

**NEW RECORD OF THE GENUS *Dicamptus Szépligeti*
(Hymenoptera: Ichneumonidae: Ophioninae) FROM VIETNAM**

Pham Thi Nhi^{*}, Hoang Vu Tru, Dang Thi Hoa, Dang Van An

Institute of Ecology and Biological Resources, VAST, Vietnam

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ABSTRACT

Dicamptus isshikii Uchida, 1928 is recorded for the first time from Vietnam on the basis of specimens collected from Bat Xat Nature Reserve, Lao Cai province, Northwest Vietnam. A checklist of the *Dicamptus* species of Vietnam is presented with detailed records on the distribution range of each species. A key to the Vietnamese species of the genus *Dicamptus* is also provided.

Keywords: Ichneumonidae, distribution, new record, taxonomy.

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**Corresponding author email:* ptnhi2@yahoo.com

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INTRODUCTION

Dicamptus Szépligeti, 1905 is a moderately species-rich genus of the subfamily Ophioninae (Hymenoptera: Ichneumonidae), with a total of 34 species that are known from Afrotropical, Australasia, Oceanic, Oriental and Palaearctic regions (Yu et al., 2016; Pham et al., 2020). They are known as solitary koinobiont endoparasitoids of Lepidoptera larvae (Gauld & Mitchell, 1981). Morphologically members of the genus *Dicamptus* can be confused with the species of genus *Enicospilus* Stephens, 1835, because they share the characteristic fenestra and sclerites in the discosubmarginal cell of the fore wing, but are separated by untwisted and untapered mandible (mandible more or less strongly tapered in *Enicospilus*).

In Vietnam, four species of the genus *Dicamptus* were recognized in previous studies including *Dicamptus cantoni* Gauld & Mitchell, *Dicamptus curvus* Pham, Matsumoto & Shimizu, *Dicamptus nigropictus* (Matsumura) and *Dicamptus reticulatus* (Cameron) (Vas, 2017; Pham et al., 2020). Based on recent field surveys, we collected some more specimens of the genus

Dicamptus, especially recorded the fifth species of this genus from Vietnam. We herein report the species, *Dicamptus isshikii* (Uchida) for the first time, highlighting the distribution range of known species in the country and provide a key to all five species of the genus *Dicamptus* from Vietnam.

MATERIALS AND METHODS

Specimens were collected at light traps and deposited at the Institute of Ecology and Biological Resources, Ha Noi, Vietnam (IEBR). Other collections referred to in this paper are the Hokkaido University, Sapporo, Japan (EIHU), the Natural History Museum, London, UK (NHMUK) and the National Museum of Natural History, Washington D.C., USA (NMNH).

Photographs. Photographs were taken using a Nikon SMZ800N M80 stereomicroscope and a Canon 700D camera. They were stacked with Combine ZP, Helicon Focus and subsequently edited by Photoshop CS2.

Terms and indices. Morphological terminology mainly follows Broad et al. (2018). Wing indices follow of Gauld & Mitchell (1981).

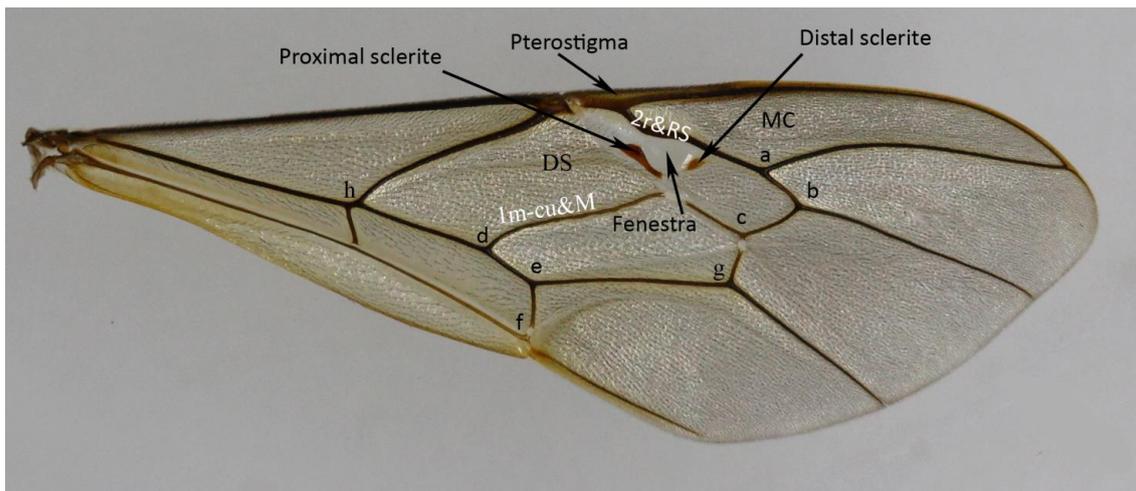


Figure 1. Fore wing of *Dicamptus nigropictus*, morphological terms and measurement characters: DS = discosubmarginal cell, MC = marginal cell, CI = de/ef, ICI = ab/cb, SDI = eg/hd

RESULTS

Genus *Dicamptus* Szépligeti, 1905

Dicamptus Szépligeti, 1905: 21; type species, *Dicamptus giganteus* Szépligeti, by monobasic.

Diagnosis. Mandibles weakly tapered and not twisted; apical teeth subequal length and shape. Ocelli usually large. Occipital carina complete. Antenna as long as fore wing or longer. Notauli absent. Scutellum weakly to moderately convex with strong lateral carinae. Epicnemial carina reaching above level of lower corner of pronotum but generally not reaching anterior margin of mesopleuron. Posterior transverse carina of mesosternum complete. Propodeum with anterior transverse carina complete and posterior area usually reticulate. Fore wing with pterostigma fairly slender, marginal cell very long, 2r&RS usually broadened and variously sinuous or bowed proximally, discosubmarginal cell with fenestra and sclerites, 1m-cu&M from arcuate to sinuate, usually without ramellus. Hind wing with RS virtually straight, RA with more than five hamuli of similar size and shape. Inner mesal margin of fore tibial spur without membranous flange. Outer distal margin of mid and hind trochantelli simple and without decurved apical tooth.

Checklist of *Dicamptus* from Vietnam (* new record)

Dicamptus cantoni Gauld & Mitchell, 1981

Dicamptus cantoni Gauld & Mitchell, 1981: 106; holotype ♂, Kwangtung, China (NHMUK).

Distribution: China, India, Indonesia, Laos, Thailand, Vietnam (Son La*, Cao Bang*, Dien Bien*, Phu Tho, Ninh Binh, Dak Lak, Lam Dong) (Gauld & Mitchell, 1981; Tang, 1993; Shimizu & Konishi, 2018; Pham et al., 2020). This species was recorded from Vietnam for the first time by Pham et al. (2020).

Dicamptus curvus Pham, Matsumoto & Shimizu, 2020

Dicamptus curvus Pham, Matsumoto & Shimizu, 2020: 373. Holotype ♂, Lai Chau, Vietnam (IEBR).

Distribution: Vietnam (Lai Chau) (Pham et al., 2020). This species is currently known only from Vietnam.

Dicamptus nigropictus (Matsumura, 1912)

Ophion nigropictus Matsumura, 1912: 113; holotype ♀, Ryukyu Is. (EIHU).

Dicamptus nigropictus: Uchida (1928).

Distribution: Brunei, China, India, Japan, Korea, Laos, Taiwan, Vietnam (Yen Bai, Dien Bien*, Ha Giang*, Cao Bang, Bac Kan, Vinh Phuc, Ha Tinh, Kon Tum) (Gauld & Mitchell, 1981; Nikam & Kanhekar, 1984; Tang, 1993; Vas, 2017; Pham et al., 2020). This species was recorded from Vietnam for the first time by Vas (2017).

Dicamptus reticulatus (Cameron, 1899)

Enicospilus reticulatus Cameron, 1899: 102; holotype ♂, India (NMNH).

Dicamptus nigropictus var *fuscus* Uchida, 1928: 211; holotype ♂, Taiwan (EIHU).

Enicospilus uchidae Chiu, 1954: 49; replacement name for *Dicamptus nigropictus* var *fuscus* Uchida, 1928, when Chiu (1954) transferred it to *Enicospilus*, it became a junior secondary synonym of *E. fuscus* (Roman, 1913); synonymized by Gauld & Mitchell (1981: 101).

Distribution: China, India, Myanmar, Sri Lanka, Taiwan, Vietnam (Lao Cai, Lai Chau, Cao Bang, Quang Nam, Lam Dong) (Nikam, 1972; Gauld & Mitchell, 1981; Tang, 1993; Pham et al., 2020). This species was recorded from Vietnam for the first time by Pham et al. (2020).

Further information about the material examined and illustrations of the four species above see Pham et al. (2020).

New country records

Dicamptus isshikii Uchida, 1928 (Fig. 2)

Dicamptus isshikii Uchida, 1928: 212. Holotype ♀, JAPAN (EIHU).

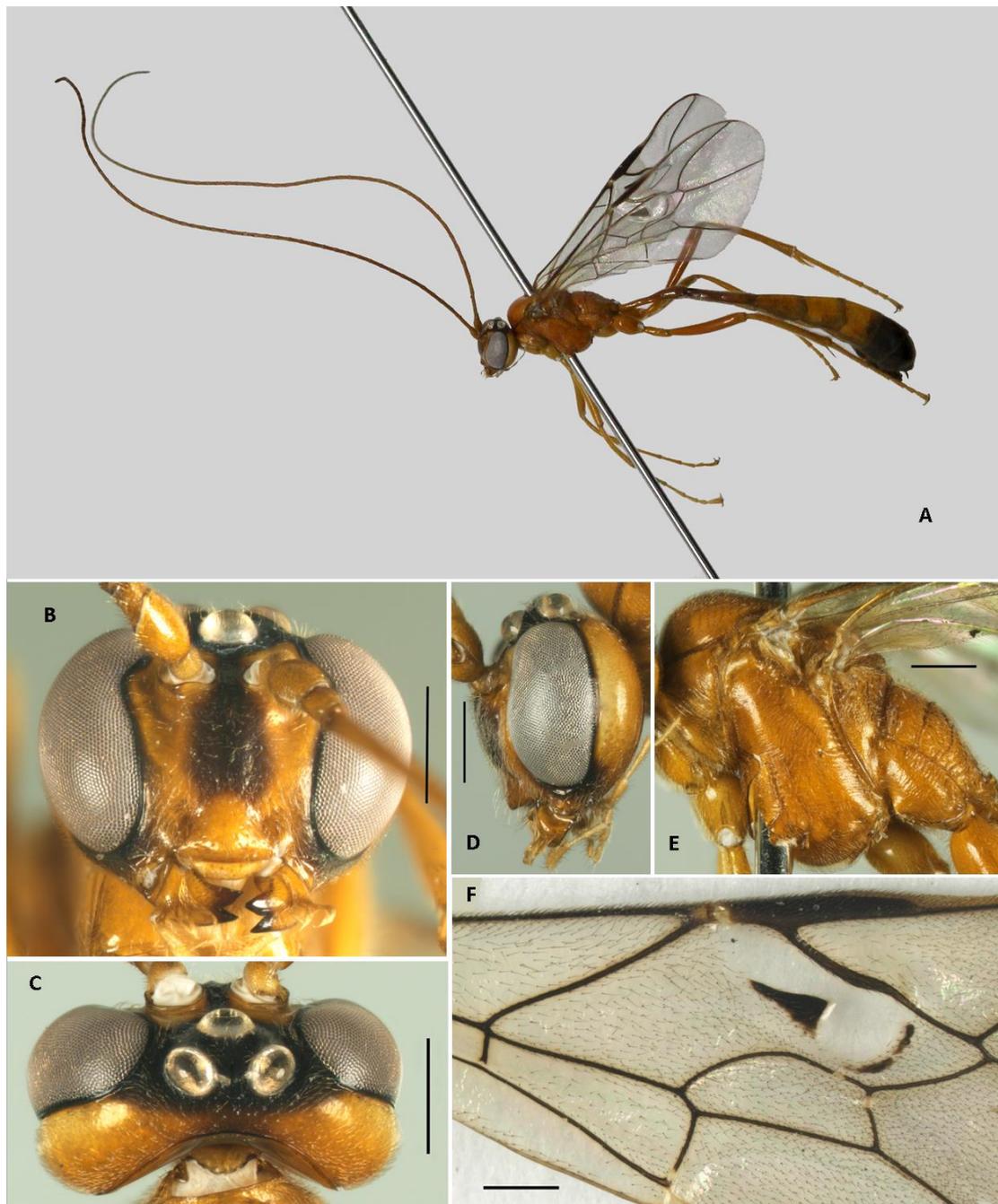


Figure 2. *Dicamptus isschikii* Uchida from Vietnam: A. habitus; B. head, frontal view; C. head, dorsal view; D. head, lateral view; E. mesosoma, lateral view; F. central part of fore wing scale bar = 0.5 mm)

Diagnosis. Mandible short, weakly concavity; fore wing with proximal and distal narrowed apically, outer surface with a sclerites strong, not confluent together; fore conspicuous brush of hairs, basally with a deep wing indices CI = 0.08–0.3, ICI = 0.13–0.2.

Dicamptus isshikii belongs to the *isshikii* species group and can be recognised from *Dicamptus indicus* by the presence of distal sclerite (entirely absent in *D. indicus*) and broader lower face (0.9× as broad as long vs. 0.73–0.77×). This species is easily distinguished from its Vietnamese congeners by its smaller body size and smaller fore wing indices as mentioned in the key.

Material examined. Vietnam: 2♂ (IEBR), Lao Cai province, Bat Xat Nature Reserve, 22°37'37" N 103°37'32" E, 1,840 m, 28.v.2022, light trap, Pham T. N., Hoang V. T., Dang T. H. & Dang V.A. coll.

Distribution. China, India, Japan, Nepal, Philippines (Gauld & Mitchell, 1981; Yu et al., 2016). These are the first records of this species from Vietnam.

Remarks. In comparison with the specimens examined by Gauld & Mitchell (1981), two male specimens from Vietnam have greater CI (0.25–0.3 vs 0.08–0.22) but slightly smaller SDI (0.84–0.89 vs. 0.87–1.03). In addition, Vietnamese specimens have their posterior ocellus separated from eye by about 0.3 times its own maximum diameter (vs. 0.1–0.2 times in Gauld & Mitchell, 1981). These variations, however, are minor and often found among different populations of Ophioninae (e.g. Pham et al., 2021).

Key to the Vietnamese species of the genus *Dicamptus*

1. Smaller body size, fore wing length from 8–8.8 mm (Fig. 2A), with CI = 0.25–0.3, ICI = 0.2 (Fig. 2F); mandible outer surface with a conspicuous brush of hairs (Fig. 2B); posterior ocellus separated from eye by about 0.3 times its maximum diameter (Fig. 2C) ***D. isshikii* Uchida**
 - Larger body size, fore wing length at least 17 mm, with CI at least 0.5, ICI at least 0.65 (Fig. 1); mandible outer surface with or without a conspicuous brush of hairs; posterior ocellus touching or close to eye.....2
2. Mandible with a conspicuous proximal concavity margined distally by an angular raised ridge, and the concavity more or less broadened and deepened from dorsal to ventral; outer surface with a conspicuous diagonal line of punctures with long hairs extending from the upper proximal corner to center.....***D. reticulatus* (Cameron)**
 - Mandible flat or with a proximal concavity but the concavity never margined by a raised ridge and broadened and deepened ventrally as above; outer surface smooth to punctate but without a conspicuous line of punctures and hairs.....3
3. Head in dorsal view inflated behind eye. Clypeus in profile strongly convex and more or less triangular, its anterior corner acute and sharp, and its ventral part strongly and abruptly impressed so that nasute. Marginal cell of fore wing adjacent to *2r*&*RS* with a conspicuous glabrous patch (Fig. 1). Fore wing fenestra between pterostigma and proximal margin of proximal sclerite setose (Fig. 1)..... ***D. nigropictus* Matsumura**
 - Head in dorsal view constricted behind eye. Clypeus in profile flat to weakly convex never nasute. Marginal cell of fore wing uniformly setose without a conspicuous glabrous patch. Fore wing fenestra between pterostigma and proximal margin of proximal sclerite almost glabrous.....4
4. Fore wing with CI = 0.5. Posterior end of proximal sclerite of fore wing separated from posterior margin of fenestra by its maximum depth ***D. curvus* Pham, Matsumoto & Shimizu**
 - Fore wing with CI greater than 0.7. Posterior end of proximal sclerite of fore wing close to posterior margin of fenestra and separated from it by less than 0.5 of its maximum depth.....***D. cantoni* Gauld & Mitchell**

DISCUSSION

Based on Averyanov et al. (2003) and Sterling et al. (2006), the territory of Vietnam can be divided into five major geographical regions: Northeast, Northwest, North Central, South Central and Central Highlands, and South Vietnam. Among five currently known species of the genus *Dicamptus* from Vietnam, all of them were found in the Northwest, three species were recorded from South Central and Central Highlands, namely *Dicamptus cantoni* Gauld & Mitchell, *Dicamptus nigropictus* (Matsumura) and *Dicamptus reticulatus* (Cameron), two species, *Dicamptus cantoni* Gauld & Mitchell and *Dicamptus nigropictus* (Matsumura), were known from Northeast, and one species, *Dicamptus nigropictus* (Matsumura), was found from North Central. However, none has been recorded from South Vietnam. Further extensive sampling efforts, especially in South Vietnam are needed to reveal the actual diversity of the genus *Dicamptus* in the country.

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