao Natural Environment Foundation, Japan. The supply of specimens of MSc. Dang Thi Hoa, Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology, Hanoi, Vietnam is gratefully acknowledged.

Zusammenfassung

Die blau gefärbte Grabwespenart *Chalybion bengalense* (DAHLBOM, 1845) ist ein Erstnachweis für den Norden Vietnams. In vorliegender Studie werden dergegenwärtige Stand, das Vorkommen und die Verbreitung kommentiert und es wird über Varianten dieser Species berichtet.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: Linzer biologische Beiträge

Jahr/Year: 2018

Band/Volume: 0050_1

Autor(en)/Author(s): Pham Pong Huy

Artikel/Article: Chalybion bengalense (DAHLBOM, 1845) (Hymenoptera, Sphecidae) first reported in north Vietnam 681-685