A journal of world insect systematics

INSECTA MUNDI

0880

New country records, annotated checklist and key to the dacine fruit flies (Diptera: Tephritidae: Dacinae: Dacini) of Bangladesh

Luc Leblanc

Department of Entomology, Plant Pathology and Nematology (EPPN)
University of Idaho
875 Perimeter Drive MS 2329
Moscow, Idaho, USA

M. Aftab Hossain

Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh

Mahfuza Momen

Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh

Kajla Seheli

Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh

Date of issue: August 27, 2021

Center for Systematic Entomology, Inc., Gainesville, FL

Leblanc L, Hossain MA, Momen M, Seheli K. 2021. New country records, annotated checklist and key to the dacine fruit flies (Diptera: Tephritidae: Dacinae: Dacini) of Bangladesh. Insecta Mundi 0880: 1–56.

Published on August 27, 2021 by
Center for Systematic Entomology, Inc.
P.O. Box 141874
Gainesville, FL 32614-1874 USA
http://centerforsystematicentomology.org/

Printed copies (ISSN 0749-6737) annually deposited in libraries

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA
The Natural History Museum, London, UK
National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russia

Electronic copies (Online ISSN 1942-1354) in PDF format

Archived digitally by Portico
Florida Virtual Campus: http://purl.fcla.edu/fcla/insectamundi
University of Nebraska-Lincoln, Digital Commons: http://digitalcommons.unl.edu/insectamundi/
Goethe-Universität, Frankfurt am Main: http://nbn-resolving.de/urn/resolver.pl?urn:nbn:de:hebis:30:3-135240

0880: 1–56 **INSECTA MUNDI** 2021

New country records, annotated checklist and key to the dacine fruit flies (Diptera: Tephritidae: Dacinae: Dacini) of Bangladesh

Luc Leblanc
Department of Entomology, Plant Pathology and Nematology (EPPN)
University of Idaho
875 Perimeter Drive MS 2329
Moscow, Idaho, USA
leblancl@uidaho.edu

M. Aftab Hossain
Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh
aftabbaec@mail.com

Mahfuza Momen
Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh

Kajla Seheli
Insect Biotechnology Division, Institute of Food and Radiation Biology
Bangladesh Atomic Energy Commission
Dhaka-1349, Bangladesh

Abstract. Thirty-four species of dacine fruit flies (Diptera: Tephritidae) were recorded in Bangladesh, based on field surveys carried out between 2013 and 2020. Five species are reported in Bangladesh for the first time: *Bactrocera aethriobasis* (Hardy), *B. limbifera* (Bezzi), *B. melania* (Hardy and Adachi), *B. nigrifemorata* Li and Wang, and *Dacus jacobi* David and Sachin. The attraction of *B. nigrifemorata* to cue-lure is a new male lure association. An annotated checklist and illustrated key to the species are provided.

Key words. *Bactrocera*, *Dacus*, *Zeugodacus*, pest, taxonomy.

ZooBank registration. urn:lsid:zoobank.org:pub:A6DE8E5B-98F9-4F31-BE36-E84EC1DB596F

Introduction

Systematic field surveys of dacine fruit flies in Bangladesh have been ongoing since 2013, initially focused on rural farmland and village environments throughout the country (Leblanc et al. 2013, 2014), and expanded to protected forest areas in 2016 (Leblanc et al. 2019b). As a result, the number of species recorded in Bangladesh has increased from seven to 15 (Leblanc et al. 2013), 20 (Leblanc et al. 2014) and 29 (Leblanc et al. 2019b). We include five new country records and one new lure association in this paper and provide an annotated checklist, with up-to-date distributions, lures, host records, and citations to published research on the ecology and control in Bangladesh for each of the 34 species.

Materials and Methods

We carried out regular snap-shot surveys in agricultural environments and protected forest areas by maintaining, for a few days, series of traps (described in Leblanc et al. 2015a) separately baited with three different male lures plus a 10x10mm piece of dichlorvos (DDVP) insecticide strip to kill trapped flies. We baited traps with

commercially available cue-lure and methyl eugenol plugs (Scentry Biologicals, Billings, Montana), or dental cotton wicks dipped in zingerone (= vanillylacetone) (Sigma-Aldrich) melted over a hot plate and allowed to solidify in the wicks. Between April 2013 and October 2020, we deployed traps at 614 sites, either as individual sites scattered over rural areas or as series of sites, about 50 meters apart along roads or trails, in protected forest areas.

Sites surveyed between 2013 and 2018 are described in detail in Leblanc et al. (2019b). More recent surveys, carried out in protected forest areas in 2019 and 2020, covered 231 sites in the Chattogram Hill tracts (Kaptai National Park, Alu Tila Hill, Zero Mile Tila Hill, Banashree Tila Hill, Panchari Forest Range), Dinajpur District (Dharmapur Forest, Ramsagar National Park, Singra National Park), Gazipur District (Chandra Forest Range), and Tangail District (Baro Choana Forest).

Sampled flies were stored in 95% ethanol in a −20°C freezer, to preserve DNA for analysis. All flies were identified by the first two authors, using available keys (Drew and Romig 2013, 2016). For series of selected specimens, DNA was extracted and the Cytochrome C Oxidase I (COI) and Elongation Factor 1-alpha (EF1-alpha) genes were sequenced to help confirm species identifications (Leblanc et al. 2019b). Reference voucher collections of double-mounted flies are preserved at the University of Hawaii Insect Museum (UHIM) and the University of Idaho's William F. Barr Entomological Museum (WFBM). Before drying flies for double-mounting, we pinned them through the scutum with a minuten pin and soaked them in ethyl-ether for 3–12 hours to fix and preserve their natural coloration. We photographed specimens using a Nikon D7100 camera attached to an Olympus SZX10 microscope and used Helicon Focus pro v6.7.1 to merge pictures taken at a range of focal planes.

The annotated checklist included in this paper covers cumulative data from all the snap-shot surveys described above, and from a two-year population monitoring study carried out in Dhaka (Hossain et al. 2019), for a total of 188,135 specimens collected and identified to species level. Except for females of *B. melania* (Hardy and Adachi) and *B. latifrons* (Hendel) bred from fruit, almost all collected specimens reported in the checklist are males. We also provide a key to the species with color plates. Red arrows in the figures indicate key characters referred to in key couplets. Detailed collection records for each of the species are available on the Global Diversity Information Facility (GBIF) (https://doi.org/10.15468/dl.yurtw8).

Annotated checklist of dacine fruit flies recorded in Bangladesh

Bactrocera (*Parazeugodacus*) *abbreviata* (Hardy, 1974)

Figure 1

Distribution. Philippines (Hardy 1974), China, Thailand (Drew and Romig 2013), Vietnam (Leblanc et al. 2018a), Bangladesh (Leblanc et al. 2019b), Nepal (Leblanc et al. 2019a), Indonesia (Doorenweerd et al. 2020).

Bangladesh records. 63 specimens. CHATTOGRAM DIVISION: Chattogram District. DHAKA DIVISION: Dhaka District.

Male lure. Zingerone.

Host plants. *Chionanthus ramiflorus* Roxb. and *Olea salicifolia* Wall. ex G. Don (Oleaceae) (Allwood et al. 1999).

Notes. Doorenweerd et al. (2018) noted that *B. abbreviata* may be conspecific with and junior synonym to *B. bipustulata* (Bezzi, 1914), known from Sri Lanka and southern India.

Bactrocera (*Bactrocera*) *aethriobasis* (Hardy, 1973)

Figure 2

Distribution. Thailand (Hardy 1973), Malaysia (Peninsular) (Norrbom et al. 1999), Bhutan, Vietnam (Drew and Romig 2013), Cambodia (Leblanc et al. 2016), India (David et al. 2017), Nepal (Leblanc et al. 2019a), Bangladesh (**NEW COUNTRY RECORD**).

Bangladesh records. One specimen. CHATTOGRAM DIVISION: Rangamati Hill District, Kaptai National Park (Bangchari Range), 25-vii-2019, methyl eugenol trap, M. Aftab Hossain. Specimen deposited in WFBM.

Male lure. Methyl eugenol.

Host plants. *Azadirachta indica* A. Juss. (Meliaceae) (Drew and Romig 2013).

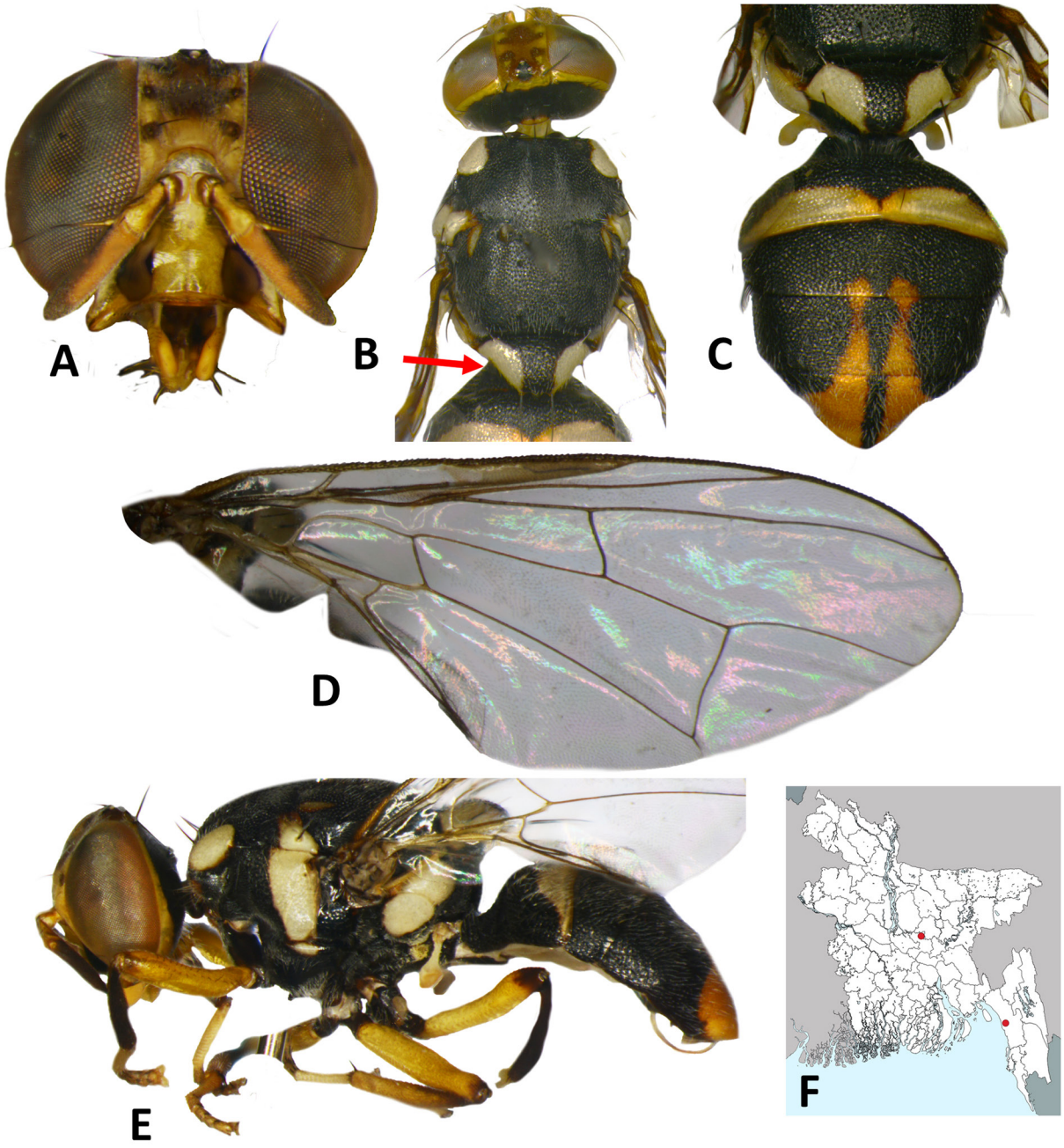

Figure 1. *Bactrocera* (*Parazeugodacus*) *abbreviata* (Hardy), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

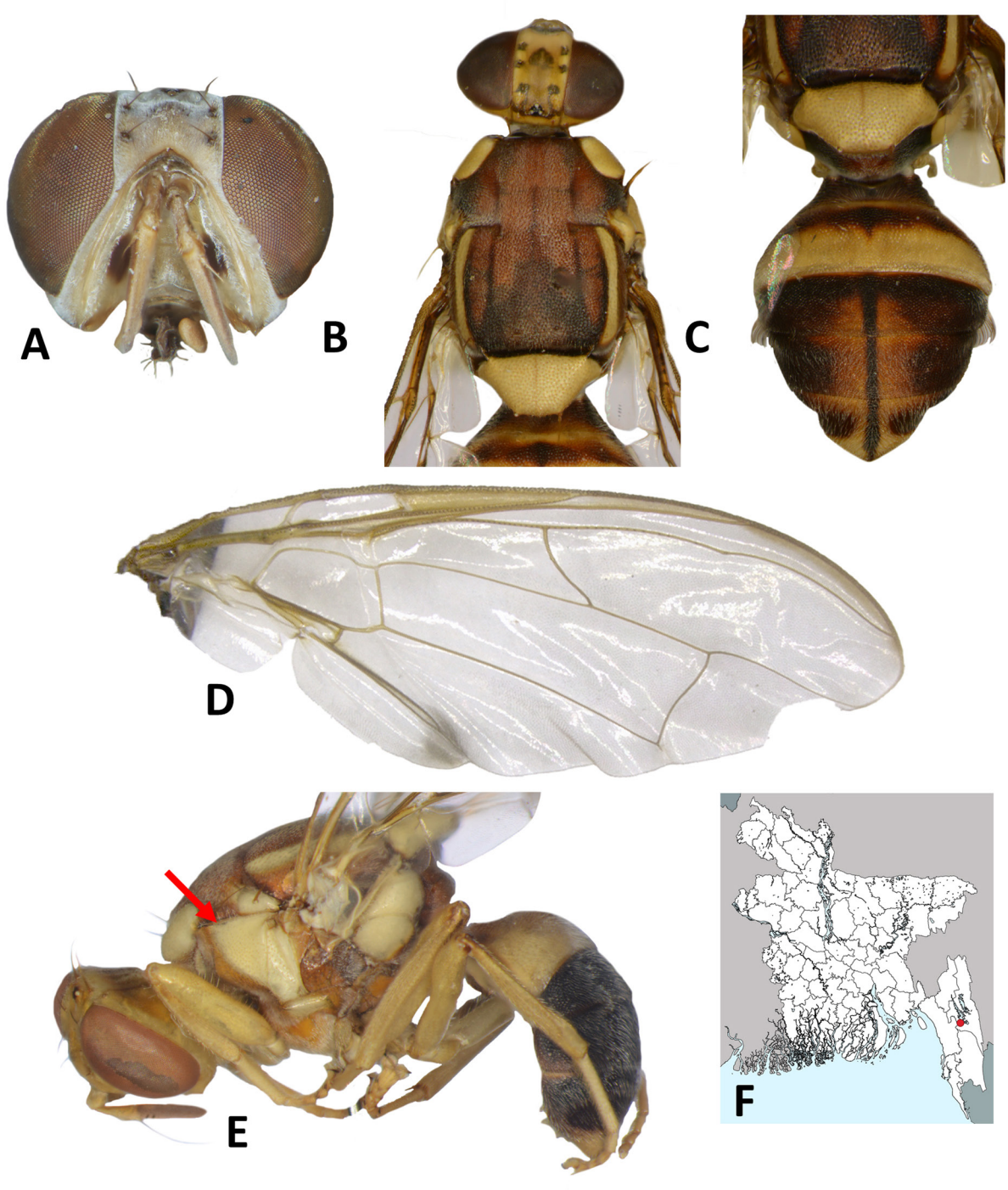

Figure 2. *Bactrocera* (*Bactrocera*) *aethriobasis* (Hardy), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

Bactrocera (*Bactrocera*) *bhutaniae* Drew and Romig, 2013

Figure 3

Distribution. Bhutan, India (Andaman Island), Vietnam, Thailand (Drew and Romig 2013), Laos, Cambodia, China (Leblanc et al. 2016), Bangladesh (Leblanc et al. 2014, 2019b).

Bangladesh records. 10 specimens. CHATTOGRAM DIVISION: Bandarban Hill and Rangamati Hill Districts. SYLHET DIVISION: Moulvibazar and Sylhet Districts.

Male lure. Cue-lure.

Host plants. *Xylosma brachystachys* Craib (Salicaceae) (Drew and Romig 2013).

Bactrocera (*Bactrocera*) *carambolae* Drew and Hancock, 1994

Figure 4

Distribution. Malaysia (Peninsular, East), Indonesia, Singapore, Thailand, India (Andaman Island), Vietnam (Drew and Romig 2013), Cambodia (Leblanc et al. 2016), Bangladesh (Leblanc et al. 2019b). Introduced in French Guiana, Surinam (Drew and Hancock 1994), and Guyana (Norrbom et al. 1999).

Bangladesh records. 172 specimens. CHATTOGRAM DIVISION: Chattogram, Cox's Bazar, and Khagrachari Hill Districts. SYLHET DIVISION: Habiganj District.

Male lure. Methyl eugenol.

Host plants. This polyphagous fruit pest infests 100 host taxa in 58 genera and 38 families (Allwood et al. 1999; Liquido et al. 2016b).

Bactrocera (*Bactrocera*) *correcta* (Bezzi, 1916)

(= *Dacus dutti* Kapoor, 1971, *Strumeta paratuberculatus* Philip, 1950, *Dacus bangaloriensis* Agarwal and Kapoor, 1983)

Figure 5

Distribution. Widespread in Asia, from Pakistan east to Vietnam and south to Peninsular Malaysia (Drew and Romig 2013), Bangladesh (Leblanc et al. 2014), Laos, Cambodia (Leblanc et al. 2016).

Bangladesh records. 656 specimens. CHATTOGRAM DIVISION: Chattogram and Cox's Bazar Districts. DHAKA DIVISION: Dhaka District.

Male lure. Methyl eugenol.

Host plants. A polyphagous pest of cultivated fruits, bred from 91 host taxa in 59 genera and 36 families (Allwood et al. 1999; Liquido et al. 2020).

Notes. In Bangladesh, Hossain et al. (2019) studied the seasonal abundance of *B. correcta* in relation to abiotic factors and host plants.

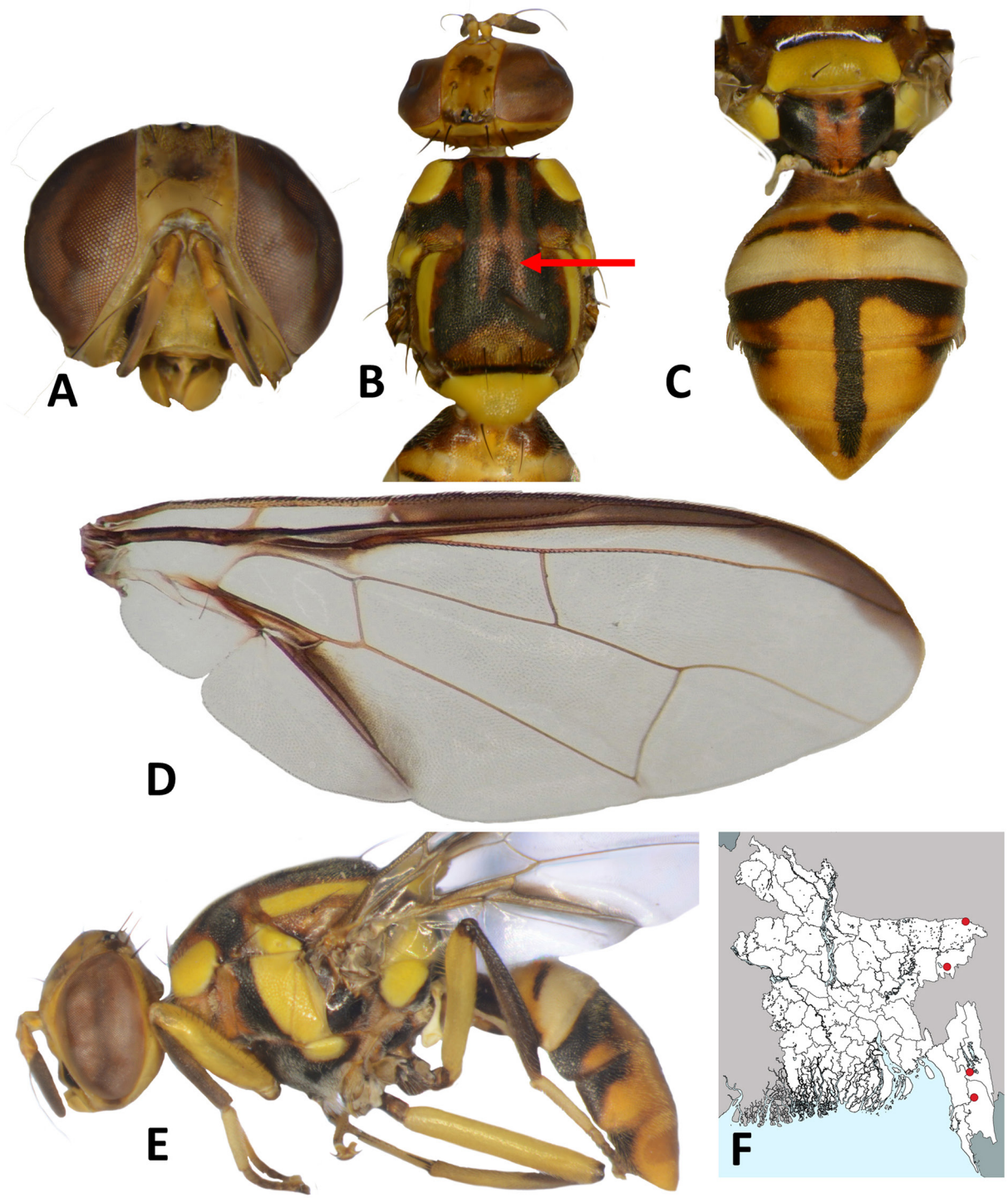

Figure 3. *Bactrocera* (*Bactrocera*) *bhutaniae* (Hardy), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing (after Leblanc et. al. 2014). **E)** Lateral view. **F)** Distribution in Bangladesh.

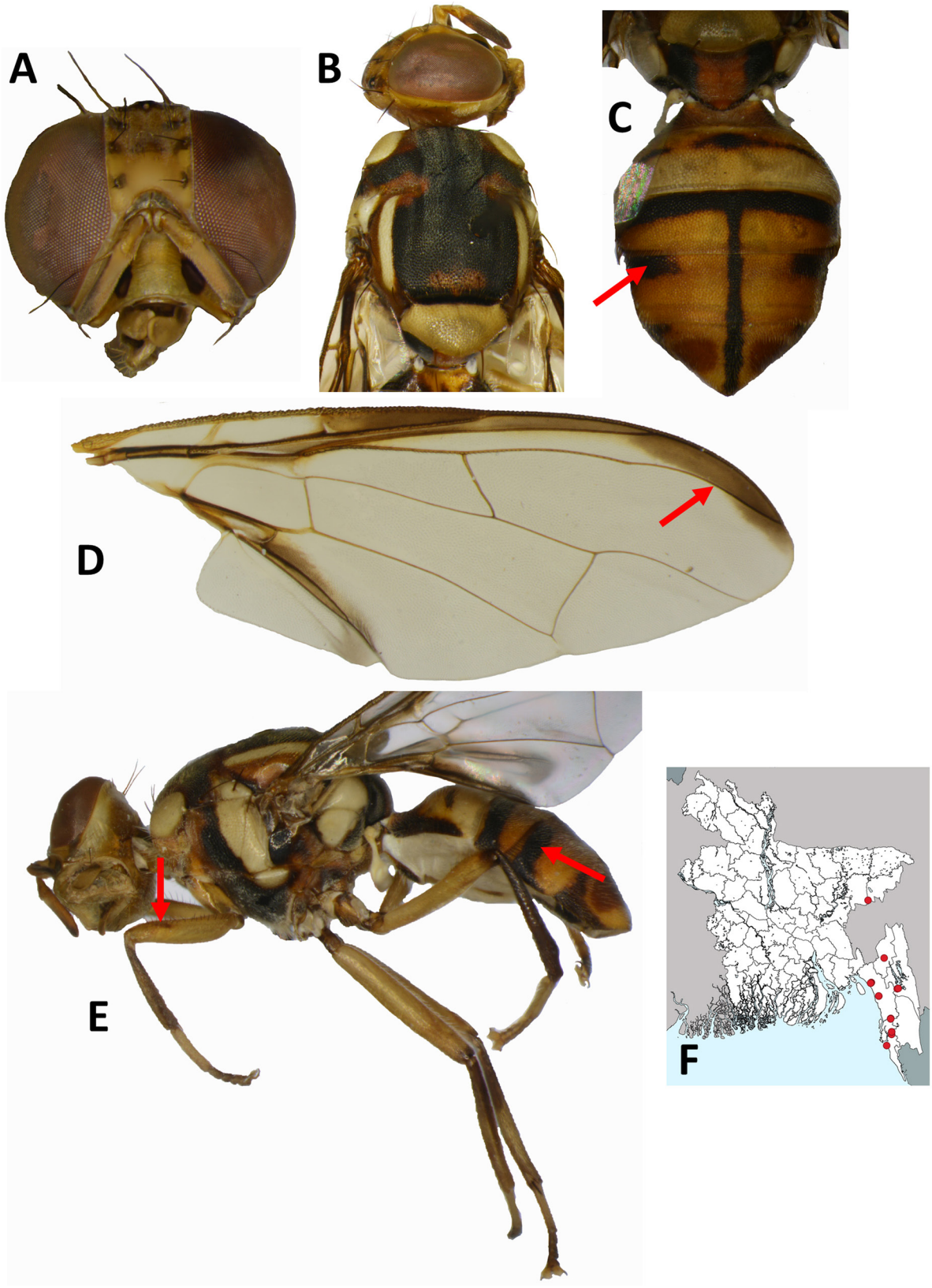

Figure 4. *Bactrocera* (*Bactrocera*) *carambolae* Drew and Hancock, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

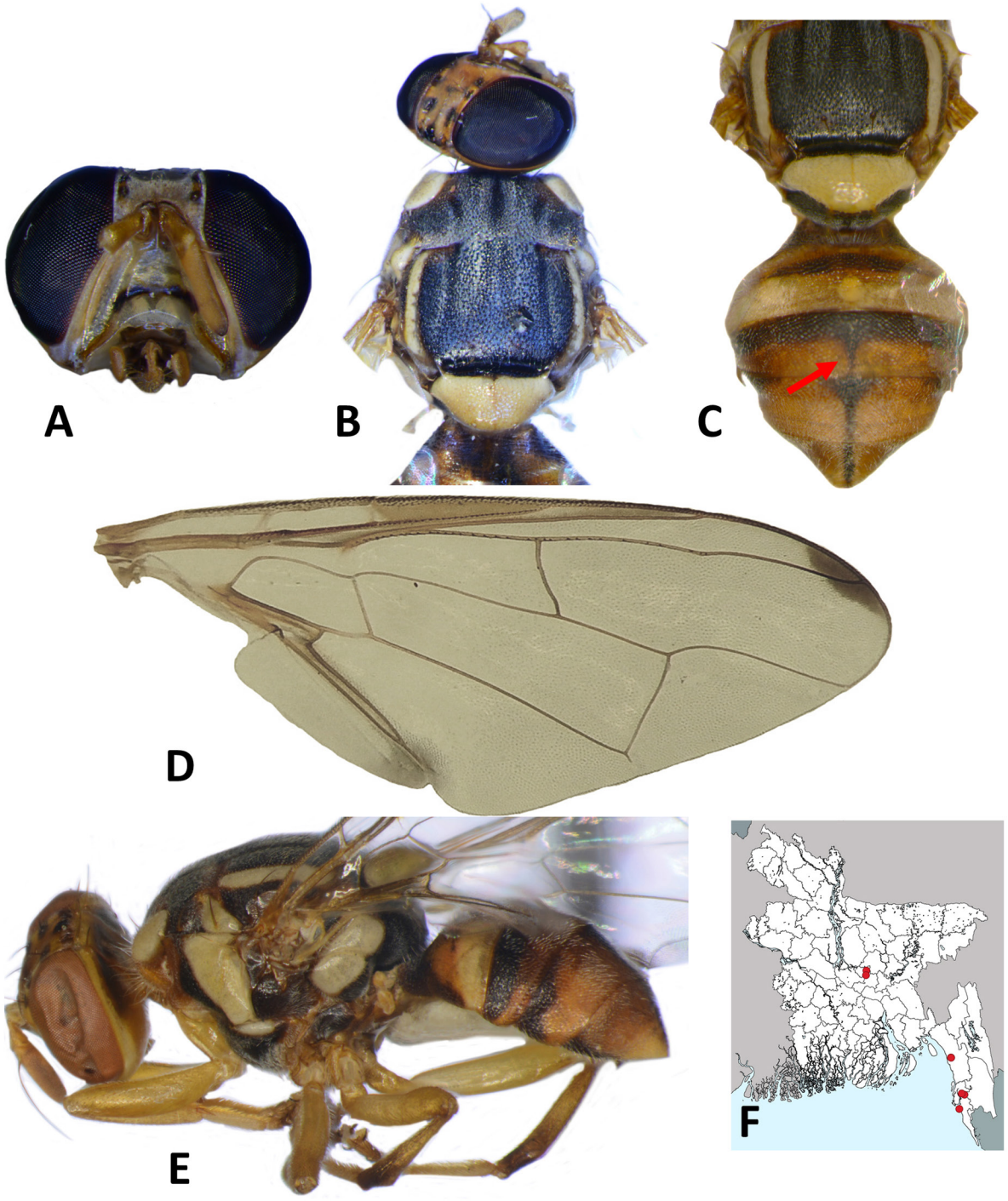

Figure 5. *Bactrocera* (*Bactrocera*) *correcta* (Bezzi), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing (after Leblanc et. al. 2014). **E)** Lateral view. **F)** Distribution in Bangladesh.

Bactrocera (*Daculus*) *digressa* Radhakrishnan, 1999

(= *Bactrocera yercaudiae* Drew in Drew and Raghu 2002)

Figure 6

Distribution. India (Radhakrishnan 1999), Bangladesh (Leblanc et al. 2013), Nepal (Leblanc et al. 2019a).

Bangladesh records. 69 specimens. DHAKA DIVISION: Dhaka and Gazipur Districts. RAJSHAHI DIVISION: Chapai Nawabgonj, Joypurhat, Naogaon, and Pabna Districts. RANGPUR DIVISION: Dinajpur District.

Male lure. Cue-lure, zingerone.

Host plants. *Alangium salviifolium* (L.f.) Wangerin (Cornaceae) (David and Ramani 2011).

Bactrocera (*Bactrocera*) *dorsalis* (Hendel, 1912)

(= *Musca ferruginea* Fabricius, 1794, *Bactrocera conformis* Doleschall, 1858, *Chaetodacus ferrugineus* var. *okinawanus* Shiraki, 1933, *Dacus semifemoralis* Tseng, Chen and Chu, 1992, *Dacus yilanensis* Tseng, Chen and Chu, 1992, *Bactrocera papayae* Drew and Hancock, 1994, *Bactrocera philippinensis* Drew and Hancock, 1994, *Bactrocera invadens* Drew, Tsuruta and White, 2005, *Bactrocera variabilis* Lin and Wang in Lin et al. (2011))

Figures 7–8

Distribution. Widespread through tropical Asia, from Pakistan to Taiwan and south to New Guinea; introduced to Africa and various islands in the Indian and Pacific Oceans (see map in Vargas et al. 2015).

Bangladesh records. 118,942 specimens. BARISHAL DIVISION: Barishal and Jhalokathi Districts. CHATTOGRAM DIVISION: Bandarban Hill, Bramhanbaria, Chandpur, Chattogram, Cox's Bazar, Cumilla, Feni, Khagrachari Hill, Laxmipur, Noakhali, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, Gazipur, Gopalgonj, Kishorgonj, Madaripur, Manikganj, Munshiganj, Narayanganj, Narsingdi, Rajbari, Shariatpur, and Tangail Districts. KHULNA DIVISION: Chuadanga, Jashore, Jhenaidah, Khulna, Kushtia, Magura, Meherpur, Narail, and Satkhira Districts. MYMENSINGH DIVISION: Jamalpur, Mymensingh, Netrokona, and Sherpur District. RAJSHAHI DIVISION: Bogura, Chapai Nawabgonj, Joypurhat, Naogaon, Natore, Pabna, Rajshahi, and Sirajganj Districts. RANGPUR DIVISION: Dinajpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagarh, Rangpur, and Thakurgaon Districts. SYLHET DIVISION: Habiganj, Moulvibazar, Sunamgonj, and Sylhet Districts.

Male lure. Methyl eugenol, zingerone (but no record of attraction to latter in Bangladesh yet).

Host plants. A highly polyphagous fruit pest with reliable published records for 500 host taxa in 219 genera and 81 families (Allwood et al. 1999; Liquido et al. 2021). Recorded hosts in Bangladesh include mango (*Mangifera indica* L. - Anacardiaceae), carambola (*Averrhoa carambola* L. - Oxalidaceae), and guava (*Psidium guajava* L. - Myrtaceae) (Kabir et al. 1991).

Notes. Oriental fruit fly is by far the most numerous species in Bangladesh. On the Indian subcontinent, including Bangladesh, this species exhibits a broad range of scutum color pattern variation, similar to that in Africa (Leblanc et al. 2013) (Fig. 7E–L), whereas further east, the dark scutum form is dominant (Fig. 7B). In Bangladesh, Hossain et al. (2019) studied the seasonal abundance of *B. dorsalis* in relation to abiotic factors and host plants for making management decisions. Male annihilation technique is practiced to control this pest fly in the northwestern part of Bangladesh (Uddin et al. 2016). To optimize the required irradiation dose for post-harvest quarantine treatments, Akhter et al. (2008) monitored adult emergence from treated bananas artificially infested with third instar larvae. They observed that a 150 Gy treatment completely prevented larval development and adult emergence. The parasitoid wasp *Diachasmimorpha longicaudata* (Ashmead, 1905) (Hymenoptera: Braconidae) was bred by Mahfuza Momen from larvae of *B. dorsalis* infesting guava, in September 2019, at the Atomic Agency Research Establishment compound, in Savar, Dhaka.

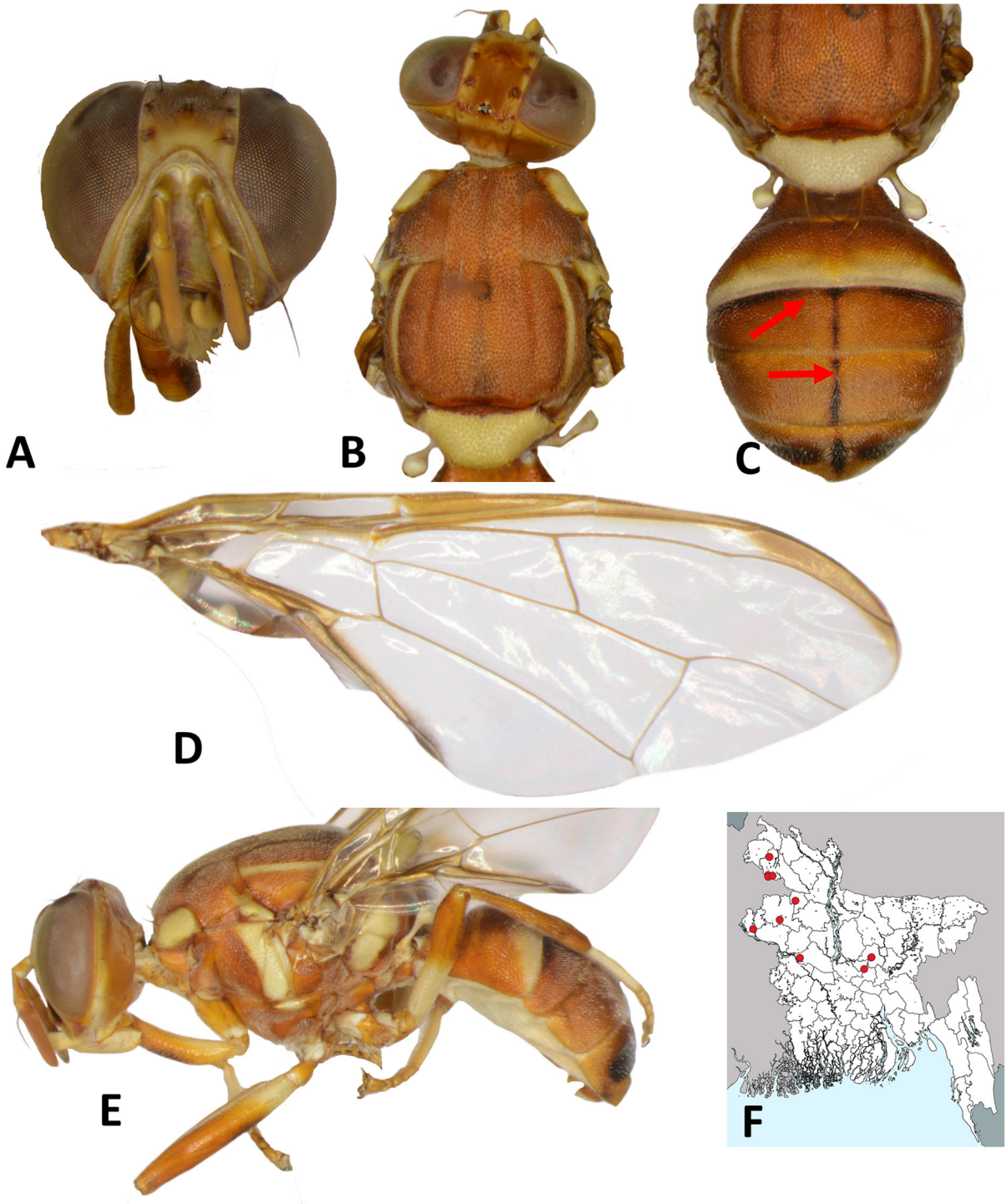

Figure 6. *Bactrocera* (*Daculus*) *digressa* Radhakrishnan, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

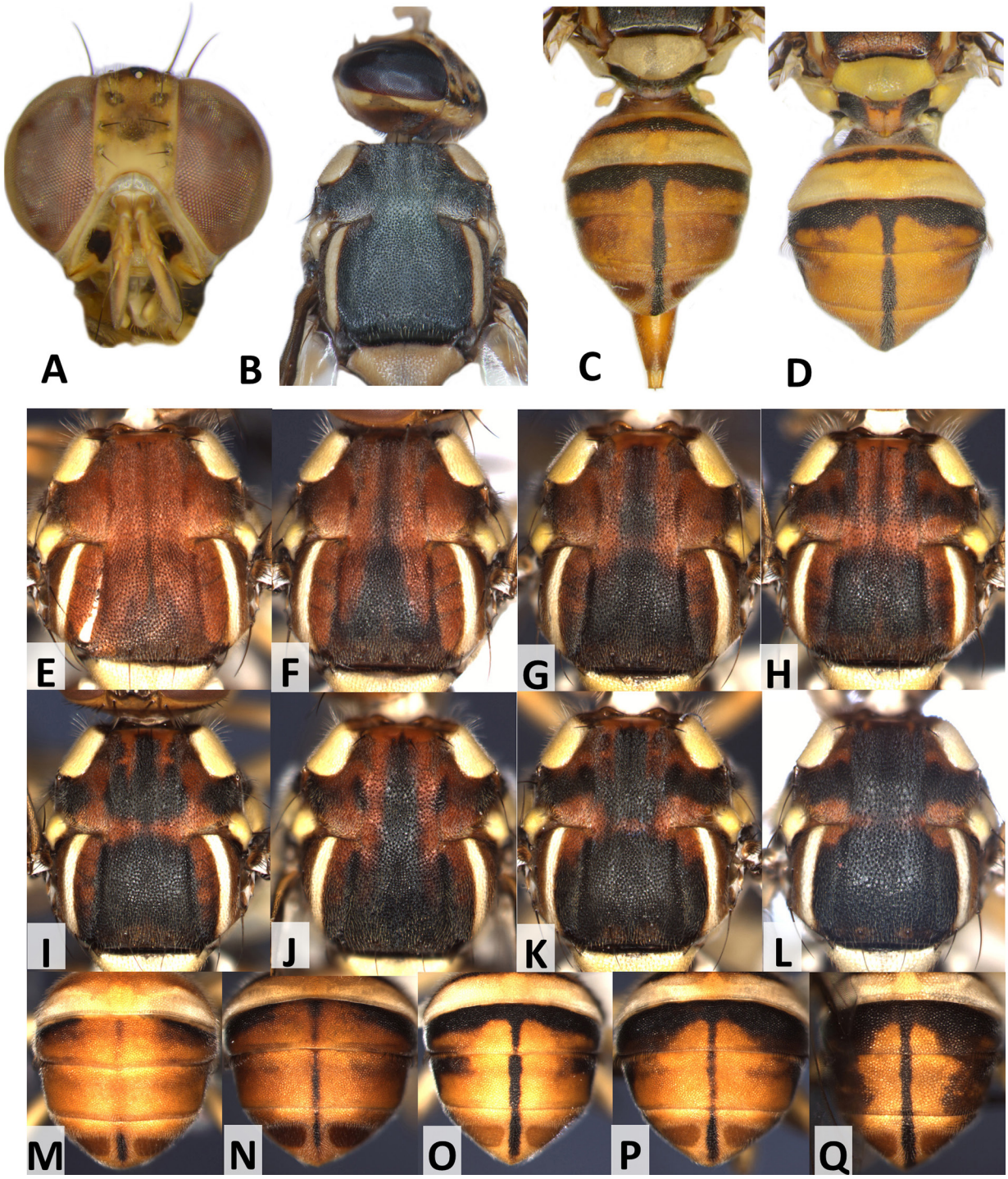

Figure 7. *Bactrocera* (*Bactrocera*) *dorsalis* (Hendel). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E–L)** Scutum variation in Bangladesh (after Leblanc et al. 2013). **M–Q)** Abdomen variation in Bangladesh (after Leblanc et al. 2013).

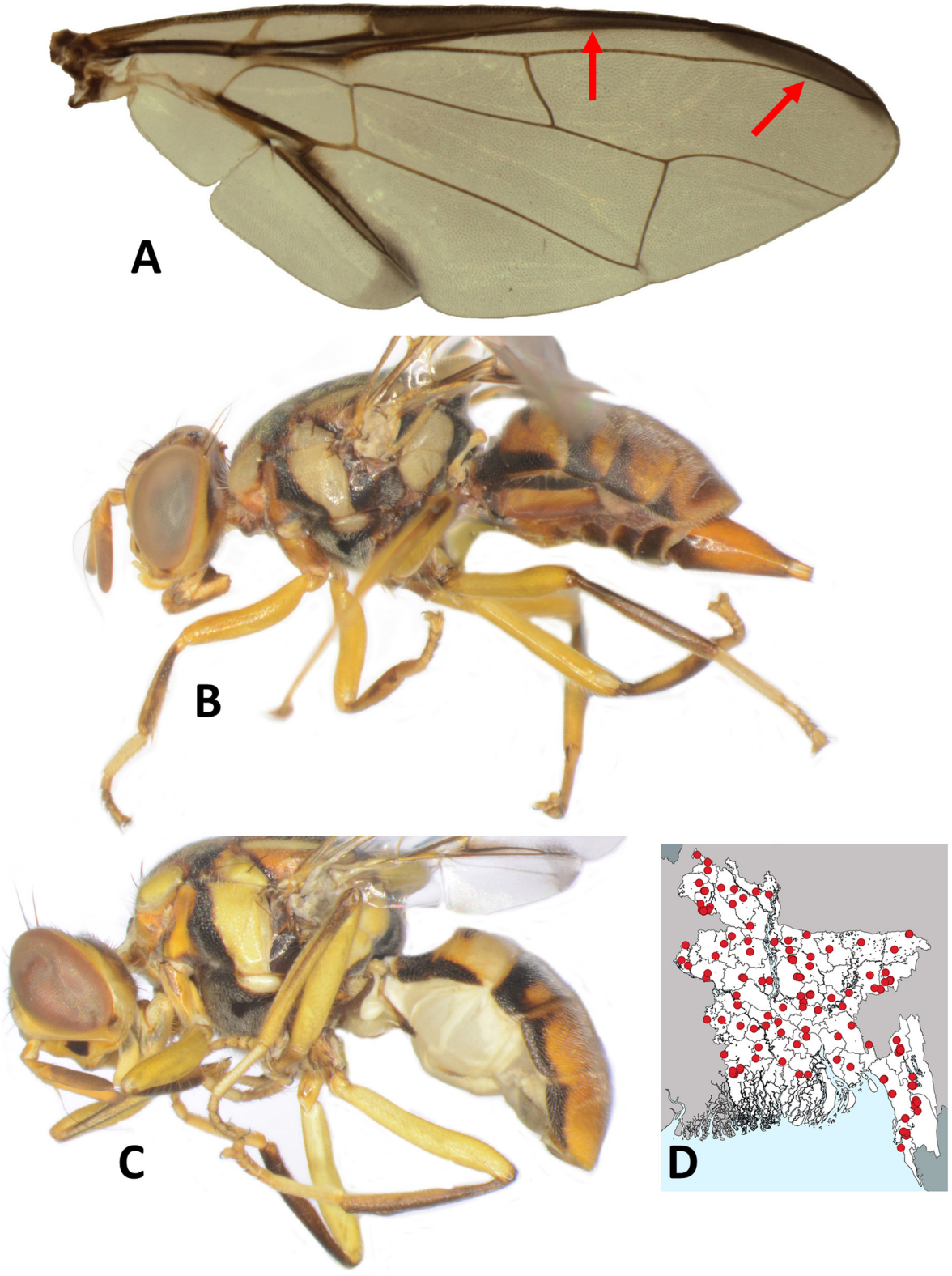

Figure 8. *Bactrocera* (*Bactrocera*) *dorsalis* (Hendel). **A)** Wing (after Leblanc et al. 2014). **B)** Lateral view, female. **C)** Lateral view, male. **D)** Distribution in Bangladesh.

Bactrocera (*Bactrocera*) *latifrons* (Hendel, 1915)

(= *Dacus amoyensis* Froggatt, 1909, *Chaetodacus antennalis* Shiraki, 1933)

Figure 9

Distribution. Widespread in tropical Asia, from India to Taiwan, and south to Sulawesi, introduced to Hawaii and Africa (Drew and Romig 2013; Vargas et al. 2015). Reported from Bangladesh by Leblanc et al. (2013).

Bangladesh records. 11 specimens. DHAKA DIVISION: Dhaka District.

Male lure. Latilure (alpha-ionol and cade oil) (McQuate and Peck 2001).

Host plants. Recorded from 59 host taxa in 25 genera and 13 families (Allwood et al. 1999; McQuate and Liquido 2016). The family Solanaceae contains the major host species and *B. latifrons* is a significant pest of *Capsicum* and *Solanum* species (Drew and Romig 2013).

Notes. The parasitoid wasp *Diachasmimorpha longicaudata* (Ashmead, 1905) (Hymenoptera: Braconidae) was bred by Mahfuza Momen from larvae of *B. latifrons* infesting *Capsicum annuum* L. (Solanaceae), in June 2020, at the Atomic Agency Research Establishment compound in Savar, Dhaka.

Bactrocera (*Bactrocera*) *limbifera* (Bezzi, 1919)

Figure 10

Distribution. Philippines (Bezzi 1919), Brunei, India (Andaman Island), Indonesia, Vietnam (Norrbom et al. 1999; Drew and Romig 2013), Laos (Leblanc et al. 2016), Bangladesh (**NEW COUNTRY RECORD**).

Bangladesh records. Two specimens. CHATTOGRAM DIVISION: Khagrachari Hill District, Matiranga Upazila, Alu Tila Hill, 25-vi-2019, cue-lure, M. Aftab Hossain. Specimens deposited in WFBM.

Male lure. Cue-lure.

Host plants. *Dracontomelon dao* (Blanco) Merr. and Rolfe (Anacardiaceae) (Hardy 1974), *Aglaia* sp. (Meliaceae) (Allwood et al. 1999), *Sterculia* sp. (Sterculiaceae) (Drew and Romig 2013).

Bactrocera (*Paratridacus*) *melania* (Hardy and Adachi, 1954)

(= *Dacus aptatus* Hardy 1973)

Figure 11

Distribution. Singapore (Hardy and Adachi 1954), China (Norrbom et al. 1999), Indonesia, Malaysia (Peninsular), Thailand (Drew and Romig 2013), Bangladesh (**NEW COUNTRY RECORD**).

Bangladesh records. Two females and one male emerged from an infested fruit, intercepted in March 2020 from a traveler arriving from Bangladesh, by USDA-APHIS quarantine inspectors in the United States. Specimens deposited in UHIM.

Male lure. No known lure.

Host plants. *Garcinia dulcis* (Roxb.) Kurz, *G. xanthochymus* Hook. f. ex T. Anderson (Clusiaceae) (Allwood et al. 1999).

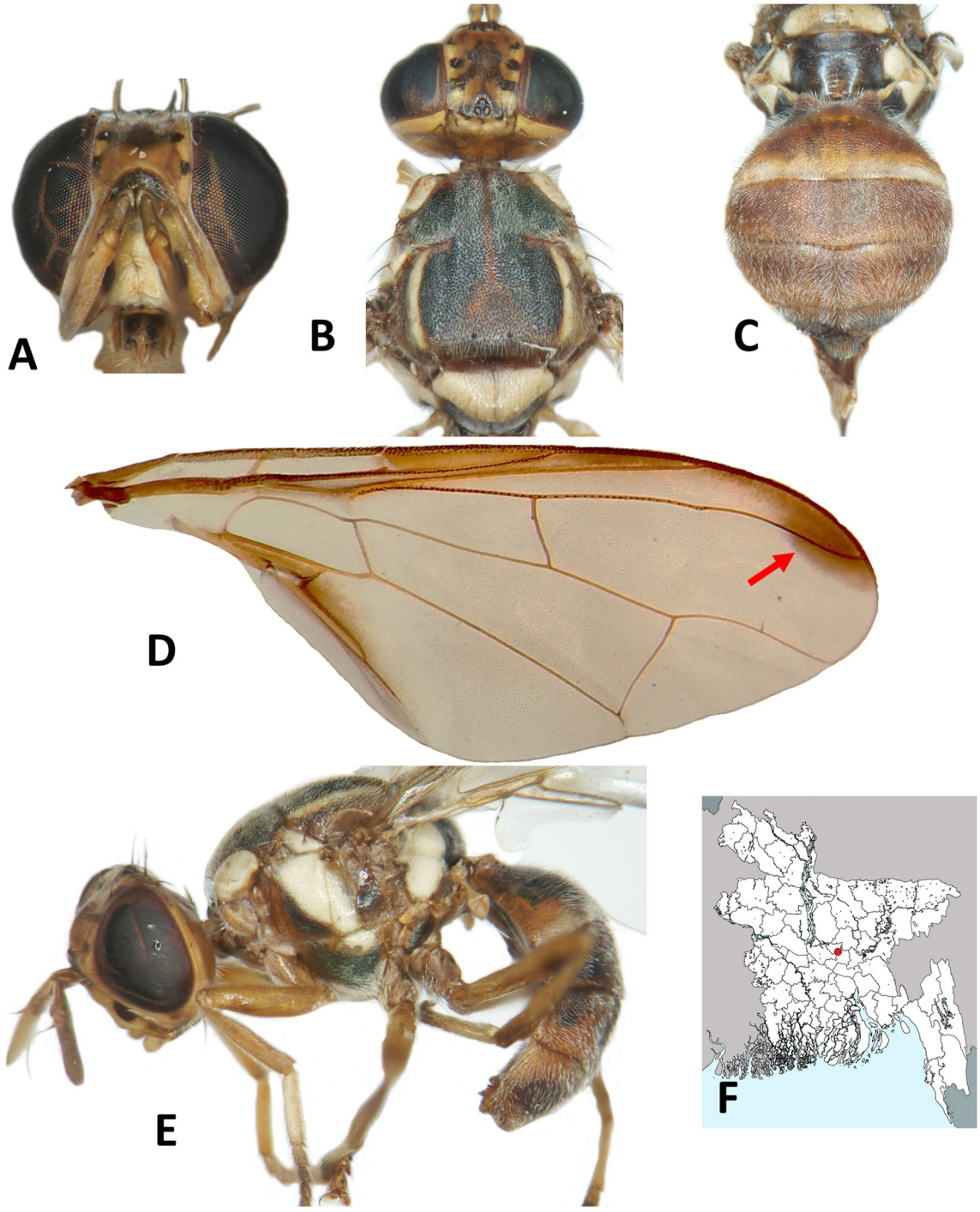

Figure 9. *Bactrocera* (*Bactrocera*) *latifrons* (Hendel). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Wing. **E)** Lateral view, male. **F)** Distribution in Bangladesh.

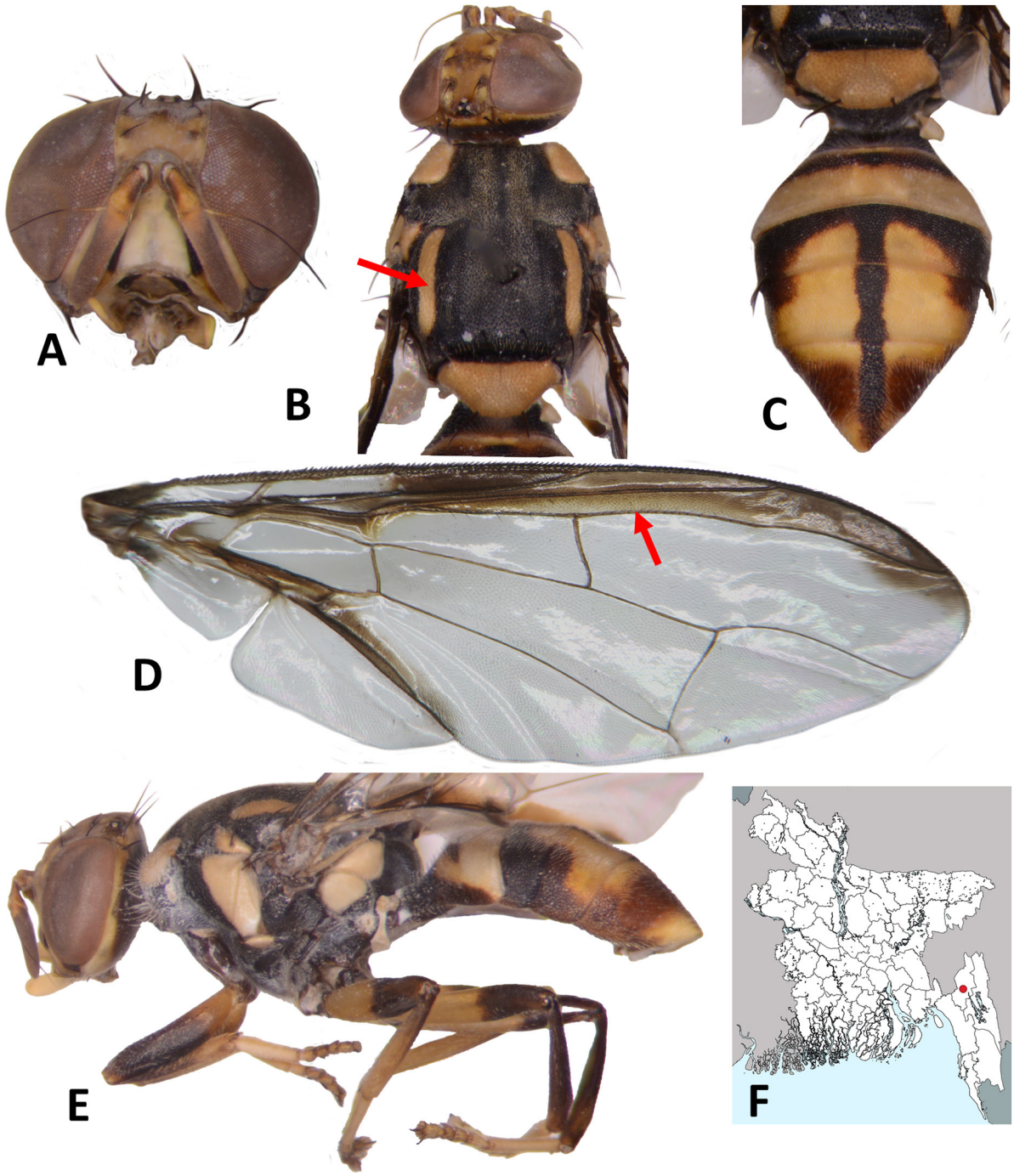

Figure 10. *Bactrocera* (*Bactrocera*) *limbifera* (Bezzi), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

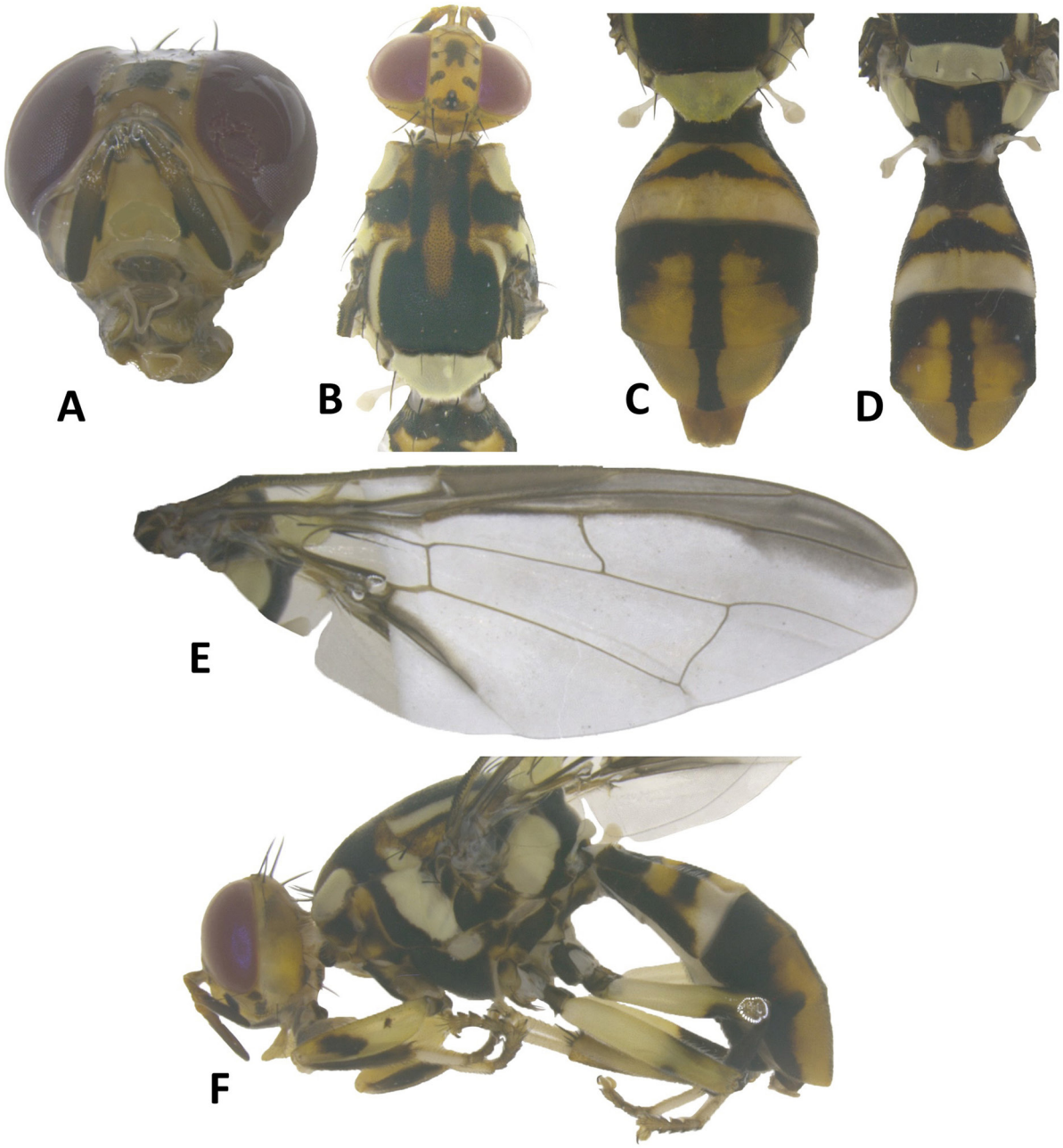

Figure 11. *Bactrocera* (*Paratridacus*) *melania* (Hardy and Adachi). **A)** Head **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing, male. **F)** Lateral view, male.

Bactrocera (*Bactrocera*) *nigrifacia* Zhang, Ji and Chen, 2011

Figure 12

Distribution. China (Zhang et al. 2011), Thailand (Drew and Romig 2013), Bangladesh (Leblanc et al. 2014), Cambodia (Leblanc et al. 2016), Taiwan (Doorenweerd et al. 2019), Nepal (Leblanc et al. 2019a).

Bangladesh records. 276 specimens. BARISHAL DIVISION: Pirojpur District. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, and Rajbari Districts. KHULNA DIVISION: Satkhira District. MYMENSINGH DIVISION: Mymensingh District. RAJSHAHI DIVISION: Chapai Nawabgonj and Natore Districts. RANGPUR DIVISION: Dinajpur, Kurigram, Lalmonirhat, Nilphamari, and Rangpur Districts. SYLHET DIVISION: Moulvibazar, Sunamgonj, and Sylhet Districts.

Male lure. Cue-lure.

Host plants. *Callicarpa arborea* Roxb. (Lamiaceae), *Capparis sepiaria* L. (Capparaceae), *Flueggea virosa* (Roxb. ex Willd.) Royle (Phyllanthaceae), *Zehneria wallichii* (Cucurbitaceae) (Drew and Romig 2013).

Bactrocera (*Bactrocera*) *nigrifemorata* Lin and Wang, 2011

Figure 13

Distribution. China (Lin et al. 2011), Bangladesh (**NEW COUNTRY RECORD**).

Bangladesh records. One specimen. CHATTOGRAM DIVISION: Rangamati Hill District: Kaptai National Park (Bangchari Range), 25-vii-2019, cue-lure, M. Aftab Hossain. Specimen deposited in UHIM.

Male lure. Cue-lure (**NEW ATTRACTANT RECORD**).

Host plants. No known record.

Bactrocera (*Bactrocera*) *nigrofemoralis* White and Tsuruta, 2001

Figure 14

Distribution. India, Pakistan, Sri Lanka (Tsuruta and White 2001), Bhutan (Drew et al. 2007), Bangladesh (Khan et al. 2015).

Bangladesh records. 12 specimens. DHAKA DIVISION: Dhaka and Gazipur Districts.

Male lure. Cue-lure.

Host plants. *Terminalia catappa* L. (Combretaceae) (Tsuruta and White 2001), *Citrus maxima* (Burm.) Merr. (Rutaceae), *Malpighia glabra* L. (Malpighiaceae), *Pouteria sapota* (Jacq.) H. E. Moore and Stearn (Sapotaceae), *Santalum album* L. (Santalaceae) (Drew and Romig 2013).

Bactrocera (*Parazeugodacus*) *pendleburyi* (Perkins, 1938)

Figure 15

Distribution. Malaysia (Peninsular) (Perkins 1938), Thailand (Drew and Romig 2013), Vietnam (Leblanc et al. 2018a), Bangladesh (Leblanc et al. 2019b), Indonesia (Doorenweerd et al. 2020).

Bangladesh records. 16 specimens. CHATTOGRAM DIVISION: Chattogram, Cox's Bazar, Khagrachari Hill, and Rangamati Hill Districts.

Male lure. Zingerone.

Host plants. *Gmelina arborea* Roxb. (Lamiaceae), *Symplocos cochinchinensis* (Lour.) S. Moore, and *S. racemosa* Roxb. (Symplocaceae) (Allwood et al. 1999).

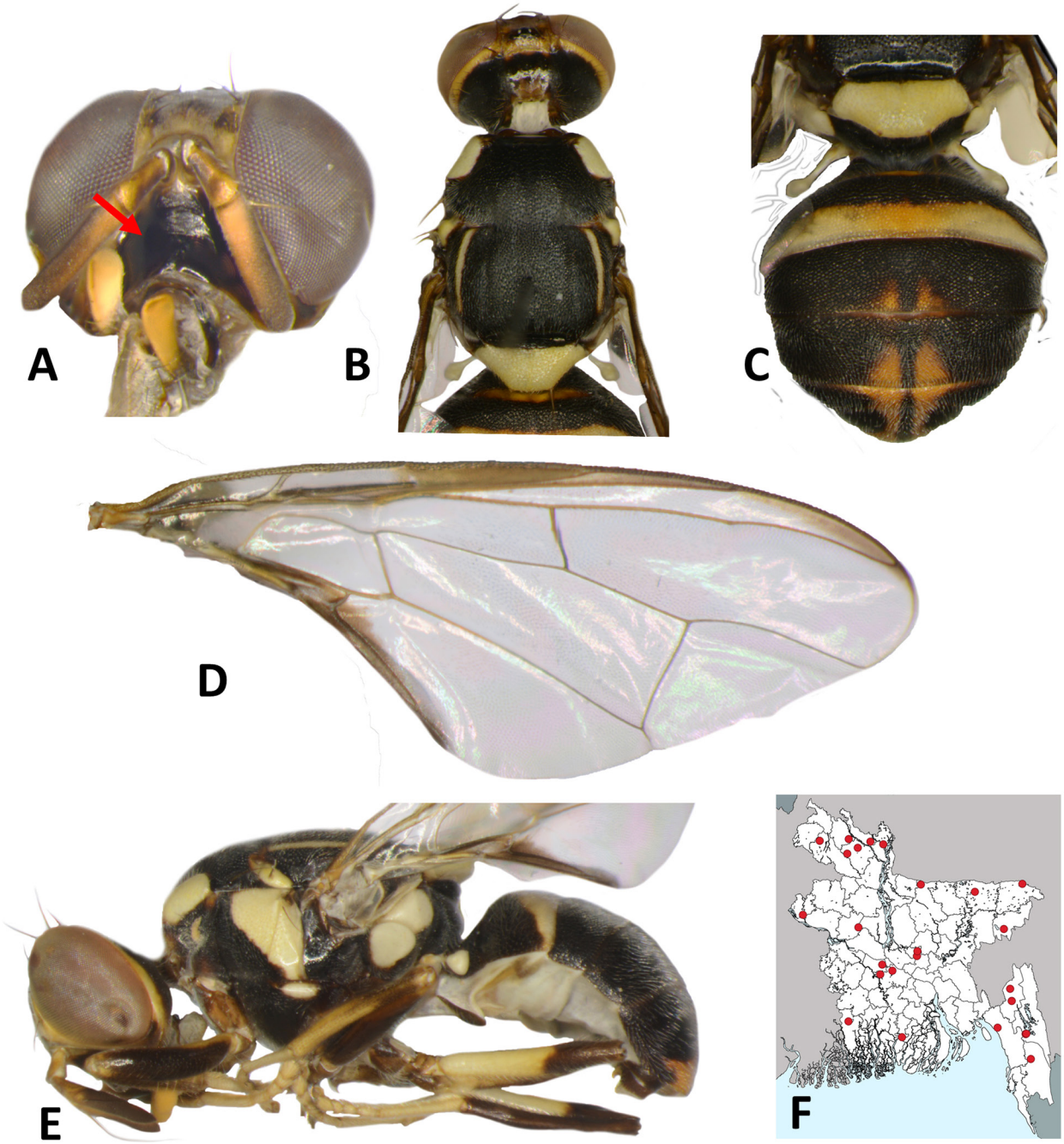

Figure 12. *Bactrocera* (*Bactrocera*) *nigrifacia* Zhang, Ji and Chen, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

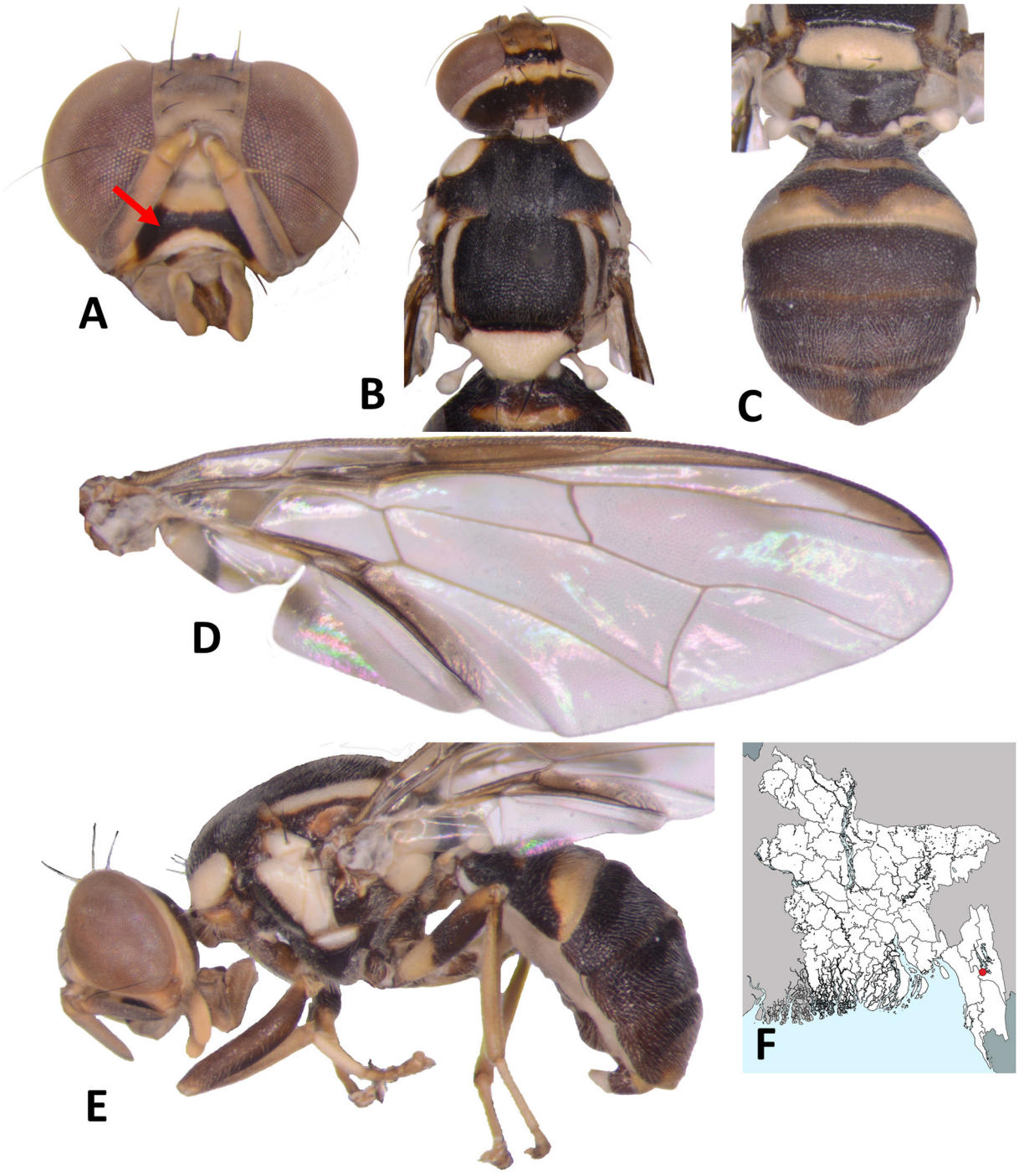

Figure 13. *Bactrocera* (*Bactrocera*) *nigrifemorata* Li and Wang, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

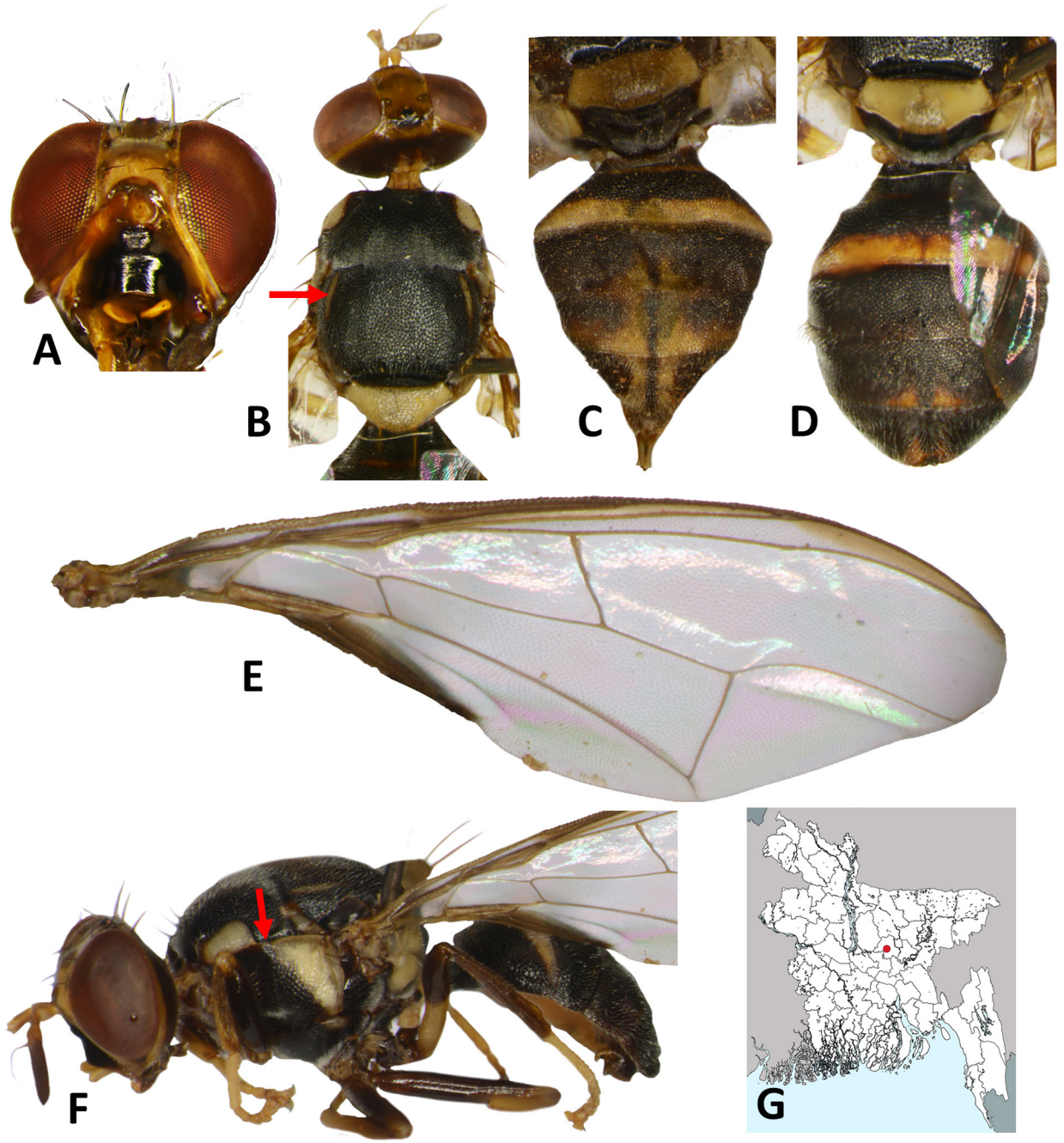

Figure 14. *Bactrocera* (*Bactrocera*) *nigrofemoralis* White and Tsuruta. **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing. **F)** Lateral view, male. **G)** Distribution in Bangladesh.

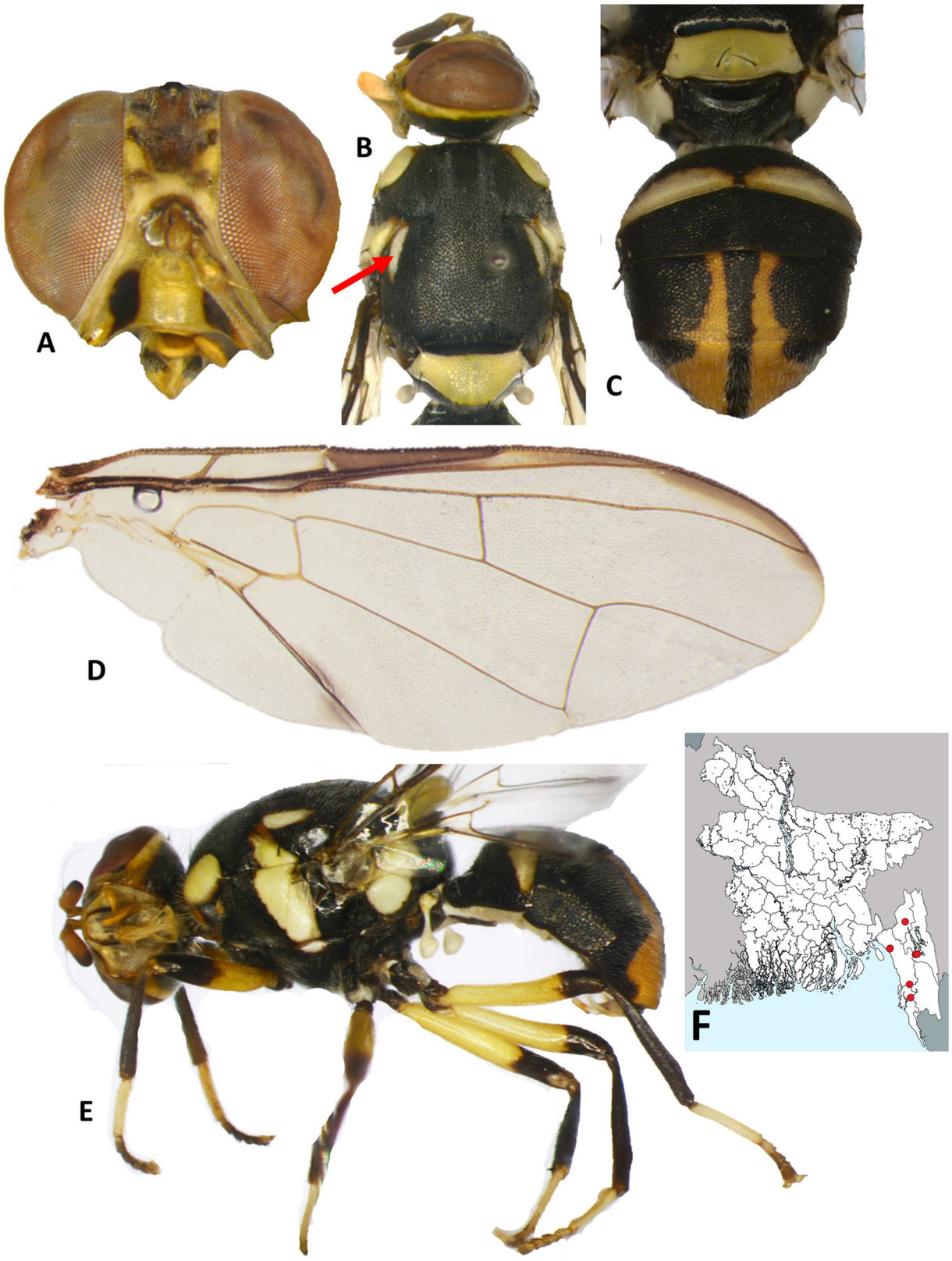

Figure 15. *Bactrocera* (*Parazeugodacus*) *pendleburyi* (Perkins), male (after Leblanc et al. 2018). **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

Bactrocera (*Bactrocera*) *propinqua* (Hardy and Adachi, 1954)

Figure 16

Distribution. Malaysia (East) (Hardy and Adachi 1954), Cambodia, Malaysia (Peninsular), Singapore, Thailand, (Drew and Hancock, 1994), Vietnam (Drew and Romig 2013), Bangladesh (Leblanc et al. 2014, 2019b), Laos, China (Leblanc et al. 2016), Indonesia (Doorenweerd et al. 2020).

Bangladesh records. 62 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram, Cox's Bazar, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Gazipur, and Tangail Districts. SYLHET DIVISION: Moulvibazar and Sylhet Districts.

Male lure. Cue-lure.

Host plants. *Garcinia bancana* Miq. (Drew and Hancock 1994), *G. atroviridis* Griff. ex T. Anderson, *G. costata* Hemsl. ex King, *G. cowa* Roxb. ex Choisy, *G. forbesii* King, *G. schomburgkiana* Pierre, G. *xanthochymus* Hook.f. ex T. Anderson (Clusiaceae) (Allwood et al. 1999).

Note. Intraspecific variation in this species has been documented by Leblanc et al. (2015b).

Bactrocera (*Bactrocera*) *rubigina* (Wang and Zhao, 1989)

Figure 17

Distribution. China (Wang and Zhao 1989), Bhutan (Drew et al. 2007), Thailand, Vietnam (Drew and Romig 2013), India (David et al. 2017), Taiwan (Doorenweerd et al. 2019), Sri Lanka (Leblanc et al. 2018b), Bangladesh (Leblanc et al. 2013), Nepal (Leblanc et al. 2019a).

Bangladesh records. 9,030 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chandpur, Chattogram, Cox's Bazar, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Gazipur, and Tangail Districts. RANGPUR DIVISION: Panchagarh District. SYLHET DIVISION: Habiganj, Moulvibazar, and Sylhet Districts.

Male lure. Cue-lure, zingerone.

Host plants. Liang et al. (1993) recorded *Litsea verticillata* Hance (Lauraceae) as host in China. Leblanc et al. (2015b) noted that *B. rubigina* was genetically indistinguishable from *B. melastomatos* Drew and Hancock and *B. osbeckiae* Drew and Hancock, both bred from flowers of *Melastoma* spp. (Melastomataceae). Attempts to breed *B. rubigina* from these flowers in Bangladesh have so far been unsuccessful.

Notes. In Bangladesh, Hossain et al. (2019) studied the seasonal abundance of *B. rubigina* in relation to abiotic factors. Intraspecific variation in this species has been documented by Leblanc et al. (2015b).

Bactrocera (*Bactrocera*) *syzygii* White and Tsuruta, 2001

Figure 18

Distribution. Sri Lanka (Tsuruta and White 2001), India (David et al. 2017), Vietnam (Leblanc et al. 2018a), Bangladesh (Leblanc et al. 2019b), Nepal (Leblanc et al. 2019a), Indonesia (Doorenweerd et al. 2020).

Bangladesh records. 342 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram, Cox's Bazar, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka and Tangail Districts. RANGPUR DIVISION: Dinajpur District. SYLHET DIVISION: Sylhet District.

Male lure. Zingerone.

Host plants. *Syzygium jambos* (L.) Alston (Myrtaceae) (Tsuruta and White 2001).

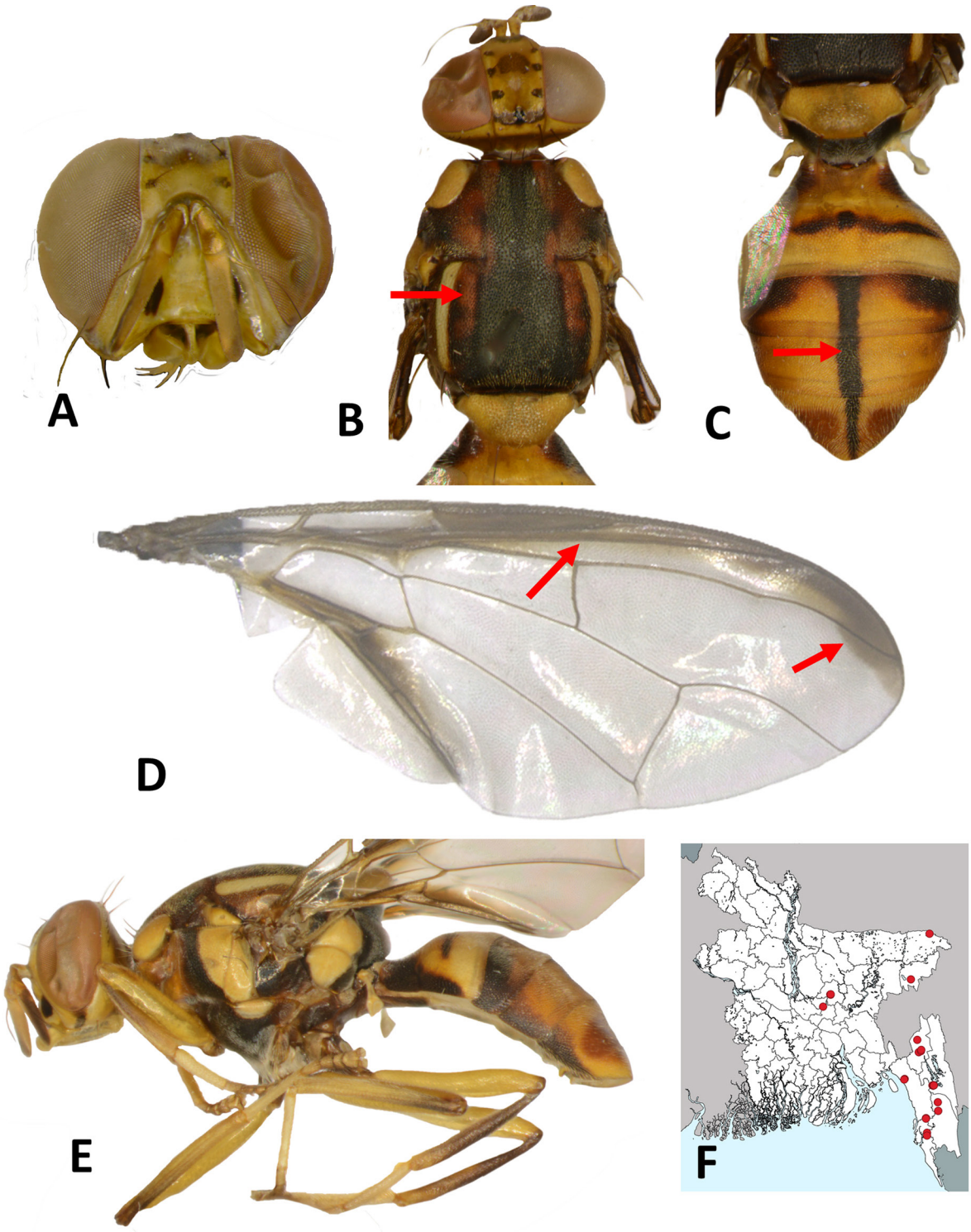

Figure 16. *Bactrocera* (*Bactrocera*) *propinqua* (Hardy and Adachi), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

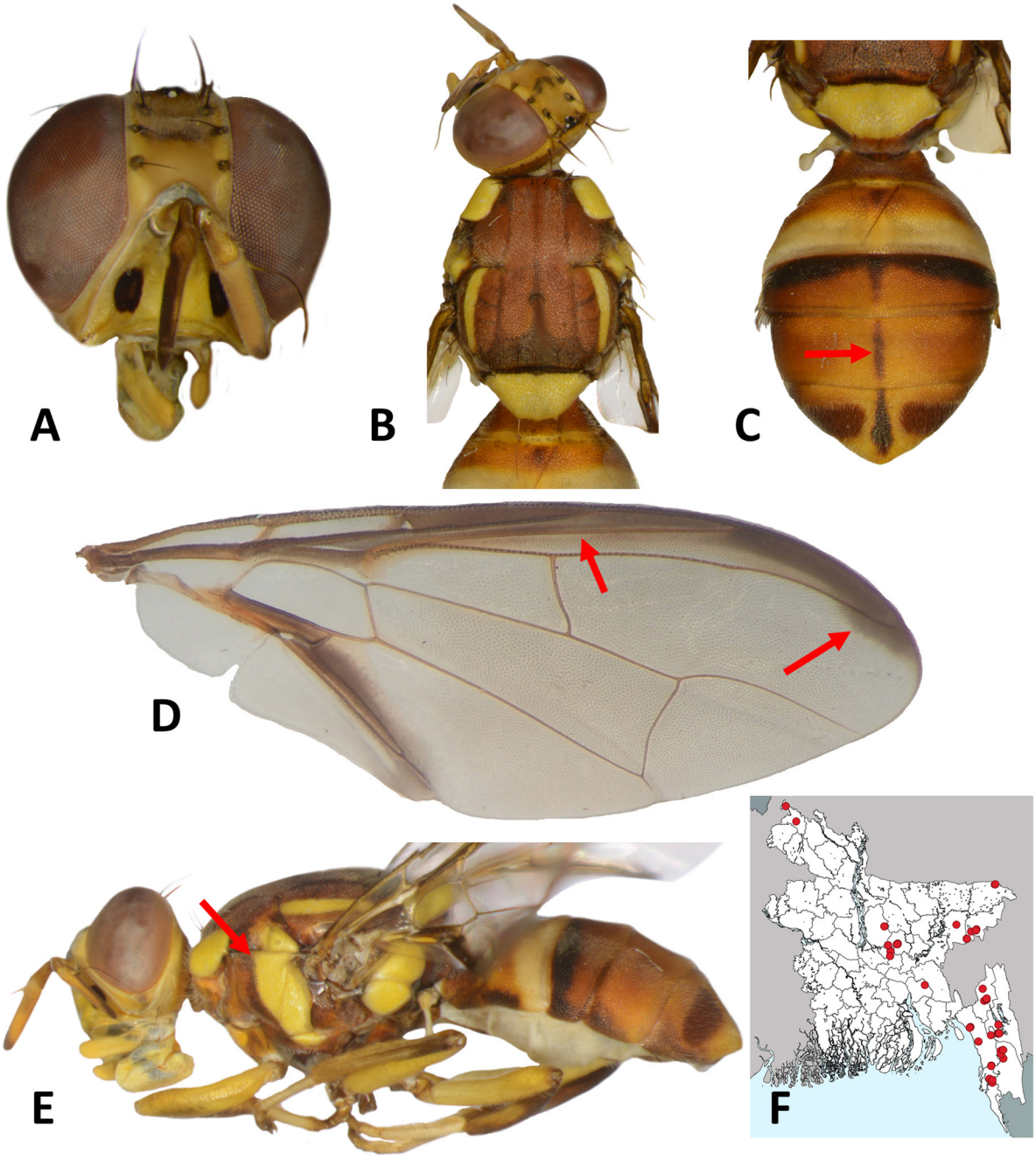

Figure 17. *Bactrocera* (*Bactrocera*) *rubigina* (Wang and Zhao). **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing (after Leblanc et al. 2014). **E)** Lateral view. **F)** Distribution in Bangladesh.

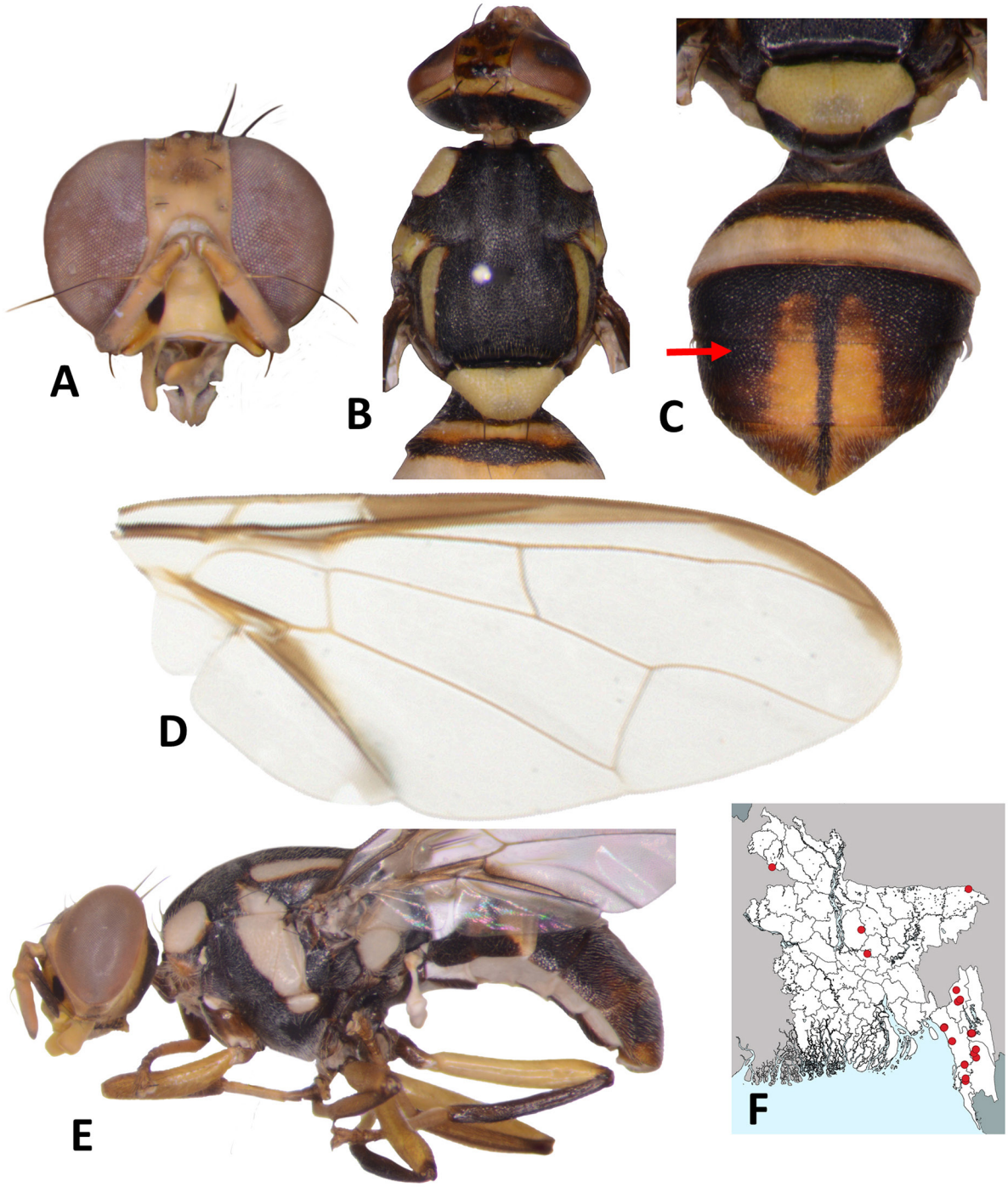

Figure 18. *Bactrocera* (*Bactrocera*) *syzygii* White and Tsuruta, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

Bactrocera (*Bactrocera*) *tuberculata* (Bezzi, 1916)

Figure 19

Distribution. Myanmar (Bezzi 1916), Thailand, Vietnam (Hardy 1973), Bhutan (Drew et al. 2007), China (Norrbom et al. 1999), Bangladesh (Leblanc et al. 2014), India (David et al. 2017), Nepal (Leblanc et al. 2019a).

Bangladesh records. 76 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram Hill, Cox's Bazar, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka District. SYLHET DIVISION: Moulvibazar and Sylhet Districts.

Male lure. Methyl eugenol.

Host plants. A moderate pest of cultivated fruit, bred from 11 host species in eight families, including mango, papaya, and plum (Allwood et al. 1999).

Bactrocera (*Bactrocera*) *zonata* (Saunders, 1842)

(= *Rivellia persicae* Bigot, 1890, *Dacus ferrugineus* var. *mangiferae* Cotes, 1893)

Figure 20

Distribution. Widespread in tropical Asia, from Pakistan east to Vietnam, but not in southern Thailand, Malaysia, Indonesia (Drew and Romig 2013). Introduced to Mauritius, Réunion, North Africa and the Middle East.

Bangladesh records. 853 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram, and Khagrachari Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, Gazipur, Madaripur, and Rajbari Districts. KHULNA DIVISION: Bagerhat, Chuadanga, Jashore, Jhenaidah, Khulna, and Satkhira Districts. MYMENSINGH DIVISION: Mymensingh District. RAJSHAHI DIVISION: Chapai Nawabgonj, Naogaon, Natore, and Rajshahi Districts. RANGPUR DIVISION: Dinajpur, Lalmonirhat, Nilphamari, and Rangpur Districts. SYLHET DIVISION: Sunamgonj District.

Male lure. Methyl eugenol.

Host plants. A broadly polyphagous fruit pest bred from 54 host taxa in 38 genera and 23 families (Allwood et al. 1999; Culliney et al. 2017). Bred from mango in Bangladesh (Kabir et al. 1991).

Note. In Bangladesh, Hossain et al. (2017, 2019) studied the seasonal abundance of *B. zonata* in relation to abiotic factors for making control decisions.

Dacus (*Didacus*) *ciliatus* Loew, 1862

(= *Dacus sexmaculatus* Walker 1871, *Dacus sigmoides* Coquillett 1901, *Dacus brevistylus* Bezzi 1908, *Dacus apoxanthus* var. *decolor* Bezzi 1924, *Tridacus mallyi* Munro 1925, *Dacus insistens* Curran 1927, *Dacus cocciniae* Premlata and Singh 1987)

Figure 21

Distribution. Widespread in Africa, introduced in Mauritius, Réunion, the Middle East to the Indian subcontinent and Sri Lanka (Drew and Romig 2013). First recorded in Bangladesh by Akhtaruzzaman et al. (1999a).

Bangladesh records. Bred from cucumber in Sylhet by Akhtaruzzaman et al. (1999a). It was not collected in our surveys, that were largely based on trapping using male lures.

Male lure. No known lure.

Host plants. Bred from 64 host species in 25 genera and 10 families, but predominantly infests Cucurbitaceae (McQuate et al. 2018). Bred from cucumber in Bangladesh (Akhtaruzzaman et al. (1999a).

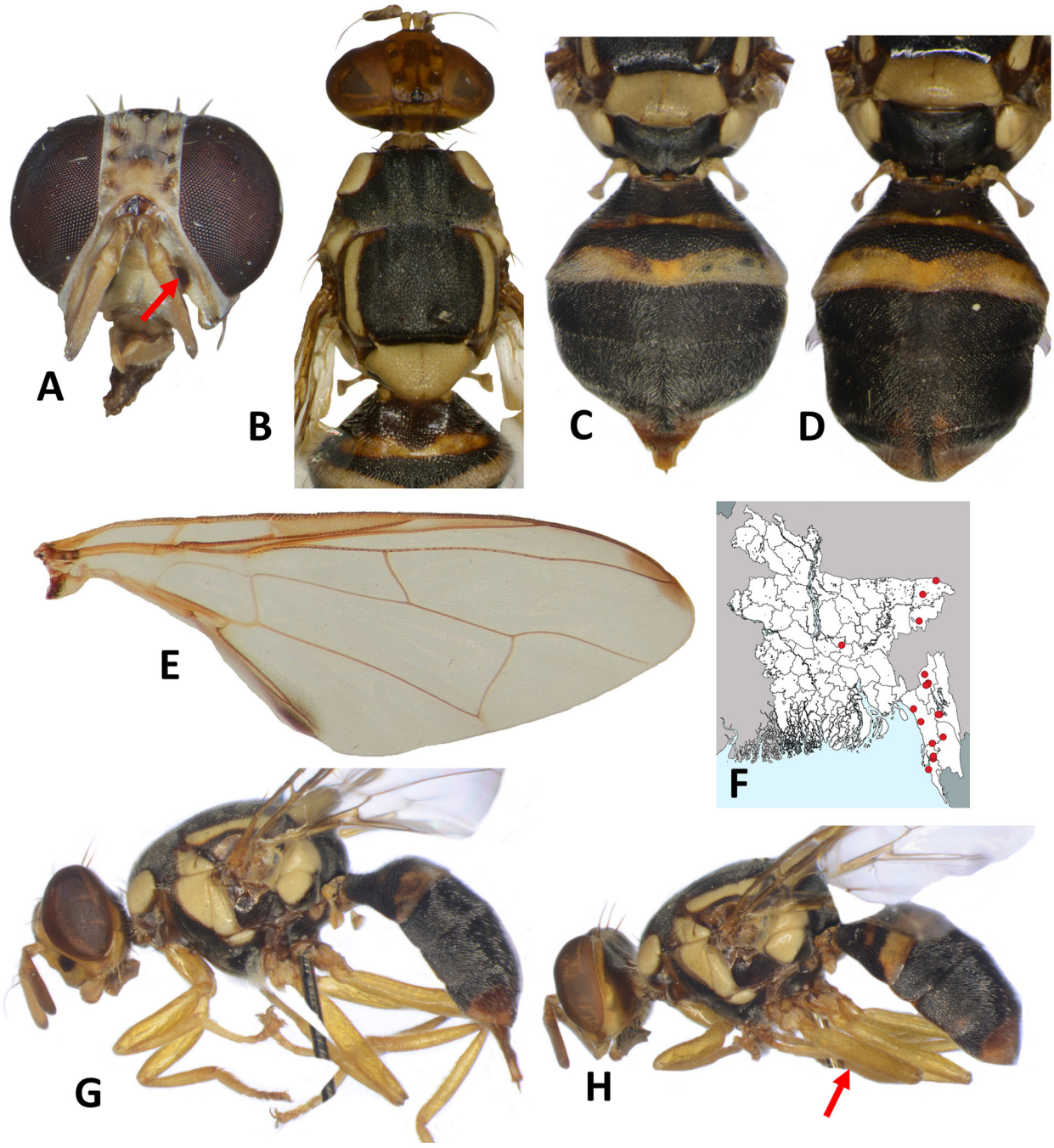

Figure 19. *Bactrocera* (*Bactrocera*) *tuberculata* (Bezzi). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing (after Leblanc et al. 2014). **F)** Distribution in Bangladesh. **G)** Lateral view, female. **H)** Lateral view, male.

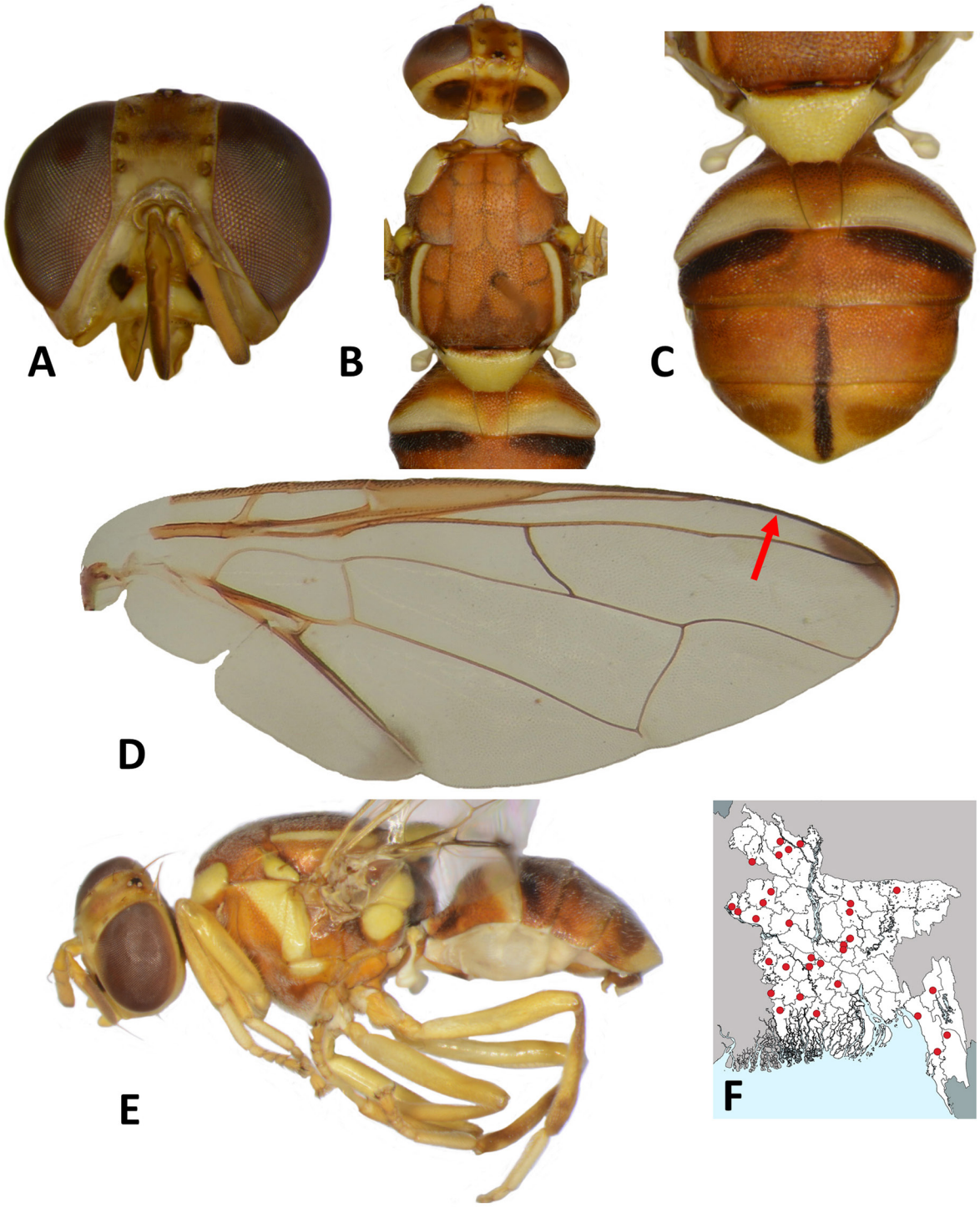

Figure 20. *Bactrocera* (*Bactrocera*) *zonata* (Saunders), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

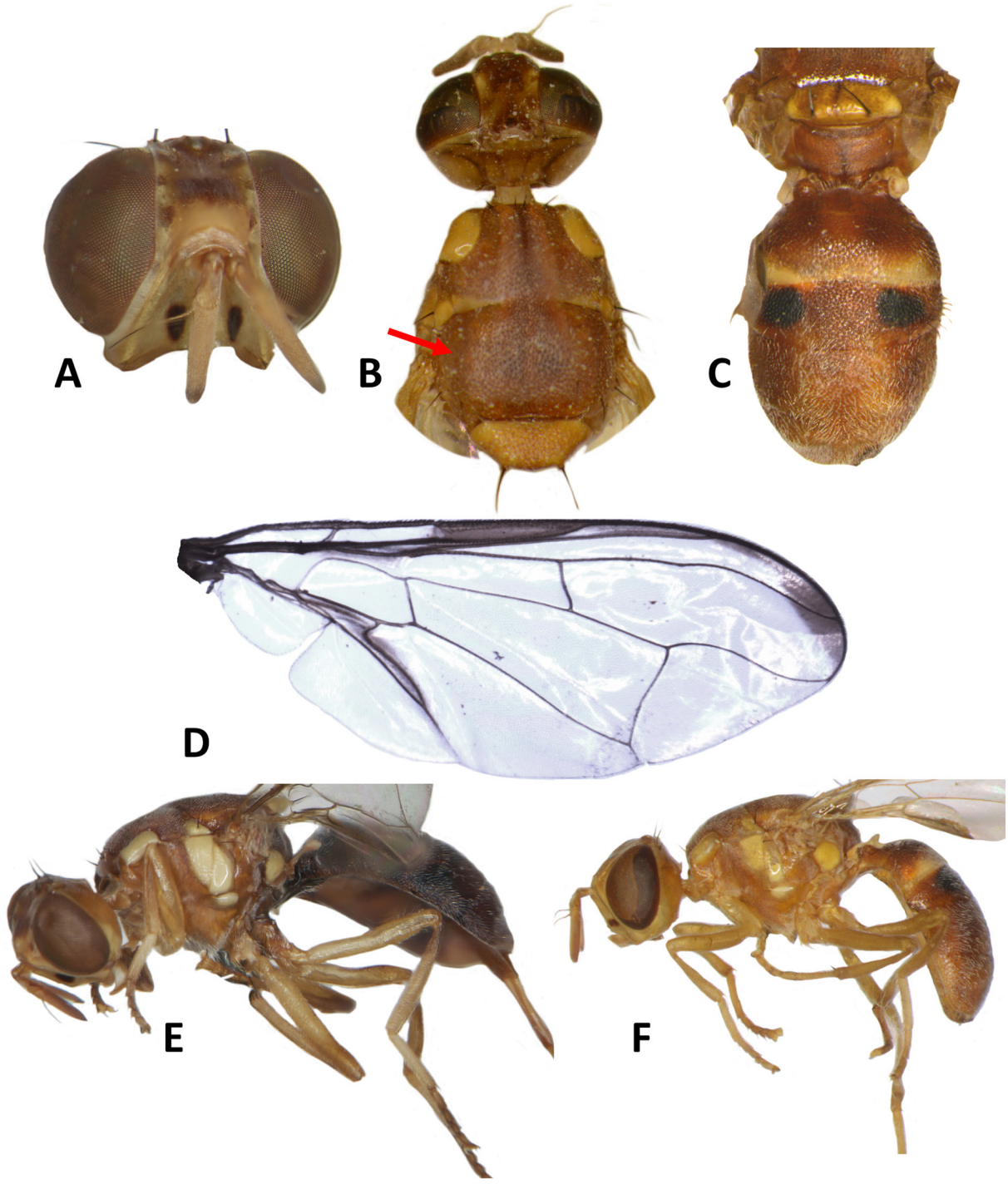

Figure 21. *Dacus* (*Didacus*) *ciliatus* Loew. **A)** Head. **B)** Head and scutum. **C)** Abdomen, male. **D)** Wing (after Leblanc et al. 2014). **E)** Lateral view, female. **F)** Lateral view, male.

Dacus (*Mellesis*) *jacobi* David and Sachin, 2020

Figure 22

Distribution. India (David et al. 2020), Bangladesh (**NEW COUNTRY RECORD**).

Bangladesh records. 7 specimens. CHATTOGRAM DIVISION: Rangamati Hill District, Kaptai National Park (Baluchar Range), 24-vii-2019, zingerone, M. Aftab Hossain. Rangamati Hill District, Kaptai National Park (Bangchari Range), 25-vii-2019, zingerone, M. Aftab Hossain. Specimens deposited in WFBM and UHIM.

Male lure. Zingerone.

Host plants. No known record.

Dacus (*Callantra*) *longicornis* (Wiedemann, 1830)

(= *Callantra smieroides* Walker, 1860, *Dacus vespoides* Bezzi, 1909, *Mellesis destillatoria* Bezzi, 1916, *Mellesis eumenoides* Bezzi, 1916, *Mellesis bioculata* Bezzi, 1919, *Callantra unifasciatus* Hardy, 1982, *Callantra variegata* Wang, 1990)

Figure 23

Distribution. Widespread in tropical Asia, from India east to Vietnam and south to Malaysia, Indonesia and the Philippines (Drew et al. 1998; Agarwal and Sueyoshi 2005; Drew and Romig 2013). Recorded from Bangladesh by Khan (2009), and Nepal by Adhikari et al. (2018).

Bangladesh records. 778 specimens. BARISHAL DIVISION: Barishal, Bhola District, and Pirojpur Districts. CHATTOGRAM DIVISION: Bandarban Hill, Bramhanbaria, Chandpur, Chattogram, Cox's Bazar, Cumilla, Feni, Khagrachari Hill, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, Gazipur, Gopalgonj, Munshiganj, Narayanganj, and Tangail Districts. KHULNA DIVISION: Jhenaidah and Satkhira Districts. MYMENSINGH DIVISION: Mymensingh District. RAJSHAHI DIVISION: Chapai, Pabna, and Sirajganj Districts. RANGPUR DIVISION: Dinajpur, Lalmonirhat, Panchagarh, and Thakurgaon Districts. SYLHET DIVISION: Habiganj, Moulvibazar, and Sylhet Districts.

Male lure. Cue-lure.

Host plants. A moderate pest of cucurbit bred from fruits of *Luffa acutangula* (L.) Roxb., *L. cylindrica* (L.) M. Roem., *Trichosanthes cucumerina* L., and *Zehneria wallichii* (C.B. Clarke) C. Jeffrey (Cucurbitaceae) (Allwood et al. 1999).

Notes. In Bangladesh, Hossain et al. (2019) studied the seasonal abundance of *D. longicornis* in relation to abiotic factors and host plants.

Zeugodacus (*Asiadacus*) *apicalis* (Meijere, 1911)

(= *Dacus modicus* Hardy, 1973, *Dacus dianensis* Wang and Zhao, 1989, *Dacus nadanus* Chao and Lin, 1993)

Figure 24

Distribution. Indonesia (Mejeire 1911), Brunei, China, Malaysia, Thailand, Vietnam (White and Hancock 1997; Drew and Romig 2013), Bangladesh (Leblanc et al. 2019b).

Bangladesh records. One specimen. CHATTOGRAM DIVISION: Chattogram District.

Male lure. Cue-lure.

Host plants. Bred from flowers of *Trichosanthes wawraei* Cogn. (Cucurbitaceae) (Allwood et al. 1999).

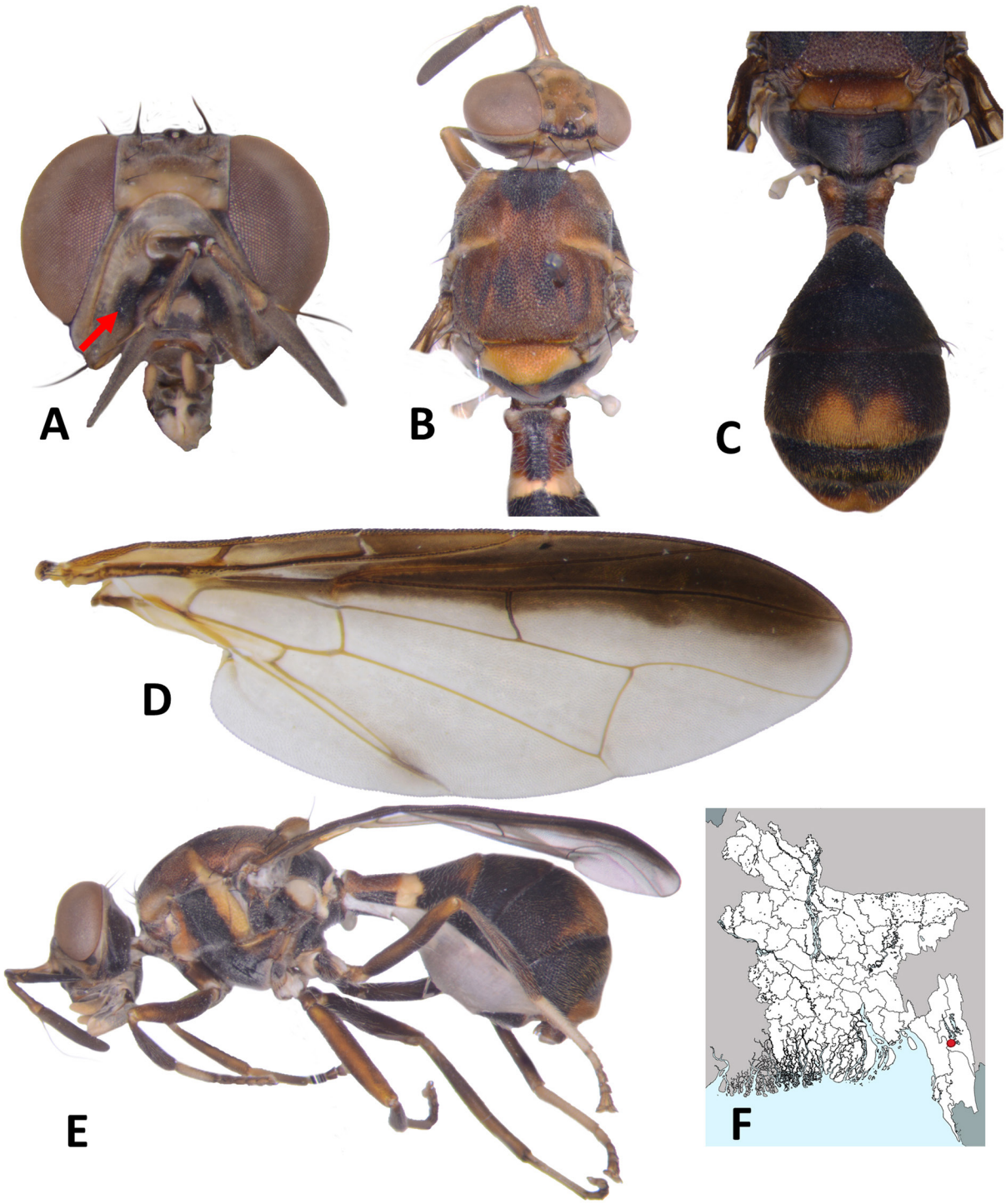

Figure 22. *Dacus* (*Mellesis*) *jacobi* David and Sachin, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

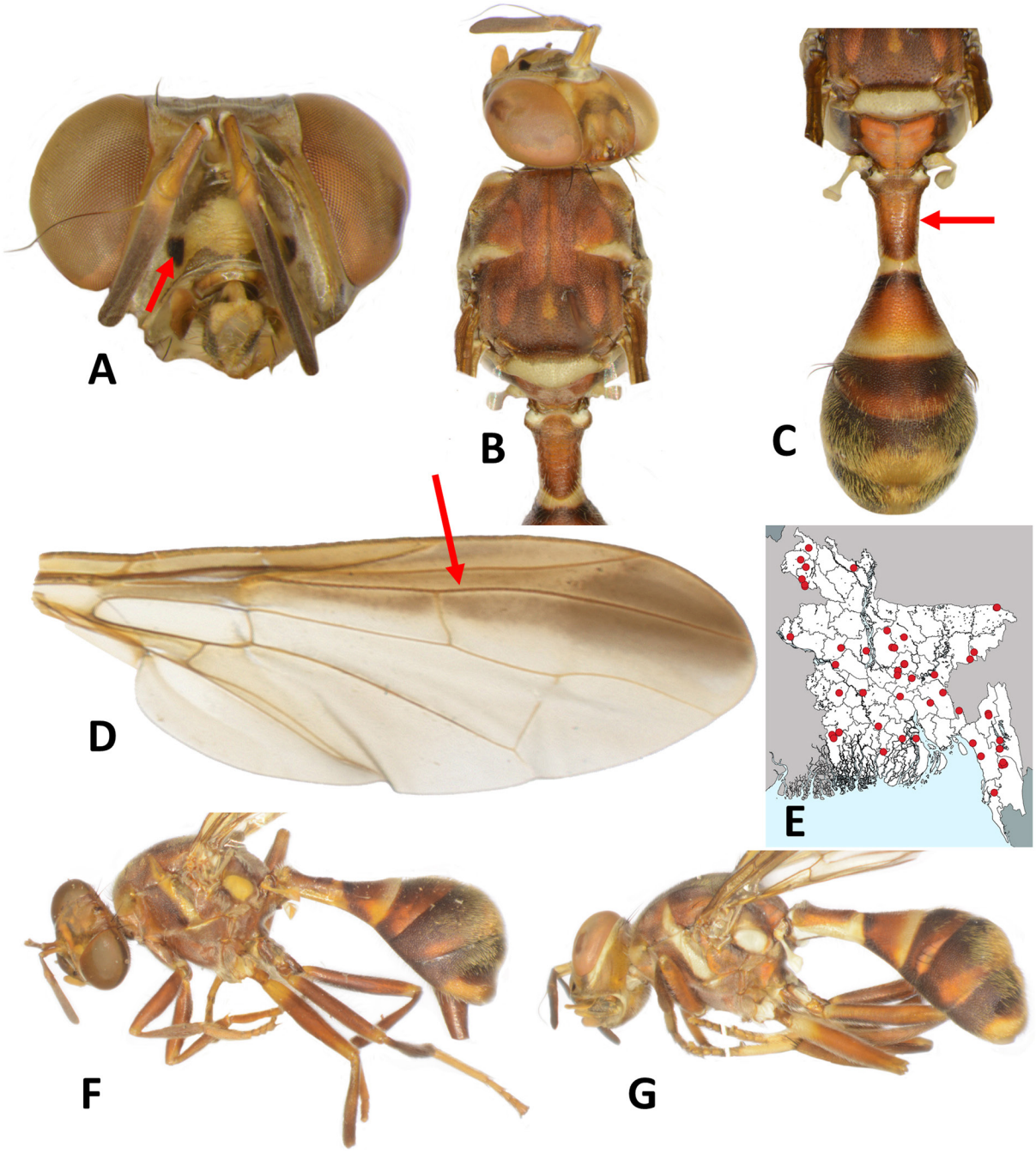

Figure 23. *Dacus* (*Callantra*) *longicornis* Wiedemann. **A)** Head. **B)** Head and scutum. **C)** Abdomen, male. **D)** Wing. **E)** Distribution in Bangladesh. **F)** Lateral view, female. **G)** Lateral view, male.

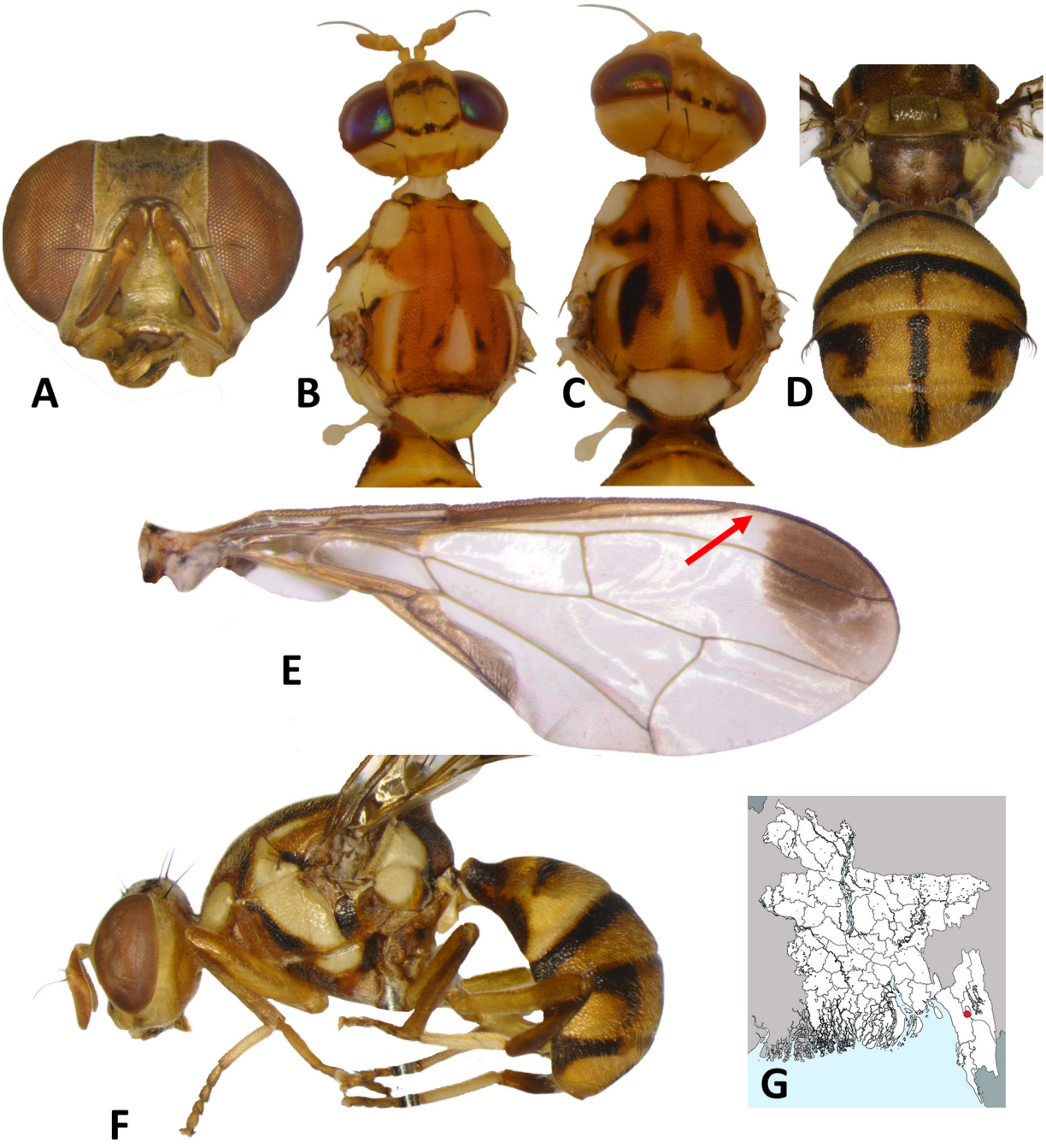

Figure 24. *Zeugodacus* (*Asiadacus*) *apicalis* (Meijere), male. **A)** Head. **B-C)** Head and scutum. **D)** Abdomen. **E)** Wing. **F)** Lateral view. **G)** Distribution in Bangladesh.

Zeugodacus (*Zeugodacus*) *atrifacies* Perkins, 1938

(= *Dacus parater* Chao and Lin, 1993)

Figure 25

Distribution. Malaysia (Peninsular) (Perkins 1938), Thailand (White and Hancock 1997), Bhutan, China, Malaysia (East), Vietnam (Drew and Romig 2013), Laos (Leblanc et al. 2016), Bangladesh (Leblanc et al. 2019b).

Bangladesh records. 29 specimens. CHATTOGRAM DIVISION: Chattogram, Khagrachari Hill, and Rangamati Hill Districts.

Male lure. Cue-lure.

Host plants. No known record.

Zeugodacus (*Zeugodacus*) *caudatus* (Fabricius, 1805)

(= *Bactrocera maculipennis* Doleschall, 1856)

Figure 26

Distribution. Brunei, China, India, Indonesia, Malaysia (Peninsular, East), Myanmar, Nepal, Sri Lanka, Taiwan, Thailand, Vietnam (Agarwal and Sueyoshi 2005, Drew and Romig 2013), Bangladesh (Leblanc et al. 2013), Cambodia (Leblanc et al. 2016).

Bangladesh records. 120 specimens. DHAKA DIVISION: Dhaka, Gazipur, and Tangail Districts. MYMENSINGH DIVISION: Mymensingh and Sherpur Districts. RAJSHAHI DIVISION: Bogura, Chapai Nawabgonj, Naogaon, Natore, and Pabna Districts. RANGPUR DIVISION: Dinajpur, Nilphamari, Panchagarh, Rangpur, and Thakurgaon Districts.

Male lure. Cue-lure.

Host plants. Bred from male flowers of *Cucurbita moschata* Duchesne (Cucurbitaceae) (Allwood et al. 1999). Liquido and Hanlin (2021) reported six host taxa in five genera in the families Cucurbitaceae and Solanaceae, as well as unverified records for additional plants.

Zeugodacus (*Parasinodacus*) *cilifer* (Hendel, 1912)

(= *Dacus tenuifinis* Hardy, 1983)

Figure 27

Distribution. Taiwan (Hendel 1912), China, Laos, Thailand, Vietnam (Norrbom et al. 1999), Malaysia (Peninsular), Indonesia (Drew and Romig 2013), Bangladesh (Leblanc et al. 2013).

Bangladesh records. Two specimens. CHATTOGRAM DIVISION: Bandarban Hill District. DHAKA DIVISION: Dhaka District.

Male lure. Cue-lure.

Host plants. Bred from male flowers of *Thladiantha hookeri* C.B. Clarke (Cucurbitaceae) (Allwood et al. 1999).

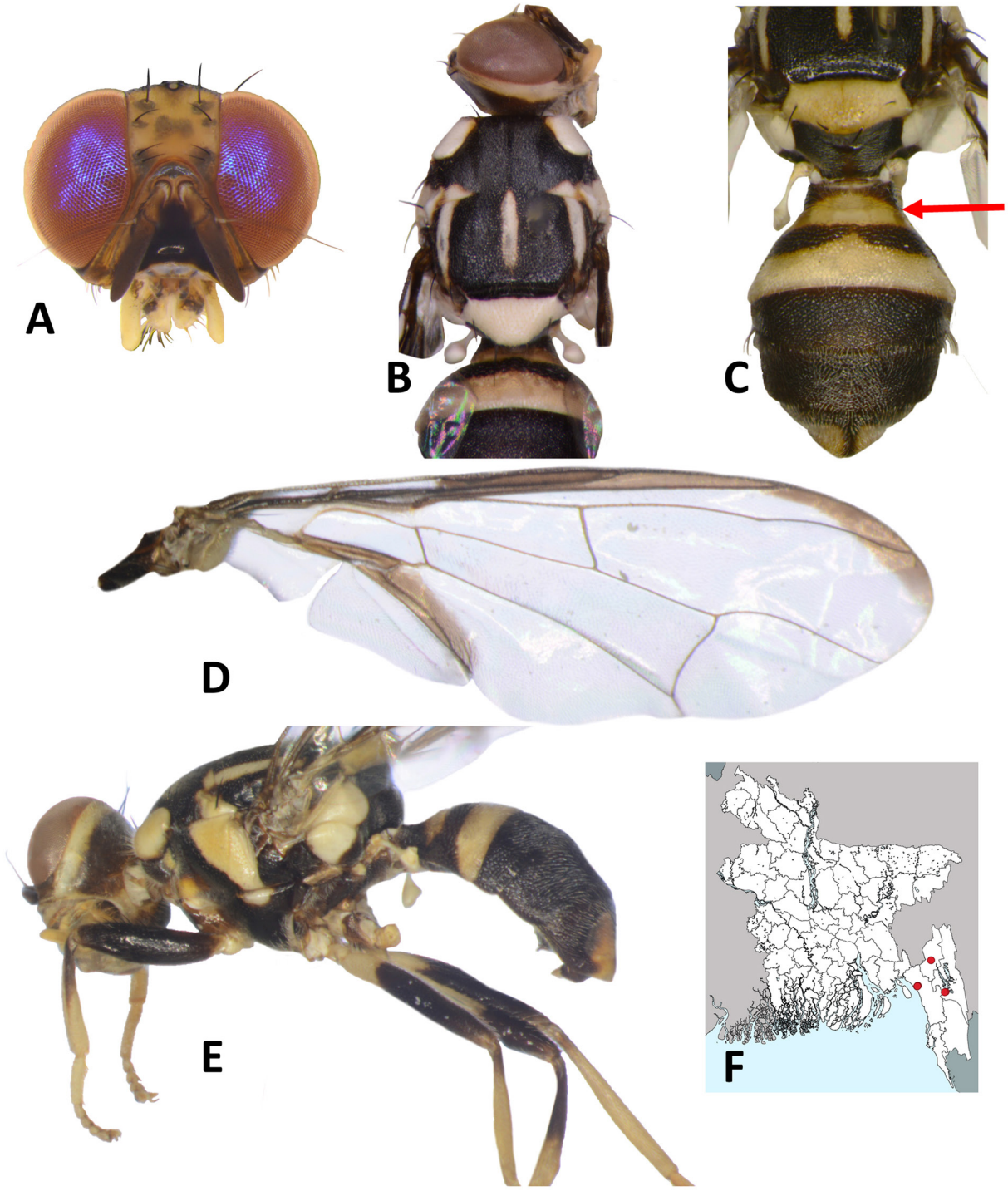

Figure 25. *Zeugodacus* (*Zeugodacus*) *atrifacies* Perkins, male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

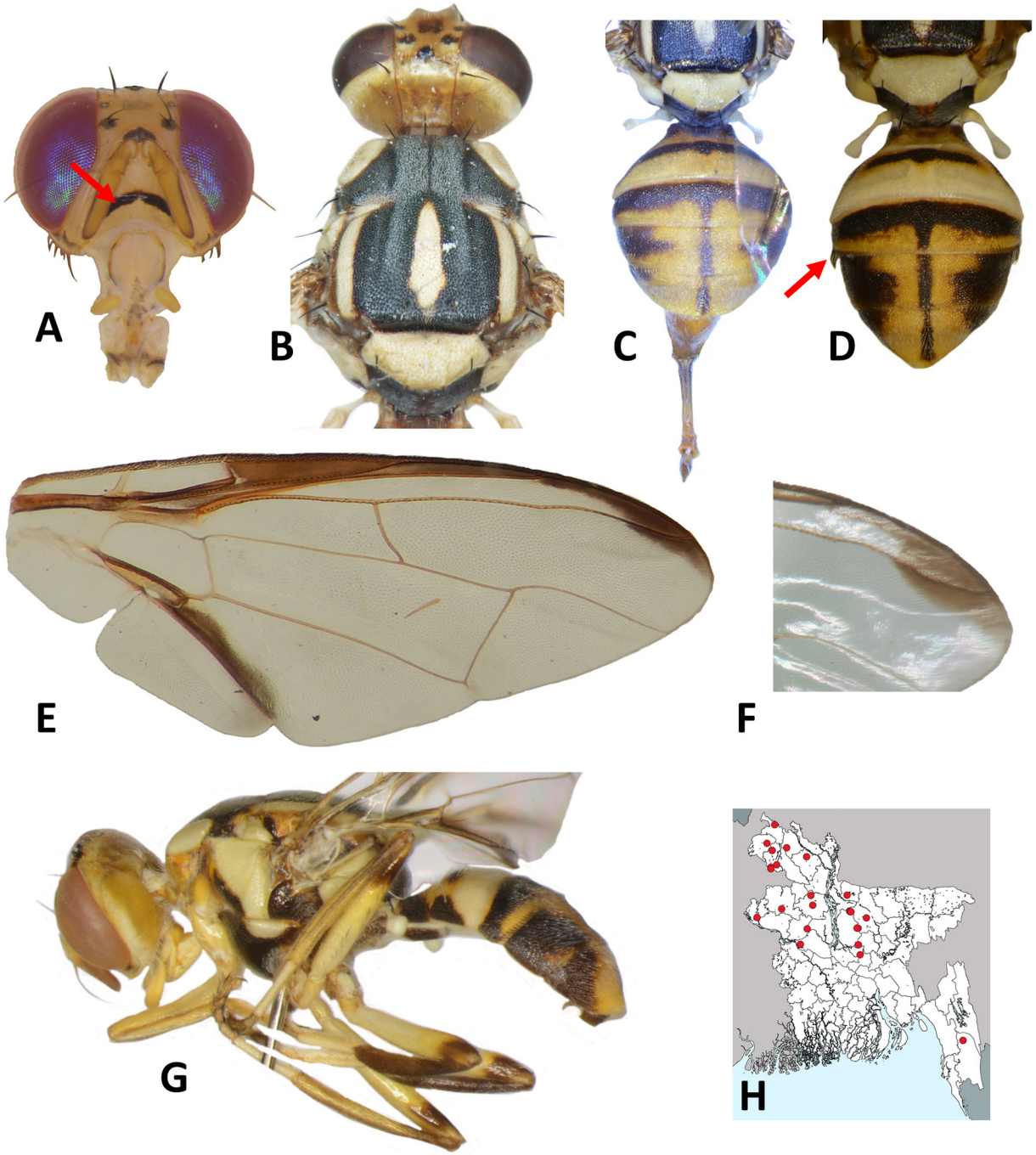

Figure 26. *Zeugodacus* (*Zeugodacus*) *caudatus* (Fabricius). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing (after Leblanc et al. 2014). **F)** Wing apex, variant. **G)** Lateral view, male. **H)** Distribution in Bangladesh.

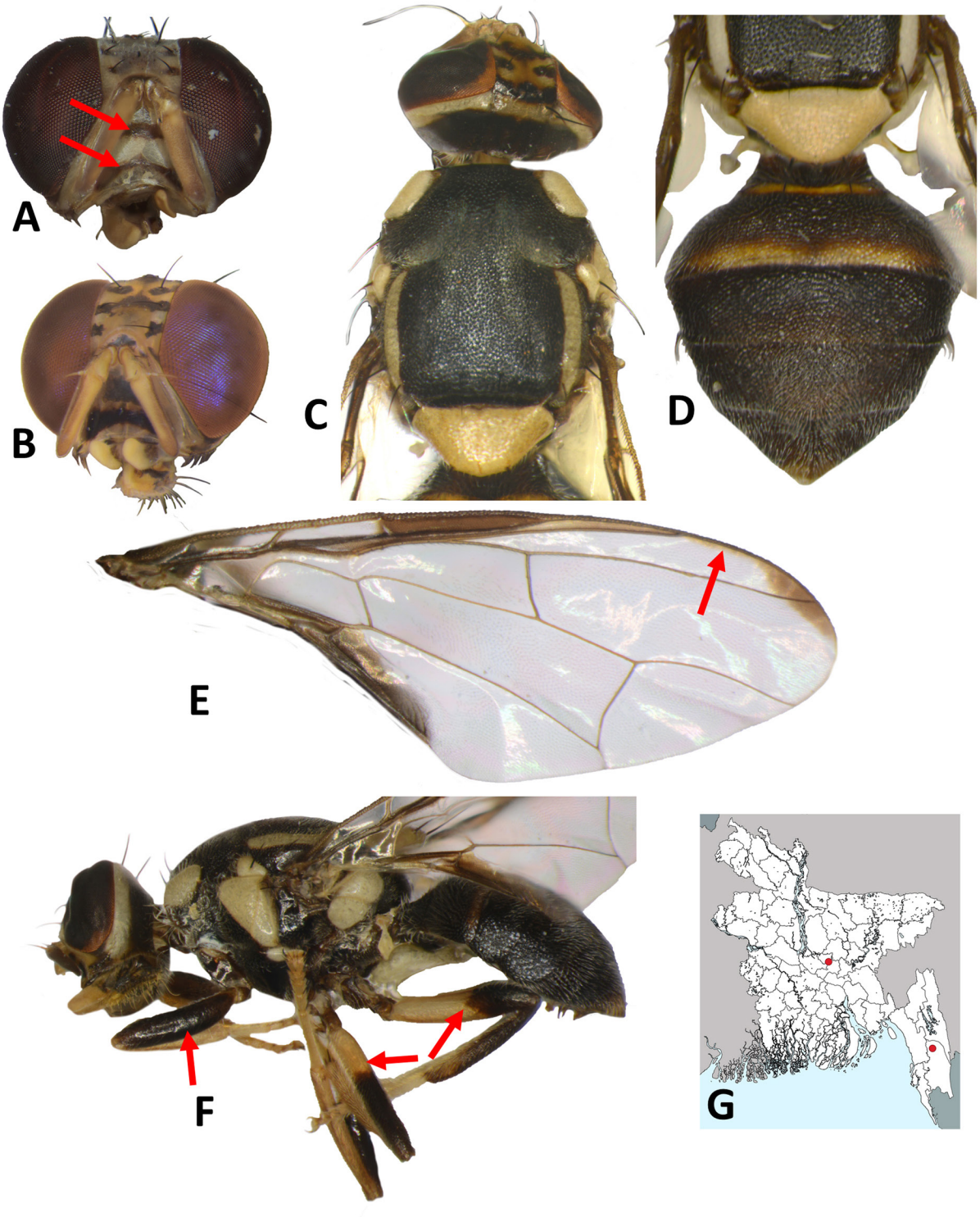

Figure 27. *Zeugodacus* (*Parasinodacus*) *cilifer* (Hendel), male. **A-B)** Head. **C)** Head and scutum. **D)** Abdomen. **E)** Wing. **F)** Lateral view. **G)** Distribution in Bangladesh.

Zeugodacus (*Javadacus*) *cucurbitae* (Coquillett, 1899)

(= *Dacus aureus* Tseng and Chu, 1982, *Dacus yuiliensis* Tseng and Chu, 1992)

Figure 28

Distribution. Widespread throughout tropical Asia, from Pakistan to Taiwan and south to New Guinea and Solomon Islands; introduced to Africa, the Middle East, and various islands in the Indian and Pacific Oceans (see distribution map in Vargas et al. 2015).

Bangladesh records. 35,091 specimens. BARISHAL DIVISION: Barguna, Barishal, Bhola, Jhalokathi, Patuakhali, and Pirojpur Districts. CHATTOGRAM DIVISION: Bandarban Hill, Bramhanbaria, Chandpur, Chattogram, Cox's Bazar, Cumilla, Feni, Khagrachari Hill, Laxmipur, Noakhali, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, Gazipur, Gopalgonj, Kishorgonj, Manikganj, Narayanganj, Narsingdi, Rajbari, Shariatpur, and Tangail Districts. KHULNA DIVISION: Bagerhat, Chuadanga, Jashore, Jhenaidah, Kushtia, Meherpur, and Satkhira Districts. MYMENSINGH DIVISION: Jamalpur, Mymensingh, Netrokona, and Sherpur Districts. RAJSHAHI DIVISION: Bogura, Chapai Nawabgonj, Joypurhat, Naogaon, Natore, Pabna, Rajshahi, and Sirajganj Districts. RANGPUR DIVISION: Dinajpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagarh, Rangpur, and Thakurgaon Districts. SYLHET DIVISION: Habiganj, Moulvibazar, Sunamgonj, and Sylhet Districts.

Male lure. Cue-lure, zingerone.

Host plants. A severe pest of cucurbit crops, also bred from a diversity of other families, with a total of 136 host taxa in 30 families (Allwood et al. 1999; McQuate et al. 2016). Hosts plants recorded in Bangladesh include: winter melon (*Benincasa hispida* (Thunb.) Cogn.), watermelon (*Citrullus lanatus* (Thunb.) Matsum. and Nakai), ivy gourd (*Coccinia grandis* (L.) Voigt), melon (*Cucumis melo* L.), cucumber (*C. sativus* L.), pumpkin (*Cucurbita pepo* L.), calabash (*Lagenaria siceraria* (Molina) Strandl.), angled luffa (*Luffa acutangula* (L.) Roxb.), smooth luffa (*L. cylindrica* (L.) M.Roem.), balsam-apple (*Momordica balsamina* L.), bittergourd (*M. charantia* L.), gac fruit (*M. cochinchinensis* (Lour.) Spreng.), spiny gourd (*M. dioica* Roxb. Ex Willd.), snakegourd (*Trichosanthes cucumerina* L.) (all Cucurbitaceae), tomato (*Lycopersicon esculentum* Mill.), and eggplant (*Solanum melongena* L.) (both Solanaceae) (Kabir et al. 1991; Akhtaruzzaman et al. 1999a; Amin et al. 2011; Alim et al. 2012).

Notes. In Bangladesh, Alim et al. (2012), Hossain et al. (2019) and Bose et al. (2021) studied the population fluctuations of melon fly at different locations of Bangladesh to develop control decisions. Chowdhury et al. (1993) first initiated melon fly control strategy in bitter gourd field using poison food bait. Akhtaruzzaman et al. (1999b) initiated bagging of cucumber to prevent melon fly infestation.

Zeugodacus (*Zeugodacus*) *diaphorus* (Hendel, 1915)

(= *Chaetodacus ater* Chen, 1940, *Dacus lunulatus* Tseng, Chen and Chu, 1992, *Dacus guangxianua* Chao and Lin, 1993, *Dacus sicieni* Chao and Lin, 1993, *Bactrocera proprediaphora* Wang, Xiao and Chen in Wang et al. 2008)

Figure 29

Distribution. Widespread in tropical Asia, from India and Sri Lanka to Taiwan, Vietnam and Indonesia (south to Sumatra) (Drew and Romig 2013). This species was misidentified in Bangladesh as *Bactrocera bogorensis* (Hardy) by Leblanc et al. (2014), and the erroneous record was rectified by Leblanc et al. (2019b).

Bangladesh records. 12 specimens. MYMENSINGH DIVISION: Sherpur District. RAJSHAHI DIVISION: Joypurhat District. RANGPUR DIVISION: Gaibandha, Kurigram, and Lalmonirhat Districts.

Male lure. Cue-lure.

Host plants. No known record.

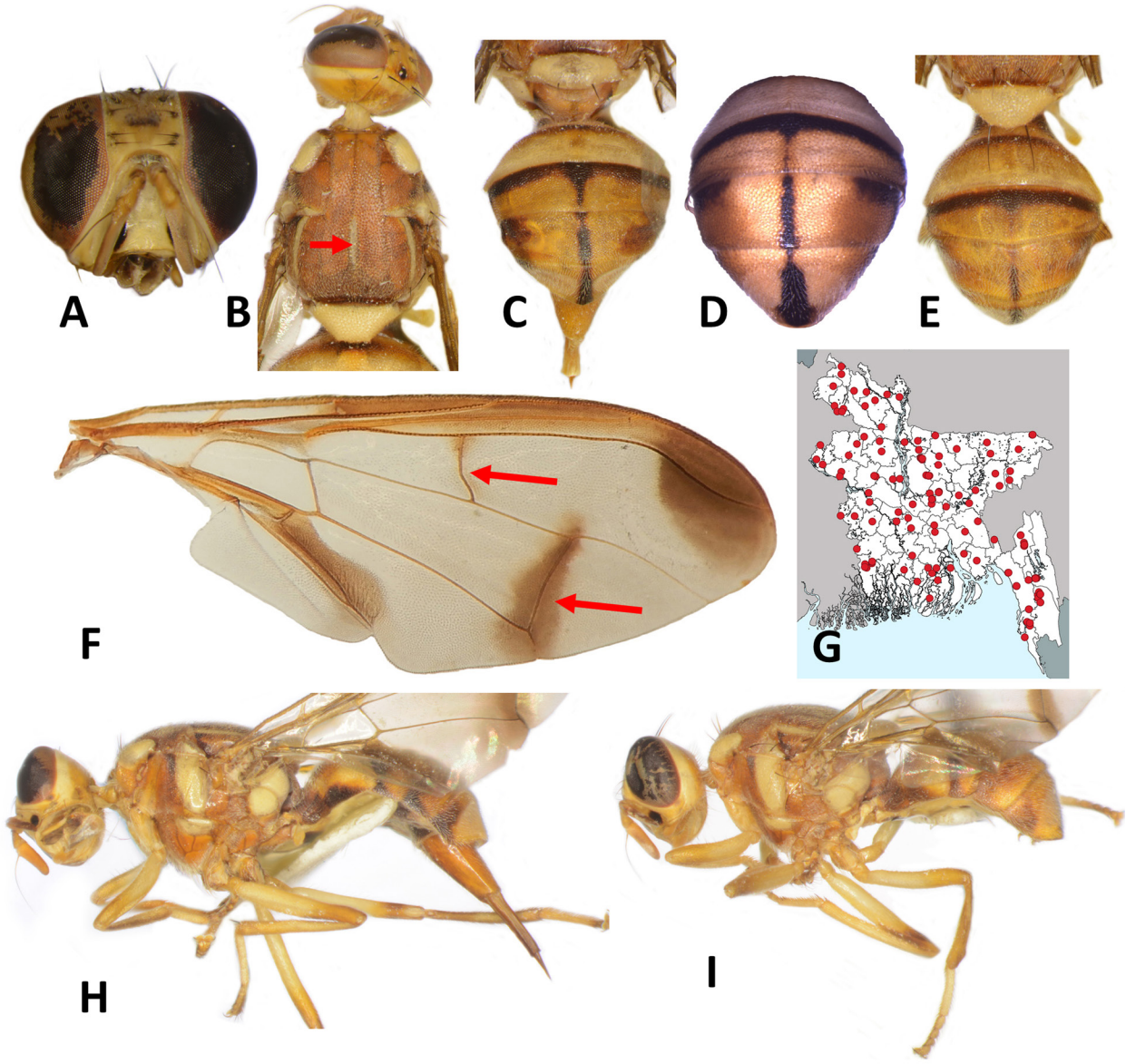

Figure 28. *Zeugodacus* (*Javadacus*) *cucurbitae* (Coquillett). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D-E)** Abdomen, male. **F)** Wing (after Leblanc et al. 2014). **G)** Distribution in Bangladesh. **H)** Lateral view, female. **I)** Lateral view, male.

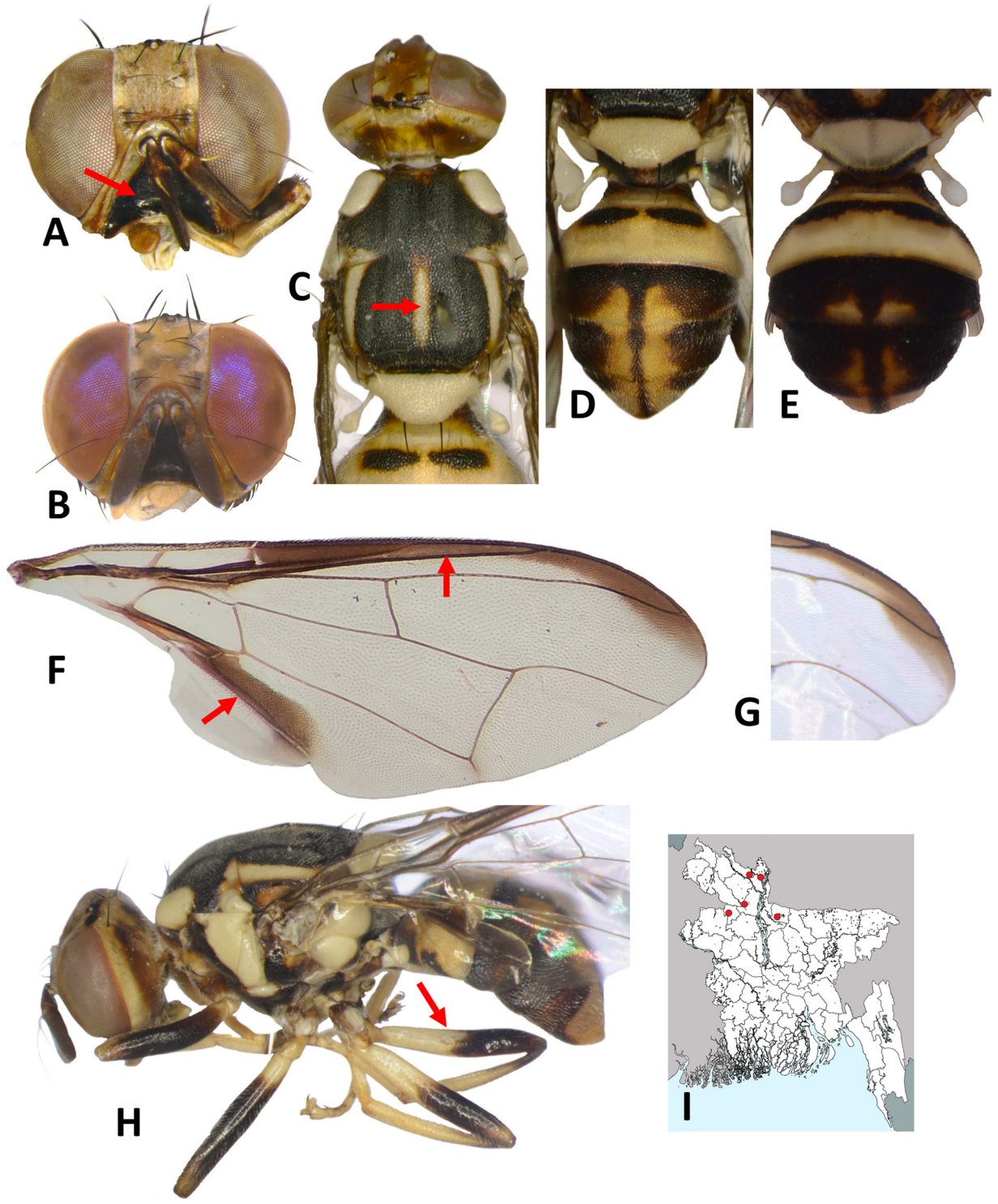

Figure 29. *Zeugodacus* (*Zeugodacus*) *diaphorus* (Hendel), male. **A-B)** Head. **C)** Head and scutum. **D-E)** Abdomen. **F)** Wing (after Leblanc et al. 2014). **G)** Wing apex, variant. **H)** Lateral view. **I)** Distribution in Bangladesh.

Zeugodacus (*Zeugodacus*) *diversus* (Coquillett, 1904)

(= *Dacus quadrifidus* Hendel, 1928, *Dacus latifae* Anwar Cheema, 1964, *Dacus citronellae* Kapoor and Katiyar, 1969)

Figure 30

Distribution. India, Sri Lanka (Coquillett 1904), China, Nepal, Thailand (Norrbom et al. 1999), Pakistan, Vietnam (Drew and Romig 2013), Bangladesh (Kabir et al. 1991).

Bangladesh records. 227 specimens. CHATTOGRAM DIVISION: Khagrachari Hill District. DHAKA DIVISION: Dhaka and Narsingdi Districts. RAJSHAHI DIVISION: Natore District. SYLHET DIVISION: Moulvibazar District.

Male lure. Poorly captured in methyl eugenol and zingerone baited traps, but strongly attracted to methyl-isoeugenol (Royer et al. 2018).

Host plants. Bred from flowers of nine species of Cucurbitaceae (Allwood et al. 1999). Liquido et al. (2019) reported that it is also known to secondarily feed on and damage cucurbit fruits as well, and list 13 hosts in 10 genera and four families for this species.

Note. Molla et al. (2000) studied the detailed life history and documented the seasonal prevalence of *Z. diversus* in Bangladesh.

Zeugodacus (*Sinodacus*) *hochii* (Zia, 1936)

(=*Sinodacus laterum* Wang, 1988, *Sinodacus quaternum* Wang, 1988, *Sinodacus hainanus* Chao and Lin, 1996, *Sinodacus jiannanus* Chao and Lin, 1996, *Sinodacus jinreni* Chao and Lin, 1996, *Sinodacus qionganus* Chao and Lin, 1996, *Sinodacus rubzovi* Chao and Lin, 1996)

Figure 31

Distribution. China (Zia 1936), Indonesia, Malaysia (Peninsular), Thailand (Norrbom et al. 1999), Vietnam (Drew and Romig 2013), Bangladesh (Leblanc et al. 2013), Laos (Leblanc et al. 2016).

Bangladesh records. 13 specimens. CHATTOGRAM DIVISION: Bandarban Hill and Chattogram Districts. DHAKA DIVISION: Tangail District. SYLHET DIVISION: Habiganj District.

Male lure. Cue-lure, zingerone.

Host plants. *Gymnopetalum chinense* (Lour.) Merr., *Luffa aegyptiaca* Mill., and *Trichosanthes wawraei* Cogn. (Cucurbitaceae) (Allwood et al. 1999).

Zeugodacus (*Parasinodacus*) *incisus* (Walker, 1861)

(= *Dacus poonnensis* Kapoor, 1971)

Figure 32

Distribution. Myanmar (Walker 1861), India, Thailand (Norrbom et al. 1999), China (Chen et al. 2011), India (Andaman Island) (David and Ramani, 2011), Malaysia (Peninsular), Vietnam (Drew and Romig 2013), Bangladesh (Leblanc et al. 2019b).

Bangladesh records. 67 specimens. CHATTOGRAM DIVISION: Bandarban Hill, Chattogram, and Cox's Bazar Districts. DHAKA DIVISION: Narayanganj District. RANGPUR DIVISION: Panchagarh District.

Male lure. Cue-lure.

Host plants. No known record.

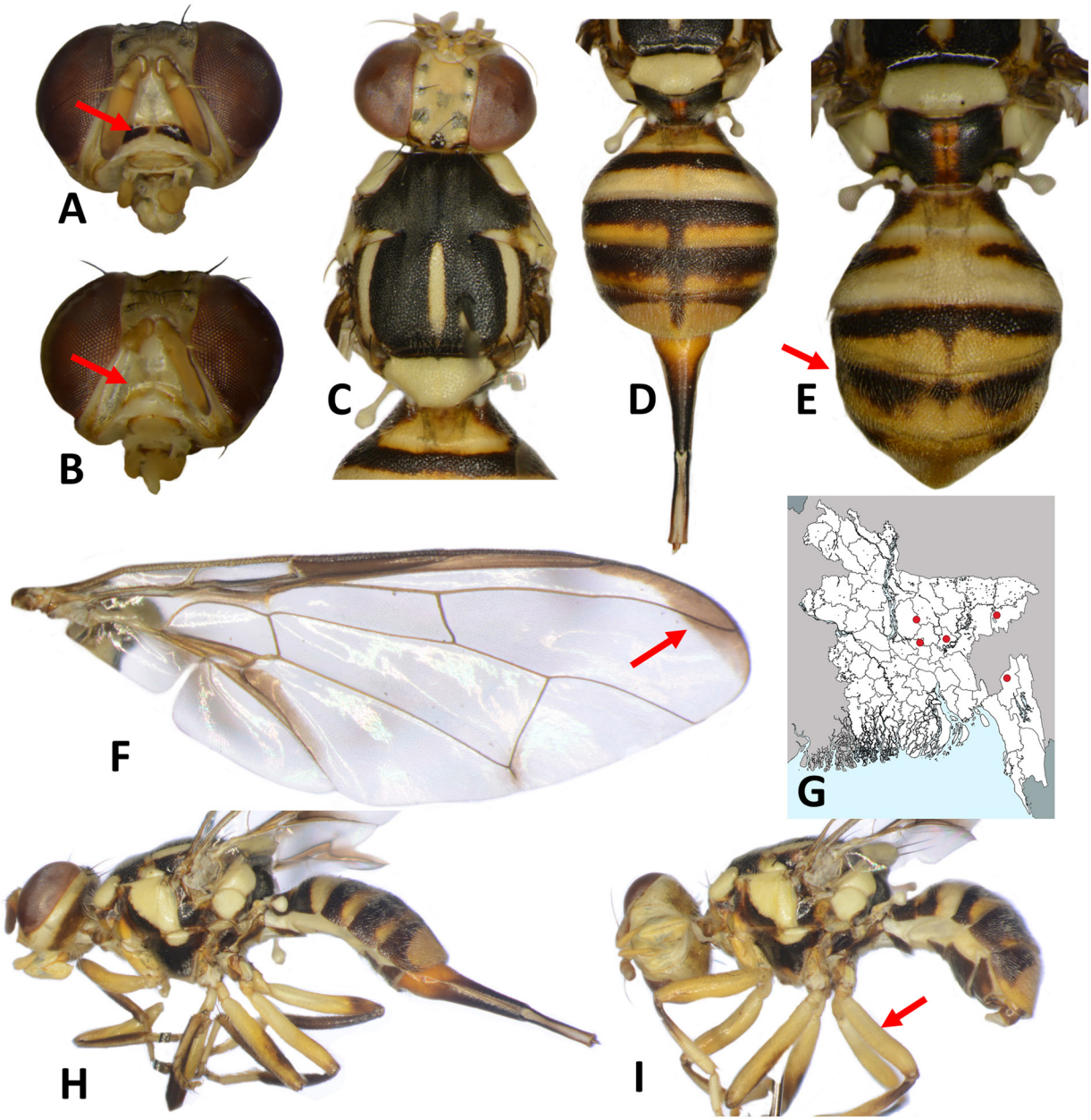

Figure 30. *Zeugodacus* (*Zeugodacus*) *diversus* (Coquillett). **A)** Head, female. **B)** Head, male. **C)** Head and scutum. **D)** Abdomen, female. **E)** Abdomen, male. **F)** Wing. **G)** Distribution in Bangladesh. **H)** Lateral view, female. **I)** Lateral view, male.

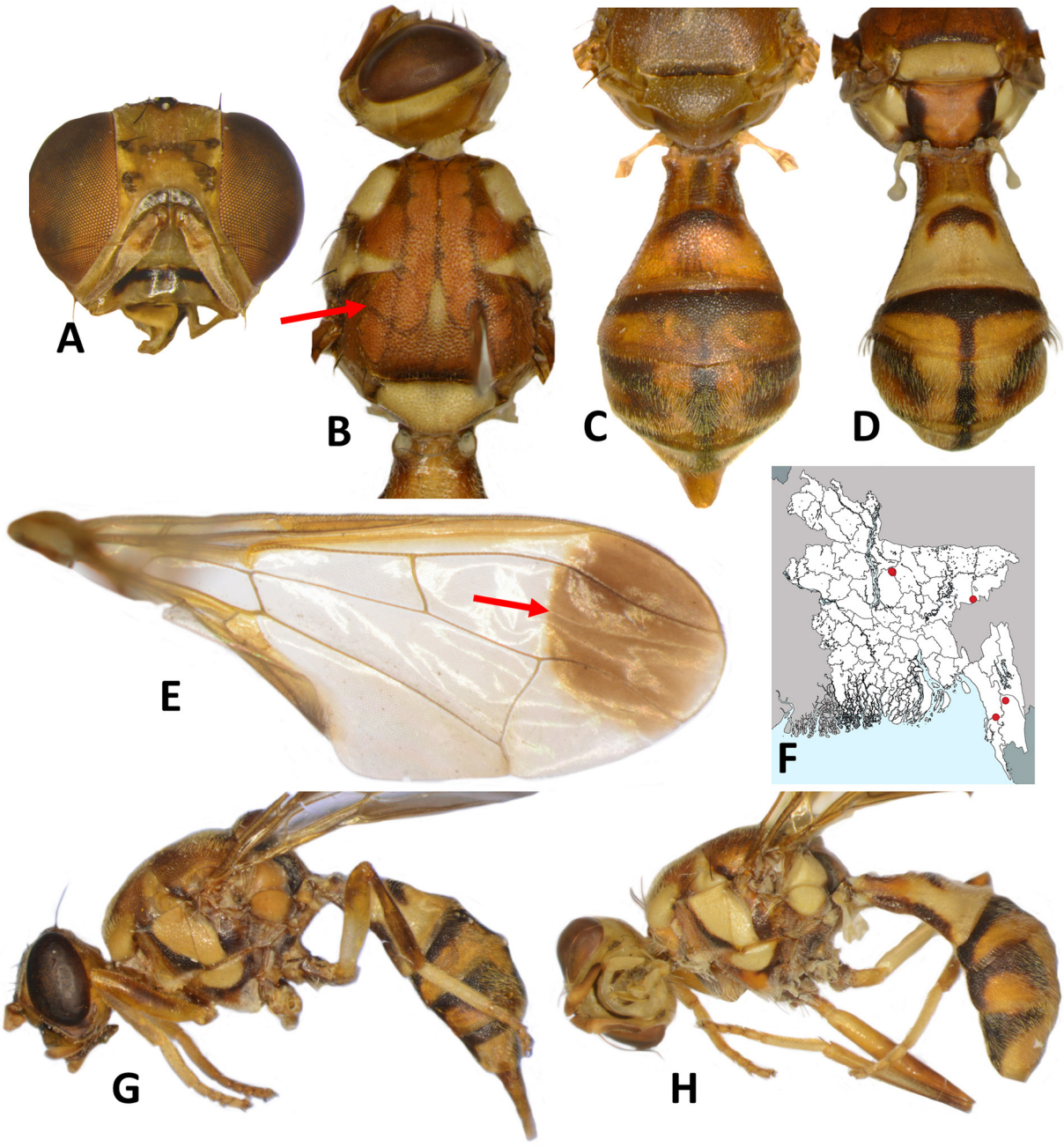

Figure 31. *Zeugodacus* (*Sinodacus*) *hochii* (Zia). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing. **F)** Distribution in Bangladesh. **G)** Lateral view, female. **H)** Lateral view, male.

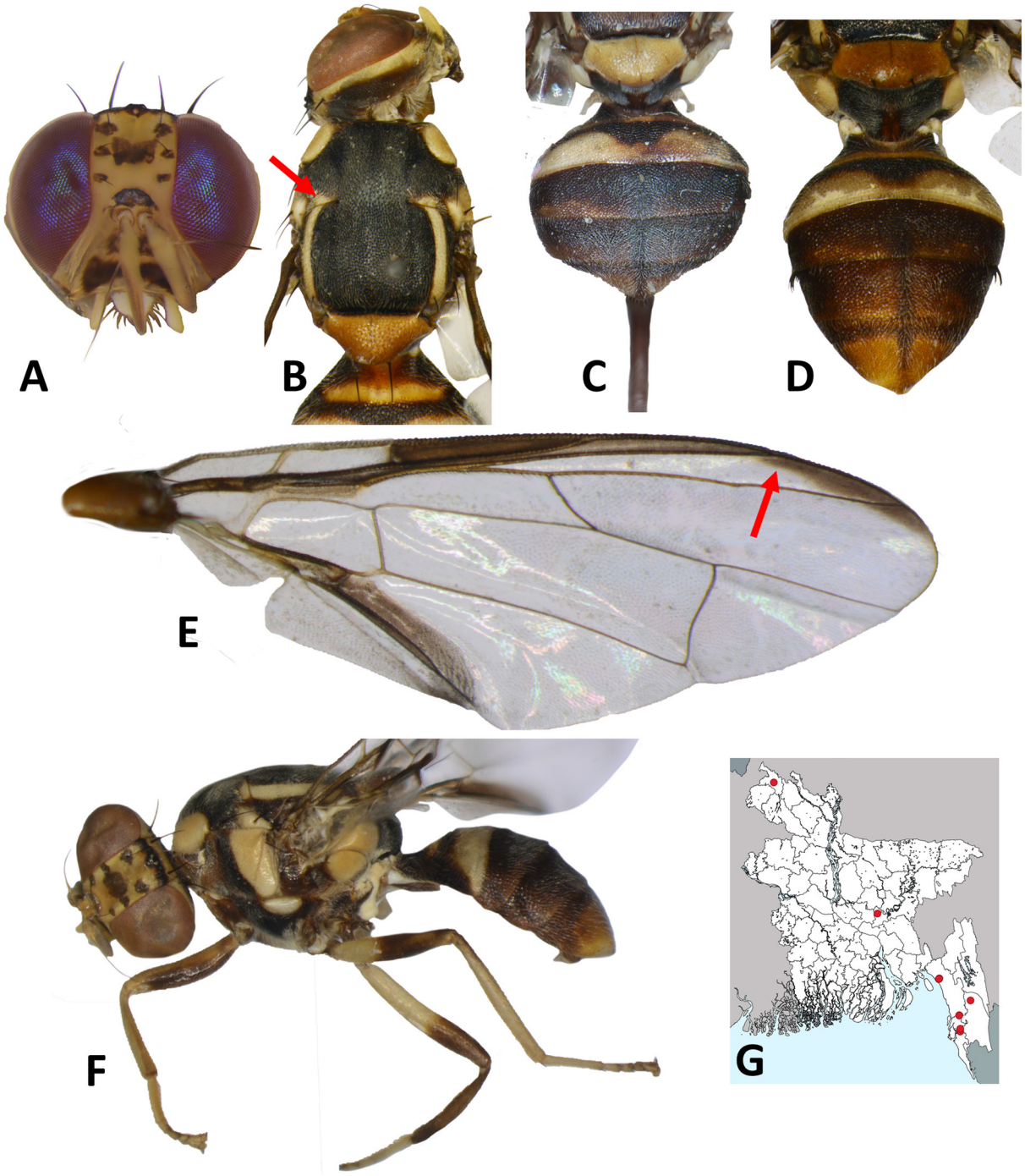

Figure 32. *Zeugodacus* (*Parasinodacus*) *incisus* (Walker). **A)** Head. **B)** Head and scutum. **C)** Abdomen, female. **D)** Abdomen, male. **E)** Wing. **F)** Lateral view, male. **G)** Distribution in Bangladesh.

Zeugodacus (*Sinodacus*) *infestus* (Enderlein, 1920)

Figure 33

Distribution. Indonesia (Enderlein 1920), Thailand (Hardy 1973), Malaysia (Peninsular), Vietnam (Drew and Romig 2013), Laos (Leblanc et al. 2016), Bangladesh (Leblanc et al. 2019b).

Bangladesh records. Two specimens. CHATTOGRAM DIVISION: Chattogram and Khagrachari Hill Districts.

Male lure. Cue-lure.

Host plants. No known record.

Zeugodacus (*Sinodacus*) *madhupuri* Leblanc and Doorenweerd, 2019

Figure 34

Distribution. Bangladesh (Leblanc et al. 2019b).

Bangladesh records. Four specimens. DHAKA DIVISION: Tangail District.

Male lure. Cue-lure.

Host plants. No known record.

Zeugodacus (*Javadacus*) *tau* (Walker, 1849)

(= *Dacus hageni* Meijere, 1911, *Dacus nubilus femoralis* Hendel, 1934, *Dacus elegantis* Tseng, Chen and Chu, 1992, *Dacus flavus* Tseng, Chen and Chu, 1992)

Figure 35

Distribution. Widespread in tropical Asia, from India and Sri Lanka to Vietnam and Taiwan, and south to Indonesia (Drew and Romig 2013), Cambodia, Laos (Leblanc et al. 2016), Nepal (Sharma et al. 2015), Bangladesh (Kabir et al. 1991).

Bangladesh records. 21,185 specimens. BARISHAL DIVISION: Barguna, Barishal, Bhola, Jhalokathi, Patuakhali, and Pirojpur Districts. CHATTOGRAM DIVISION: Bandarban Hill, Bramhanbaria, Chandpur, Chattogram, Cox's Bazar, Cumilla, Feni, Khagrachari Hill, Laxmipur, Noakhali, and Rangamati Hill Districts. DHAKA DIVISION: Dhaka, Faridpur, Gazipur, Gopalgonj, Kishorgonj, Madaripur, Manikganj, Munshiganj, Narayanganj, Narsingdi, Rajbari, Shariatpur, and Tangail Districts. KHULNA DIVISION: Bagerhat, Chuadanga, Jashore, Jhenaidah, Kushtia, Magura, Meherpur, Narail, and Satkhira Districts. MYMENSINGH DIVISION: Jamalpur, Mymensingh, Netrokona, and Sherpur Districts. RAJSHAHI DIVISION: Bogura, Chapai Nawabgonj, Joypurhat, Naogaon, Natore, Pabna, Rajshahi, and Sirajgonj Districts. RANGPUR DIVISION: Dinajpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagarh, Rangpur, and Thakurgaon Districts. SYLHET DIVISION: Habiganj, Moulvibazar, Sunamgonj, and Sylhet Districts.

Male lure. Cue-lure.

Host plants. Primarily a pest of cucurbit fruits, though its host range is much broader, as it has been bred from 77 host taxa in 44 genera and 23 families (Liquido et al. 2016a). Hosts in Bangladesh include: winter melon (*Benincasa hispida* (Thunb.) Cogn.), melon (*Cucumis melo* L.), cucumber (*C. sativus* L.), pumpkin (*Cucurbita pepo* L.), calabash (*Lagenaria siceraria* (Molina) Strandl.), angled luffa (*Luffa acutangula* (L.) Roxb.), smooth luffa (*L. cylindrica* (L.) M.Roem.), bittergourd (*Mormodica charantia* L.), gac fruit (*M. cochinchinensis* (Lour.) Spreng.), spiny gourd (*M. dioica* Roxb. Ex Willd.), and snakegourd (*Trichosanthes cucumerina* L.) (all Cucurbitaceae) (Kabir et al. 1991; Akhtaruzzaman et al. 1999a; Huque 2006).

Notes. In Bangladesh, Hossain et al. (2019) studied the seasonal abundance of *Z. tau* to develop a control strategy. Chowdhury et al. (1993) initiated a melon fly and pumpkin fly control strategy in bitter gourd field using poison bait. Akhtaruzzaman et al. (1999b) initiated bagging method in cucumber to prevent pumpkin fly infestation. The detailed life history of this species in Bangladesh was published by Kabir et al. (1997).

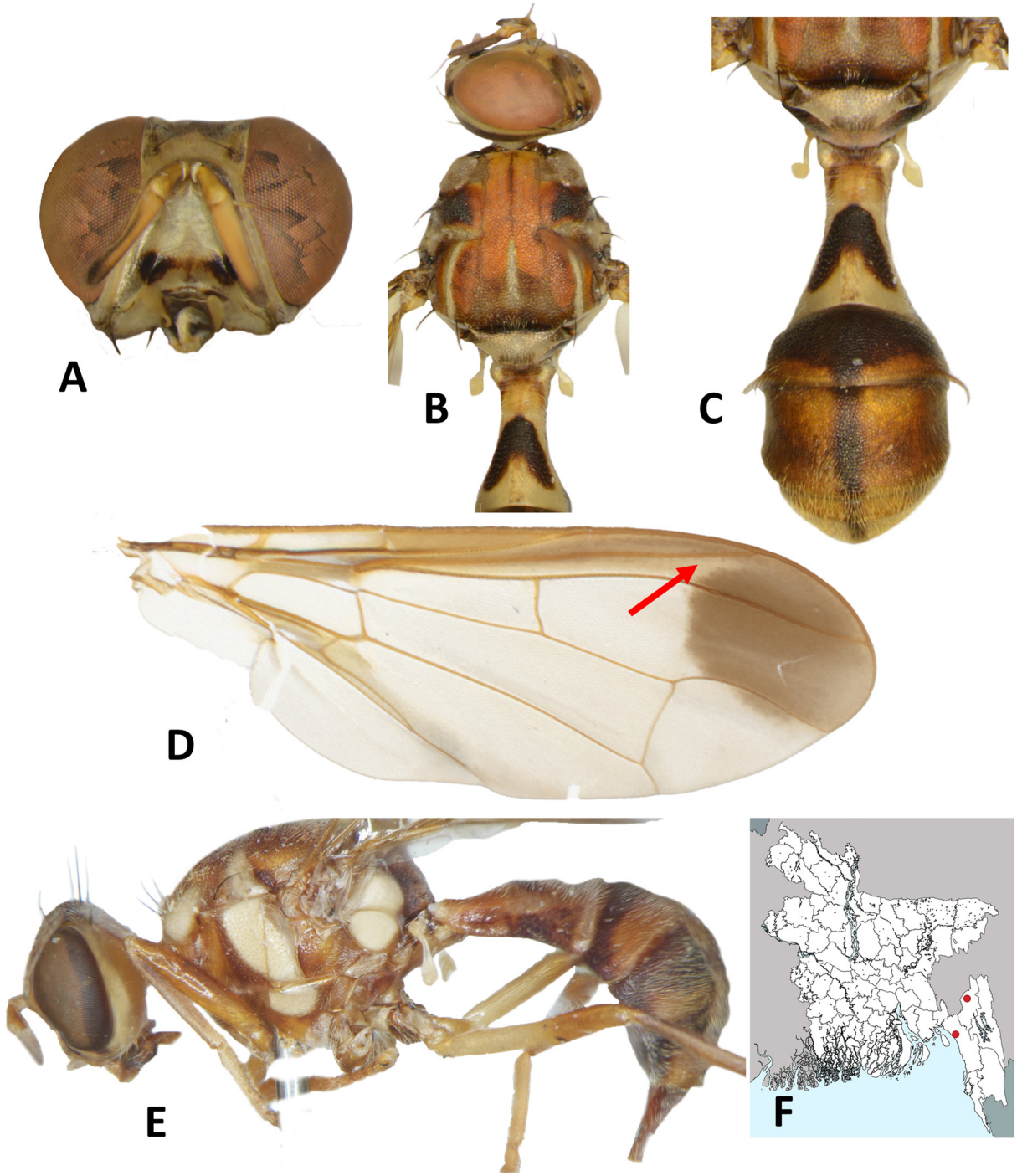

Figure 33. *Zeugodacus* (*Sinodacus*) *infestus* (Enderlein). **A)** Head. **B)** Head and scutum. **C)** Abdomen, male. **D)** Wing. **E)** Lateral view, female. **F)** Distribution in Bangladesh.

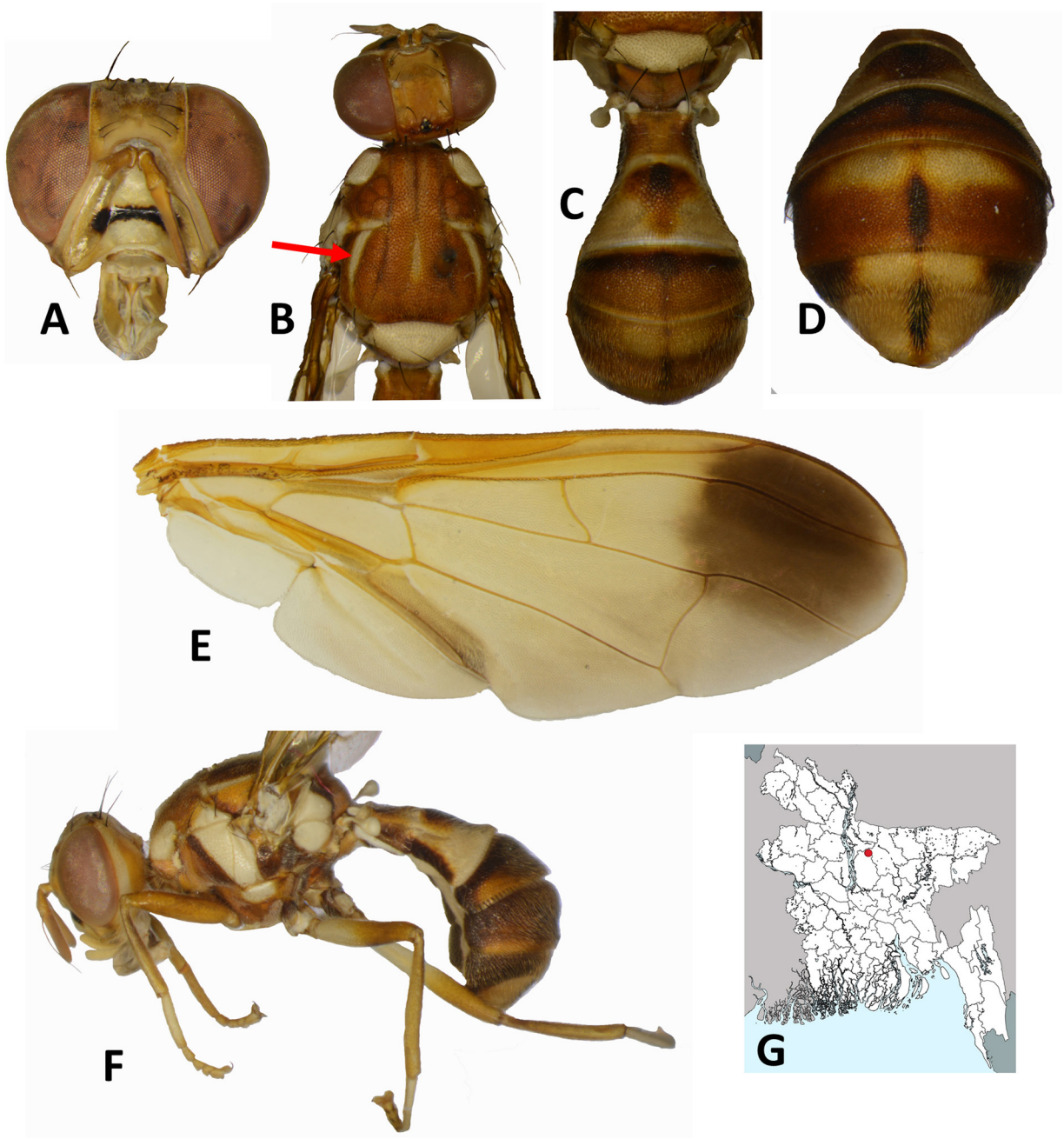

Figure 34. *Zeugodacus* (*Sinodacus*) *madhupuri* Leblanc and Doorenweerd, male. **A)** Head. **B)** Head and scutum. **C–D)** Abdomen. **E)** Wing. **F)** Lateral view. **G)** Distribution in Bangladesh. **A–F** after Leblanc et. al. (2019).

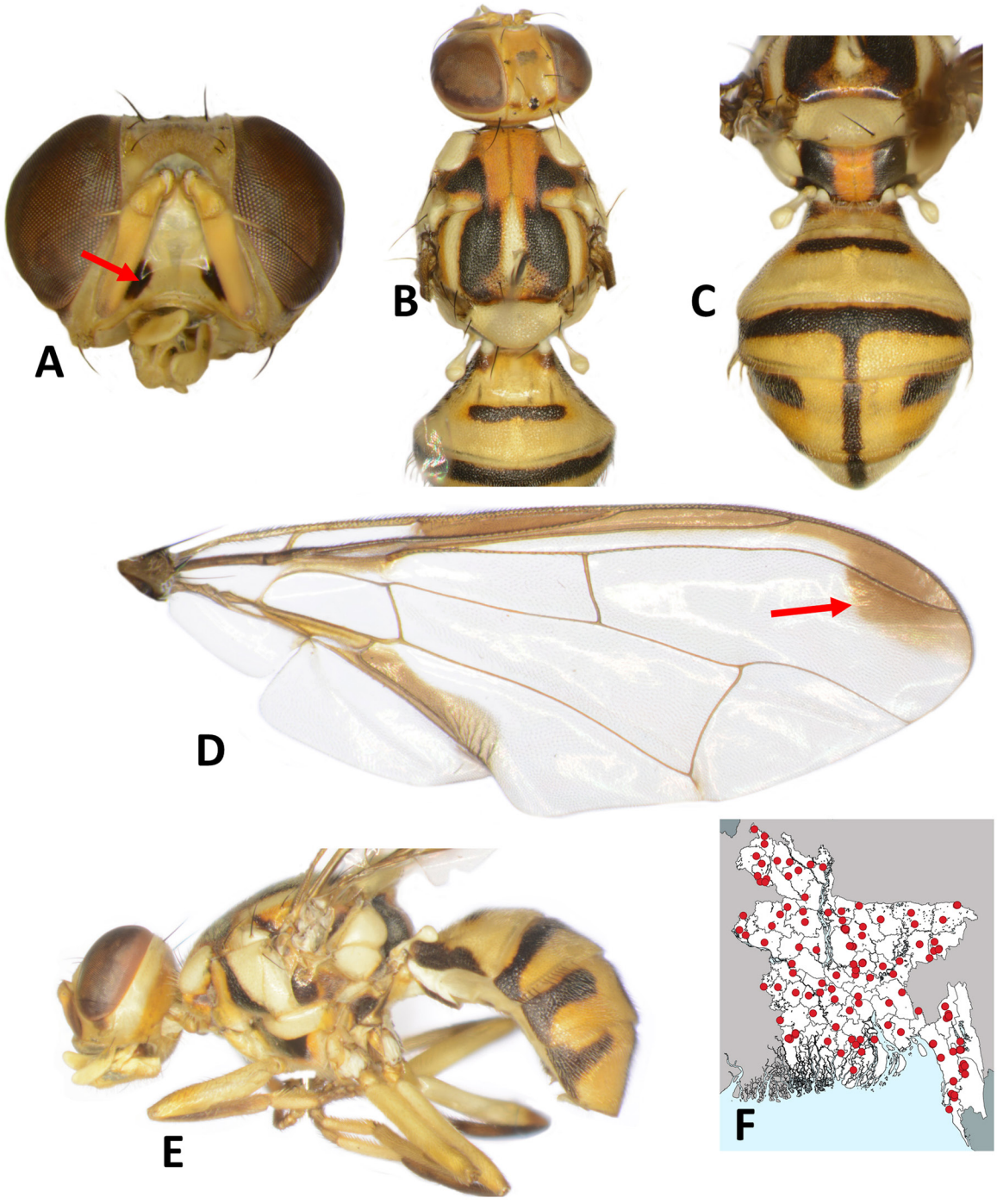

Figure 35. *Zeugodacus* (*Javadacus*) *tau* (Walker), male. **A)** Head. **B)** Head and scutum. **C)** Abdomen. **D)** Wing. **E)** Lateral view. **F)** Distribution in Bangladesh.

Key to the species of dacine fruit flies recorded in Bangladesh

1. Large wasp-like red-brown fly (wing at least 8 mm long) with abdominal base of syntergite 1+2 longer than broad (Fig. 23C) and wing costal band very broadly overlapping vein R_{4+5} (Fig. 23D) **2**
— Smaller fly (wing less than 8 mm long) with abdominal base of syntergite 1+2 broader than long (Fig. 25C) and wing costal band narrower, at most reaching vein R_{4+5} (Fig. 10D) **3**

2. Face fulvous with two small oval black spots; males attracted to cue-lure; (Fig. 23) . . . . . ***Dacus* (*Callantra*) *longicornis* Wiedemann**
— Face reddish brown with a large inverted U-shaped black marking; males attracted to cue-lure; (Fig. 22) . . . . . ***Dacus* (*Mellesis*) *jacobi* David and Sachin**

3(1). Scutum with yellow median postsutural vitta (Fig. 29C), though sometimes very reduced (Fig. 28B) . . **4**
— Scutum without yellow median postsutural vitta **13**

4(3). Wing with infuscations present along r-m and dm-cu crossveins, in addition to the costal band and anal streak; males attracted to cue-lure; (Fig. 28) . . . . . ***Zeugodacus* (*Javadacus*) *cucurbitae* (Coquillett)**
— Wing with infuscations restricted to the costal band and anal streak (Fig. 29F) **5**

5(4). Apex of costal band on wing greatly expanded into an enlarged circular spot (Fig. 31E) **6**
— Apex of costal band on wing not so greatly expanded (Fig. 35C) **9**

6(5). Lateral postsutural vitta absent or at most very short and narrow males attracted to cue-lure; (Fig. 31) . . . . . ***Zeugodacus* (*Sinodacus*) *hochii* (Zia)**
— Lateral postsutural vitta well developed (Fig. 34B) **7**

7(6). Wing membrane with a fulvous tinge, in addition to fuscous costal band and anal streak; males attracted to cue-lure; (Fig. 34) . . . . . ***Zeugodacus* (*Sinodacus*) *madhupuri* Leblanc and Doorenweerd**
— Wing membrane nearly hyaline, other than fuscous costal band and anal streak **8**

8(7). Anterior supra-alar seta present; costal band complete, not interrupted beyond the apex of vein R_{2+3}; males attracted to cue-lure; (Fig. 33) . . . . . ***Zeugodacus* (*Sinodacus*) *infestus* (Enderlein)**
— Anterior supra-alar seta absent; costal band interrupted between the apex of vein R_{2+3} and the large apical spot; males attracted to cue-lure; (Fig. 24) . . . . . ***Zeugodacus* (*Asiadacus*) *apicalis* (Meijere)**

9(5). Face fulvous with a pair of circular to oval black spots (Fig. 35A); apex of wing costal band expanded into an apical spot; males attracted to cue-lure; (Fig. 35) . . . . . ***Zeugodacus* (*Javadacus*) *tau* (Walker)**
— Face either uniformly black (Fig. 29A), or fulvous, with (Fig. 30A) or without (Fig. 30B) a transverse black band; apex of wing costal band at most slightly expanded (Fig. 30F) **10**

10(9). Face entirely black (Fig. 29A); femora basally fulvous and apically dark fuscous to black (Fig. 29H) . . **11**
— Face fulvous, with (Fig. 30A) or without (Fig. 30B) a transverse dark band; femora mostly or entirely fulvous (Fig. 30I) **12**

11(10). Scutellum with one pair of setae; males attracted to cue-lure; (Fig. 29) . . . . . ***Zeugodacus* (*Zeugodacus*) *diaphorus* (Hendel)**
— Scutellum with two pairs of setae; males attracted to cue-lure; (Fig. 25) . . . . . ***Zeugodacus* (*Zeugodacus*) *atrifacies* Perkins**

12(10). Face entirely fulvous in male (Fig. 30B), fulvous with transverse dark band across oral margin in female (Fig. 30A); scutellum with one pair of setae (rarely two pairs in male); male abdomen without pecten (Fig. 30E); males weakly attracted to methyl eugenol and zingerone, and strongly attracted to methyl-isoeugenol; (Fig. 30) . . . . . ***Zeugodacus* (*Zeugodacus*) *diversus* (Coquillett)**
— Face entirely fulvous with transverse dark band across oral margin in both sexes (Fig. 26A); scutellum with two pairs of setae; male abdomen with pecten (Fig. 26D); males attracted to cue-lure; (Fig. 26) . . . . . ***Zeugodacus* (*Zeugodacus*) *caudatus* (Fabricius)**

13(3). Costal band interrupted (Fig. 20D) or drastically narrowed (Fig. 27E) before reaching its apex **14**
— Costal band not interrupted before reaching its apex (Fig. 32E) **17**

14(13). Scutum and abdomen red-brown; males attracted to methyl eugenol; (Fig. 20) . . . . . ***Bactrocera* (*Bactrocera*) *zonata* (Saunders)**

— Scutum predominantly to entirely black; abdomen black or predominantly red-brown **15**

15(14). Abdomen red-brown with a dark T-shaped pattern on terga III–V (Fig. 5C); males attracted to methyl eugenol; (Fig. 5) . . . . . ***Bactrocera* (*Bactrocera*) *correcta* (Bezzi)**

— Abdomen predominantly or entirely black **16**

16(15). Legs entirely fulvous (Fig. 19H); face fulvous with a pair of oval black spots (Fig. 19A); males attracted to methyl eugenol; (Fig. 19) . . . . . ***Bactrocera* (*Bactrocera*) *tuberculata* (Bezzi)**

— Fore femur black and mid and hind femora basally fulvous and apically black (Fig. 27F); face fulvous with two parallel transverse black bands, across oral margin and below antennal sockets (Fig. 27A); males attracted to cue-lure; (Fig. 27) . . . . . ***Zeugodacus* (*Parasinodacus*) *cilifer* (Hendel)**

17(13). Yellow lateral postsutural vitta absent (Fig. 21B); scutum and abdomen predominantly red-brown (Fig. 21B); abdomen with tergites fused into a single plate; no known male lure; (Fig. 21) . . . . . ***Dacus* (*Didacus*) *ciliatus* Loew**

— Yellow lateral postsutural vitta present (Fig. 10B), though sometimes very short; scutum and abdomen color variable; abdomen with tergites not fused **18**

18(17). Costal band very broad and confluent with vein R_{4+5} (Fig. 10D) **19**

— Costal band narrower, at most overlapping vein R_{2+3} but never reaching vein R_{4+5} (Fig. 17D) **20**

19(18). Scutellum with one pair of setae; abdominal sternum V with a deep concavity on posterior margin in male; apex of aculeus of ovipositor needle-like in female; males attracted to cue-lure; (Fig. 10) . . . . . ***Bactrocera* (*Bactrocera*) *limbifera* (Bezzi)**

— Scutellum with two pairs of setae; abdominal sternum V with a slight concavity on posterior margin in male; apex of aculeus of ovipositor trilobed (needle-like with two subapical teeth) in female; no known male lure; (Fig. 11) . . . . . ***Bactrocera* (*Paratridacus*) *melania* (Hardy and Adachi)**

20(18). Scutellum yellow with a broad medial longitudinal black stripe, with two pairs of setae; males attracted to zingerone; (Fig. 1) . . . . . ***Bactrocera* (*Parazeugodacus*) *abbreviata* (Hardy)**

— Scutellum entirely yellow, with one or two pairs of setae **21**

21(20). Fore and middle femora apically or entirely black; apex of hind femur black; abdomen predominantly or mostly black **22**

— Femora fulvous or red-brown with at most a dark anterior subapical dorsal spot on fore femur (Fig. 4E); abdomen pale colored, sometimes with broad lateral black markings **26**

22(21). Scutellum with two pairs of setae; lateral postsutural vitta very short; males attracted to zingerone; (Fig. 15) . . . . . ***Bactrocera* (*Parazeugodacus*) *pendleburyi* (Perkins)**

— Scutellum with one pair of setae; lateral postsutural vitta short or well developed **23**

23(22). Lateral postsutural vitta very short (Fig. 14B); anepisternal yellow stripe reaching to anterior notopleural seta dorsally (Fig. 14F); males attracted to cue-lure; (Fig. 14) . . . . . ***Bactrocera* (*Bactrocera*) *nigrofemoralis* White and Tsuruta**

— Lateral postsutural vitta well developed and ending at level of intra-alar seta; anepisternal yellow stripe not reaching to anterior notopleural seta dorsally **24**

24(23). Scutum with yellow spot anterior to transverse suture (Fig. 32B); prescutellar acrostichal seta absent; males attracted to cue-lure; (Fig. 32) . . . . . ***Zeugodacus* (*Parasinodacus*) *incisus* (Walker)**

— Scutum without yellow spot anterior to transverse suture; prescutellar acrostichal seta present **25**

25(24). Face fulvous with a black band across oral margin (Fig. 13A); abdominal terga entirely black (Fig. 13C); males attracted to cue-lure; (Fig. 13) . . . . . ***Bactrocera* (*Bactrocera*) *nigrifemorata* Lin and Wang**

— Face black (Fig. 12A) or dark fuscous with a pair of large oval dark spots; abdomen black with orange-brown medially on terga III-V (Fig. 12C); males attracted to cue-lure; (Fig. 12) . . . . . ***Bactrocera* (*Bactrocera*) *nigrifacia* Zhang, Ji and Chen**

26(21). Abdomen orange-brown, without a T-shaped dark pattern (Fig. 9C); apex of wing costal band expanded (Fig. 9D); males attracted to latilure; (Fig. 9) . . . . . ***Bactrocera* (*Bactrocera*) *latifrons* (Hendel)**

— Abdomen with a T-shaped pattern, with or without extensive lateral dark markings; apex of costal band not as expanded (Fig. 17D) **27**

27(26). Anterior supra-alar seta (on scutum between wing attachment and yellow lateral postsutural vitta) and prescutellar acrostichal seta absent; scutum and abdomen predominantly orange-brown, abdomen with a very narrow dark T-shaped pattern (Fig. 6C); femora predominantly red-brown; males attracted to cue-lure and zingerone; (Fig. 6) . . . . . ***Bactrocera* (*Daculus*) *digressa* Radhakrishnan**

— Anterior supra-alar seta and prescutellar acrostichal seta present; scutum color variable and abdomen with a T-shaped pattern, with medial stripe narrow (Fig. 17C) to broad (Fig. 16C); femora fulvous with at most small anterior subapical dorsal spot on fore femur **28**

28(27). Anepisternal yellow stripe very broad, extended anteriorly and reaching anterior notopleural seta dorsally (Fig. 2E); males attracted to methyl eugenol; (Fig. 2) . . . . . ***Bactrocera* (*Bactrocera*) *aethriobasis* (Hardy)**

— Anepisternal yellow stripe narrower, not reaching anterior notopleural seta dorsally (Fig. 17E) **29**

29(28). Scutum uniformly red-brown with at most a faint lanceolate pattern (Fig. 17B); abdomen red-brown with a faint or incomplete T-shaped pattern with the medial stripe very narrow (Fig. 17C); wing costal band confluent with or faintly overlapping vein R_{2+3} and slightly expanded apically (Fig. 17D); males attracted to cue-lure; (Fig. 17) . . . . . ***Bactrocera* (*Bactrocera*) *rubigina* (Wang and Zhao)**

— Scutum color highly variable, from predominantly orange-brown to predominantly or entirely black; abdomen orange-brown with a usually well-defined T-shaped pattern with the medial stripe usually broader, with limited to extensive lateral black markings; wing costal band confluent with or faintly overlapping vein R_{2+3} and slightly to moderately expanded apically (Fig. 4D), or confluent with vein R_{2+3} and not expanded apically (Fig. 8A) **30**

30(29). Scutum entirely black, without orange-brown markings (Fig. 18B); abdomen terga III-V with very broad black lateral markings (Fig. 18C); males attracted to zingerone; (Fig. 18) . . . . . ***Bactrocera* (*Bactrocera*) *syzygii* White and Tsuruta**

— Scutum varies from predominantly orange-brown to predominantly or entirely black, with limited orange-brown markings; abdomen terga III-V largely orange-brown, with reduced black lateral markings **31**

31(30). Wing costal band faintly overlapping vein R_{2+3} and slightly expanded beyond apex of vein R_{2+3} (Fig. 4D); fore femur usually with a dark fuscous to black anterior subapical dorsal spot (Fig. 4E); abdomen tergum IV with rectangular lateral black bands along its base (Fig. 4C, E); males attracted to methyl eugenol; (Fig. 4) . . . . . ***Bactrocera* (*Bactrocera*) *carambolae* Drew and Hancock**

— Wing costal band confluent with or faintly overlapping vein R_{2+3}, with or without apical expansion; fore femur with or without an anterior subapical dorsal spot; abdomen usually not as above, if with basolateral bands on tergum IV then scutum with parallel longitudinal red-brown medial vittae (Fig. 3B) **32**

32(31). Wing costal band confluent with vein R_{2+3} vein, and not expanded or at most very slightly expanded apically (Fig. 8A); scutum color pattern highly variable, from almost entirely black to black with variable lanceolate orange-brown pattern to entirely orange-brown (Fig. 7E–L); abdomen with a T-shaped pattern with medial stripe narrow, and limited to extensive lateral dark markings (Fig. 7C, D, M–Q); males attracted to methyl eugenol; (Fig. 7–8) . . . . . ***Bactrocera* (*Bactrocera*) *dorsalis* (Hendel)**

— Wing costal band at least faintly overlapping vein R_{2+3}, appearing as a faint tinge below the vein, and expanded apically (Fig. 3D, 16D); scutum color pattern as in Fig. 3B or 16B; abdomen with a T-shaped pattern with medial stripe broader and with generally limited lateral dark markings (Fig. 3C, 16C) **33**

33(32). Scutum black medially and orange-brown laterally (Fig. 16B); femora fulvous with a faint dark anterior subapical dorsal spot on fore femur; males attracted to cue-lure; (Fig. 16) . . . . . ***Bactrocera* (*Bactrocera*) *propinqua* (Hardy and Adachi)**

— Scutum orange-brown with one narrow medial and two narrow lateral black stripes connected near apex of scutum (Fig. 3B); femora entirely fulvous; males attracted to methyl eugenol; (Fig. 3) . . . . . ***Bactrocera* (*Bactrocera*) *bhutaniae* (Hardy)**

Acknowledgments

Many thanks to our great colleagues Allen Norrbom and Gary Steck for their constructive pre-submission peer reviews of the manuscript. Funding for this project was provided by the Bangladesh Atomic Energy Commission (BAEC) and the United States Department of Agriculture (USDA) Farm Bill Section 10007 Plant Pest and Disease Management and Disaster Prevention Program in support of suggestion "Genomic approaches to fruit fly exclusion and pathway analysis, 3.0497- FY19", through Cooperative Agreement FB3.0292.04: "Taxonomy of *Bactrocera* complexes FY19" with the University of Idaho's College of Agricultural and Life Sciences. We are very grateful to the Bangladesh Forest Department for its assistance during field surveys and Camiel Doorenweerd and Mike San Jose (University of Hawaii, College of Tropical Agriculture and Human Resources) for the genetic analyses that helped confirm species identifications over the years. Allen Norrbom (USDA-ARS, Systematic Entomology Laboratory) has kindly provided the specimens of *Bactrocera melania* for our study. We warmly thank Ellie Hitching for her great image editing work.

Literature Cited

Adhikari D, Tiwari DB, Joshi SL. 2018. Population dynamics of fruit flies in sweet orange (*Citrus sinensis* L.) orchards in Sindhuli, Nepal. Journal of Agriculture and Environment 19: 9–16.

Agarwal ML, Kapoor VC. 1983. Two new species of *Dacus* Fabricius (Diptera: Tephritidae) from India. Journal of Entomological Research (New Delhi) 7: 169–172.

Agarwal ML, Sueyoshi M. 2005. Catalogue of Indian fruit flies (Diptera: Tephritidae). Oriental Insects 39: 371–433.

Akhtaruzzaman M, Alam MZ, Ali-Sardar MM. 1999a. Identification and distribution of fruit flies infesting cucurbits in Bangladesh. Bangladesh Journal of Entomology 9: 93–101.

Akhtaruzzaman M, Alam MZ, Ali-Sardar MM. 1999b. Suppressing fruit fly infestation by bagging cucumber at different days after anthesis. Bangladesh Journal of Entomology 9: 103–112.

Akhter ABM, Khan SA, Akter H, Islam MS, Howlader MA. 2008. Evaluation of gamma irradiation as a quarantine treatment against the oriental fruit fly, *Bactrocera dorsalis* (Hendel). Journal of the Asiatic Society of Bangladesh, Science 34: 157–168.

Alim MA, Hossain MA, Khan M, Khan SA, Islam MS, Khalequzzaman M. 2012. Seasonal variations of melon fly, *Bactrocera cucurbitae* (Coquillett) (Diptera: Tephritidae) in different agricultural habitats of Bangladesh. ARPN Journal of Agricultural and Biological Science 7: 905–911.

Allwood AJ, Chinajariyawong A, Drew RAI, Hamacek EL, Hancock DL, Hengsawad C, Jipanin JC, Jirasurat M, Kong Krong C, Kritsaeneepaiboon S, Leong CTS, Vijaysegaran S. 1999. Host plant records for fruit flies (Diptera: Tephritidae) in South East Asia. Raffles Bulletin of Zoology. Supplement 7: 1–92.

Amin MR, Sarkar T, Chun IJ. 2011. Comparison of host plants infestation level and life history of fruit fly (*Bactrocera cucurbitae* Coquillett) on cucurbitaceous crops. Horticulture, Environment and Biotechnology 52: 541–545.

Anwar Cheema M. 1964. Taxonomic study of fruit flies of Lyallpur belonging to genus *Dacus*. Pakistan Journal of Science 16: 299–306.

Ashmead WH. 1905. Additions to the recorded hymenopterous fauna of the Philippine Islands, with descriptions of new species. Proceedings of the United States National Museum 28: 957–971.

Bezzi M. 1908. Ditteri eritrei raccolti dal Dott. Andreini e dal Prof. Tellini. Parte seconda. Diptera Cyclorrhapha. Bullettino della Societa Entomologica Italiana (Genoa) 39: 3–199.

Bezzi M. 1909. Le species dei generi *Ceratitis*, *Anastrepha* e *Dacus*. Bollettino del Laboratorio di Zoologia Generale e Agraria della Regia Scuola Superiore d'Agricoltura, Portici 3: 273–313.

Bezzi M. 1914. Two new species of fruit flies from southern India. Bulletin of Entomological research 5: 153-154.

Bezzi M. 1916. On the fruit flies of the genus *Dacus* (s.l.) occurring in India, Burma, and Ceylon. Bulletin of Entomological research 7: 99–121.

Bezzi M. 1919. Fruit flies of the genus *Dacus* sensu-latiore (Diptera) from the Philippine Islands. Philippine Journal of Science 15: 411–443.

Bezzi M. 1924. South African trypaneid Diptera in the collection of the South African Museum. Annals of the South African Museum 19: 449–577.

Bigot JMF. 1890. New species of Indian Diptera. Indian Museum Notes 1: 191–192.

Bose R, Hossain S, Khalequzzaman M, Khan SA, Hossain MA. 2021. Population fluctuation of adult males and pupal radiosensitivity of the melon fly, *Zeugodacus cucurbitae* (Coq.) (Diptera: Tephritidae). Journal of Entomology and Zoology Studies 9(2): 41-45.

Chao YS, Lin XL. 1993. Three new species of *Dacus* (Diptera: Tephritidae) from China. Entomotaxonomia 15: 137–143.

Chao YS, Lin XL. 1996. Notes on the genus *Sinodacus* Zia (Diptera: Tephritidae) with descriptions of six new species from China. Entomotaxonomia 18: 125–134.

Chen SH. 1940. Two new Dacinae from Szechwan. Sinensia 11: 131–135.

Chen X-L, Zhou L, Wang S, Li Z, Li J. 2011. A new species and record of *Bactrocera* Macquart (Diptera Tephritidae) from China. Zootaxa 3014: 59–64.

Chowdhury MK, Malapert JC, Hosanna MN. 1993. Efficiency of poison bait trap in controlling fruit fly, *Dacus cucurbitae* in bitter gourd. Bangladesh Journal of Entomology 3: 91–92.

Coquillett DW. 1899. A new trypetid from Hawaii. Entomological News 10: 129–130.

Coquillett DW. 1901. New Diptera from southern Africa. Proceedings of the United States National Museum 24: 27–32.

Coquillett DW. 1904. New Diptera from India and Australia. Proceedings of the Entomological Society of Washington 6: 137 –140.

Cotes EC. 1893. Miscellaneous notes. Indian Museum Notes 3: 1–62.

Culliney TW, Liquido NJ, McQuate GT, Hanlin MA, Tateno APK, Lee KLK, Birnbaum AL, Ching AJ, Nakamichi KA, Inskeep JR, Marnell SA. 2017. A review of recorded host plants of peach fruit fly, *Bactrocera* (*Bactrocera*) *zonata* (Saunders) (Diptera: Tephritidae), Version 1.3. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.0, https://coffhi.cphst.org/. (Last accessed March 2021.)

Curran CH. 1927. Diptera of the American Museum Congo Expedition. Part I. – Bibionidae, Bombyliidae, Dolichopodidae, Syrphidae and Trypaneidae. Bulletin of the American Museum of Natural History (New York) 57: 33–89.

David KJ, Hancock DL, Singh SK, Ramani S, Behere GT, Salini S. 2017. New species, new records and updated subgeneric key of *Bactrocera* Macquart (Diptera: Tephritidae: Dacinae: Dacini) from India. Zootaxa 4272: 386–400.

David KJ, Ramani S. 2011. An illustrated key to fruit flies (Diptera: Tephritidae) from Peninsular India and the Andaman and Nicobar Islands. Zootaxa 3021: 1–31.

David KJ, Sachin K, Hancock DL. 2020. Two new species and a record of *Dacus* (Diptera: Tephritidae) from India. Zootaxa 4743: 553–560.

Doleschall CL. 1856. Eerste bijdrage tot de kennis der dipterologische fauna van Nederlandsch Indie. Natuurkundig Tijdschrift voor Nederlandsch Indie 10: 403–414.

Doleschall CL. 1858. Derde bijdrage tot de kennis der dipteren fauna van Nederlandsch Indie. Natuurkundig Tijdschrift voor Nederlandsch Indie 17: 73–128.

Doorenweerd C, Ekayanti A, Rubinoff D. 2020. The Dacini fruit fly fauna of Sulawesi fits Lydekker's line but also supports Wallacea as a biogeographic region (Diptera, Tephritidae). ZooKeys 973: 103–122.

Doorenweerd C, Leblanc L, Hsu YF, Huang CL, Lin YC, San Jose M, Rubinoff D. 2019. Taiwan's Dacini fruit flies: rare endemics and abundant pests, along altitudinal gradients. Pacific Science 73: 35–59.

Doorenweerd C, Leblanc L, Norrbom AL, San Jose M, Rubinoff R. 2018. A global checklist of the 932 fruit fly species in the tribe Dacini (Diptera, Tephritidae). ZooKeys 730: 17–54.

Drew RAI, Hancock DL. 1994. The *Bactrocera dorsalis* complex of fruit flies (Diptera: Tephritidae: Dacinae) in Asia. Bulletin of Entomological Research. Supplement Series 2: 1–68.

Drew RAI, Hancock DL, White IM. 1998. Revision of the tropical fruit flies (Diptera: Tephritidae: Dacinae) of South East Asia. II. *Dacus* Fabricius. Invertebrate Taxonomy 12: 567–654.

Drew RAI, Raghu S. 2002. The fruit fly fauna (Diptera: Tephritidae: Dacinae) of the rainforest habitat of the Western Ghats, India. Raffles Bulletin of Zoology 50: 327–352.

Drew RAI, Romig MC. 2013. Tropical fruit flies of South-East Asia. CABI; Wallingford, UK. 655 p.

Drew RAI, Romig MC. 2016. Keys to the tropical fruit flies of South-East Asia. CABI; Wallingford, UK. 487 p.

Drew RAI, Romig MC, Dorji C. 2007. Records of Dacine fruit flies and new species of *Dacus* (Diptera: Tephritidae) in Bhutan. Raffles Bulletin of Zoology 55: 1–21.

Drew RAI, Tsuruta K, White IM. 2005. A new species of pest fruit fly (Diptera: Tephritidae: Dacinae) from Sri Lanka and Africa. African Entomology 13: 149–154.

Enderlein G. 1920. Zur Kenntnis tropischer Frucht-Bohrfliegen. Zoologische Jahrbüecher. Abteilung für Systematik, Geographie und Biologie der Tiere 43: 336–360.

Fabricius JC. 1794. Entomologia systematica emendata et aucta. Secundum classes, ordines, genera, species, adiectis, synonymis, locis, observationibus, descriptionibus. Tome 4. C.G. Proft; Copenhagen, Denmark. 472 p.

Fabricius JC. 1805. Systema antliatorum secundum ordines, genera, species, adiectis, synonymis, locis, observationibus, descriptionibus. Reichard; Brunswick, Gremany. 373 p.

Froggatt WW. 1909. Part III. Fruit flies. A general account of the flies belonging to the family Trypetidae, that damage sound fruit, with descriptions of the different species (some described as new) and their habits, range, and suggestions for destroying them. p. 73–115. In: Froggatt WW. Official report on fruit fly and other pests in various countries 1907-1908. Report on parasitic and injurious insects. New South Wales Department of Agriculture, Sydney, Australia. 115 p.

Hardy DE. 1973. The fruit flies (Tephritidae-Diptera) of Thailand and bordering countries. Pacific Insects Monograph 31: 1–353.

Hardy DE. 1974. The fruit flies of the Philippines (Diptera: Tephritidae). Pacific Insects Monograph 32: 1–266.

Hardy DE. 1982. The Dacini of Sulawesi (Diptera: Tephritidae). Treubia 28: 173–241.

Hardy DE. 1983. The fruit flies of the genus *Dacus* Fabricius of Java, Sumatra and Lombok, Indonesia (Diptera: Tephritidae). Treubia 29: 1–45.

Hardy DE, Adachi MS. 1954. Studies in the fruit flies of the Philippine Islands, Indonesia and Malaya, Part 1. Dacini (Tephritidae-Diptera). Pacific Science 8: 147–204.

Hendel FG. 1912. H. Sauter's Formosa-Ausbeute. Genus *Dacus*, Fabricius (1805) (Diptera). Supplementa Entomologica 1: 13–24.

Hendel FG. 1915. H. Sauter's Formosa-Ausbeute. Tephritinae. Annales Musei Nationalis Hunggarici 13: 424–467.

Hendel FG. 1928. Neue oder weniger bekannte Bohrfliegen (Trypetidae) meist aus dem Deutschen Entomologischen Institut Berlin-Dahlem. Entomologische Mitteilungen 17: 341–370.

Hendel FG. 1934. Schwedisch-chinesische wissenschaftliche Expedition nach den nordwestlichen Provinzen Chinas, unter Leitung von Dr. Sven Hedin und Prof. Su Ping-chang. Insekten gesammelt vom schwedischen Arzt der Expedition Dr. David Hummel 1927-1930. 13. Diptera. - 5. Muscaria holometopa. Arkivfoer Zoologi 25: 1–18.

Hossain MA, Leblanc L, Momen M, Bari MA, Khan SA. 2019. Seasonal abundance of economically important fruit flies (Diptera: Tephritidae: Dacinae) in Bangladesh, in relation to abiotic factors and host plants. Proceedings of the Hawaiian Entomological Society 51(2): 25–37.

Hossain MA, Momen M, Uddin MS, Khan SA, Howlader AJ. 2017. Abundance of peach fruit fly, *Bactrocera zonata* (Saunders) in mango orchard. Bangladesh Journal of Entomology 27(2): 25–34.

Huque R. 2006. Comparative studies of the susceptibility of various vegetables to *Bactrocera tau* (Diptera: Tephritidae). Pakistan Journal of Biological Science 9: 93–95.

Kabir SMH, Rahman R, Molla MAS. 1991. Host plants of dacine fruit flies (Diptera: Tephritidae) of Bangladesh. Bangladesh Journal of Entomology 1: 69–75.

Kabir SMH, Rahman R, Molla MAS. 1997. Biology of *Dacus* (*Zeugodacus*) *tau* Walker (Tephritidae: Diptera). Bangladesh Journal of Zoology 25: 115–120.

Kapoor VC. 1971. Four new species of fruit flies (Tephritidae) from India. Oriental Insects 5: 477–482.

Kapoor VC, Katiyar KN. 1969. New record of *Melanodacus* Perkins, a subgenus of *Dacus* Fabricius, with description of its new species (Dacinae: Tephritidae). Bulletin of Entomology 10: 123–125.

Khan M. 2009. First record of fruit fly, *Dacus longicornis* Wiedemann (Diptera: Tephritidae) from Bangladesh. Insect Pest Control Newsletter 72: 33.

Khan M, Leblanc L, Bari MA, Vargas RI. 2015. First record of the fruit fly *Bactrocera* (*Bactrocera*) *nigrofemoralis* White & Tsuruta (Diptera: Tephritidae) in Bangladesh. Journal of Entomology and Zoology Studies 3: 387–389.

Leblanc L, Bhandari BP, Aryal LN, Bista S. 2019a. New country records and annotated checklist of the Dacine fruit flies (Diptera: Tephritidae: Dacini) of Nepal. Proceedings of the Hawaiian Entomological Society 51(2): 39–46.

Leblanc L, Doorenweerd C, San Jose M, Pham HT, Rubinoff D. 2018a. Descriptions of four new species of *Bactrocera* and new country records highlight the high biodiversity of fruit flies in Vietnam (Diptera, Tephritidae, Dacinae). Zookeys 797: 87–115.

Leblanc L, Doorenweerd C, San Jose M, Sirisena UGAI, Hemachandra KS, Rubinoff D. 2018b. Description of a new species of *Dacus* from Sri Lanka (Diptera, Tephritidae, Dacinae), and new country distribution records. Zookeys 795: 105–114.

Leblanc L, Fay H, Sengebau F, San Jose M, Rubinoff, D, Pereira R. 2015a. A survey of fruit flies (Diptera: Tephritidae: Dacinae) and their Opiine parasitoids (Hymenoptera: Braconidae) in Palau. Proceedings of the Hawaiian Entomological Society. 47: 55–66.

Leblanc L, Hossain MA, Doorenweerd C, Khan SA, Momen M, San Jose M, Rubinoff D. 2019b. Six years of fruit fly surveys in Bangladesh: a new species, 33 new country records and recent discovery of the highly invasive *Bactrocera carambolae* (Diptera, Tephritidae). Zookeys 876: 87–109.

Leblanc L, Hossain MA, Khan SA, San Jose M, Rubinoff D. 2013. A preliminary survey of the fruit flies (Diptera: Tephritidae: Dacinae) of Bangladesh. Proceedings of the Hawaiian Entomological Society 45: 51–58.

Leblanc L, Hossain MA, Khan SA, San Jose M, Rubinoff D. 2014. Additions to the fruit fly fauna (Diptera: Tephritidae: Dacinae) of Bangladesh, with a key to the species. Proceedings of the Hawaiian Entomological Society 46: 31–40.

Leblanc L, San Jose M, Barr N, Rubinoff D. 2015b. A phylogenetic assessment of the polyphyletic nature and intraspecific color polymorphism in the *Bactrocera dorsalis* complex (Diptera, Tephritidae). p. 339–367. In: De Meyer M, Clarke AR, Vera MT, Hendrichs J (eds.). Resolution of Cryptic Species Complexes of Tephritid Pests to Enhance SIT Application and Facilitate International Trade. ZooKeys 540: 1–558.

Leblanc L, San Jose M, Wright MG, Rubinoff D. 2016. Declines in biodiversity and the abundance of pest species across land use gradients in Southeast Asia. Landscape Ecology 31: 505–516.

Liang GQ, Hancock DL, Xu W, Liang F. 1993. Notes on the Dacinae from southern China (Diptera: Tephritidae). Journal of the Australian Entomological Society 32: 137–140.

Lin M-G, Wang X-J, Zeng L. 2011. Three new species of the genus *Bactrocera* Macquart (Diptera, Tephritidae) from Hainan, China. Acta Zootaxonomica Sinica 36: 896–900.

Liquido NJ, Hanlin MA. 2021. Host plant records of *Zeugodacus caudatus* (Fabricius) (Diptera: Tephritidae), Version 1.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), https://coffhi.cphst.org/. (Last accessed March 2021.)

Liquido NJ, Lee KALK, Santamaria J, Nakamichi KAA. 2019. Host plant records of the three striped fruit fly, *Zeugodacus diversus* (Coquillett) (Diptera: Tephritidae), Version 1.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 4.1, https://coffhi.cphst.org/. (Last accessed March 2021.)

Liquido NJ, Marnell SA, Hanlin MA, Ayson KG, Kurashima RS, Montoya JE. 2020. Provisional list of host plants of guava fruit fly, *Bactrocera* (*Bactrocera*) *correcta* (Bezzi) (Diptera: Tephritidae), Version 2.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), https://coffhi.cphst.org/. (Last accessed March 2021.)

Liquido NJ, McQuate GT, Birnbaum AL, Hanlin MA, Nakamichi KA, Inskeep JR, Ching AJF, Marnell SA, Kurashima RS. 2021. A review of recorded host plants of the oriental fruit fly, *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae), Version 4.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), https://coffhi.cphst.org/. (Last accessed March 2021.)

Liquido NJ, McQuate GT, Nakamichi KA, Kurashima RS, Birnbaum AL, Hanlin MA. 2016b. Provisional list of suitable host plants of carambola fruit fly, *Bactrocera* (*Bactrocera*) *carambolae* Drew & Hancock (Diptera: Tephritidae), Version 1.1. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.0, https://coffhi.cphst.org/. (Last accessed March 2021.)

Liquido NJ, Norrbom AL, McQuate GT, Ching AJ, Marnell SA, Birnbaum AL, Inskeep JR, Hanlin MA, Nakamichi KA. 2016a. Host plant records of *Bactrocera* (*Zeugodacus*) *tau* complex (Diptera: Tephritidae), Version 1.1. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.0, https://coffhi.cphst.org/. (Last accessed March 2021.)

Loew H. 1862. Bidrag till kannedomen om Afrikas Diptera. Ofversigt af Finska Vetenskaps-Akademiens Forhandlingar, Stockholm 19: 3–14.

McQuate GT, Liquido NJ. 2016. Provisional list of suitable host plants of *Bactrocera* (*Bactrocera*) *latifrons* (Hendel) (Diptera: Tephritidae), Version 1.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.0, https://coffhi.cphst.org/. (Last accessed March 2021.)

McQuate GT, Liquido NJ, Nakamichi KA. 2016. Provisional list of suitable host plants of the melon fly, *Bactrocera* (*Zeugodacus*) *cucurbitae* (Coquillett) (Diptera: Tephritidae), Version 2.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.0, https:// coffhi.cphst.org/. (Last accessed March 2021.)

McQuate GT, Liquido NJ, Nakamichi KAA. 2018. Host plant records of the lesser pumpkin fly, *Dacus ciliatus* Loew (Diptera: Tephritidae), Version 1.0. Available at USDA Compendium of Fruit Fly Host Information (CoFFHI), Edition 3.1, https://coffhi.cphst.org/. (Last accessed March 2021.)

McQuate GT, Peck SL. 2001. Enhancement of attraction of alpha-ionol to male *Bactrocera latifrons* (Diptera: Tephritidae) by addition of a synergist, cade oil. Journal of Economic Entomology 94: 39–46.

Meijere JCH. 1911. Studien uber sudostasiatische Dipteren. VI. Tijdschrift voor Entomologie 54: 258–432.

Molla MAS, Rahman R, Kabir SMH. 2000. Life history pattern and seasonal prevalence of *Dacus* (*Hemigymnodacus*) *diversus* Coq. (Tephritidae: Diptera). Bangladesh Journal of Zoology 28: 27–32.

Munro HK. 1925. Biological notes on South African Trypaneidae (fruit-flies). – I. Entomology Memoirs. Union of South Africa. Department of Agriculture 3: 40–67.

Norrbom AL, Carroll LE, Thompson FC, White IM, Freidberg A. 1999. Systematic Database of Names. p. 65–251. In: Thompson FC (ed.). Fruit fly expert identification system and systematic information database. Myia (1998) Vol. 9, 524 p., and Diptera Data Dissemination Disk (CD-ROM) (1998) 1.

Perkins FA. 1938. Studies in oriental and Australian Trypaenidae. – Part II. Adraminae and Dacinae from India, Ceylon, Malaya, Sumatra, Java, Borneo, Philippine Islands, and Formosa. Proceedings of the Royal Society of Queensland 49: 120–144.

Philip A. 1950. Description of one new species of *Strumeta* Walker (Trypetidae: Diptera) from Burma and a record of one far-eastern species of the genus from India. Indian Journal of Entomology 10: 31–32.

Premlata, Singh A. 1987. A new species of genus *Dacus* Fabricius (Tephritidae: Diptera) from India. Journal of the Bombay Natural History Society 84: 401–404.

Radhakrishnan C. 1999. A new species of *Bactrocera* Macquart (Diptera: Tephritidae: Dacinae) from Southern India. Records of the Zoological Survey of India 97: 1–4.

Royer JE, Khan M, Mayer DG. 2018. Methyl-isoeugenol, a highly attractive male lure for the cucurbit flower pest *Zeugodacus diversus* (Coquillett) (syn. *Bactrocera diversa*) (Diptera: Tephritidae: Dacinae). Journal of Economic Entomology 111: 1197–1201.

Saunders WW. 1842. Descriptions of four new dipterous insects from central and northern India. Transactions of the Entomological Society of London 3: 59–61.

Sharma DR, Adhikari D, Tiwari DB. 2015. Fruit fly surveillance in Nepal. Agricultural and Biological Sciences Journal 1: 121–125.

Shiraki, T. 1933. A systematic study of Trypetidae in the Japanese Empire. Memoirs of the Faculty of Science and Agriculture, Taihoku Imperial University 8 (Entomol. 2) 509 p.

Tseng YH, Chen CC, Chu YI. 1992. The fruit flies. Genus *Dacus* Fabricius of Taiwan (Diptera: Tephritidae). Journal of Taiwan Museum 45: 15–91.

Tseng YH, Chu YI. 1982. A new fruit fly from Taiwan (Diptera: Tephritidae). Chinese Journal of Entomology 2: 85–90.

Tsuruta K, White IM. 2001. Eleven new species of the genus *Bactrocera* Macquart (Diptera: Tephritidae) from Sri Lanka. Entomological Science 4: 69–87.

Uddin MS, Reza MH, Hossain MM, Hossain MA, Islam MZ. 2016. Population fluctuation of male oriental fruit fly, *Bactrocera dorsalis* (Hendel) in a mango orchard of Chapainawabganj. International Journal of Experimental Agriculture 6: 1–3.

Vargas RI, Pinero JC, Leblanc L. 2015. An overview of pest species of *Bactrocera* fruit flies (Diptera: Tephritidae) and the integration of biopesticides with other biological approaches for their management with a focus on the Pacific region. Insects 6: 297–318.

Walker F. 1849. List of the specimens of dipterous insects in the collection of the British Museum. Part IV. British Museum (Natural History), London. p. 689–1172.

Walker F. 1860. Catalogue of the dipterous insects collected at Makessar in Celebes, by Mr. A.R. Wallace, with descriptions of new species [conclusion]. Journal of Proceedings of the Linnean Society. Zoology. London 4: 90–172.

Walker F. 1861. Characters of undescribed Diptera in the collection of W. W. Saunders, Esq., F.R.S. &c. Transactions of the Entomological Society of London 5: 297–334.

Walker F. 1871. List of Diptera collected in Egypt and Arabia, by J.K. Lord, Esq., with descriptions of the species new to science [concl.]. Entomologist 5: 339–346.

Wang X-J. 1988. A study on Chinese *Sinodacus* Zia with description of new species (Diptera: Tephritidae). Sinozoologia 6: 292–296.

Wang X-J. 1990. Notes on six new species of the genus *Callantra* from China (Diptera: Tephritidae). Acta Zootaxonomica Sinica 15: 67–76.

Wang, X-J, Xiao S, Chen X-L, Long R, Zhang C-L. 2008. Two new species of the genus *Bactrocera* Macquart (Diptera, Tephritidae) from Yunnan, China. Acta Zootaxonomica Sinica 33: 73–76.

Wang X-J, Zhao M-Z. 1989. Notes on the genus *Dacus* Fabricius in China with descriptions of five new species (Diptera: Tephritidae). Acta Zootaxonomica Sinica 14: 209–219.

White IM, Hancock DL. 1997. CAB1KEY to the Dacini (Diptera: Tephritidae) of the Asia-Pacific-Australasian Regions. CAB International, Wallingford, UK, CD-ROM.

Wiedemann CRW. 1830. Aussereuropaische Zweiflugelige Insekten. Vol. 2. Schulz; Hamm, Germany. 684 p.

Zhang N-N, Ji Q-E, Chen J-H. 2011. Three new species and one new record of genus *Bactrocera* Macquart (Diptera, Tephritidae) from Yunnan, China. Acta Zootaxonomica Sinica 36: 598–603.

Zia Y. 1936. New Diptera Trypetidae from Hainan. Chinese Journal of Zoology 2: 157–161.

Received May 24, 2021; accepted July 28, 2021.
Review editor Erick Rodriguez.