



## Taxonomic studies on the genus *Orancistrocerus* van der Vecht, 1963 (Hymenoptera: Vespidae: Eumeninae) from Vietnam, with description of a new species

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### Abstract

Two species of the genus *Orancistrocerus* van der Vecht, 1963 from Vietnam are recorded. Of them, a new species, *O. altus* sp. nov. from Lang Son province in the northern part of Vietnam is described and illustrated. In addition, one subspecies, *O. aterrimus nigriceps* van der Vecht, 1963 is newly recorded from China.

**Key words:** *Orancistrocerus*, solitary wasps, new species, new record, Vietnam, China

### Introduction

The little-known genus *Orancistrocerus* was described by van der Vecht (1963) based on the type species *Odynerus drewseni* de Saussure, 1857. It included four species and 9 subspecies worldwide, *O. aterrimus* (Saussure, 1852), *O. drewseni* (Saussure, 1857), *O. moelleri* (Bingham, 1897), *O. bicoloripennis* (Gribodo, 1892), at the time when van der Vecht proposed the genus. Later, Giordani Soika (1973) described one more subspecies of *O. moelleri*. To this date, after more than half of a century, the genus still has only four species and 10 subspecies, distributed in Eastern Asia, from China and Japan South to Borneo.

In Vietnam, only one subspecies was recorded, namely *O. aterrimus nigriceps* van der Vecht, 1963 (Nguyen *et al.*, 2015, 2017). In China, three species and five subspecies have been recorded: *O. aterrimus aterrimus* (de Saussure, 1852), *O. drewseni drewseni* (de Saussure, 1857), *O. drewseni ingens* (von Schulthess, 1934), *O. drewseni opulentissimus* (Giordani Soika, 1941), and *O. moelleri aulicus* Giordani Soika, 1973 (Tan *et al.*, 2018).

In this paper, the genus *Orancistrocerus* is studied from Vietnam and one new species is described and illustrated. Notes on the new record of a subspecies from China are also mentioned.

### Material and methods

The examined specimens of the present study are deposited in the collections of the Institute of Ecology and Biological Resources [IEBR] and South China Agricultural University (SCAU).

The adult morphological and color characters were observed on pinned and dried specimens under an Olympus SZ61 stereoscopic microscope. Measurements of body parts were made with an ocular micrometer attached to the microscope. “Body length” indicates the length of head, mesosoma and the first two metasomal segments combined. Terminology follows Yamane (1990), and Carpenter and Cumming (1985). For identification of the

species, see van der Vecht (1963). Photographic images were made with a Leica M80 Stereo Microscope, using LAS exclusive microscopy software (LAS EZ 3.1.1); the plates were edited with Photoshop CS6.

## Taxonomy

### Genus *Orancistrocerus* van der Vecht, 1963

*Orancistrocerus* van der Vecht, 1963, Zool. Verh., Leiden 60: 58, 99, genus.

Type species: *Odynerus drewseni* de Saussure, 1857, by original designation.

### *Orancistrocerus aterrimus nigriceps* van der Vecht, 1963

(Figs 1–2)

*Orancistrocerus aterrimus nigriceps* van der Vecht, 1963, Zool. Verh., Leiden 60: 102 (key), 106, male - “Indo-China: ... Cochinchine, Phuquoc” (Brussels).

**Material examined.** VIETNAM: **Ha Giang:** 1 ♀, Dong Van, 12 July 2015, L.D. Khuat; **Cao Bang:** [2 ♀, Tam Kim, Nguyen Binh, 22°36'17"N, 106°01'47.6"E, 299 m, 18 October 2015; 1 ♀, Tran Hung Dao forest, Nguyen Binh, 22°36'17"N, 106°01'47.6"E, 470 m, 18 October 2015], L.T.P. Nguyen, D.D. Nguyen & M.P. Nguyen; **Lao Cai:** 1 ♀, Hoang Lien NP, Ban Ho, Sa Pa, 27–29 July 2008, L.T.P. Nguyen; **Dien Bien:** 1 ♀, Muong Fang, ca 500 m, 23 July 2009, L.T.P. Nguyen, P.H. Pham, J. Kojima; **Tuyen Quang:** 1 ♀, Son Phu ranger station, Na Hang NR, Na Hang, 22°21.2'07"N, 105°24'34.7"E, 264 m, L.T.P. Nguyen, D.D. Nguyen & L.X. Truong; **Lang Son:** Cai Kinh, Huu Lung [1 ♂, 20°31'37.6"N, 105°0'24.2"E, 86 m, 16 July 2016, L.T.P. Nguyen, D.D. Nguyen, N.T. Tran; 2 ♀, 22°39'42.9"N, 106°15'36"E, L.T.P. Nguyen, D.D. Nguyen, N.T. Tran; 1 ♀, Huu Lien NR, Lan Nghe, Huu Lien, Huu Lung, 21°33'48.6"N, 106°24'36.4"E, 289 m, 11 June 2018, L.T.P. Nguyen *et al.*]; **Bac Giang:** 1 female, Dong Bay, An Lac, Son Dong, Bac Giang, 21°20'42.8"N, 106°56'31.1"E, 12 August 2012, J. Kojima, H. Nugroho & IED-c; **Quang Ninh:** 1 ♀, Dong Quang, Hoanh Bo, 2 August 2013, T. V. Tran; **Hai Phong:** 1 ♀, Cat Ba NP, Cat Hai, 20°47'38"N, 106°59'45"E, 25 July 2013 L.T.P. Nguyen & D. D. Nguyen; **Vinh Phuc:** 1 ♀, Ngoc Thanh, Me Linh, 7 June 2001, L.X. Truong; **Hoa Binh:** 1 ♀, Bao Hieu, Yen Thuy, 14 July 1999, L.X. Truong; 1 ♀, Yen Thuy, 1 May 2012, T.V. Hoang; 1 ♂, Lac village, Chieng Chau, Mai Chau, ca 600 m, 1 June 2008, L.T.P. Nguyen; **Thanh Hoa:** 1 ♀, 1 ♂, Xuan Lien NP, Hon Can, Van Xuan, Thuong Xuan, 19°51'55.5"N, 105°14'28.8"E, ca 120 m, Nest#2012-TH-Eumeninae-01, 23 August 2012, L.T.P. Nguyen; 1 ♀, Xuan Lien NP, Hon Can, Van Xuan, Thuong Xuan, 19°52'27.5"N, 105°14'20.8"E, ca 110 m, 23 August 2012, L.T.P. Nguyen; **Da Nang:** 1 ♀, Vinh An, Phu Ly, Vinh Cuu, 30 July 2008, ISD-c; **Dak Lak:** 1 ♀, Chu Yang Sin NP, Krong Kmar, Krong Bong, 12°25'02.8"N, 108°22'30.8"E, ca 1081 m, 4 May 2016, L.T.P. Nguyen, D.D. Nguyen, N.T. Tran; **Lam Dong:** 2 ♀, Bidoup Nui Ba NP, Da Lat, 12°10'56.7"N, 108°40'47.9"E, ca 1458 m, 7 May 2016, L.T.P. Nguyen, D.D. Nguyen, N.T. Tran. CHINA: 1 ♀, 1 ♂, Tianzhu, Guizhou, August 2009, Wang Yang-wen.

**Distribution.** Vietnam, China (new record).

### *Orancistrocerus altus* sp. nov.

(Figs 3–9)

**Material examined.** Holotype, ♀, labeled “VIETNAM, Lan Chau, Huu Lien NR, Huu Lien, Lang Son, 21°43'22.9"N, 106°22'40.2"E, ca 370 m, 12 June 2018, coll. L.T.P. Nguyen” [IEBR]. Paratype: VIETNAM: [IEBR]: 1 ♀, Lan Nghe, Huu Lien NR, Huu Lien, Lang Son, 21°33'48.6"N, 106°24'36.4"E, ca 289 m, 11 June 2018, coll. L.T.P. Nguyen, T.V. Luong, N.T. Tran, L.X. Truong.

**Diagnosis.** This species can be distinguished from other *Orancistrocerus* by the clypeus and tergum II: the clypeus in frontal view is nearly as high as wide, with the apical margin deeply emarginated, half oval shape, the width of the emargination is 0.4 times the width of the clypeus between the inner eye margins, and has an inversed U-shaped yellow mark near the basal margin; and tergum II in dorsal view is slightly wider than long, with large undefined punctures.

**Description.** *Female.* Body length 13.8–14.5 mm (holotype: 13.8 mm); fore wing length 12.2–13.1 mm (holotype: 12.2 mm). Head in frontal view subcircular, 1.3 times as wide as high (Fig. 3). Vertex sloping down behind posterior ocelli towards occipital carina, with cephalic foveae small, bearing dense pubescence, situated on depressed area on vertex behind posterior ocelli, and with distance between foveae slightly greater than diameter of front ocellus. Distance from posterior ocelli to apical margin of vertex 2.4 times distance from posterior ocelli to inner eye margin (Fig. 4). Gena in lateral view 0.7 times as wide as eye. Occipital carina complete, present along entire length of gena, widened at lateral part. Inner eye margins in frontal view 1.2 times further apart from each other at vertex than at clypeus. Clypeus in lateral view slightly convex basally and apically, straight medially; in frontal view nearly as high as wide (Fig. 3), apical margin deeply emarginate, half-oval shaped, width of emargination 0.4 times width of clypeus between inner eye margins. Mandible with prominent wide teeth, fourth tooth blunt apically. Antennal scape long, 3.7 times as long as its maximum width; flagellomeres I 2 times as long as wide, flagellomere II 1.1 times as long as wide, flagellomeres III–IX wider than long, last flagellomere bullet shape, as long as its basal width.



**FIGURES 1–2.** *Orancistrocerus aterrimus nigriceps*, ♀. 1. Head, frontal view. 2. Habitus

Mesosoma slightly longer than wide in dorsal view. Pronotal carina present, produced at humeral angle, reaching ventral corner of pronotum. Mesoscutum convex, 0.8 times as long as wide between tegulae; anterior margin broadly rounded. Disc of scutellum slightly convex, with middle carina present at basal two-thirds. Metanotum round. Propodeum (Fig. 6) strongly excavated medially, with posterior surface distinctly concave, basal triangular area with a basal fovea, at lower end median carina running to apical margin; border between dorsal and lateral surfaces rounded, posterior and lateral surfaces angled.

Metasomal tergum I in dorsal view narrower than tergum II, truncate at base (Fig. 7); anterior vertical surface of tergum I slightly convex, with sparse shallow punctures, clearly separated from posterior horizontal surface by carina; posterior horizontal surface of tergum I in lateral view slightly convex dorsally; tergum I laterally divided by sharp carina into upper and lower parts. Tergum I in dorsal view 1.8 times as wide as long; tergum II in dorsal view slightly wider than long (Fig. 7); sternum II in lateral view (Fig. 8) slightly depressed basally, then gradually and slightly convex to apical margin.

Body with short, sparse silver setae except lower part of propodeum with longer and denser setae. Clypeus with shallow large undefined punctures on disc, border between punctures raised to form weak longitudinal striations, laterally with smaller and deeper punctures. Mandible with a row of punctures laterally. Frons with dense deep and large flat-bottomed punctures, interspaces strongly raised to form reticulation; vertex and gena with smaller and weaker punctures, interspaces not raised. Pronotum with coarser punctures than frons, spaces between punctures raised to form reticulations. Mesoscutum with dense strong flat-bottomed punctures, space between punctures raised to form longitudinal striations, the striations stronger at apical margin. Scutellum punctures similar to those on pronotum. Metanotum punctures coarse and dense. Mesepisternum punctures larger coarser posterodorsally than pronotum, some small and shallow punctures anteroventrally near border between posterodorsal and anteroventral, margins indistinct. Metapleuron with few strong striae and large deep hole at upper part of dorsal area, with sparse shallow small punctures in ventral area. Propodeum with coarse and large flat-bottomed punctures dorsally, laterally punctures shallower smaller sparser, posteriorly shiny, with punctures at upper part and oblique weak carina at lower part. Tergum I with moderate punctures, clearly separated, tergum II punctures shallower undefined, punctures near apical margins of tergum II deeper, larger and coarser than those on

other part of the tergum, tergum III–V punctures strong and deep, smaller than tergum II, tergum VI punctures minute; sternum II punctures deeper and larger than lateral tergum II margins, sternum III–V punctures smaller and shallower than sternum II; sternum I narrow basal part smooth.

*Color.* Black; following parts yellow: inverse U-shaped mark near basal margin of clypeus, two separate small spots between antennae, large spot on mandible basally, spot on tegula, band (incised medially) on apical margin of terga II and III; and the following parts ferruginous: antennal scape beneath, spot on tegula, inner side of fore femur and tibia, dorsal side of middle and hind femur. Propodeal valvulae dark brown. Wings brown, transparent, veins dark brown (Fig. 5).



**FIGURES 3–9.** *Orancistrocerus altus* sp. nov., ♀, holotype. 3. Head, frontal view. 4. Vertex, dorsal view. 5. Fore wing. 6. Propodeum, dorsal view. 7. T1–2, dorsal view. 8. Metasoma, lateral view. 9. Habitus.

**Distribution.** Vietnam (northern provinces).

**Etymology.** From the Latin *altus*, “high”, in reference to the deep apical margin of the clypeus.

**Remark.** This species comes close to *O. aterrimus nigriceps* but differs from the latter by the shape of clypeus in the female, with its apical margin deeply emarginated (slightly emarginated in *O. aterrimus nigriceps*) and tergum II in dorsal view scarcely wider than long (it is about 1.2 times wider than long in *O. aterrimus nigriceps*).

## Key to species of genus *Orancistrocerus*

The characters are applicable to both sexes unless the sex is specified. The characters of *O. moelleri* and *O. bicoloripennis* are taken from the descriptions of the species, following van der Vecht (1963), Yamane (1990), and the key to species by van der Vecht (1963), except for specimens of *O. aterrimus nigreps* from Vietnam and *O. drewseni drewseni* from China.

- 1 Metasomal tergum II sparsely punctate, interspaces much greater (two to three times) than puncture diameter, except at base and at apical margin with interspaces smaller than puncture diameter. Orange-yellow markings present as follows: large inter-antennal spot on clypeus, spot near base of mandibles, antennal scape beneath, apical bands of terga I-II. . . . . *O. drewseni* (de Saussure, 1857)
- Metasomal tergum II densely punctate, interspaces larger (about 1.5 times) than puncture diameter, except at base and at apical margin with interspaces equal or smaller than puncture diameter. Mesosoma with yellow apical band on terga I-II or extensively marked with red or entirely black. . . . . 2
- 2 Female clypeus with apical margin deeply emarginated, half-oval shaped, with an inverse U-shaped mark near basal margin of clypeus and apical bands of terga I-II yellow . . . . . *O. altus*, **sp. nov.**
- Female clypeus with apical margin shallowly emarginated . . . . . 3
- 3 Wings yellowish or light cupreous brown, not conspicuously infuscated on apical half.  
Mesosoma extensively marked with red. . . . . *O. moelleri* (Bingham, 1897)
- Wings subhyaline or yellow, strongly infuscated at apex . . . . . 4
- 4 Mandible with ivory white spot at base. Basal part of wings rich golden hyaline, apical half fuscous with golden and violaceous reflections . . . . . *O. aterrimus* (de Saussure, 1852)
- Mandibles with irregular yellow spot at base. Wings with less pronounced yellow tinge; the apical cloud covers the marginal cell, the second and third submarginal cells and the areas below and beyond these cells . . . *O. bicoloripennis* (Gribodo, 1892).

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## References

- Bingham, C.T. (1897) *The Fauna of British India, including Ceylon and Burma: Hymenoptera. Vol. 1. Wasps and Bees*. Taylor and Francis, London, 579 pp.
- Carpenter, J.M. & Cumming, J.M. (1985) A character analysis of the North American potter wasps (Hymenoptera: Vespidae: Eumeninae). *Journal of Natural History*, 19, 877–916.  
<https://doi.org/10.1080/00222938500770551>
- Giordani Soika, A. (1941) Studi sui Vespidi Solitari. *Bollettino della Societa Veneziana Storia Naturale*, 2, 130–279.
- Giordani Soika, A. (1973) Notulae vespilogicae 35. Descrizione di nuovi eumenidi. *Bollettino del Museo civico di storia naturale di Venezia*, 24, 97–131.
- Nguyen, L.T.P., Dang, H.T., Nguyen, D.D., Nguyen, C.Q., Tran, H.P. & Phan, H.T.T. (2015) *Study on solitary wasps (Hymenoptera: Vespidae: Eumeninae) from Vinh Phuc and Bac Giang provinces*. Proceedings of the 6th National Scientific Conference on Ecology and Biological Resources Hanoi, 28 October 2015, 204–207.
- Nguyen, L.T.P. & Dang, H.T. (2017) *Species composition of solitary wasps (Hymenoptera: Vespidae: Eumeninae) from Bac Kan and Cao Bang provinces*. Proceedings of the 9th Vietnam national conference on entomology, Hanoi, April 10–11, 887–891.
- Saussure, H. de. (1852–1853) *Études sur la Famille des Vespides 1. Monographie des Guêpes solitaires ou de la tribu des Euméniens*. V. Masson, Paris & J. Kessmann, Genève, 286 pp., 21 pls.
- Tan, J.L., Carpenter, J.M. & van Achterberg, C. (2018) An illustrated key to the genera of Eumeninae from China, with a checklist of species (Hymenoptera, Vespidae). *ZooKeys*, 740, 109–149.  
<https://doi.org/10.3897/zookeys.740.22654>
- van der Vecht, J. (1963) Studies on Indo-Australian and East-Asiatic Eumenidae (Hymenoptera, Vespoidea). *Zoologische Verhandelingen*, 60, 3–113.