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Taxonomic review of the potter wasp genus *Antepipona* de Saussure, 1855 (Hymenoptera, Vespidae, Eumeninae) from Vietnam, with descriptions of two new species and keys to the Oriental fauna

Lien Thi Phuong NGUYEN, Anh D. NGUYEN, Hoa T. DANG, Seiki YAMANE & Michael S. ENGEL

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Antepipona biguttulata (Fabricius, 1787), from Vietnam, male, front view.

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Taxonomic review of the potter wasp genus *Antepipona* de Saussure, 1855 (Hymenoptera, Vespidae, Eumeninae) from Vietnam, with descriptions of two new species and keys to the Oriental fauna

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Nguyen L. T. P., Nguyen A. D., Dang H. T., Yamane S. & Engel M. S. 2024. — Taxonomic review of the potter wasp genus *Antepipona* de Saussure, 1855 (Hymenoptera, Vespidae, Eumeninae) from Vietnam, with descriptions of two new species and keys to the Oriental fauna. *Zoosystema* 46 (27): 697-722. https://doi.org/10.5252/zoosystema2024v46a27. http://zoosystema.com/46/27

ABSTRACT
Species of the solitary wasp genus *Antepipona* de Saussure, 1855 (Eumeninae Leach, 1815, Odynerini Lepeletier, 1841) occurring in Vietnam are reviewed. Seven species have been collected from the study area, with two species new to science. These are described and figured, along with their male genitalia, as *Antepipona concava* Nguyen, Dang & A. D. Nguyen, n. sp. and *Antepipona crenula* Nguyen, Yamane & Engel, n. sp. Four species, *A. bipustulata* (de Saussure, 1855), *A. ceylonica* (de Saussure, 1867), *A. rufescens* (Smith, 1857), and *A. tytides* (Cameron, 1904), are recorded from Vietnam for the first time. The male genitalia of *A. ceylonica* and *A. tytides* are described for the first time. Keys are provided to the Oriental species of the genus.

KEY WORDS
Biodiversity,
identification key,
Oriental,
solitary wasps,
new records,
new species.

RÉSUMÉ
Revue taxonomique du genre de guêpe à papier Antepipona *de Saussure, 1855 (Hymenoptera, Vespidae, Eumeninae) du Vietnam, avec la description de deux nouvelles espèces et une clé pour la faune orientale.*
Les espèces du genre de guêpes solitaires *Antepipona* de Saussure, 1855 (Eumeninae Leach, 1815, Odynerini Lepeletier, 1841) présentes au Vietnam sont passées en revue. Sept espèces ont été collectées dans la zone d'étude, dont deux sont nouvelles pour la science. Celles-ci sont décrites et représentées, avec leurs genitalia mâles, comme *Antepipona concava* Nguyen, Dang & A. D. Nguyen, n. sp. et *Antepipona crenula* Nguyen, Yamane & Engel, n. sp. Quatre espèces, *A. bipustulata* (de Saussure, 1855), *A. ceylonica* (de Saussure, 1867), *A. rufescens* (Smith, 1857), et *A. tytides* (Cameron, 1904), sont signalées au Vietnam pour la première fois. Les genitalia mâles d'*A. ceylonica* et d'*A. tytides* sont décrits pour la première fois. Des clés sont fournies pour les espèces orientales du genre.

MOTS CLÉS
Biodiversité,
clé d'identification,
Orient,
guêpes solitaires,
signalisations nouvelles,
espèces nouvelles.

INTRODUCTION

The genus *Antepipona* de Saussure, 1855 is a diverse lineage of solitary potter wasps, with 169 species spanning the Palaearctic, Afrotropical, and Indomalayan regions. In the Oriental region there are currently 30 species and seven subspecies (Kumar *et al.* 2016; Selis 2018), and until recently only a single species, *Antepipona biguttata* (Fabricius, 1787), had been recorded from Vietnam (Nguyen *et al.* 2014, 2018). Extensive sampling of vespid wasps throughout Vietnam in recent years has resulted in the discovery of much further material. Based on these samples from the Insect Ecology Department, Institute of Ecology & Biological Resources, Hanoi, as well as additional material in the private collection of Seiki Yamane, Japan we provide a review of the diversity of *Antepipona* from Vietnam. Based on this work we report four additional species for the country as well as two new species, which are described and figured herein. We also provide keys to the species of *Antepipona* in the Oriental region, including figures of pertinent characters. It is hoped that this review will encourage hymenopterists to seek these wasps to clarify their biology and biogeography.

MATERIAL AND METHODS

Specimens of *Antepipona* were examined from the Insect Ecology Department, Institute of Ecology & Biological Resources (IEBR), Hanoi, Vietnam, and from the private collection of Seiki Yamane, Japan (coll. SKYC). Morphological and color characters of mature specimens were observed using pinned and dried specimens under an Olympus SZ4 stereomicroscope, and measurements were made with an ocular micrometer. "Body length" indicates the combined lengths of the head, mesosoma, and the first two metasomal segments. Morphological terminology follows that of Carpenter & Cumming (1985) and Yamane (1990). Genitalic terminology follows Kojima (1999) and Nguyen *et al.* (2023). Photographic images were made with a Nikon SMZ 800N digital stereomicroscope and an attached Sony *α*6000 digital camera. Images were stacked using Helicon Focus v.7, then grouped into plates using Adobe Photoshop CS6.

The names of provinces in Vietnam are arranged in order from north to south and from west to east.

ABBREVIATIONS

Repository

IEBR	Insect Ecology Department, Institute of Ecology & Biological Resources, Hanoi;
coll. SKYC	private collection of Seiki Yamane, Kagoshima.

Other abbreviations and symbol

IED-c	collectors from the Insect Ecology Department (IEBR);
ISD-c	collectors from the Insect Systematics Department (IEBR).
F, S, and T (I, II, III, …)	numbered flagellomeres, metasomal sterna, and metasomal terga, respectively.
NP	National Park;
NR	National Reserve;
*	new record from Vietnam.

SYSTEMATICS

Family VESPIDAE Latreille, 1802
Subfamily EUMENINAE Leach, 1815

Genus *Antepipona* de Saussure, 1855

Antepipona de Saussure, 1855: 244 (name for section C of division V of subgenus *Leionotus* de Saussure, 1852 of genus *Odynerus* Latreille in de Saussure, 1853: 213; declared available from date of publication by Opinion 893 (ICZN 1970)).

TYPE SPECIES. — *Odynerus silaos* de Saussure, 1852, by subsequent designation van der Vecht (1967): 30; confirmed by Opinion 893.

DIAGNOSIS. — Metanotum bituberculate; forewing prestigma much shorter than pterostigma, second submarginal cell not petiolate; propodeum without deep fossae; axillary fossa oval, broader than long; propodeum with submarginal carina produced into pointed lamella apically, valvula enlarged and free posteriorly from submarginal carina; metasoma not petiolate (TI with width more than half that of TII, much less than twice as long as wide); TII not carinate anterodorsally.
Refer to Kumar *et al.* (2016) for the diagnoses of *Antepipona biguttata*, *A. bipustulata* (de Saussure, 1855), *A. ceylonica* (de Saussure, 1867), *A. rufescens* (Smith, 1857), and *A. tytides* (Cameron, 1904).

REMARKS

The genus *Antepipona* was proposed by de Saussure (1855) for what he had earlier classified as section C of division V of the subgenus *Leionotus* in a more widely circumscribed *Odynerus* Latreille, 1802 (de Saussure 1853). As was somewhat customary for the time, de Saussure (1855) did not designate a type species and it was not until van der Vecht (1967) that *Odynerus silaos* de Saussure, 1853 was subsequently selected as the type, thereby fixing the concept of the genus.

Antepipona biguttata (Fabricius, 1787)
(Figs 1; 2)

Vespa biguttata Fabricius, 1787: 291.

Antepipona biguttata – van der Vecht & Fischer 1972: 71.

MATERIAL EXAMINED. — **Vietnam** • 1 ♀, 7 ♂; Ha Giang, Bac Me, Lac Nong; 22°46'24.8"N, 105°10'22.9"E; alt. 418 m; 29.X.2023; Cuong Quang Nguyen, Hoa Thi Dang, Thai Van Mai, Tam Thi Thanh Vu leg.; IEBR • 1 ♀; Ha Giang, Vi Xuyen, Tung Ba; 3.III.2013; Nguyen Van Tuan leg.; IEBR • 1 ♂; Ha Giang, Vi Xuyen, Cao Bo; 5-15.VI.2001; Long Dang Khuat leg.; IEBR • 2 ♂; Ha Giang, Dong Van, Dong Van town; 22°07'16.6"N, 105°05'39.5"E; alt. 1081 m; 12.VII.2015; Cuong Quang Ngyyytyyen, Dai Dac Nguyen, Minh Phuong Nguyen leg.; IEBR • 1 ♀, 1 ♂; Cao Bang, Nguyen Binh, Thanh Cong; 22°32'29.7"N, 105°52'51.7"E; 8.VIII.2012; J. Kojima, H. Nugroho & IED-c leg.; IEBR • 2 ♀, 3 ♂; Cao Bang, Nguyen Binh, Thanh Cong; 22°32'37.0"N, 105°52'10.4"E; 7.VIII.2012; Hoa Thi Dang leg.; IEBR • 1 ♀; Cao Bang, Nguyen Binh, Quang Thanh, Hoai Khao; 22°36'0.2"N, 105°54'32"E; alt. 885 m; 9.V.2021; Nguyen Thi Phuong Lien *et al.* leg.; IEBR • 1 ♀; Lao Cai, Bat Xat NR, road to Red water fall; 22°39'18"N, 103°36'33"E; alt. 1400 m; 16.IX.2023; Anh Duc Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♀, 4 ♂; Lao Cai, Bat Xat, Ban Xeo; 23.VI.2008; Lien Thi Phuong Nguyen, Phong Huy Pham leg.; IEBR • 1 ♂; Lao Cai, Lao Cai city; 20.VI.2008;

FIG. 1. — *Antepipona biguttulata* (Fabricius, 1787), from Vietnam: **A**, **C**-**F**, female; **B**, male: **A**, **B**, facial view; **C**, pronotum and mesoscutum, dorsal view; **D**, mesoscutellum, metanotum, and propodeum, dorsal view; **E**, metasoma, lateral view; **F**, habitus, lateral view. Scale bars: 1 mm.

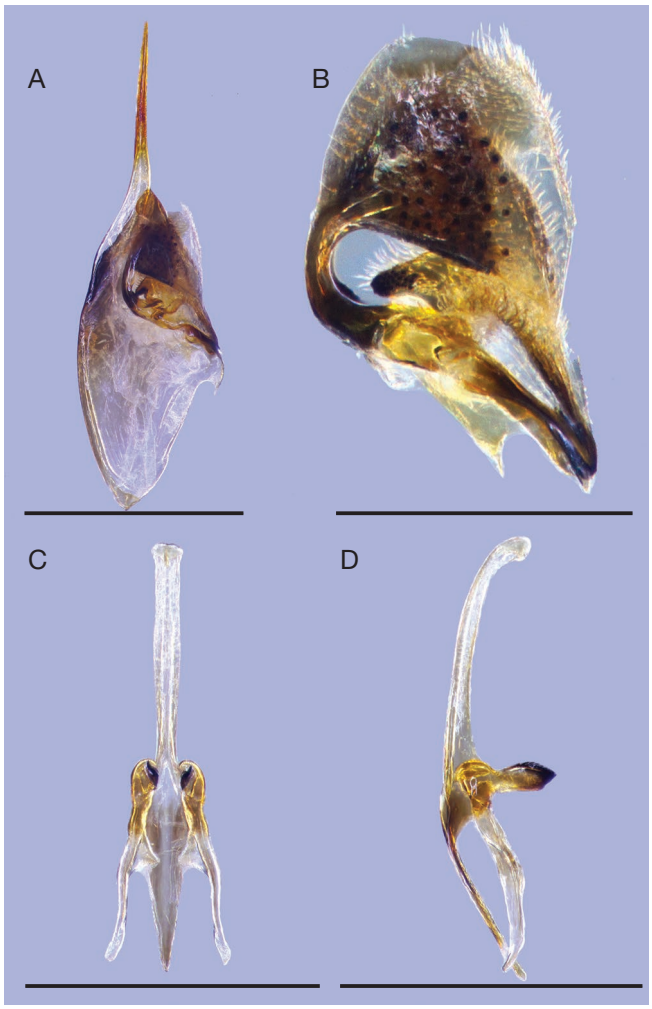

FIG. 2. — *Antepipona biguttulata* (Fabricius, 1787), genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bars: 1 mm.

Lien Thi Phuong Nguyen, Phong Huy Pham leg.; IEBR • 1 ♀; Dien Bien, Muong Nhe, Muong Toong; 22°09'25.1"N, 102°34'19.5"E; 22.VII.2009; Lien Thi Phuong Nguyen, Phong Huy Pham, J. Kojima leg.; IEBR • 1 ♀; Tuyen Quang, Ham Yen, Yen Thuan, Cao Duong, Cham Chu NP; 22°20'16.4"N, 103°51'9.4"E; alt. 670 m; 12.V.2019; Lam Xuan Truong, Lien Thi Phuong Nguyen, Cuong Quang Nguyen, Ngat Thi Tran, Thai Van Mai leg.; IEBR • 1 ♂; Tuyen Quang, Ham Yen, Yen Thuan, Cao Duong, Cham Chu NP; 22°41'8"N, 104°59'18.2"E; alt. 661 m; 14.V.2019; Cuong Quang Nguyen, Ngat Thi Tran, Thai Van Mai leg.; IEBR • 4 ♀; Tuyen Quang, Ham Yen, Yen Thuan, Cao Duong, Cham Chu NP, way to waterfall; 22°17'35.5"N, 104°59'28"E; alt. 643 m; 15.V.2019; Lam Xuan Truong, Cuong Quang Nguyen, Thai Van Mai leg.; IEBR • 6 ♀; Tuyen Quang, Ham Yen, Yen Thuan, Cao Duong, Cham Chu NP, way to waterfall; 22°17'35.5"N, 104°59'28"E; alt. 643 m; 16.V.2019; Lien Thi Phuong Nguyen, Cuong Quang Nguyen, Lam Xuan Truong, Ngat Thi Tran, Thai Van Mai leg.; IEBR • 1 ♀; Tuyen Quang, Na Hang, Na Hang NR, Road to Ban Bung, 22°16'59.5"N, 105°26'01"E; alt. 369 m; 11.VI.2015; Lien Thi Phuong Nguyen, Dai Dac Nguyen, Lam Xuan Truong leg.; IEBR • 4 ♀, 1 ♂; Son La, Muong La, Nam Pam; alt. 660 m; 25.VII.2009; Lien Thi Phuong Nguyen, Phong Huy Pham, J Kojima leg.; IEBR • 1 ♂; Son La, Phu Yen, Gia Phu, Vo Nguyen Giap forest; 21°13'7.9"N, 104°32'39.7"E; alt. 350 m; 18.VI.2015; Dai Dac Nguyen leg.; IEBR • 1 ♂; Son La, To Hieu; 5.X.1999; Lam Xuan Truong leg.; IEBR • 1 ♀; Phu Tho, Xuan Son, Tan Son; 20.V.2011; Phong Huy Pham leg.; IEBR • 4 ♂; Phu Tho, Tan Son, Lai Dong; 3.X.2011; Long Dang Khuat leg.; IEBR • 1 ♀; Hoa Binh, Mai Chau, Pa Co; 21°56'16.7"N, 102°52'58.1"E; 23.VII.2009; Lien Thi Phuong Nguyen, Phong Huy Pham, J Kojima leg.; IEBR • 1 ♀; Hoa Binh, Yen Thuy, Da Phuc; 4.V.2002; Tru Vu Hoang leg.; IEBR • 1 ♀; Thanh Hoa, Trung Son; 1.X.2017; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♀, 1 ♂; Thanh Hoa, Quan Hoa, Pu Hu NR; 20°31'32.1"N, 104°57'38.5"E; alt. 284 m; 12.VI.2016; Lam Xuan Truong, Dac Dai Nguyen, Ngat Thi Tran, Linh Ngoc Ha leg.; IEBR • 1 ♂; Thanh Hoa, Quan Hoa, Pu Hu NR; 20°33'37.3"N, 105°00'37.9"E; alt. 120 m; 15.VI.2016; Dac Dai Nguyen, Ngat Thi Tran, Linh Ngoc Ha leg.; IEBR • 1 ♀; Nghe An, Que Phong, Thong Thu; 19°47'24.5"N, 104°59'46.5"E; alt. 300 m; 21.IV.2016; Lien Thi Phuong Nguyen, Lam Xuan Truong, Dac Dai Nguyen leg.; IEBR • 6 ♀, 4 ♂; Kien Giang, U Minh Thuong, An Minh Bac, U Minh Thuong NP; 09°54'6"N, 105°8'16"E; alt. 30 m; 30.X.2023; Anh Duc Nguyen, Ngat Thi Tran leg.; IEBR • 4 ♀, 1 ♂; Kon Tum, Sa Thay, Chu Mom Ray NP; 14°47'24.5"N, 107°59'46.5"E; alt. 729 m, 25.IV.2016; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♂; Kon Tum, Sa Thay, Su Son, Ba Gooh, Chu Mom Ray NP; alt. 270 m; 4.IV.2014; Tru Vu Hoang, Tuan Van Nguyen leg.; IEBR • 3 ♀; Kon Tum, Sa Thay, Xa Son, Chu Mom Ray NP; 14°25'19"N, 107°43'54"E; alt. 653 m; 24.IV.2022; Lien Thi Phuong Nguyen, Ngat Thi Tran leg.; IEBR • 5 ♀; Gia Lai, KBang, RS No5, Kon Ka Kinh NP; 14°17'46"N, 108°27'01"E; alt. 525 m; 28.IV.2022; Lien Thi Phuong Nguyen, Ngat Thi Tran leg.; IEBR • 2 ♂; Gia Lai, KBang, Konpne, Kon Ka Kinh NP; 14°23'22.9"N, 108°20'27.5"E; alt. 847 m; 15.VII.2012; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♀; Gia Lai, KBang, Konpne, Kon Ka Kinh NP; 14°23'22.9"N, 108°20'27.5"E; alt. 847 m; 17.VII.2012; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♂; Gia Lai, Kon Ka Kinh NP; 14°11'56.7"N, 108°17'19.5"E; alt. 700 m; 13.VII.2012; Lien Thi Phuong Nguyen leg.; IEBR • 8 ♀, 3 ♂; Dak Lak, Ea Kar, Ea So, Ea So NR, Ranger station no. 9; 13°01'24.5"N, 108°33'13.6"E; alt. 264 m; 14.IV.2015; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Phuong Minh Nguyen leg.; IEBR • 1 ♂; Dak Lak, Ea Kar, Ea So, Ea So NR, sation 9; 14°28'27"N, 108°32'23.9"E; alt. 267 m; 15.IV.2015; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Phuong Minh Nguyen leg.; IEBR • 1 ♀; Dak Lak, Ea Kar, Ea So, Ea So NR, sation 5; 12°55'24.37"N, 108°33'04"E; alt. 95 m; 15.IV.2015, Lien Thi Phuong Nguyen, Dac Dai Nguyen, Phuong Minh Nguyen leg.; IEBR • 1 ♀; Dak Lak, Krong Bong, Krong Kmar, Chu Yang Sin NP; 12°26'0.07"N, 108°20'22.9"E; alt. 822 m; 3.V.2016; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♀; Dak Lak, Krong Bong, Krong Kmar, Chu Yang Sin NP; 12°25'2.8"N, 108°22'30.8"E; alt. 1081 m; 4.V.2016; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♀; Lam Dong, Lac Duong, Da Nhim, Bi Doup Nui Ba NP; 12°08'35.3"N, 108°31'58.1"E; alt. 1501 m; 6.VI.2013, Lien Thi Phuong Nguyen leg.; IEBR • 1 ♀; Dong Nai, Tan Phu, Nam Cat Tien NP; 10.VIII.2005; Lien Thi Phuong Nguyen, J. Kojima leg.; IEBR.
India • 1 ♂; Tamil Nadu, Top slip, Anamalai; alt. 550-800 m; 2-5.XII.1978; Japan-India Collection Trip; coll. SKYC.

DISTRIBUTION. — India: Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Manipur, Meghalaya, Odisha, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal; Bhutan; China: Guandong, Jiangxi, Zhejian, Fujian, Yunnan, Hainan; Taiwan; Korea; Thailand; Laos; Vietnam; Myanmar; Malaysia.

REMARKS

This species has been recorded previously from Vietnam (Lang Son, Tuyen Quang: Nguyen *et al.* [2014]; Nguyen *et al.* [2018]). Here, the range of this species is extended to the middle and southern part of Vietnam. The male genitalia were described by Giordani Soika (1982) but are redescribed here in more detail.

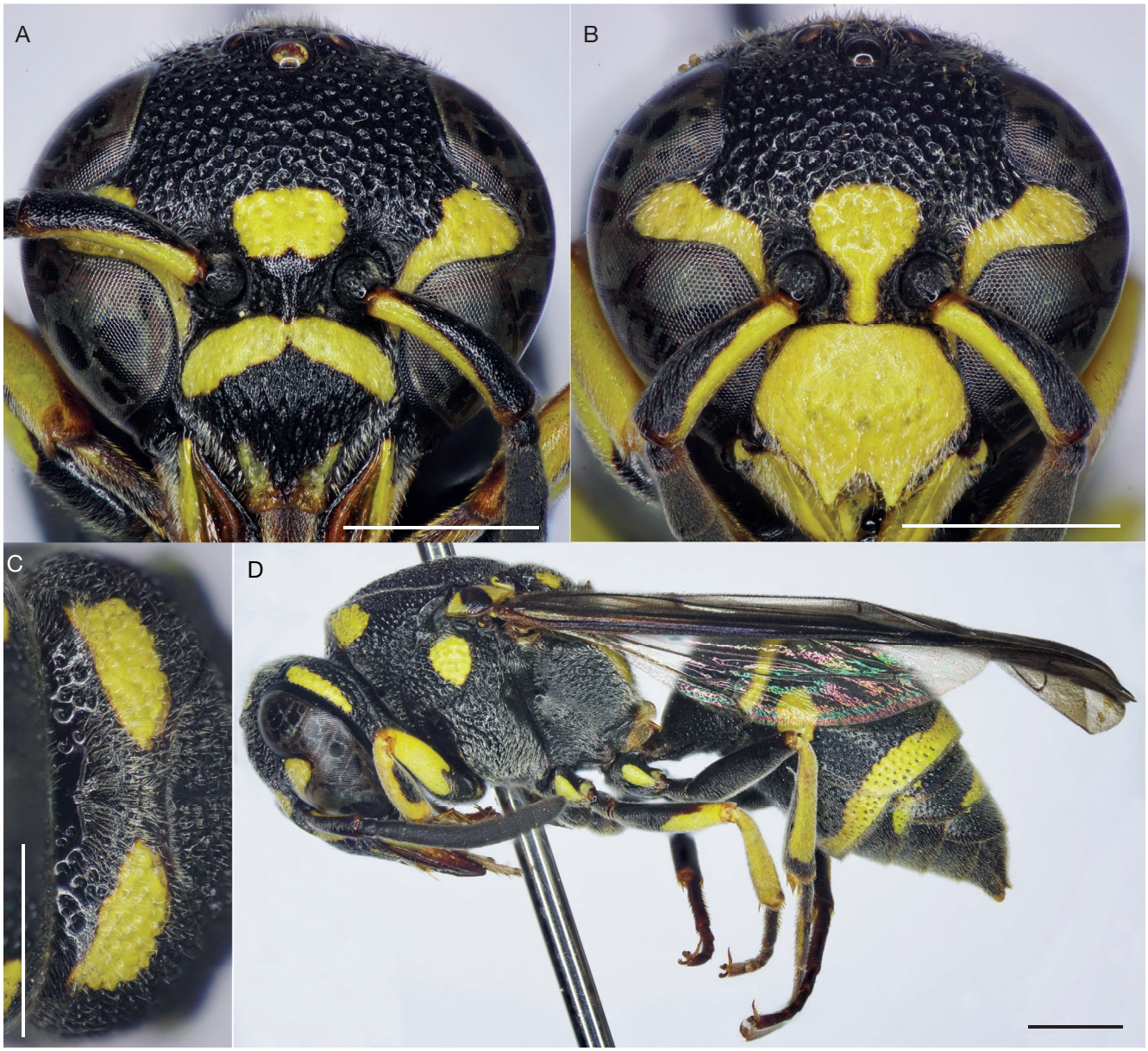

FIG. 3. — *Antepipona bipustulata* (de Saussure, 1855), from Vietnam: **A**, **C**, **D**, female; **B**, male: **A**, **B**, facial view; **C**, pronotum, frontal view; **D**, habitus, lateral view. Scale bar: 1 mm.

MALE GENITALIA. — As in Figure 2. Parameral spine lacking setae. Volsella flattened, spatulate, wide on inner aspect, and without setae at top (Fig. 2A). Digitus almost trapezoidal apically, with apical margin almost straight, with a tuff of setae at right corner (Fig. 2B). Penis valve long (Fig. 2C), about 1.8× as long as basal apodeme, in profile apical part strongly produced into a large pointed lobe (Fig. 2D); upper part of proximal margin serrated (Fig. 2D).

Antepipona bipustulata
(de Saussure, 1855)*
(Figs 3; 4)

Odynerus bipustulatus de Saussure, 1855: 277.

Antepipona bipustulata – Giordani Soika 1982 (1981): 205, 210 (key), 228, fig. 29.

MATERIAL EXAMINED. — **Vietnam** • 1 ♀; Son La, Moc Chau, Nam Kham; alt. 630 m; 22.VI.2020; Lien Thi Phuong Nguyen, Cuong Quang Nguyen, Ngat Thi Tran, Thai Van Mai leg.; IEBR • 1 ♂; Ha Noi, Thach That, Hoa Lac; 6-16.IV.2002; Malaise trap; IEBR • 3 ♂; Thanh Hoa, Quan Hoa, Pu Hu NR; 20°31'32.1"N, 104°57'38.5"E; alt. 284 m; 12.VI.2016; Lam Xuan Truong, Dac Dai Nguyen, Ngat Thi Tran, Linh Ngoc Ha leg.; IEBR • 1 ♀; Nghe An, Con Cuong, Pu Mat NP, Khe Choang; 18°57'44.8"N, 104°41'08"E; alt. 142 m; 31.VIII.2020; Ngat Thi Tran leg.; IEBR • 1 ♀; Nghe An, Que Phong, Thong Thu; 19°47'24.5"N, 104°59'45.6"E; alt. 300 m; 21.IV.2016; Lien Thi Phuong Nguyen, Lam Xuan Truong, Dac Dai Nguyen leg.; IEBR • 2 ♀, 1 ♂; Quang Nam, Tam Ky, Tan Thanh; 15°35'16.3"N, 108°28'26.5"E; alt. 2 m; 23.IV.2023; Hoa Thi Dang leg.; IEBR • 2 ♂; Kon Tum, Sa Thay, Chu Mom Ray NP; 31.III – 4.IV.2014; Tru Hoang Vu leg.; IEBR • 1 ♀; Kon Tum, Sa Thay, Chu Mom Ray NP; 14°47'24.5"N, 107°59'46.5"E; alt. 729 m; 25.IV.2016; Lien Thi Phuong Nguyen, Dac Dai Nguyen,

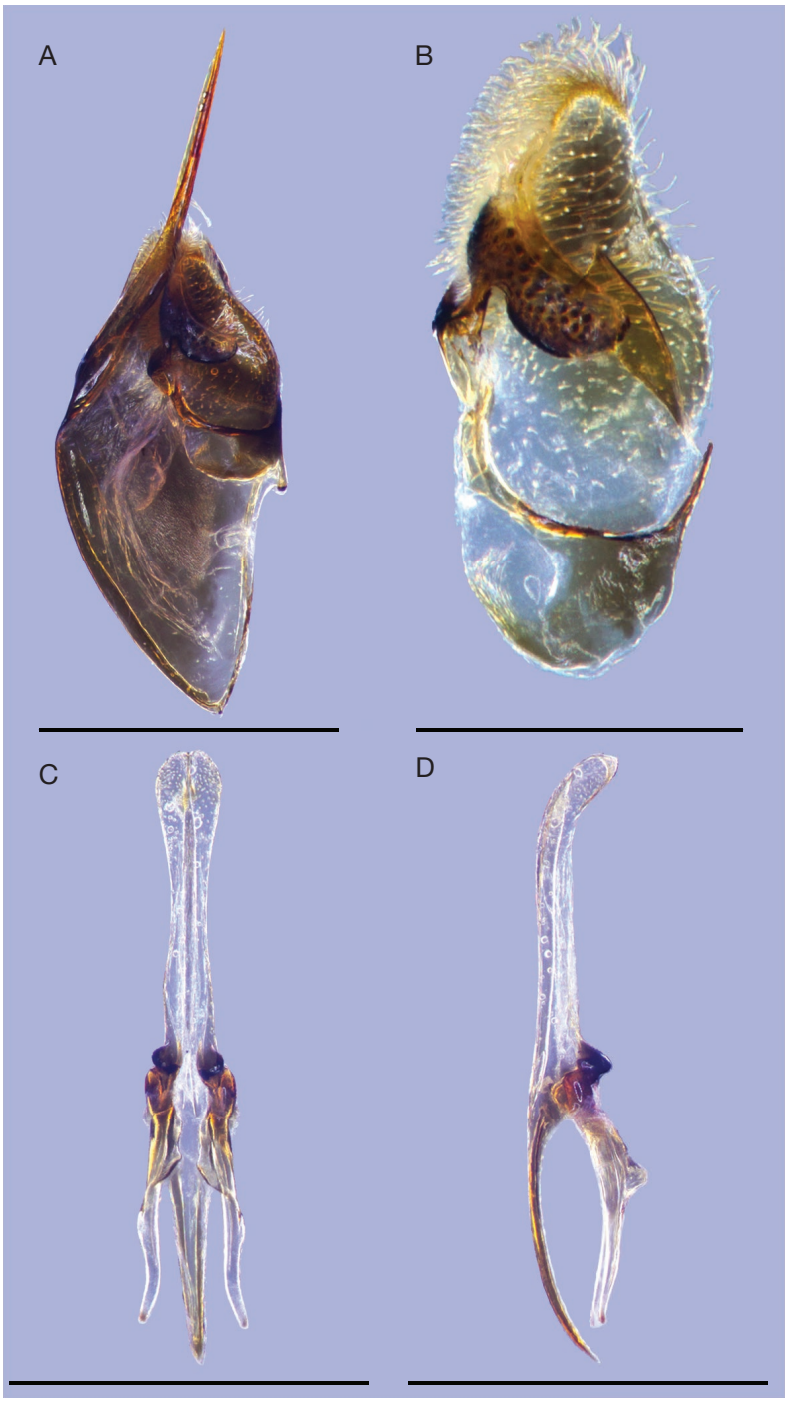

FIG. 4. — *Antepipona bipustulata* (de Saussure, 1855), genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bar: 1 mm.

Ngat Thi Tran leg.; IEBR • 1 ♀, 3 ♂; Dak Lak, Ea Kar, Ea So, Ea So NR, sation 9; 13°01'24.5"N, 108°33'13.6"E; alt. 264 m; 14.IV.2015; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Phuong Minh Nguyen leg.; IEBR • 1 ♀; Dak Lak, Ea Kar, Ea So, Ea So NR, sation 9; 14°28'27"N, 108°32'23.9"E; alt. 267 m; 15.IV.2015; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Phuong Minh Nguyen leg.; IEBR • 1 ♂; Dak Nong, Dak Glong, Dak Som, Ta Dung NR; 11°50'16.1"N, 107°59'16.7"E; alt. 745 m; IEBR • 6.V.2016; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♂; Dong Nai, Tan Phu, Nam Cat Tien NP; 9.VIII.2005; Lien Thi Phuong Nguyen, J Kojima leg.; IEBR • 1 ♂; Soc Trang, My Tu, My Phuoc; 09°34'11.8"N, 105°44'52.9"E; 4.IV.2018; Hoa Thị Dang leg.; IEBR • 1 ♂; Soc Trang, My Tu, My Phuoc; 09°33'54.2"N, 105°44'54.5"E; 5.IV.2018; Hoa Thị Dang leg.; IEBR • 1 ♂; Soc Trang, My Tu, My Phuoc; 09°34'22.6"N, 105°45'13.7"E; 8.IV.2018; Hoa Thị Dang leg.; IEBR.

Singapore • 1 ♀; Mandai, Inside Zoological Gardens; 11.VIII.2015; John L. leg.; coll. SKYC.

Indonesia • 1 ♀, 1 ♂; Sungai Dareh, Sumatra; 4.I.1981; Sk. Yamane leg.; coll. SKYC.

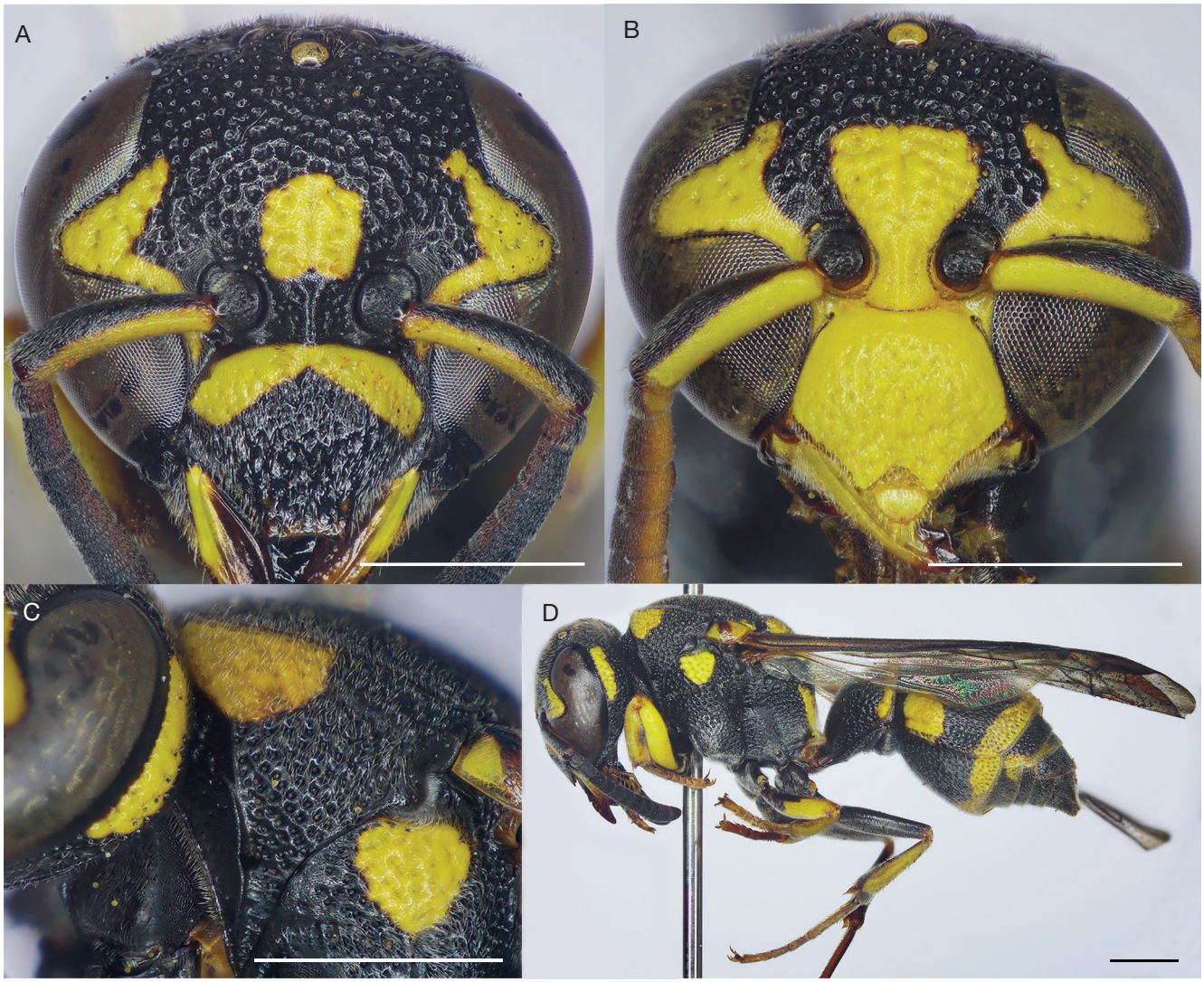

FIG. 5. — *Antepipona ceylonica* (de Saussure, 1867), from Vietnam (female) and India (male): **A**, **C**, **D**, female; **B**, male: **A**, **B**, facial view; **C**, pronotum, lateral view; **D**, habitus, lateral view. Scale bar: 1 mm.

DISTRIBUTION. — India: Arunachal Pradesh, Chhattisgarh, Delhi, Jharkhand, Meghalaya, Nagaland, Odisha, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal; Sri Lanka; China: Hong Kong (to be confirmed); Myanmar; Thailand; Laos; Malaysia; Singapore; Indonesia: Sumatra (including Riau Islands), Java; Vietnam (new record).

REMARK

This species is recorded for the first time from Vietnam. The male genitalia were described by Giordani Soika (1982) but is redescribed here in more detail.

MALE GENITALIA. — As in Figure 4. Parameral spine lacking setae. Volsella flattened, spatulate, wide on inner aspect, and without setae at top (Fig. 4A). Digitus crescent-moon-shaped, with setae along left lateral margin (Fig. 4B). Penis valves short (Fig. 4C), about 1.5× as long as basal apodeme, in profile apical part produced into a blunt tubercle (Fig. 4D); proximal margin smooth (Fig. 4D).

Antepipona ceylonica (de Saussure, 1867)* (Figs 5; 6)

Odynerus ceylonicus de Saussure, 1867: 12.

Antepipona ceylonica – Giordani Soika 1982 (1981): 207 (key), 215, figs 7-10: 207 (key), 215, figs 7-10.

MATERIAL EXAMINED. — **Vietnam** • 1 ♀; Lang Son, Huu Lung, Cai Kinh; 22°39'42.9"N, 106°15'365"E; alt. 28 m; 24.X.2015; Lien Thi Phuong Nguyen, Dac Dai Nguyen, Lam Xuan Truong, Ngat Thi Tran leg.; IEBR • 1 ♀; Thanh Hoa, Quan Hoa, Pu Hu NR; 20°33'56.0"N, 104°58'39.7"E; alt. 255 m; 14.VI.2016; Lam Xuan Truong, Dac Dai Nguyen, Ngat Thi Tran, Linh Ngoc Ha leg.; IEBR • 1 ♀; Gia Lai, Chu Se, Ia Glai; 1.V.2011; Tru Vu Hoang leg.; IEBR. **India** • 1 ♂; Tamil Nadu, Madras; 16-19.XII.1978; Jap-Ind Co Tr; coll. SKYC • 1 ♀; Tamil Nadu; Top slip, Anamalai; alt. 550-800 m; 2-5.XII.1978; Japan-India Collection Trip; coll. SKYC • 1 ♀; Tamil Nadu, Mudumalai; alt. 1000 m; 27-28.XI.1978; Japan-India Collection Trip; coll. SKYC • 1 ♀; Tamil Nadu, Thambaram nr. Madras; 18.XII.1978; Japan-India Collection Trip; coll. SKYC.

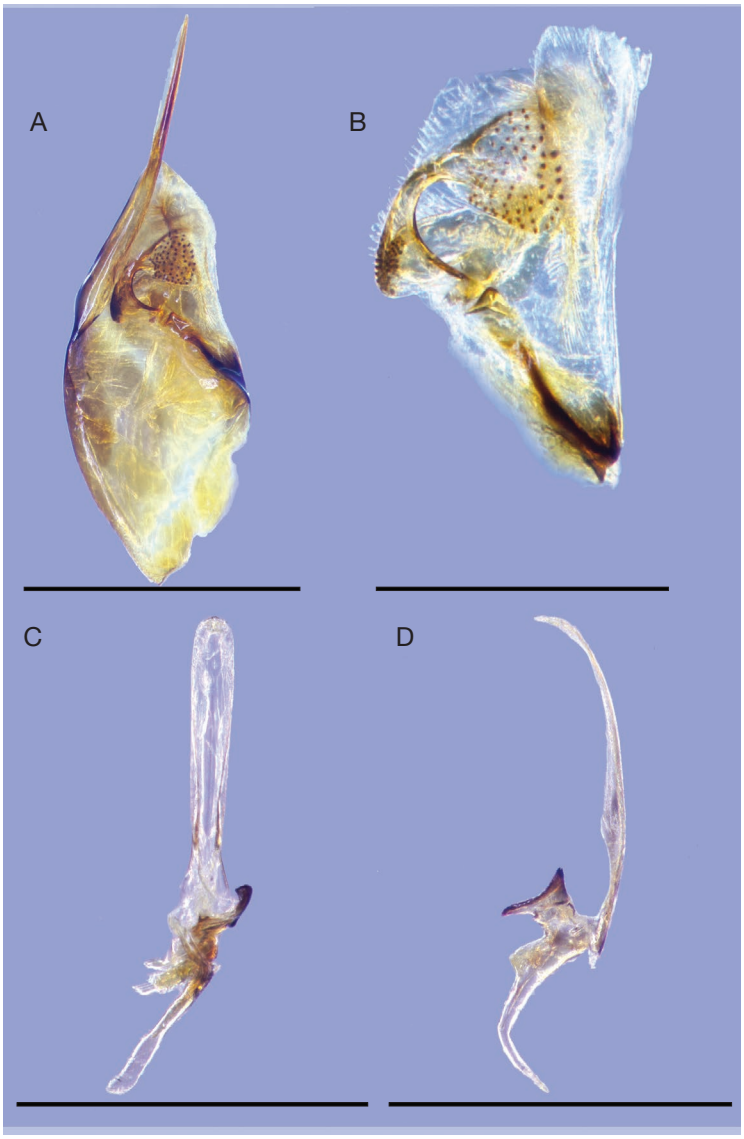

Fig. 6. — *Antepipona ceylonica* (de Saussure, 1867), genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bars: 1 mm.

Distribution. — India: Andhra Pradesh, Chhattisgarh, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Rajasthan, Sikkim, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh, West Bengal; Sri Lanka; Myanmar; Vietnam (new record).

Remark

This species is recorded for the first time from Vietnam. The male genitalia of the species are described for the first time.

Male genitalia. — As in Figure 6. Parameral spine lacking setae. Volsella flattened, spatulate, wide on inner aspect, and without setae at top (Fig. 6A). Digitus enlarged apically (Fig. 6B). Penis valves long (Fig. 6C), about 1.7× as long as basal apodeme, in profile apical part produced into a lobe with sharp teeth at upper and lower margins (Fig. 6D); proximal margin smooth (Fig. 6D).

Antepipona rufescens (Smith, 1857)*
(Figs 7; 8)

Odynerus rufescens Smith, 1857: 61.

Antipipona rufescens – Giordani Soika 1982 (1981): 205, 209 (key), 235, figs 37-39.

Material examined. — **Vietnam** • 1 ♀; Ha Giang, Vi Xuyen, Cao Bo; 5-15.XI.2001; Long Dang Khuat leg.; IEBR • 1 ♂; Ha Giang, Quan Ba, Dong Ha; 23°03'48.4"N, 105°02'01.6"E; alt. 515 m; 19.X.2016; Ngat Thi Tran, Minh Phuong Nguyen, Cuong Quang Nguyen leg.; IEBR • 1 ♀; Cao Bang, Ha Lang, Thanh Nhat; 22°42'8"N, 106°39'49"E; alt. 332 m; 19.XI.2023; Cuong Quang Nguyen, Ngat Thi Tran leg.; IEBR • 1 ♀; Cao Bang, Nguyen Binh, Tam Kim; 23°36'17.0"N, 106°01'47.5"E; alt. 320 m; 5.VI.2016; Minh Phuong Nguyen, Cuong Quang Nguyen leg.; IEBR • 3 ♂; Yen Bai, Tan Phuong, Khe Bin; 22°15'51.3"N, 104°38'07"E; alt. 500 m; 7.IX.2017; Lien Thi Phuong Nguyen, Cuong Quang Nguyen, Tuan Viet Luong leg.; IEBR • 1 ♀; Tuyen Quang, Tuyen Quang

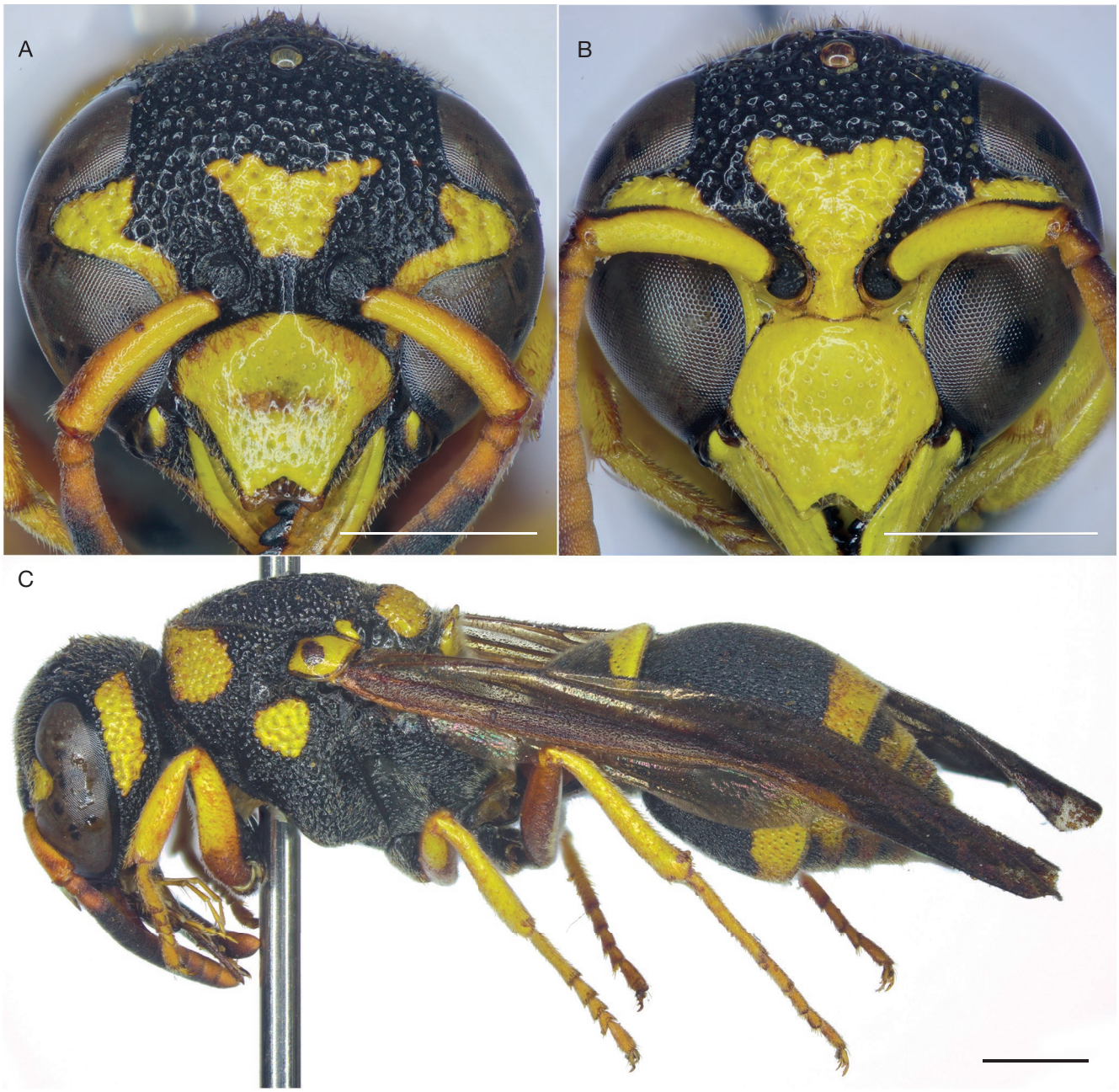

Fig. 7. — *Antepipona rufescens* (Smith, 1857), from Vietnam: **A**, female, facial view; **B**, male, facial view; **C**, female, habitus, lateral view. Scale bar: 1 mm.

city, Trang Da; 21°55'48"N, 105°14'23"E; 1.XII.2014; Lam Xuan Truong, Lien Thi Phuong Nguyen, Minh Phuong Nguyen, Dai Dac Nguyen leg; IEBR • 1 ♂; Bac Kan, Na Ri, Lang San, Kim Hy NP; 22°19'22.6"N, 105°54'524"E; 4.VII.2012; J. Kojima, H. Nugroho & IED-c leg.; IEBR • 1 ♀; Bac Kan, Bach Thong, Vu Muon; 22°12.5'N, 105°58'E; alt. 550 m; 5.VIII.2012; Lien Thi Phuong Nguyen & IED-c leg.; IEBR • 1 ♀, 1 ♂; Thai Nguyen, Minh Tien; 25.V.2007; Long Dang Khuat leg.; IEBR • 1 ♀, 1 ♂; Lang Son, Hoang Dong, Na Sen; 21°51'42"N, 106°43'54"E; 31.X.2014; Dai Dac Nguyen, Lien Thi Phuong Nguyen, Minh Phuong Nguyen leg.; IEBR • 1 ♀; Lang Son, Huu Lung, Huu Lien, Lan Chau, Huu Lien NR; 21°43'22.9"N, 106°22'40.2"E; 12.VI.2018; Lien Thi Phuong Nguyen, Lam Xuan Truong, Ngat Thi Tran, Tuan Viet Luong, Ha Thi Thu Nguyen leg.; IEBR • 1 ♀; Phu Tho, Xuan Son, Xuan Dai; 5-10.IX.2009; Long Dang Khuat leg.; IEBR • 2 ♀; Phu Tho, Xuan Son, Xuan Dai; 10-15.X.2009; Long Dang Khuat leg.; IEBR • 1 ♀; Phu Tho, Xuan Son, Xuan Dai; 20-25.X.2009; Long Dang Khuat leg.; IEBR • 1 ♀; Phu Tho, Xuan Son, Xuan Dai; 10-20.XI.2009; Long Dang Khuat leg.; IEBR • 2 ♂; Phu Tho, Xuan Son, Xuan Son NP; alt. 300-400 m; 24.IX.2005; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♂; Phu Tho, Xuan Dai, Tan Son; 19.V.2011; Phong Huy Pham leg.; IEBR • 2 ♂; Phu Tho, Xuan Dai, Tan Son; 20.V.2011; Phong Huy Pham leg.; IEBR • 1 ♂; Phu Tho, Thanh Son; 22.V.2011; Long Dang Khuat leg.; IEBR • 2 ♀; Ha Noi, Ba Vi; 25.X.2016; Ngat Thi Tran leg.; IEBR • 1 ♂; Ha Noi, Thach That, Hoa Lac; 6-16.IV.2002; Malaise trap; IEBR • 1 ♀; Ha Noi, Thach That, Hoa Lac; 15-25.IV.2002; Tea garden, Malaise trap, leg.; IEBR • 1 ♀; Ha Tay, Thach That, Hoa Lac; 20-30.XI.2002; Tea garden, Malaise trap, leg.; IEBR • 1 ♀; Bac Giang, Son Dong, Tay Yen Tu; alt. 150 m; 2.VII.2010; Phong Huy Pham leg.; IEBR •

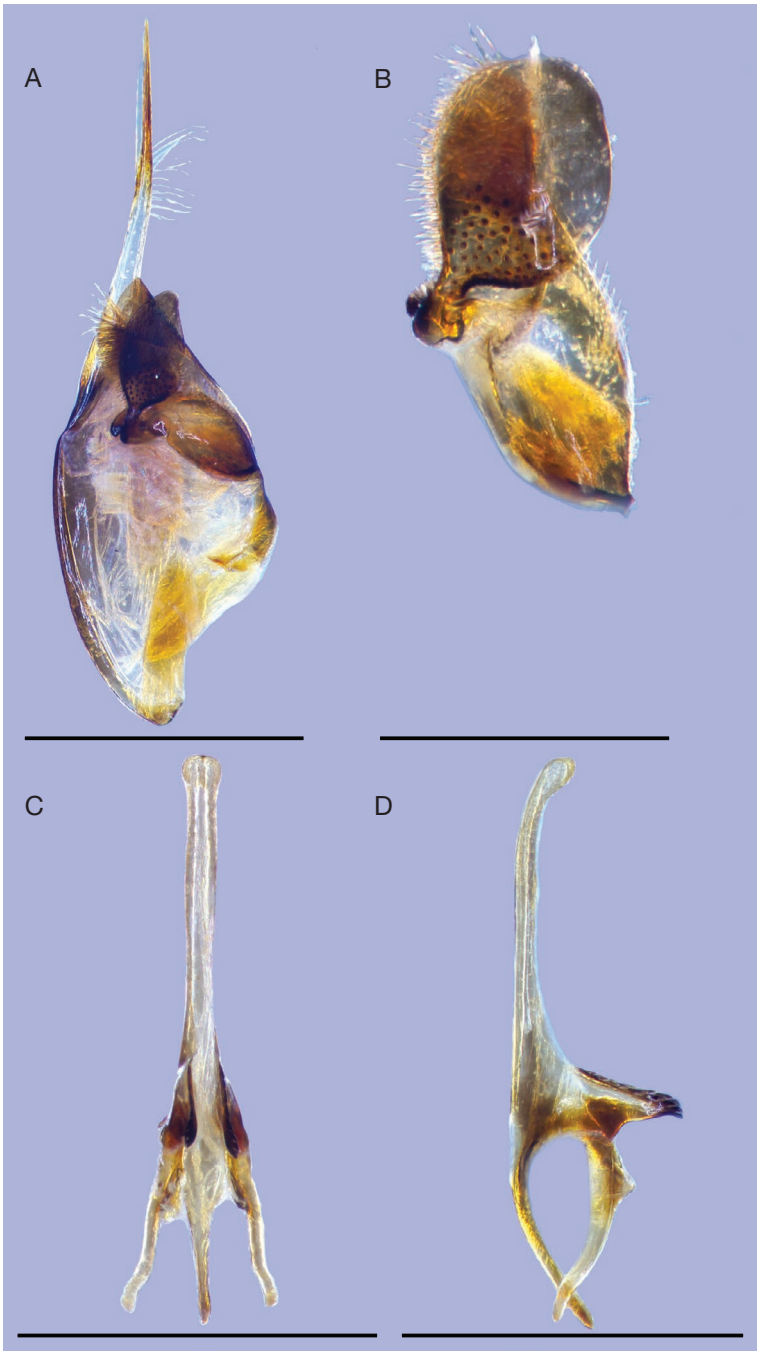

FIG. 8. — *Antepipona rufescens* (Smith, 1857), genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bar: 1 mm.

1 ♀; Hoa Binh, Da Bac; 26.IV.2012; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♀, 1 ♂; Thanh Hoa, Thuong Xuan, Van Xuan, Hon Can, Xuan Lien NR; 19°52'27.5"N, 105°14'20.8"E; alt. 106 m; 23.VIII.2012; Lien Thi Phuong Nguyen leg; IEBR • 2 ♂; Thanh Hoa, Quan Hoa, Pu Hu NR; 20°31'32.1"N, 104°57'38.5"E; alt. 284 m; 12.VI.2016; Lam Xuan Truong, Dac Dai Nguyen, Ngat Thi Tran, Linh Ngoc Ha leg.; IEBR • 1 ♀; Quang Tri, Dakrong, Ta Rut; alt. 300 m; 2.VI.2006; ISD-c leg.; IEBR • 1 ♂; Quang Nam, Nam Giang, Cha Vai, Song Thanh NR; alt. 500-600 m; 28.V.2005; ISD-c leg.; IEBR • 1 ♀; Quang Nam, Cha Vai, Song Thanh NR; alt. 400-600 m; 29.IV.2005; ISD-c leg.; IEBR • 1 ♀, 1 ♂; Quang Nam, Phuoc Son, Phuoc Hiep; alt. 300 m; 30.VII.2004; ISD-c leg.; IEBR • 1 ♂; Quang Nam, Phuoc Son, Phuoc My; alt. 200-300 m; 24.V.2006; IEBR • 1 ♀; Quang Nam, Phuoc Son, Phuoc My; alt. 300-400 m; 25.V.2006; ISD-c leg.; IEBR • 1 ♂; Quang Nam, Phuoc Son, Phuoc My; alt. 450-500 m; 26.V.2006; ISD-c leg.; IEBR.

Indonesia • 2 ♀; Lubuk Mintrun nr Padang, W, Sumatra; 15.VIII.1985; So. & Sk. Yamane leg.; coll. SKYC.

DISTRIBUTION. — India: Kerala, Meghalaya, Sikkim, Tripura; China: Shanghai, Sichuan, Hong Kong; Taiwan; Thailand; Myanmar; Laos; Malaysia; Indonesia: Java (including Kangean), Sumatra, Sulawesi, Moluccas; Vietnam (new record).

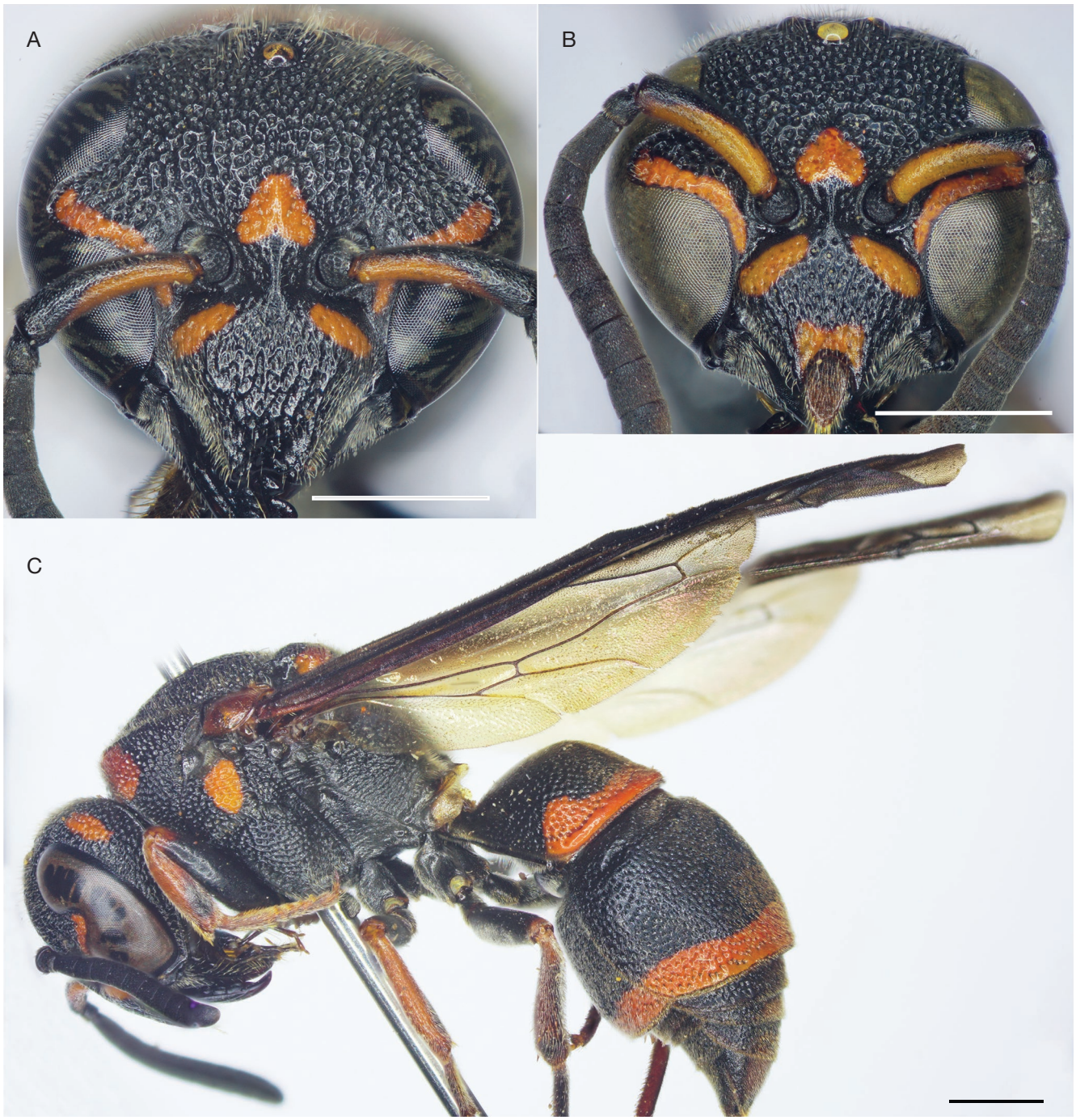

Fig. 9. — *Antepipona tytides* (Cameron, 1904), from Vietnam: **A**, female, facial view; **B**, male, facial view; **C**, female, habitus, lateral view. Scale bar: 1 mm.

Remark

This species is recorded for the first time from Vietnam. The male genitalia were described by Giordani Soika (1982) but is redescribed here in added detail.

Male genitalia. — As in Figure 8. Parameral spine with setae at middle part. Volsella flattened, spatulate, wide on inner aspect, and without setae at top (Fig. 8A). Digitus almost oval-shaped apically (Fig. 8B). Penis valves long (Fig. 8C), about 2.2× as long as basal apodeme, in profile apical part strongly produced into a large triangular lobe (Fig. 8D); upper part of proximal margin with long teeth (Fig. 8D).

Antepipona tytides (Cameron, 1904)* (Figs 9; 10)

Odynerus tytides Cameron, 1904: 309.

Antepipona tytides – Giordani Soika 1975: 390, figs 3, 5.

Material examined. — **Vietnam** • 1 ♀; Yen Bai, Mu Cang Chai, Road to Che Tao village; alt. 1400 m; 12.IX.2017, Lien Thi Phuong Nguyen, Quang Cuong Nguyen leg.; IEBR • 1 ♀; Lam Dong, Lac Duong, Da Chais, Bi Doup Nui Ba NP, way to NP station;

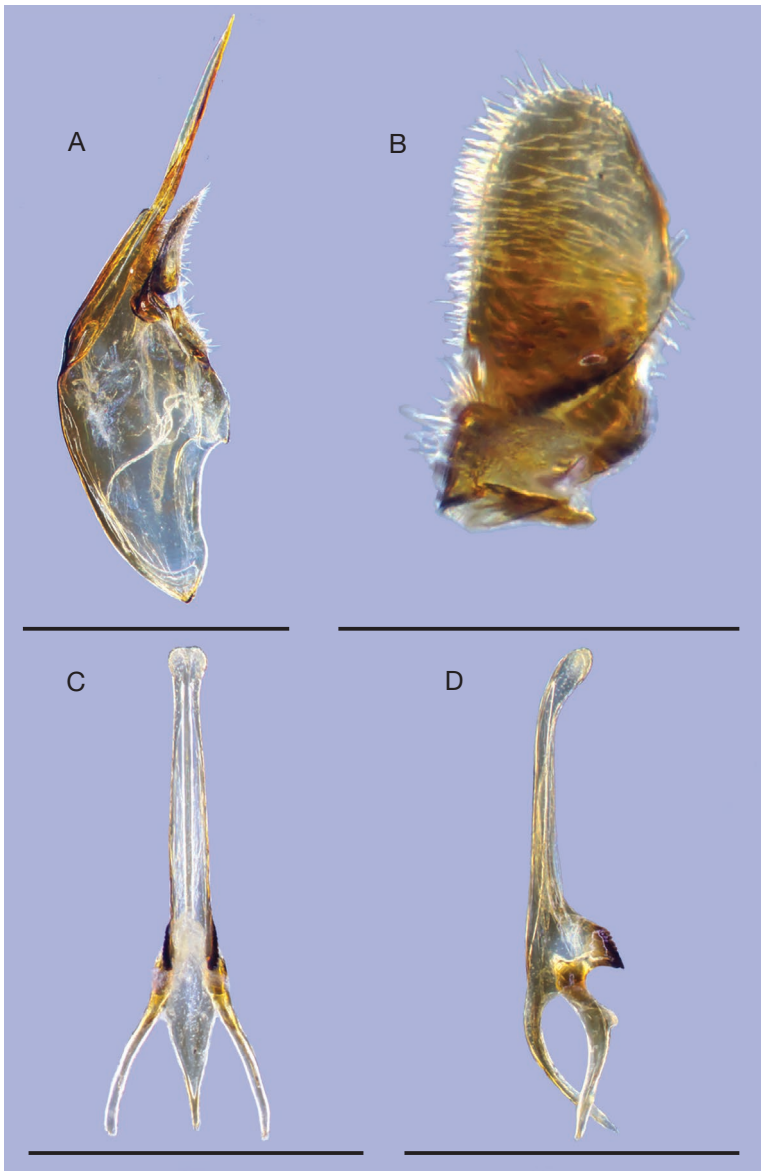

FIG. 10. — *Antepipona tytides* (Cameron, 1904), genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bars: 1 mm.

12°08'35.3"N, 108°31'58.1"E; alt. 1501 m; 6.VI.2013; Lien Thi Phuong Nguyen leg.; IEBR • 1 ♀; Lam Dong, Lac Duong, Da Lat, Dinh Lang Biang; 12°02'50.3"N, 108°26'26.6"E; alt. 2168 m; 2.VI.2013; Lien Thi Phuong Nguyen leg.; IEBR.
Thailand • 1 ♂; Chendao [probably Chiang Dao]; 18.V.1980; T. Fujisawa; coll. SKYC.

DISTRIBUTION. — India: Manipur, Meghalaya, Sikkim, West Bengal; Nepal; Bhutan; China: Sichuan; Myanmar; Laos; Vietnam (new record).

REMARK

This species is recorded for the first time from Vietnam. The male genitalia are described for the first time.

MALE GENITALIA. — As in Figure 10. Parameral spine with setae at middle part. Volsella flattened, spatulate, wide on inner aspect, and without setae at top (Fig. 10A). Digitus in inner aspect gradually narrowed apically, with lower right corner rounded (Fig. 10B). Penis valves long (Fig. 10C), about 2.1× as long as basal apodeme, in profile apical part strongly produced into a blade-shaped lobe (Fig. 10D); proximal margin serrate laterally (Fig. 10D).

Antepipona concava
Nguyen, Dang & A. D. Nguyen, n. sp.
(Figs 11; 12)

urn:lsid:zoobank.org:act:293164CF-EDE5-4DF1-ABF9-A86846773957

MATERIAL EXAMINED. — **Holotype. Vietnam** • ♂; Ke Go National Researve, Cam Xuyen, Ha Tinh; 22.VI.2018; Nguyen Quang Cuong leg.; IEBR.
Paratypes. Vietnam • 4 ♂; same data as for holotype; IEBR.

DIAGNOSIS. — This species can be distinguished from congeners by the following character combination: Inner compound eye margins strongly convergent ventrally, in anterior view *c.* 1.7× further apart

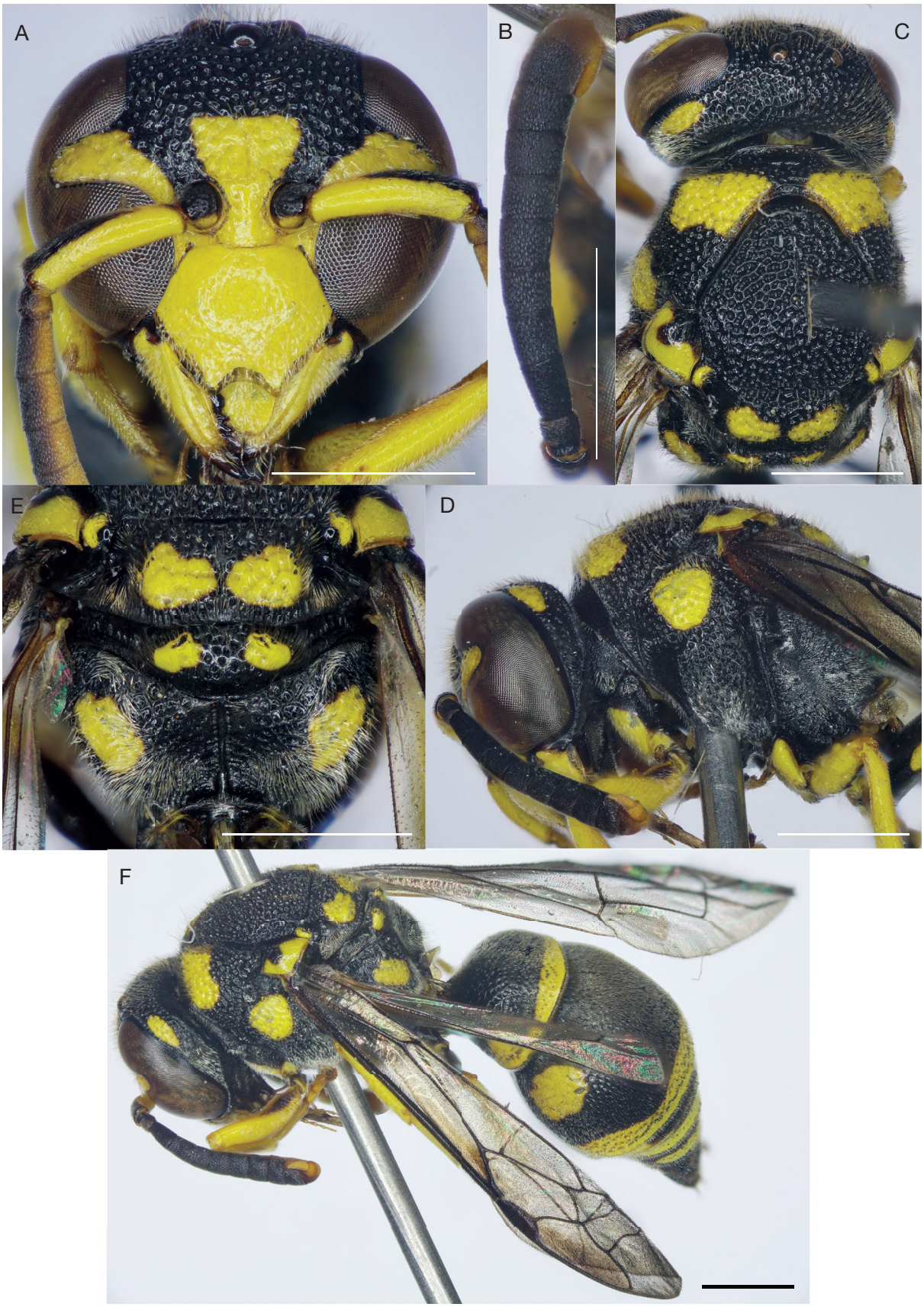

FIG. 11. — *Antepipona concava* Nguyen, Dang & A. D. Nguyen, n. sp., male holotype: **A**, head, facial view; **B**, antenna; **C**, mesosoma, dorsal view; **D**, head and mesosoma, lateral view; **E**, mesoscutellum, metanotum, and propodeum, posterior view; **F**, habitus, lateral view. Scale bars: 1 mm.

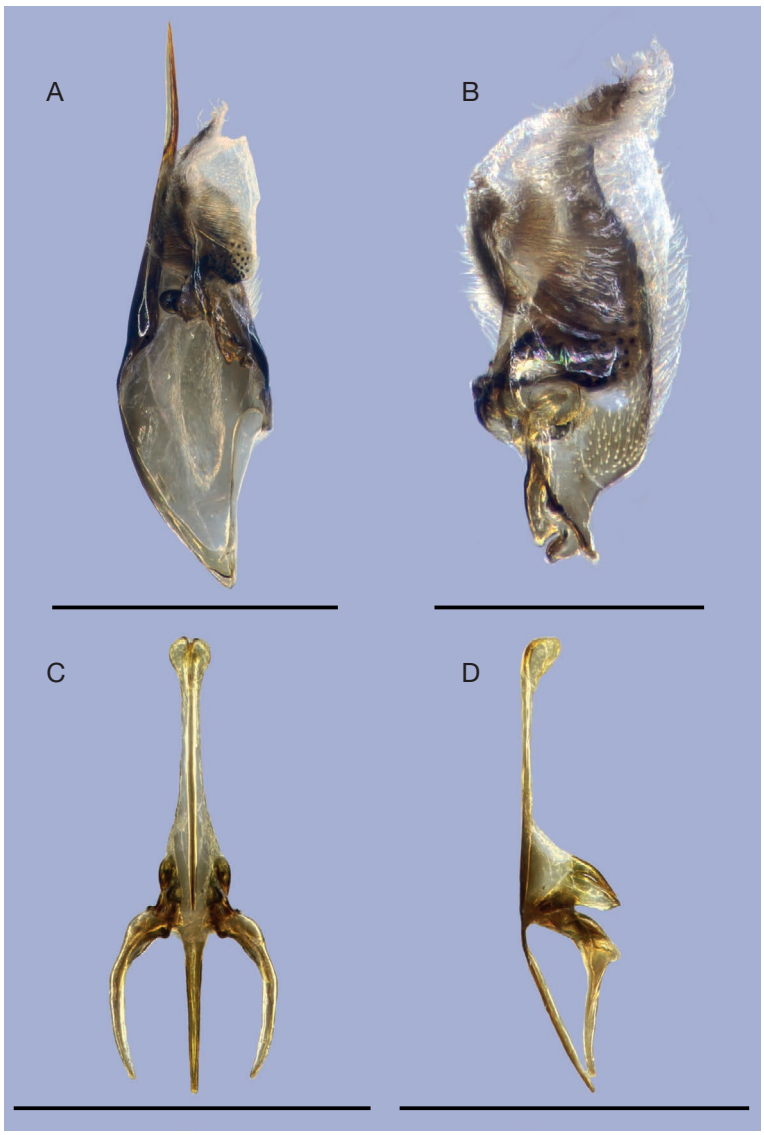

Fig. 12. — *Antepipona concava* Nguyen, Dang & A. D. Nguyen, n. sp., genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bar: 1 mm.

from each other at vertex than at clypeus; clypeus with apical margin widely and deeply emarginate medially, forming rather blunt tooth on each side, distance between teeth nearly half width of clypeus between inner compound eye margins (*c.* 0.45× width of clypeus between inner compound eye margins); propodeum with deep concavities, the concavities shiny and with dense strong punctures, corner between dorsal and posterior surfaces angled, posterior surface without carinae; SII not bulging at base.

Distribution. — Central Vietnam.

Etymology. — The specific epithet is the Latin adjective *concavus*, meaning, "concave", and refers to the deep concavity of the posterior surface of the propodeum in this species.

Description

Male (Fig. 11F)

Measurements. Body length 5.5-6.0 mm (holotype: 5.7 mm); forewing length 5.2-5.8 mm (holotype: 5.5 mm).

Structure. Head in facial view transverse, 1.2× as wide as high (Fig. 11A). Vertex without cephalic fovea. Distance from posterior ocellus to posterior margin of vertex 1.4× distance from posterior ocellus to inner compound eye margin (Fig. 11C). Gena in lateral view narrower than compound eye, about 0.8× as wide as compound eye; occipital carina not complete, present only along length of gena, obsolete dorsally. Inner compound eye margins strongly convergent ventrally, in anterior view *c.* 1.7× further apart from each other at vertex than at clypeus (Fig. 11A). Clypeus in lateral view gradually convex from base to apical margin; in frontal view slightly wider than high (Fig. 11A), with basal margin slightly concave medially and distinctly separated from antennal toruli; apical margin widely and deeply emarginate medially, forming rather blunt tooth on each side, distance between teeth nearly half width of clypeus between inner compound eye margins (*c.* 0.45× width of clypeus between

inner compound eye margins). Mandible with five prominent teeth. Antennal scape *c.* 4× as long as its maximum width, slightly curved; FI *c.* 2× longer than wide, FII slightly longer than wide, FIII-IV as wide as long, FV-FVIII wider than long, FX small, terminal flagellomere slightly curved, long and gradually narrow from base to apex, *c.* 2.2× as long as its basal width (Fig. 11B).

Mesosoma. Longer than wide in dorsal view (Fig. 11C). Pronotal carina fully developed, reaching ventral corner of pronotum, somewhat weak dorsally; anterior surface of pronotum with two close, deeply impressed pits medially, with dense strong punctures mediolaterally. Mesoscutum weakly convex, slightly longer than wide between tegulae, without depressed and oblique furrows apically (Fig. 11C). Disc of mesoscutellum convex, in lateral view at same level of mesoscutum (Fig. 11D), narrowly depressed basally, with a row of short longitudinal carinae basally and apically. Metanotum weakly convex, with two large and sharp tubercles, distance between tubercles slightly longer than distant from tubercle to lateral margin of metanotum (Fig. 11E). Propodeal dorsum below level with metanotum; declivity of propodeum with strong carina medially; concavity deep and wide, without short carinae (Fig. 11E), corner between lateral and dorsal surfaces angulate, corner between dorsal and posterior surfaces angulate.
Metasomal segment I narrower than segment II (Fig. 11F); TI conical in shape, in dorsal view almost half as long as wide; TII wider than long, about 1.1× as wide as long in dorsal view; SII depressed at base, in lateral view slightly convex from base to apical margin.

Sculpturing. Clypeus with dense strong punctures, interspaces between punctures smooth, larger than puncture diameter at lateral parts, each puncture bearing a short bristle. Frons densely covered with coarse flat-bottomed punctures, interspaces between punctures raised to form reticulations. Vertex with punctures similar with those on frons, but larger; gena with large strong punctures, punctures weaker and smaller near base; occipital carina weakly widened laterally (Fig. 11D). Pronotum with punctures coarser than those on vertex, interspaces between punctures thicker and raised to form reticulation. Mesoscutum covered with coarse punctures, punctures equal in size, smaller than those on pronotum, interspaces between punctures smooth, raised to form reticulations; mesoscutellum with punctures similar to those on pronotum, punctures on metanotum smaller than those on mesoscutellum. Mesepisternum with flat-bottomed punctures similar to those on pronotum posterodorsally, smooth anteroventrally; border between posterodorsal and anteroventral parts distinct, without epicnemial carina. Dorsal part of metapleuron largely smooth and with several short weak striae, ventral part with sparse shallow punctures. Propodeum with coarse punctures dorsally, interspaces between punctures strongly raised to form reticulation, punctures much shallower and weaker laterally, dorso-lateral margin of propodeum somewhat angled; posterior surface shiny, with dense strong punctures. Tegula with minute punctures. Metasomal TI covered with dense strong punctures, punctures on lateral and apical margins sparser and weaker; punctures on TII smaller and shallower than those on TI, punctures on apical margin of TIII-IV larger than those on apical margin of TII, punctures on apical margin of TV-VI smaller than those on apical margin of TIII-TIV, punctures on TVII and SVII small and sparse, punctures on SII clear, deeper than those on TII, interspaces with minute punctures.

Color. Body black, with following parts yellow: clypeus except apical margin, a large spot on frons, a large mark along inner orbit to clypeus, mandible except base and teeth, antennal scape except a longitudinal black strip dorsally, two spots on vertex below compound eye margins, two large spots on pronotum, two large spots on mesoscutellum and two smaller spots on metanotum, a large spot on mesopleuron, two very large spots on propodeum laterally, tegulae except large brown-black spots centrally and parategulae, two large spots on TI laterally and apical margin, two large spots laterally and a thick band apically on TII, bands on TIII and TIV laterally, two small spots at lower corner laterally on SIII and SIV, apical margin of TV-TVI, coxae of all legs except dorsal part black, all femora except dorsal part brown on profemur and black on mesofemur and apex of metafemur. Valvulae brown. Wing membrane transparent, veins dark brown (Fig. 11F).

Pubescence. Body with silver setae of medium-length.

Genitalia. As in Figure 12. Parameral spine without setae. Volsella flattened, spatulate, wide on inner aspect, without setae at top (Fig. 12A). Digitus with very dense and long setae (Fig. 12B). Penis valves short (Fig. 12C), about 1.7× as long as basal apodeme, in ventral view with small tubercle at base of basal apodeme, in profile apical part strongly produced into a large triangle lobe (Fig. 12D), smooth, without teeth.

Female
Unknown.

Remarks
This species is quite similar to *A. ovalis* (de Saussure, 1853) in having the posterior surface of the propodeum without carinae, SII not bulging at base, clypeus wider than long, punctures on metasoma dense and strong, but it differs from the latter by the following characters: clypeus slightly wider than high (clypeus in frontal view about 1.3× as wide as high in *A. ovalis*); metanotum with two large sharp tubercles (metanotum with two small blunt tubercles in *A. ovalis*); propodeum angled laterally (propodeum rounded laterally in *A. ovalis*); posterior surface of propodeum deeply concave, with dense strong punctures, corner between dorsal and posterior surfaces angled (posterior surface of propodeum shallowly concave, with sparse small punctures, corner between dorsal and posterior surfaces rounded in *A. ovalis*).

Antepipona crenula
Nguyen, Yamane & Engel, n. sp.
(Figs 13; 14)

urn:lsid:zoobank.org:act:B13E8981-B532-4201-9E59-2829BC0B87B5

MATERIAL EXAMINED. — **Holotype. Vietnam** • ♂; Xuan Son National Park, Xuan Son, Phu Tho; 11.IX.2009; Nguyen Huu Thao leg.; IEBR.

DIAGNOSIS. — This species can be distinguished from congeners by the following character combination: Clypeus in frontal view slightly wider than high; inner compound eye margins strongly convergent ventrally, in anterior view slightly more than 1.5× further apart from each other at vertex than at clypeus; mesoscutum shorter than wide between tegulae (*c.* 0.9× shorter than wide between tegulae), with faint short longitudinal carina laterally; metanotum weakly convex, with two large sharp tubercles; propodeum with slightly oblique short carinae, with corner between lateral and dorsal surfaces rounded, corner between dorsal and posterior surfaces angled; SII depressed at base, in lateral view convex from base to apical margin. Penis valve about 1.7× as long as basal apodeme, in profile apical part strongly produced into a large rounded lobe, with apical margin serrate.

DESCRIPTION
Male (Fig. 13G)
Measurements. Body length 7 mm; forewing length 6.5 mm.

Structure. Head in facial view transverse, 1.2× as wide as high (Fig. 13A). Vertex without cephalic fovea. Distance from posterior ocellus to posterior margin of vertex 1.2× distance from posterior ocellus to inner compound eye margin (Fig. 13B). Gena in lateral view narrower than compound eye, about 0.8× as wide as compound eye; occipital carina not complete, present along length of gena laterally, obsolete dorsally. Inner compound eye margins strongly convergent ventrally, in anterior view slightly more than 1.5× further apart from each other at vertex than at clypeus (Fig. 13A). Clypeus in lateral view gradually convex from base to middle, then straight to apical margin; in frontal view slightly wider than high (Fig. 13A), with basal margin slightly convex medially and distinctly separated from antennal toruli; apical margin narrowly and deeply emarginate medially, forming slightly sharp tooth on each side, distance between teeth nearly ⅓ width of clypeus between inner compound eye margins (*c.* 0.30× width of clypeus between inner compound eye margins). Mandible with five prominent teeth. Antennal scape 3.7× as long as its maximum width, slightly curved; FI 1.5× longer than wide, FII slightly longer than wide, FIII-IV as wide as long, FV-FVIII wider than long, FX small, terminal flagellomere slightly curved, long and gradually narrowed from base to apex, 2× as long as its basal width.

Mesosoma. Longer than wide in dorsal view (Fig. 13E). Pronotal carina developed at lateral sides, reaching ventral corner of pronotum, obsoleted dorsally, in dorsal view slightly produced at lateral corners; anterior surface of pronotum with two closely, deeply impressed pits medially, with dense strong punctures mediolaterally (Fig. 13D). Mesoscutum convex, shorter than wide between tegulae (*c.* 0.9× shorter than wide between tegulae), with faint short longitudinal carina laterally (Fig. 13E). Disc of mesoscutellum convex, in lateral view not at same level of mesoscutum (Fig. 13G), narrowly depressed basally, with a row of short longitudinal carinae basally and apically, with longitudinal carina laterally. Metanotum weakly convex, with two large sharp tubercles, distance between tubercles slightly longer than distance from tubercle to lateral margin of metanotum. Propodeal dorsum below level with metanotum; declivity of propodeum with narrow longitudinal carina medially, with slightly oblique short carinae (Fig. 13F); concavity deep and wide, corner between lateral and dorsal surfaces rounded, corner between dorsal and posterior surfaces angled.
Metasomal segment I narrower than segment II (Fig. 13G); TI conical in shape, in dorsal view 1.6× as wide as long; TII wider than long, 1.2× as wide as long; SII depressed at base, in lateral view convex from base to apical margin.

Sculpturing. Clypeus with dense strong punctures, interspaces between punctures smooth, each puncture bearing a short bristle. Frons densely covered with coarse flat-bottomed punctures, interspaces between punctures raised to form reticulation. Vertex with punctures similar with those on frons, but coarser; gena with strong and large punctures; occipital carina not widened laterally. Pronotum with punctures similar to those on vertex. Mesoscutum covered with coarse punctures larger than those on pronotum, interspaces between punctures smooth, raised to form reticulation; mesoscutellum with punctures similar to those on pronotum, punctures on metanotum smaller than those on mesoscutellum. Mesepisternum with flat-bottomed punctures, punctures similar to those on pronotum posterodorsally, with sparse strong punctures anteroventrally; border between posterodorsal and anteroventral parts distinct, looking like a carina, without epicnemial carina. Dorsal part of metapleuron largely smooth, with several short and weak striae, ventral part with dense strong punctures. Propodeum with coarse punctures dorsally, punctures much shallower and weaker to form weak transverse striae laterally, interspaces between punctures strongly raised to form reticulation, dorso-lateral margin of propodeum somewhat angled; posterior surface shiny, with dense strong punctures. Tegula with dense small punctures. Metasomal TI covered with dense strong punctures, punctures on lateral and apical margins sparser and weaker; punctures on TII smaller and shallower than those on TI, punctures on apical margin of TIII larger than those on apical margin of TII, punctures on apical margin of TIV-VI smaller than those on apical margin of TIII-TIV, punctures on TVII and SVII small and sparse, punctures on SII clear, deeper than those on TII, interspaces with minute punctures.

Color. Body black, with following parts yellow: clypeus except small brown spot at central and black lateral margins, a large spot on frons, a large mark along inner orbit extended close to clypeus, mandible except base and teeth, antennal scape except a longitudinal black strip dorsally, flagellomeres VII-X

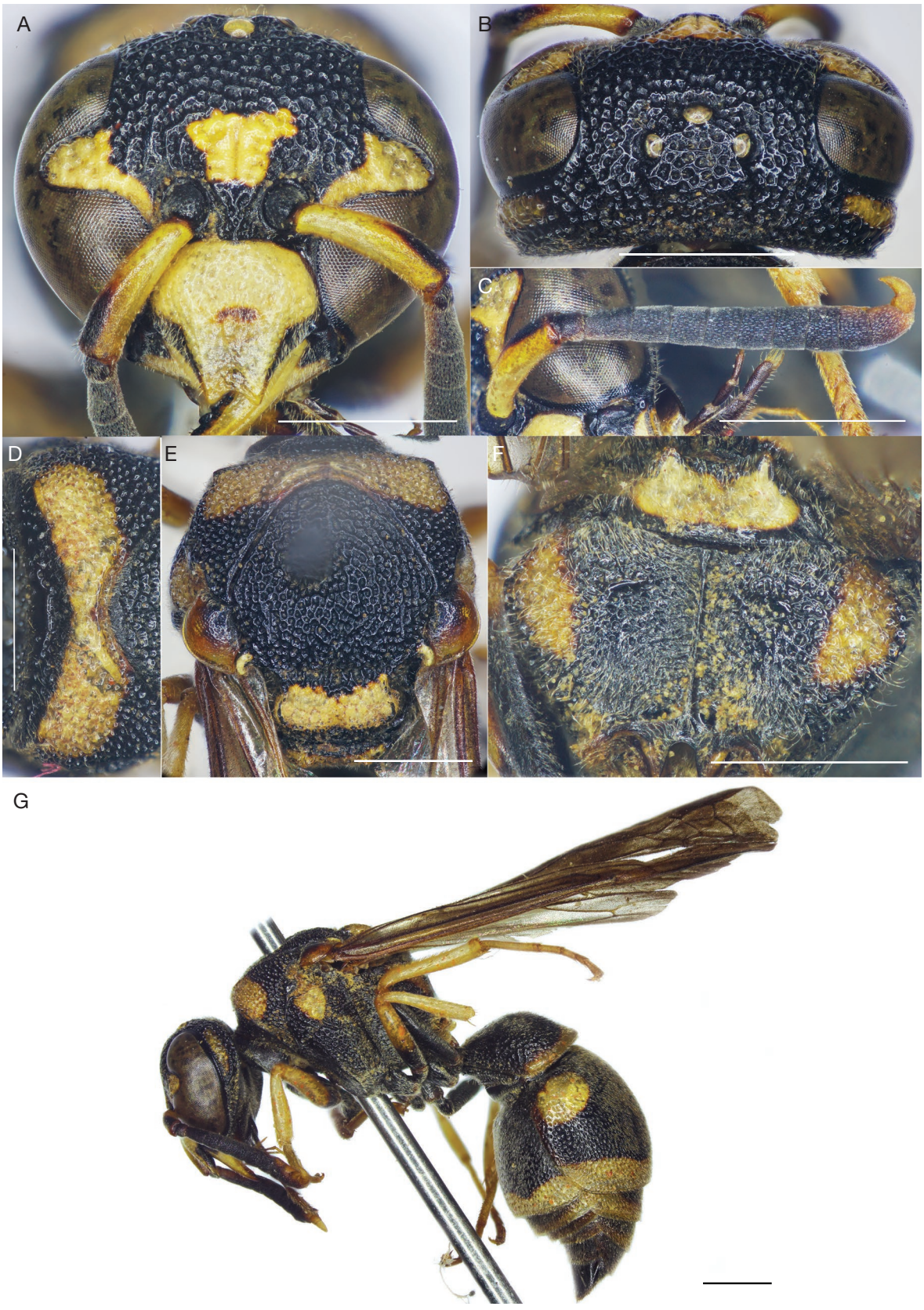

FIG. 13. — *Antepipona crenula* Nguyen, Yamane & Engel, n. sp., male holotype: **A**, head, facial view; **B**, head, dorsal view; **C**, antenna; **D**, pronotum, frontal view; **E**, mesosoma, dorsal view; **F**, metanotum and propodeum, posterior view; **G**, habitus, lateral view. Scale bars: 1 mm.

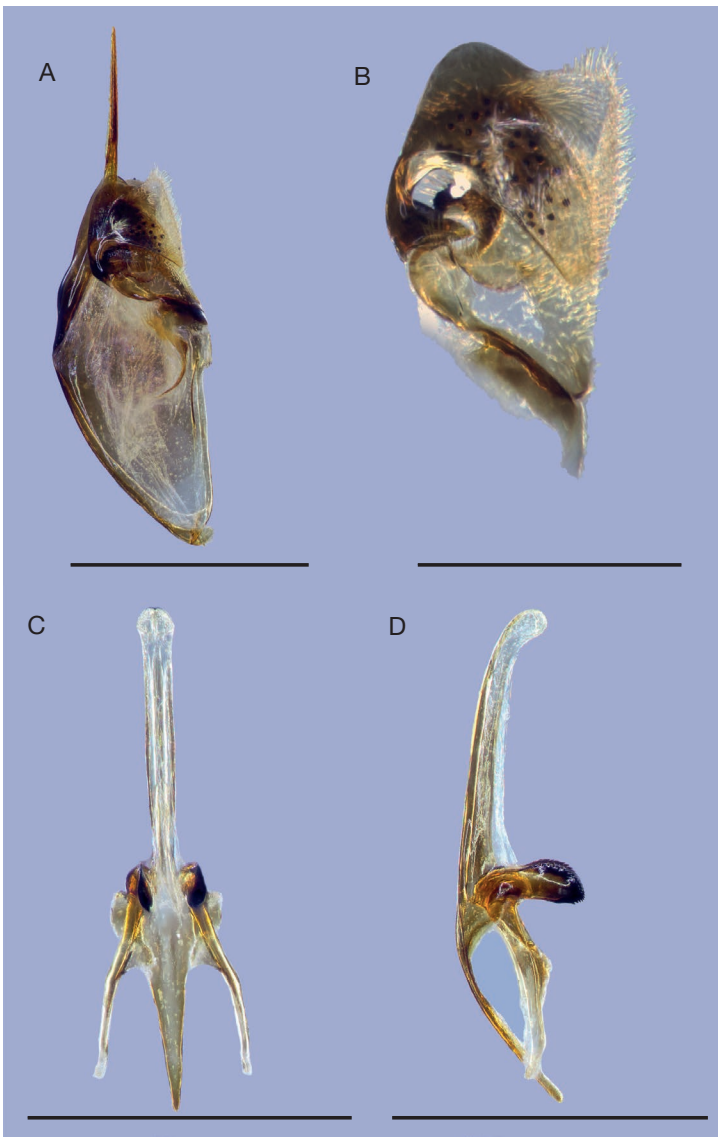

Fig. 14. — *Antepipona crenula* Nguyen, Yamane & Engel, n. sp., genitalia: **A**, inner aspect of paramere with volsella and digitus; **B**, digitus; **C**, aedeagus, ventral view; **D**, aedeagus, lateral view. Scale bars: 1 mm.

beneath, last flagellomere entirely, two spots on vertex below compound eye margins, a thick transverse strip on pronotum, scutellum except black margins, metanotum except black margins, a large spot on mesopleuron, two large spots on propodeum laterally, parategulae, apical margin of TI, two large spots laterally near base and a thick band apically on TII, bands on TIII-TV, SIII-SV apically, tibiae and basitarsi of all legs, and femora of all legs except ⅓ basally. Tegulae dark brown with a black mark medially. Valvulae brown. Wing membrane with apical part dark infumate, veins dark brown (Fig. 13G).

Pubescence. Body with silver setae of medium-length.

Genitalia. As in Figure 14. Parameral spine lacking setae. Volsella flattened, wide on inner aspect, without setae at top (Fig. 14A). Digitus almost trapezoidal apically, with apical margin deeply emarginate. Penis valve (Fig. 14C), about 1.7× as long as basal apodeme, in profile apical part strongly produced into a large rounded lobe (Fig. 14D), with short teeth at most edges of lobe (Fig. 14D).

Female
Unknown.

Distribution. — Central Vietnam.

Etymology. — The specific epithet refers to the small notch in apical margin of the digitus in this species.

Remarks
This species is quite similar to *A. biguttata* in having the posterior surface of the propodeum with slightly oblique short carinae, SII not bulging at base, clypeus wider than long, color and shape of digitus and aedeagus in general, but it

differs from the latter by the following characters: Anterior surface of pronotum with two closely and deeply impressed pits located medially (anterior surface of pronotum with horizontal series of punctures on middle third, close to each other and separated by short longitudinal carinae in *A. biguttata*); pronotal carina weakly produced at lateral corner (pronotal carina strongly produced at lateral corner in *A. biguttata*); tegulae brown with a black mark medio-laterally (tegulae yellow with a black transverse strip medially in *A. biguttata*); two lateral carinae at apical margin of mesoscutum weak (strong in *A. buguttata*); digitus with apical margin deeply emarginate (rounded in *A. biguttata*); penis valve in profile with apical part strongly produced into a large rounded lobe (produced into a pointed lobe in *A. biguttata*), with short teeth present on most of the lobe (upper part of proximal margin serrated in *A. biguttata*).

Keys to Oriental species of *Antepipona* de Saussure, 1855

A key is provided here to the 33 recognized species in the genus *Antepipona* de Saussure, 1855 from the Oriental region. The characters are taken from the descriptions and figures of van der Vecht (1963), Giordani Soika (1976, 1977, 1982), Yamane (1990), Kumar *et al.* (2016), and Selis (2018), as well as from specimens of *A. bipustulata* (de Saussure, 1855), *A. buguttata* (Fabricius, 1787), *A. ceylonica* (de Saussure, 1867), *A. rufescens* (Smith, 1857), *A. tytides* (Cameron, 1904), *A. concava* Nguyen, Dang & A. D. Nguyen, n. sp., and *A. crenula* Nguyen, Yamane & Engel, n. sp. from Vietnam; *A. biguttata* from China and India; *A. bipustulata* from Singapore and Japan; *A. ceylonica*, *A. minutissima* Giordani Soika, 1982, *A. ovalis* (de Saussure, 1853), and *A. sibilans* (Cameron, 1903) from India; *A. brunnipes* (Fabricius, 1804), and *A. rufescens* from Indonesia; *A. excelsa* Giordani Soika, 1982 from Nepal; *A. sibilans* from Taiwan; *A. tytides* (Cameron, 1904) from Thailand; *A. luzonensis* (Rohwer, 1919) from the Philippines; and the holotype of *A. haryana* Gusenleitner, 1996 deposited in Hokkaido University Museum, Sapporo, Japan. Because some species are known only from the female (such as *A. sexfasciata* Giordani Soika, 1986, *A. tricolorata* Selis, 2018, *A. menkei* Giordani Soika, 1986, *A. excelsa*, and *A. haryana*) or the male (such as *A. brunneola* Giordani Soika, 1986, *A. concava* Nguyen, Dang & A. D. Nguyen, n. sp., and *A. crenula* Nguyen, Yamane & Engel, n. sp.), separate keys are provided for females and males.

Key to females

1. Posterior surface of propodeum without carinae (Fig. 11E) 2
— Posterior surface of propodeum with two short horizontal or slightly oblique carinae (Fig. 1D; 13F) 16

2. Frons with sparse and fine punctures, interspaces between punctures not raised to form reticulation (Fig. 15A, B) 3
— Frons with dense and coarse punctures, interspaces between punctures raised to form reticulation (Figs 7A; 9A) 4

3. Clypeus in anterior view 1.5 × wider than high; apical margin widely and deeply emarginate (distance between lateral teeth much greater than ⅓ width of clypeus between inner compound eye margins) (Fig. 15A) ..... *A. frontalis* Giordani Soika, 1982
— Clypeus in frontal view slightly wider than high; apical margin narrowly and shallowly emarginate (distance between lateral teeth about one-fourth width of clypeus between inner compound eye margins) (Fig. 15B).... *A. haryana* Gusenleitner, 1996

4. SII bulging at base (Fig. 9C) 5
— SII not bulging at base (Figs 1E; 5D; 13G) 8

5. SII strongly convex at base; TII with strong punctures, interspaces between punctures larger than puncture diameter (Fig. 9C) 6
— SII less convex at base; TII with strong punctures, interspaces between punctures equal to or smaller than puncture diameter (Fig. 3D) 7

6. Clypeus with very strong punctures, interspaces between punctures not raised to form reticulation, apical margin shallowly emarginate; anterior surface of pronotum with sparse punctures laterally; tegulae with external margin strongly concave in posterior third; body black with yellow markings ..... *A. exaltata* Giordani Soika, 1982
— Clypeus with very coarse and dense punctures, interspaces between punctures raised to form reticulation, apical margin deeply emarginate; anterior surface of pronotum with dense punctures laterally; tegulae not as above; body black with orange markings ..... *A. tytides* (Cameron, 1904)

7. Occipital carina gradually narrowing from top to bottom; clypeus with large dense punctures, widely emarginate at apex (distance between lateral teeth less than ⅓ width of clypeus between inner compound eye margins) (Fig. 3A) ..... *A. bipustulata* (de Saussure, 1855)
— Occipital carina wide in the upper two-thirds, narrowing rapidly in lower third to form a distinct angle; clypeus with larger and denser punctures, more widely emarginate at apex (distance between teeth much greater than ⅓ width of clypeus between inner compound eye margins) (fig. 34 in Giordani Soika, 1986)..... ..... *A. sexfasciata* Giordani Soika, 1986

8. Clypeus much wider than long, distance between lateral teeth much greater than ⅓ width of clypeus between inner compound eye margins (Fig. 7A, fig. 43 in Giordani Soika 1982) 9
— Clypeus as long as or slightly wider than long, distance between lateral teeth less than ⅓ width of clypeus between inner compound eye margins (figs 1, 3 in Giordani Soika 1982) 15

9. Clypeus with sparse small punctures (fig.43 inGiordani Soika 1982); punctures on metasoma sparse and fine .... *A. siamensis* Giordani Soika, 1982
— Clypeus with denser stronger punctures; punctures on metasoma denser and stronger 10

10. Clypeus with strong punctures, interspaces between punctures at central part not raised (Fig. 7A, fig. 51 *in* Kumar *et al.* 2016) 11
— Clypeus with coarse punctures, interspaces between punctures at least at central part slightly or strongly raised (Figs 15C, D) 12

11. Metanotum with small teeth at base laterally (fig. 13 in Giordani Soika 1982); posterior surface of propodeum with sparse small punctures; terga with strong punctures (fig. 53 in Kumar *et al.* 2016); clypeus slightly emarginate, with sparse punctures (fig. 51 in Kumar *et al.* 2016); body black with yellow markings (fig. 49 in Kumar *et al.*, 2016) ..... *A. ovalis* (de Saussure, 1853)
— Metanotum with large triangular teeth at base laterally (Fig. 7C); posterior surface of propodeum with dense strong punctures; terga with stronger punctures (fig. 6 in Selis 2018); clypeus more deeply emarginate, with denser punctures (Fig. 7A, fig.7 in Selis 2018); body back with yellow and ferruginous markings (Fig. 7C) ... . *A. rufescens* (Smith, 1857),

12. Posterior surface of propodeum with dense coarse punctures, interspaces between punctures raised; clypeus with two faint longitudinal carinae at apical half or two-thirds (fig. 3 in Gusenleitner 2015, fig. 7 in Selis 2018) 13
— Posterior surface of propodeum with sparse small punctures; clypeus without faint longitudinal carinae (Fig. 15C, 15D) 14

13. Pronotum with anterior carina rounded at shoulder, anterior surface of pronotum with uniform punctures except a smooth shiny area medially; body black with yellow markings ..... *A. consimilis* Gusenleitner, 2015
— Pronotum with anterior carina slightly produced at shoulder; anterior surface of pronotum smooth shiny, with some scattered deep punctures; body black with yellow and ferruginous markings ..... *A. tricolorata* Selis, 2018

14. Large species, body length about 11.5 mm; clypeus less convex, with apical margin more than ⅓ width of clypeus between compound eyes (Fig. 15C, fig. 44 in Giordani Soika 1982); anterior carina of pronotum present only laterally, pronotal shoulder rounded; metanotum with sharp teeth at base laterally; body ferruginous with yellow markings (Fig. 15E) ..... *A. aurantiaca* Giordani Soika, 1982
— Smaller species, body length about 6.5 mm; clypeus more convex, with apical margin about ¼ width of clypeus between compound eyes (Fig. 15D); anterior carina of pronotum present laterally and in dorsal third, produced to blunt angle at shoulder; metanotum with blunt teeth at base laterally; body black with yellow markings (Fig. 15F) ..... *A. minutissima* Giordani Soika, 1982

15. Clypeus deeply emarginate with blunt teeth laterally (fig. 1 in Giordani Soika, 1982); frons with dense punctures; lower part of mesepisternum with spaced punctures, interspaces between punctures slightly smaller than puncture diameter; metanotum with well-developed sharp teeth at base laterally (fig. 2 in Giordani Soika 1982) .... *A. guttata* (Smith, 1852).
— Clypeus less deeply emarginate with sharp teeth laterally (fig. 3 in Giordani Soika, 1982); frons with denser punctures; lower part of mesepisternum with more spaced punctures, interspaces between punctures much greater than puncture diameter; metanotum with smaller teeth at base laterally (fig. 4 in Giordani Soika 1982) .... *A. consors* Giordani Soika, 1982

16. Body with dense, coarse, deep punctures; body almost black except some faint yellow marks on head and antennal scape (fig. 7-9 in Gusenleitner 2015) ..... *A. ressli* Gusenleitner, 2015
— Body punctures less coarse, shallower, sparser; body black with extensive yellow markings (Figs 1A, C-F; figs 1-6 in Kumar *et al.* 2016) 17

17. Frons with strong or sparse, fine punctures, interspaces between punctures smooth, not raised to form reticulation 18
— Frons with dense coarse punctures, interspaces between punctures raised to form reticulation 19

18. Frons with sparse fine punctures; SII bulging at base ..... *A. intricata* (Smith, 1857)
— Frons with strong punctures; SII not bulging at base ..... *A. sasidharani* Lambert & Narendran, 2002

19. Anterior surface of pronotum with horizontal series of punctures on middle third, close to each other and separated by short longitudinal carinae 20
— Anterior surface of pronotum without horizontal series of punctures 22

20. SII bulging at base (Fig. 16A); pronotum with anterior carina produced to sharp angle at shoulder (Fig. 16C) ..... *A. excelsa* Giordani Soika, 1982
— SII not bulging at base (Fig. 1E; 16B); pronotum with anterior carina slightly produced at shoulder (Fig. 16D) 21

21. Clypeus as wide as long, with two longitudinal carinae in apical half (Fig. 1A); metanotum with sharp teeth at base laterally (Fig. 1D); propodeum with large deep punctures ..... *A. biguttata* (Fabricius, 1787)
— Clypeus wider than long, without longitudinal carinae (Fig. 16I); metanotum with blunter teeth at base laterally (Fig. 16K); propodeum with smaller shallower punctures ..... *A. sibilans* (Cameron, 1903)

22. Pronotum with anterior carina produced to blunt to sharp angle at shoulder 23
— Pronotum with shoulder rounded 26

23. SII bulging at base ..... *A. bhutanensis* Giordani Soika, 1976
— SII not bulging at base 24

24. Clypeus with fine punctures, interspaces between punctures several times larger than puncture diameter; posterior surface of propodeum with fine punctures, interspaces between punctures smooth ..... *A. thailandia* Gusenleitner, 2002
— Clypeus with stronger punctures, interspaces between punctures as large as puncture diameter; posterior surface of propodeum with strong coarse punctures, interspaces between punctures raised to form reticulation, interspaces with minor punctures 25

25. Pronotum with anterior carina produced to sharp angle at shoulder (Fig. 16G); body with finer punctures ..... *A. luzonensis* (Rohwer, 1919)
— Pronotum with anterior carina produced to blunt angle at shoulder (fig. 9 in Gusenleitner, 2013); body with coarser punctures ..... *A. pruthii* Giordani Soika, 1982

26. Pronotum with anterior carina well developed on lateral surface, bent inwards before and not reaching dorsal surface (Fig. 5C) ..... *A. ceylonica* (de Saussure, 1867)
— Pronotum with anterior carina not bent inwards before reaching dorsal surface (Fig. 16K) 27

27. Clypeus as long as wide, glossy, with large, round, dense punctures; propodeum with posterior surface flat ..... *A. menkei* Giordani Soika, 1986
— Clypeus wider than long, punctures not rounded; propodeum with posterior surface concave 28

28. Clypeus with deep semicircular emargination apically, with sharp teeth laterally (figs 28, in Giordani Soika, 1976); punctures on clypeus coarse, interspaces tending to form longitudinal striation ..... *A. kashmirensis* Giordani Soika, 1976
— Clypeus with shallower emargination, with blunt teeth laterally (Fig. 16H); punctures on clypeus less coarse, interspaces not tending to form longitudinal striation ..... *A. brunnipes* (Fabricius, 1804)

Key to males

1. Posterior surface of propodeum without carinae (Fig. 11E) 2
— Posterior surface of propodeum with two short horizontal or slightly oblique carinae (Fig. 1D; 13F) 14

2. Frons with sparse fine punctures, interspaces between punctures not raised to form reticulation ..... *A. frontalis* Giordani Soika, 1982
— Frons with dense coarse punctures, interspaces between punctures raised to form reticulation 3

3. SII bulging at base (Fig. 9C) 4
— SII not bulging at base (Figs 1E; 5D; 13G) 6

4. SII less convex at base; TII with strong punctures, interspaces between punctures smaller than puncture diameter (Fig. 3D) ..... *A. bipustulata* (de Saussure, 1855)
— SII strongly convex at base; TII with strong punctures, interspaces between punctures larger than puncture diameter (Fig. 9C) 5

5. Anterior surface of pronotum with sparse punctures laterally; tegulae with external margin strongly concave in posterior third; digitus in inner aspect with lower right corner angled (fig. 36 in Giordani Soika, 1982), penis valves in profile with apical part strongly produced into a crow-beak-shaped lobe (fig. 35 in Giordani Soika 1982); body black with yellow markings ..... *A. exaltata* Giordani Soika, 1982
— Anterior surface of pronotum with dense punctures laterally; tegulae not as above; digitus in inner aspect with lower right corner rounded (Fig. 10B), penis valves in profile with apical part strongly produced into a blade-shaped lobe (Fig. 10D); body black with orange markings ..... *A. tytides* (Cameron, 1904)

6. Clypeus shallowly emarginate at apex 7
— Clypeus deeply emarginate at apex 13

7. Punctures on metasoma sparse and fine ..... *A. siamensis* Giordani Soika, 1982
— Punctures on metasoma denser and stronger 8

8. Propodeum rounded laterally 9
— Propodeum angled laterally 11

9. Posterior surface of propodeum with dense coarse punctures, interspaces between punctures raised to form reticulation ..... *A. consimilis* Gusenleitner, 2015
— Posterior surface of propodeum with sparse small punctures 10

10. Large species, body length about 11.5 mm; clypeus less convex, with apical margin more than ⅓ width of clypeus between compound eyes (fig. 44 in Giordani Soika, 1982); anterior carina of pronotum present only laterally, pronotal shoulder rounded; metanotum with sharp teeth at base laterally; FXI large, exceeding middle of FVIII; body ferruginous with yellow markings ..... *A. aurantiaca* Giordani Soika, 1982
— Smaller species, body length about 6.5 mm; clypeus more convex, with apical margin about ¼ width of clypeus between compound eyes (Fig. 16F); anterior carina of pronotum present laterally and in dorsal third, produced to blunt angle at shoulder; metanotum with blunt teeth at base laterally; FXI small, reaching only apical margin of FIX; body black with yellow markings ..... *A. minutissima* Giordani Soika, 1982

11. Metanotum with minute tubercles laterally ..... *A. ovalis* (de Saussure, 1853)
— Metanotum with larger tubercles laterally 12

12. Mesoscutum almost as long as wide between tegulae; pronotal carina in dorsal view strongly produced at lateral corners; inner compound eye margins weakly convergent ventrally, in anterior view about 1.3 × further apart from each other at vertex than at clypeus; digitus almost oval in shape apically (Fig. 8B); penis valves long (Fig. 8C), about 2.2× as long as basal apodeme, in profile apical part strongly produced into a large triangular lobe, upper part of proximal margin with long teeth (Fig. 8D); body black with yellow and ferruginous markings ..... *A. rufescens* (Smith, 1857)
— Mesoscutum shorter than wide between tegulae; pronotal carina in dorsal view round or slightly produced at lateral corners; inner compound eye margins strongly convergent ventrally, in anterior view more than 1.7 × further apart from each other at vertex than at clypeus; digitus with dense long setae (Fig. 12B); penis valves short (Fig. 12C), about 1.7× as long as basal apodeme, in profile apical part strongly produced into a large triangular lobe (Fig. 12D), smooth, without teeth; body black with yellow markings ..... *A. concava* Nguyen, Dang & A. D. Nguyen, n. sp.

13. Clypeus wider than long; frons with dense punctures; lower part of mesepisternum with spaced punctures, interspaces between punctures slightly smaller than puncture diameter; metanotum with well-developed sharp teeth at base laterally (fig. 2 in Giordani Soika 1982); FXI bending backwards, its apex reaching near base of FIX ..... *A. guttata* (Smith, 1852)
— Clypeus not wider than long; frons with denser punctures; lower part of mesepisternum with more spaced punctures, interspaces between punctures much greater than puncture diameter; metanotum with smaller teeth at base laterally (fig. 4 in Giordani Soika 1982); FXI with apex scarcely reaching to base of FIX ..... *A. consors* Giordani Soika, 1982

14. Body with coarse dense punctures, punctures quite deep; body almost black except some faint yellow marks on head and antennal scape (figs 5-8 in Gusenleitner, 2015) ..... *A. ressli* Gusenleitner, 2015
— Body punctures less coarse sparser, punctures shallower; body black with extensive yellow markings (Fig. 1B-F) 15

15. Frons with strong, or sparse fine punctures, interspaces between punctures smooth, not raised to form reticulation 16
— Frons with dense coarse punctures, interspaces between punctures raised to form reticulation 17

16. Frons with sparse fine punctures; S2 bulging at base ..... *A. intricata* (Smith, 1857)
— Frons with strong punctures; S2 not bulging at base ..... *A. sasidharani* Lambert and Narendran, 2002

17. Anterior surface of pronotum with horizontal series of punctures on middle third, series close to each other and separated by short longitudinal carinae 18
— Anterior surface of pronotum without horizontal series of punctures 20

18. SII bulging at base (Fig. 16A); pronotum with anterior carina produced to sharp angle at shoulder (Fig. 16C) ..... *A. excelsa* Giordani Soika, 1982
— SII not bulging at base (Fig. 16B); pronotum with anterior carina slightly produced at shoulder (Fig. 1C, 16D) 19

19. Metanotum with sharp teeth at base laterally; propodeum with large deep punctures ..... *A. biguttata* (Fabricius, 1787)
— Metanotum with blunter teeth at base laterally; propodeum with smaller shallower punctures ..... *A. sibilans* (Cameron, 1903)

20. Pronotum with anterior carina produced to form blunt to sharp angle at shoulder 21
— Pronotum with shoulder rounded 26

21. SII bulging at base ..... *A. bhutanensis* Giordani Soika, 1976
— SII not bulging at base 22

22. Posterior surface of propodeum with fine punctures, interspaces between punctures smooth; clypeus shallowly emarginate apically, with blunt lateral teeth ..... *A. thailandia* Gusenleitner, 2002
— Posterior surface of propodeum with strong coarse punctures, interspaces between punctures raised to form reticulation; apical emargination of clypeus quite deep, semicircular or deeper, with sharp teeth laterally (Fig. 13A, fig. 61 in Kumar *et al.* 2016 23

23. Clypeus strongly convex, with narrow emargination apically, depth of emargination about as long as the width of emargination; body ferruginous and brown-ferruginous ..... *A. brunneola* Giordani Soika, 1986
— Clypeus less convex, with wider emargination apically, depth of emargination longer than width of emargination, or about half its width; body black with yellow markings 24

24. Anterior vertical surface of pronotum with several large punctures medially; metanotum with large sharp teeth, teeth close to each other; clypeus slightly wider than high, with deep emargination apically, depth of emargination about half its width (Fig. 13A) ..... *A. crenula* Nguyen, Yamane & Engel, n. sp.
— Anterior vertical surface of pronotum not as above; metanotum with small blunt teeth, teeth placed far from each other; clypeus much wider than high, about 1 ¼ times as wide as high, with quite deep emargination apically, depth of emargination longer than width of emargination (fig. 51 in Giordani Soika 1982, fig. 61 in Kumar *et al.* 2016) 25

25. Pronotum with anterior carina produced to sharp angle at shoulder; body punctures not very coarse; clypeus with long, exceptionally sharp teeth laterally (fig. 33 in Giordani Soika 1982); FXI bending backwards and curved, its apex reaching to base of FIX (fig. 34 in Giordani Soika 1982) ..... *A. luzonensis* (Rohwer, 1919)
— Pronotum with anterior carina produced to blunt angle at shoulder; body with coarser punctures; clypeus with shorter blunter teeth laterally (fig. 51 in Giordani Soika 1982, fig. 61 in Kumar *et al.* 2016); FXI almost straight, its apex not reaching to base of FIX (fig. 52 in Giordani Soika 1982, fig. 62 in Kumar *et al.* 2016) ..... *A. pruthii* Giordani Soika, 1982

26. Pronotum with anterior carina well developed on lateral surface, bent inwards before and not reaching dorsal surface (Fig. 5C) ..... *A. ceylonica* (de Saussure, 1867)
— Pronotum with anterior carina not bent inwards before reaching dorsal surface (Fig. 16F) 27

27. Clypeus with deep semicircular emargination apically, with sharp teeth laterally (figs 29 in Giordani Soika, 1976) ..... *A. kashmirensis* Giordani Soika, 1976
— Clypeus with shallower emargination apically, with blunt teeth laterally (Fig. 16G) ..... *A. brunnipes* (Fabricius, 1804)

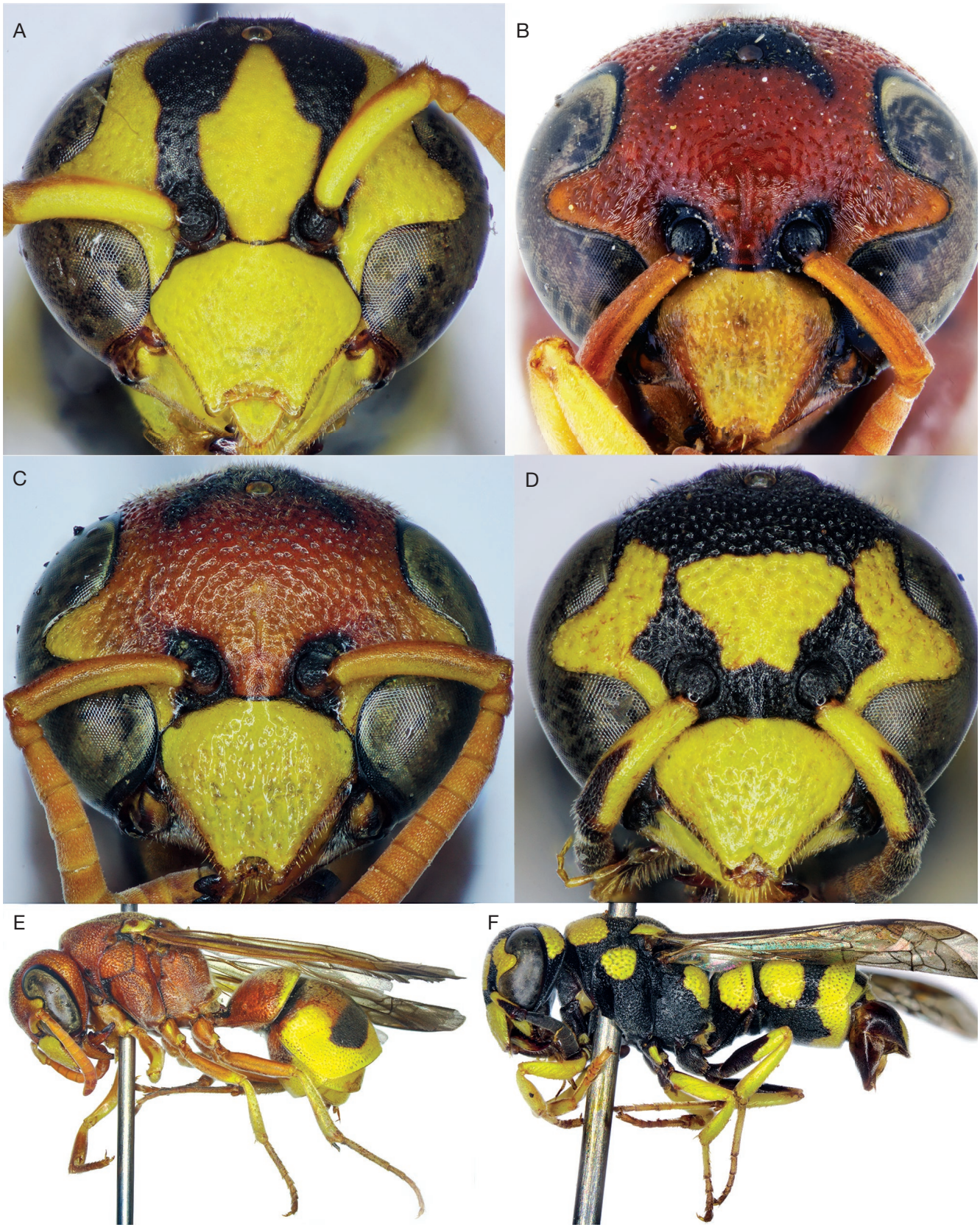

Fig. 15. — Characters of female of genus *Antepipona* de Saussure, 1855: **A**, *A. frontalis* Giordani Soika, 1982, frons, frontal view; **B**, *A. haryana* Gusenleitner, 1996, frons, frontal view; **C**, **E**, *A. aurantiaca* Giordani Soika, 1982: clypeus, frontal view (**C**), habitus, lateral view (**E**); **D**, **F**, *A. minutissima* Giordani Soika, 1982: clypeus, frontal view (**D**), habitus, lateral view (**F**). Not to scale.

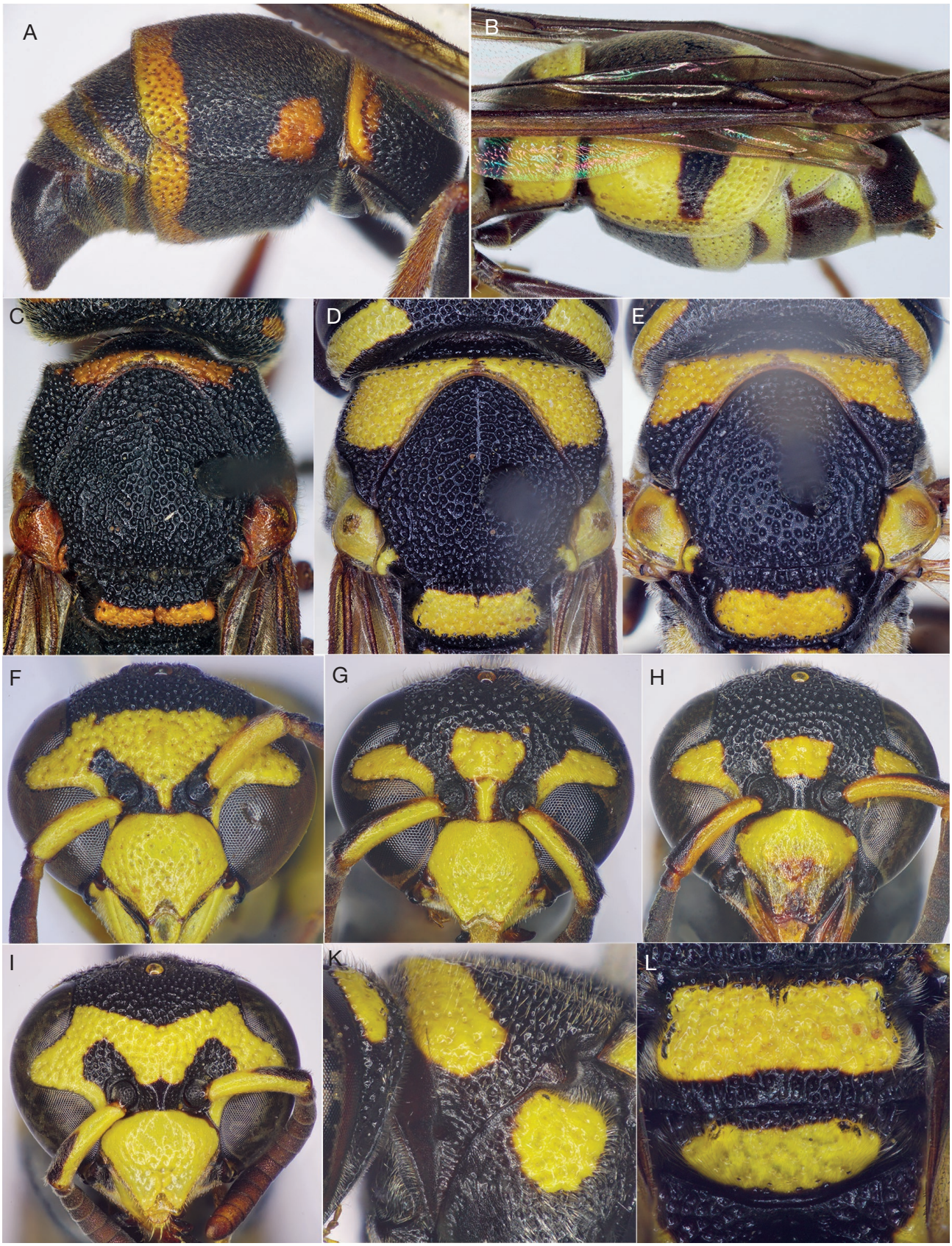

FIG. 16. — Characters of females of *Antepipona* de Saussure, 1855 (except a male of *A. brunnipes* (Fabricius, 1804) and *A. minutissima* Giordani Soika, 1982): **A**, *A. excelsa* Giordani Soika, 1982, SII, lateral view; **B**, **D**, **I**, L, *A. sibilans* (Cameron, 1903): SII, lateral view (**B**) pronotum dorsal view (**D**), clypeus, frontal view (**I**); metanotum, dorsal view (**L**); **C**, *A. excelsa*, pronotum, dorsal view; **E**, *A. luzonensis* (Rohwer, 1919), pronotum, dorsal view; **F**, *A. minutissima*, clypeus, frontal view; **G**, **H**, **K**, *A. brunnipes*: clypeus, frontal view, male (**G**); clypeus, frontal view (**H**); pronotal carina (**K**). Not to scale.

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REFERENCES

CAMERON P. 1903. — Description of nineteen new species of Larridae, *Odynerus* and Apidae from Barrackpore. *Transactions of the Entomological Society of London* 1903: 117-132. https://doi.org/10.1111/j.1365-2311.1903.tb01129.x

CAMERON P. 1904. — Description of a new genus and some new species of east Indian Hymenoptera. *Entomologist* 37: 306-310. https://doi.org/10.5962/bhl.part.288

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

DE SAUSSURE H. 1852. — Études sur la famille des Vespides 1, *in* de SAUSSURE H. (ed.): Monographie des Guêpes solitaires ou de la tribu des Eumeniens. Masson, V., Paris and Cherbuliez, J., Genève: 12-286. https://doi.org/10.5962/bhl.title.39973

DE SAUSSURE H. 1854-1856. — Études sur la famille des Vespides 3, *in* de SAUSSURE H. (ed.): *La Monographie des Masariens et un supplement a la Monographie des Euméniens*. Masson, V., Paris and Kessmann, J., Genève: 1-352.

DE SAUSSURE H. 1867. — *Reise der Österreichischen Fregatte Novara um die Erde in den jahren 1857, 1858, 1859. Zool. Teil, 2 Band 1. Abteil A. 2. Hymenoptera*. Kaiserlich, Wein, 142 p.

FABRICIUS J. C. 1787. — *Mantissa insectorum: sistens eorum species nuper detectas, adiectis characteribus genericis, differentiis specificis, emendationibus, observationibus*. Impensis C. G. Proft, Hafniae, XX + 348 p. https://doi.org/10.5962/bhl.title.11657

FABRICIUS J. C. 1804. — *Systema Piezatorum secundum Ordines, Genera, Species adjectis Synonymis, Locis, Observationibus, Descriptionibus*. Carolum Reichard, Brunsvigae (Braunschweig), 440 + 30 p. [p. i-xiv + 15-440 + 1-30]. https://doi.org/10.5962/bhl.title.10490

GIORDANI SOIKA A. 1975. — Ergebnisse der Bhutan-Expedition des Naturhistorisches Museums in Basel, Hymenoptera, Fam. Eumenidae. *Entomologica basiliensis* 1: 387-393.

GIORDANI SOIKA A. 1976. — Vespidi ed eumenidi raccolti in Corea (Hymenoptera). *Annales historico-naturales Musei nationalis hungarici* 68: 287-293.

GIORDANI SOIKA A. 1977 ["1976"]. — Notulae vespidologicae-XXXIX. Nuovi Eumenidi Paleartici. *Bollettino del Museo Civico di Storia Naturale di Venezia* 28: 153-178.

GIORDANI SOIKA A. 1982 [1981]. — Revisione delle specie orientali del genere *Antepipona* Sauss. (Hym. Vespoidea). *Bollettino del Museo Civico di Storia Naturale di Venezia* 32: 205-257.

GIORDANI SOIKA A. 1986. — Eumenidi palearctici nuovi o poco noti. *Bollettino del Museo civico di storia naturale di Venezia* 35: 91-162.

GUSENLEITNER J. 1996. — Über Eumenidae der orientalischen Region (Hymenoptera, Vespoidea). *Linzer biologischen Beiträge* 28 (1): 39-56.

GUSENLEITNER J. 2002 — Bemerkenswerte Faltenwespen-Funde aus der oriental- ischen Region Teil 2 (Hymenoptera: Vespoidea, Eumenidae). *Linzer Biologische Beitrage* 34 (2): 1091-1099.

GUSENLEITNER J. 2013. — Bemerkenswerte Faltenwespen-Funde aus der orientalischen Region Teil 7 (Hymenoptera: Vespidae, Eumeninae, Polistinae). *Linzer Biologische Beiträge* 45 (1): 121-132.

GUSENLEITNER J. 2015. — Bemerkenswerte Faltenwespen-Funde aus der orientalischen Region Teil 8 (Hymenoptera: Vespidae: Eumeninae). *Linzer Biologische Beiträge* 47 (2): 1321-1326.

ICZN 1970. — Declaration 43 (Case 1543) Repeal of Article 23b. *Bulletin of Zoological Nomenclature* 27 (3-4): 135-163.

KIM J. K. & YAMANE S. 2003. — A review of the genus *Antepipona* Saussure (Hymenoptera: Vespidae: Eumeninae) in Taiwan. *Insect of Koreana* 20 (3, 4): 287-293.

KOJIMA J. 1999. — Male genitalia and antennae on an Old World paper wasp genus *Ropalidia* Guérin-Méneville, 1831 (Insecta: Hymenoptera; Vespidae, Polistinae). *Natural History Bulletin of Ibaraki University* 3: 51-68.

KUMAR G. P., CARPENTER J. M. & SURESHAN P. M. 2016. — A taxonomic review of the genus *Antepipona* de Saussure, 1855 (Hymenoptera: Vespidae: Eumeninae) from India. *Zootaxa* 4150 85): 501-536.

LAMBERT K. & NARENDRAN T. C. 2002. — A new species of *Antepipona* Saussure (Hymenoptera: Vespidae) from India. *Journal of Zoological Society of Kerala* 10 (1-2): 1-4.

NGUYEN L. T. P., DANG H. T., KOJIMA J. & CARPENTER J. M. 2014. — An annotated distributional checklist of solitary wasps of the subfamily Eumeninae (Hymenoptera: Vespidae) of Vietnam. *Entomologica Americana* 120 (1): 7-17. https://doi.org/10.1664/13-RA-010.1

NGUYEN L. T. P., NGUYEN A. D., TRAN N. T., NGUYEN M. T., ENGEL M. S. 2023. —The potter wasp genus *Allorhynchium* from Vietnam, with descriptions of three new species and a new country record (Hymenoptera, Vespidae, Eumeninae). *ZooKeys* 1166: 1-32. https://doi. org/10.3897/zookeys.1166.102674

NGUYEN L. T. P., NGUYEN H. T. T., DOAN N. H. & CAO N. T. T. 2018. — Study on solitary wasps of the subfamily Eumeninae (Hymenoptera: Vespidae) from Na Hang and Huu Lien Natural Reserves, with new records of one genus and three species. *Academia Journal of Biology* 40 (3): 23-28.

ROHWER S. A. 1919. — Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. *Hawaiian Sugar Planter's Association, Experimental Station* 14: 17.

SAUSSURE H. DE. 1853. — *Études sur la Famille des Vespides 1. Monographie des Guêpes solitaires ou de la tribu des Euméniens*. V. Masson , Paris and J. Kessmann, Genève, p. i-l + 129-286, pls 1, 6, 8-9, 11-13, 15-22.

SELIS M. 2018. —Additions to the knowledge of solitary wasps (Hymenoptera: Vespidae: Eumeninae), with description of eight new species. *Zootaxa* 4403 (3): 441-468. https://doi.org/10.11646/zootaxa.4403.3.2

SMITH F. 1852. — Descriptions of some Hymenopterous insects captured in India, with notes on their economy, by Ezra T. Downes, Esq. who presented them to the Honourable East India Company. *Annals and Magazine of Natural History* 9 (2): 44-50.

SMITH F. 1857. — *Catalogue of Hymenopterous insects in the collection of the British Museum. Part V. Vespidae. 5*. Taylor and Francis, London, 147 p.

VAN DER VECHT J. 1963. — Studies on Indo-Australian and East Asiatic Eumenidae (Hymenoptera: Vespoidea). *Zoologische Verhandelingen* 60: 1-116.

VAN DER VECHT J. 1967. — The status of certain genus-group names in the Eumenidae (Hymenoptera, Vespoidea). Z.N.(S.) 1689. *Bulletin of Zoological Nomenclature* 27-33.

VAN DER VECHT J. & FISCHER F. C. J. 1972. — *Palearctic Eumenidae. Hymenopterum Catalogus*. New Edition. W. Jung, s. Graven- hage: v + 199 p.

YAMANE SK. 1990. — A revision of the Japanese Eumenidae (Hymenoptera, Vespoidea). *Insecta Matsumurana, New Series* 43: 1-189.

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