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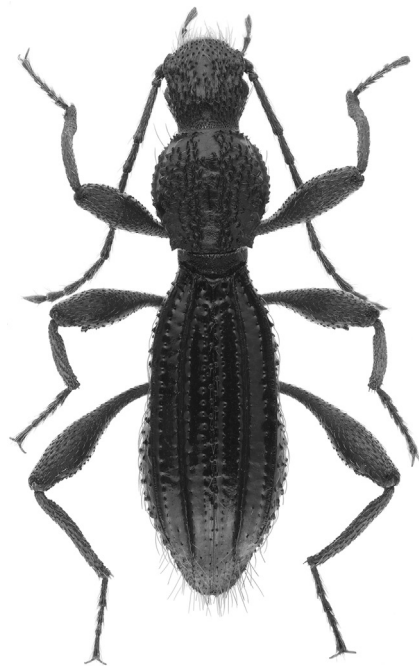


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Four new species and new records of *Thinophilus* Wahlberg, 1844 (Diptera: Dolichopodidae) from Iranian mangroves with a key to the species known from Iran

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Abstract. Four new long-legged fly species, *Thinophilus albihirtus* sp. n., *Thinophilus albisetosus* sp. n., *Thinophilus nigrihirtus* sp. n., and *Thinophilus qeshmensis* sp. n., from southern Iran, all collected in or near the mangrove forests, are described and illustrated. Four more species of the genus are collected from the same localities. Polyzoal *T. indigenus* Becker, 1902 is found in the Fars Province. Three known species are firstly recorded from Iran (*T. deemingi* Grichanov, 2023, *T. gallagheri* Grichanov, 2023 and *T. ochripalpis* Becker, 1910). The Iranian species are considered members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and *T. indigenus* lineage distributed widely in the Old World. A check-list and identification key to males of 12 species known from Iran are provided.

Key words: Hydrophorinae, *Thinophilus*, new species, Palearctic, Bushehr, Fars, Hormozgan, Sistan and Baluchestan.

Четыре новых вида и новые указания *Thinophilus* Wahlberg, 1844 (Diptera: Dolichopodidae) из иранских мангровых лесов с определителем видов из Ирана

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Резюме. Даны описания и иллюстрации четырех новых видов мух-зеленушек, *Thinophilus albihirtus* sp. n., *Thinophilus albisetosus* sp. n., *Thinophilus nigrihirtus* sp. n. и *Thinophilus qeshmensis* sp. n., из Южного Ирана, все собраны в мангровых лесах или рядом с ними. Еще четыре вида рода собраны в тех же стациях. Полизоальный *T. indigenus* Becker, 1902 обнаружен в провинции Фарс. Три известных вида впервые зарегистрированы в Иране (*T. deemingi* Grichanov, 2023, *T. gallagheri* Grichanov, 2023 и *T. ochripalpis* Becker, 1910). Иранские виды считаются членами одной группы ориентальных (группа *T. murphy*), двух групп афротропических видов (*T. gallagheri* и *T. calopus*) и линии *T. indigenus*, широко распространенной в Старом Свете. Приведен список и определительная таблица самцов 12 видов, известных из Ирана.

Ключевые слова: Hydrophorinae, *Thinophilus*, новые виды, Палеарктика, Бушер, Фарс, Хормозган, Систан и Белуджистан.

Introduction

The Palearctic, Afrotropical and western Oriental species of the genus *Thinophilus* Wahlberg, 1844 (subfamily Hydrophorinae) were recently reviewed, and regional identification keys were compiled [Negrobov et al., 2016; Grichanov, 2022, 2023a, b]. Now about 160 species are known from all realms worldwide [Grichanov, 2017, 2023a, b]. The genus is very diverse at mangroves and salt lakes along the Indian Ocean coast, but yet unknown from Iran close Persian and Oman gulfs of the Arabian Sea. Only five species of *Thinophilus* widely distributed in the Old World were known from Iranian inland [Grichanov, Gilasian, 2023a]. Unfortunately, exact collection localities were usually not provided in old literature.

Eight species including four new species of this hydrophorine genus collected from Iranian mangroves have been found in the collection of the Hayk Mirzayans Insect Museum (HMIM), Iranian Research Institute of Plant Protection (IRIPP, Tehran, Iran). They are considered

members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and the *T. indigenus* lineage distributed widely in the Old World. A list and identification key to males of 12 species from Iran are provided.

Material and methods

The paper is based on the material found in the HMIM collection that will be deposited in HMIM and the Zoological Institute of the Russian Academy of Sciences (ZISP, St Petersburg, Russia). All specimens are mounted on pins.

Specimens have been studied and photographed with a ZEISS SteREO Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera. The preparations of the male genitalia were photographed with a ZEISS Axiostar stereo microscope and an AxioCam ICc3 camera. The measurement accuracy of these microscopes is 0.01 mm. Morphological terminology and abbreviations follow

Cumming and Wood [2017] and Grichanov and Brooks [2017]. The lengths of the antennomeres and podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Wing length is measured from the base to the wing apex. Antenna length is measured from the base of the scape to the tip of the arista-like stylus. The figures showing the hypopygium in lateral view are oriented as it appears on the intact specimen, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left. References with only Iranian records are provided for known species.

Genus *Thinophilus* Wahlberg, 1844

Thinophilus Wahlberg, 1844: 37. Type species: *Rhaphium flavipalpe* Zetterstedt, 1843 (monotypy).

Note. See diagnosis and discussion on species groups in Negrobov [1979], Grootaert [2018] and Grichanov [2023b]. Species known from Iran are listed below.

Thinophilus argyropalpis Becker, 1907

Becker, Stein, 1913: 597 (female).

Material. Iran: 1♂ (HMIM), Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap, 15.05.2022 (M. Mofidi, A. Hajiesmalian).

Type locality. Egypt: Port Said.

Distribution. Afrotropical: Senegal. The species is known from Algeria, Tunisia, Egypt; Ukraine (Odessa), Russia (Volgograd); Iraq, Saudi Arabia, Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, and Mongolia. Iran (Hormozgan, Sistan and Baluchestan: "Kirman, Chousdar, Gurmuk" (between Hamun Lake and Taftan volcano)); first record from Hormozgan Province and second record from Iran.

Thinophilus deemingi Grichanov, 2023

Material. Iran: 1♂, 1♀ (HMIM, ZISP), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap, 30.10–2.11.2021 (E. Gilasian); 3♂ (HMIM, ZISP), Hormozgan Prov., Qeshm Island, Kovarzin, 26°48'39"N / 56°46'38"E, 0 m, yellow pan trap, 3–4.11.2021 (E. Gilasian); 1♂ (HMIM), Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian); 1♀ (HMIM), Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, 27°24'07"N / 52°40'9.0"E, –10 m, yellow pan trap, 6–8.11.2021 (E. Gilasian); 6♂, 3♀ (HMIM), Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

Type locality. Oman: "Muscat, Qurum Beach".

Distribution. Afrotropical: Oman. First record from the Palaearctic Region and Iran (Bushehr, Hormozgan, Sistan and Baluchestan).

Thinophilus flavipalpis (Zetterstedt, 1843)

Grichanov et al., 2017: 106.

Type locality. Sweden: Gottlandia, Bursviken.

Distribution. Trans-Palaearctic species. Iran (Markazi: Kavir-e Meighan Lake).

Thinophilus gallagheri Grichanov, 2023

Material. Iran: 1♂, 2♀ (HMIM, ZISP), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap,

30.10–2.11.2021 (E. Gilasian); 2♂, 1♀ (HMIM), Hormozgan Prov., Qeshm Island, Kovarzin, 26°48'39"N / 56°46'38"E, 0 m, yellow pan trap, 3–4.11.2021 (E. Gilasian); 3♂, 1♀ (HMIM), Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap, 15.05.2022 (M. Mofidi, A. Hajiesmalian); 2♂ (in ethanol; ZISP): Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

Type locality. Oman: "Shinass".

Distribution. Afrotropical: Oman. Palaearctic: Iran (Hormozgan, Sistan and Baluchestan). First record from Iran.

Thinophilus indigenus Becker, 1902

Becker, Stein, 1913: 596 ("Bampur"); Negrobov, 1971: 904 ("Baluchestan"); Rezaei et al., 2019: 9 (as *Thinophilus* sp.).

Material. Iran: 1♂ (ZISP), Fars Prov., Larestan, 27°31'55.4"N / 54°26'1.36"E, 30.03–9.04.2018 (S. Rezaei).

Type locality. Egypt: Kairo, Assiur, Luxor, Assuan, Fayum, and Suez.

Distribution. Palaearctic: Morocco, Algeria, Egypt, Turkey, Israel, Saudi Arabia, Mongolia. Oriental and Afrotropical regions. Iran (Fars; Sistan and Baluchestan: Bampur); first record from Fars Province of Iran.

Thinophilus ochripalpis Becker, 1910

Material. Iran: 1♂ (ZISP), Hormozgan Prov., Bandar-e Khamir to Bandar-e Lenge rd., Sayeh Khosh, next to hand planted Mangrove trees, 26°47'4.0"N / 55°21'17"E, 1.11.2021, 0 m, light trap (E. Gilasian); 2♂, 2♀ (HMIM), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, Malaise trap, 30.10–2.11.2021 (E. Gilasian); 1♂ (HMIM), Hormozgan Prov., Sirik, Azini wharf, 26°19'39.9"N / 057°06'15.7"E, 0 m, pan trap, 13.05.2022 (M. Mofidi, A. Hajiesmalian); 7♂, 2♀ (HMIM), Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, 27°24'07"N / 52°40'9.0"E, –10 m, yellow pan trap, 6–8.11.2021 (E. Gilasian).

Type locality. South Yemen: "von Aden, Makallaebene".

Distribution. Afrotropical: Tanzania, Somalia, Yemen, Oman. Palaearctic: Saudi Arabia. Iran (Bushehr, Hormozgan); first record from Iran.

Thinophilus quadrimaculatus Becker, 1902

Becker, Stein, 1913: 596; Negrobov, 1979: 432.

Type locality. Egypt: Cairo.

Distribution. The species is known from Algeria, Tunisia, Egypt, Israel, and Tadjikistan. Iran (Sistan and Baluchestan: "Kirman, Basman [= Bazman] über Farra und nach Bampur").

Thinophilus spinatarsis Becker, 1907

Becker, Stein, 1913: 597 (females).

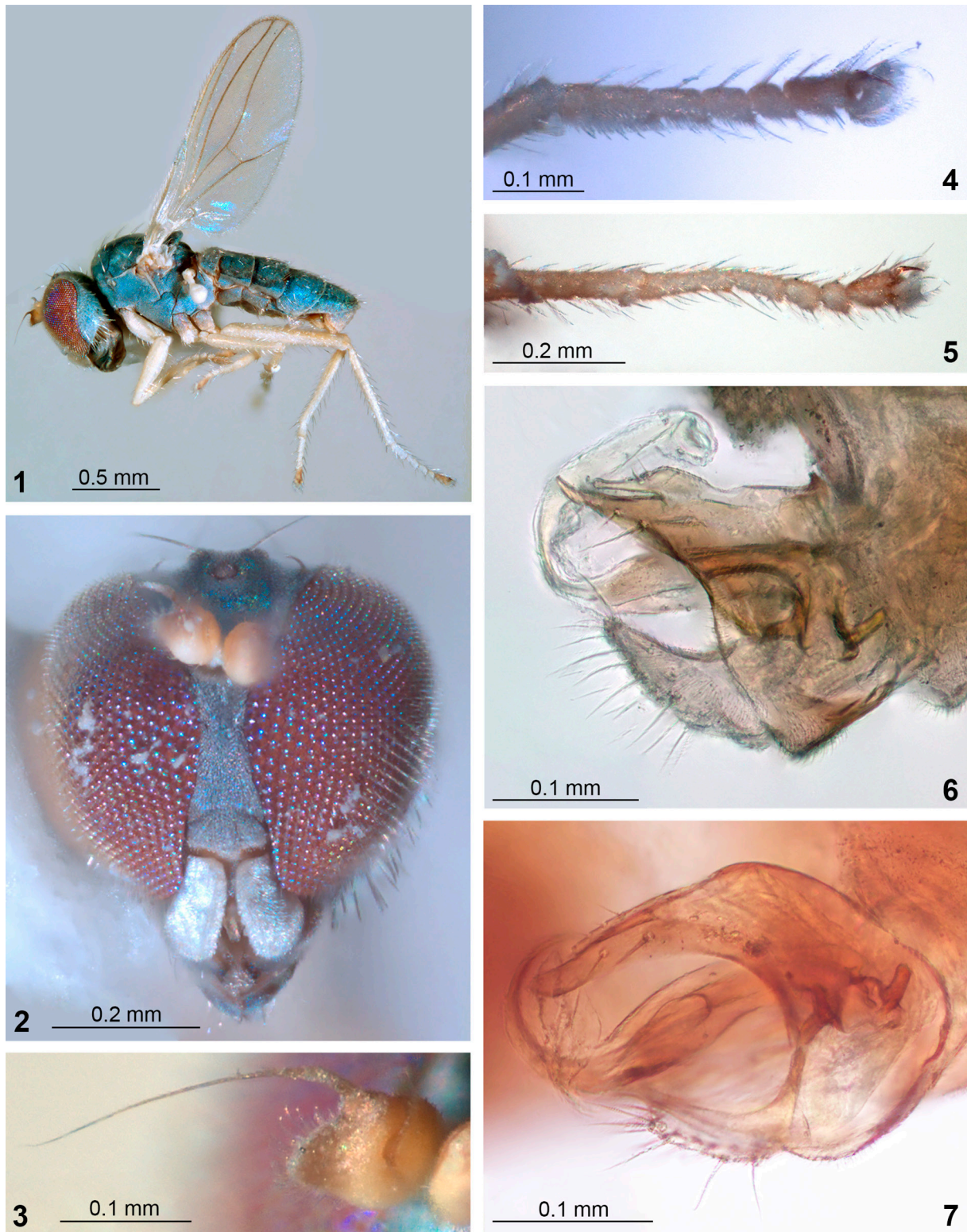
Type locality. China: "O. Zaidam, im nord-Osu; Tibet, Kurlyk am Fl. Baingol".

Distribution. The species is known from Russia (Kherson), Israel, Turkmenistan, Tajikistan, China (Tibet). Afrotropical: Senegal. Oriental: India (Gujarat), China (Taiwan). Iran (Sistan and Baluchestan: "Kirman, von Ssargad").

Thinophilus albisetosus sp. n.

(Figs 1–7)

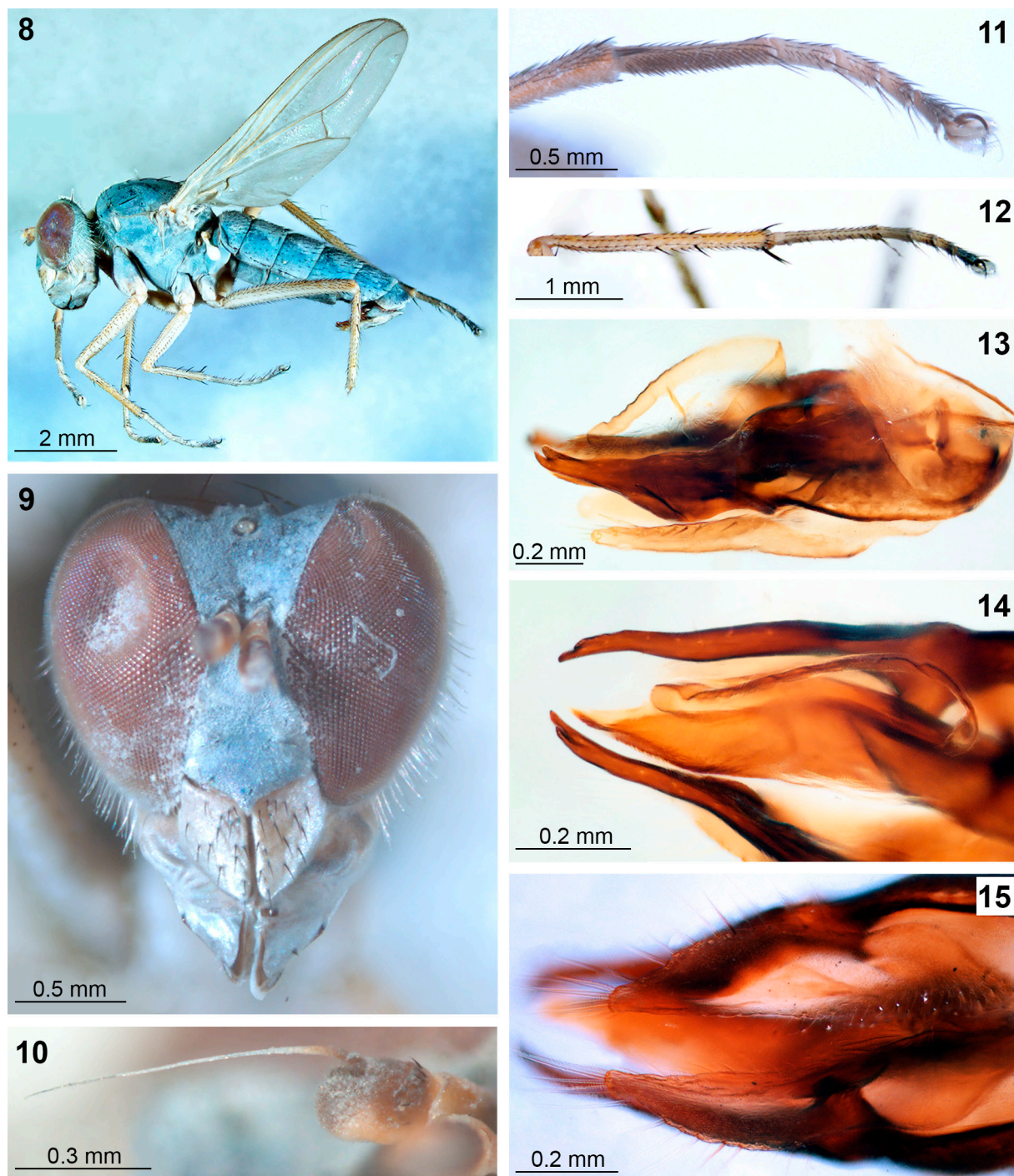
Material. Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap,



Figs 1–7. *Thinophilus albisetosus* sp. n., male, paratype, general view and details of structure. 1 – habitus; 2 – head; 3 – antenna; 4 – fore tarsus; 5 – mid tarsus; 6 – hypopygium after maceration, lateral view; 7 – hypopygium after maceration, ventral-lateral view.

Рис. 1–7. *Thinophilus albisetosus* sp. n., самец, паратип, общий вид и детали строения.

1 – внешний вид; 2 – голова; 3 – усик; 4 – передняя лапка; 5 – средняя лапка; 6 – гипопигий после размачивания, сбоку; 7 – гипопигий после размачивания, снизу-сбоку.



Figs 8–15. *Thinophilus qeshmensis* sp. n., male, paratype, general view and details of structure.

8 – habitus; 9 – head; 10 – antenna; 11 – fore tarsus; 12 – mid tibia and tarsus; 13 – hypopygium after maceration, lateral view; 14 – phallosome and surstylus, ventral view; 15 – cerci, dorsal view.

Рис. 8–15. *Thinophilus qeshmensis* sp. n., самец, паратип, общий вид и детали строения.

8 – внешний вид; 9 – голова; 10 – усик; 11 – передняя лапка; 12 – средняя голень и лапка; 13 – гипопигий после размачивания, сбоку; 14 – фаллосома и сурстиль, снизу; 15 – церки, сверху.

15.05.2022 (M. Mofidi, A. Hajiesmalian). Paratypes: 2♂ (HMIM, ZISP), same data as for holotype; 1♂ (ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

Additional material. 3♀ (HMIM, ZISP), same data as for holotype.

Diagnosis. *Thinophilus albisetosus* sp. n. and *T. gallagheri* are remarkable in bearing only whitish yellow bristles and setae on body and legs, differing from all other Old World species bearing black major bristles. The new species differs from the latter in narrow male face, not wider than height of postpedicel, which is subtriangular, nearly as high as long (8/9), with basodorsal arista-like stylus. *Thinophilus gallagheri* male has broad face, nearly 2 times as wide as height of postpedicel, which is rounded, higher than long (12/9), with nearly apical arista-like stylus.

Description. Male (Fig. 1). Length (mm): body 1.8, antenna 0.4, wing 1.6/0.6. Head (Fig. 2) with all bristles yellowish white; postcranium and frons greenish blue, white pollinose; face black, densely white pollinose, narrow under antenna, not wider than height of postpedicel, broad at clypeus; clypeus broad, 2 times wider than face; palp yellow, bearing yellow bristly hairs; proboscis black; 2 diverging ocellars; 1 strong vertical, 1 postvertical, nearly as long as vertical, stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate; middle and lower postoculars biseriate, slightly longer than upper postoculars; antenna (Fig. 3) yellow, darkened at apex of postpedicel; scape small; pedicel simple, convex on inner side; postpedicel subtriangular, pubescent, nearly as high as long (8/9); arista-like stylus basodorsal, brown, thick basally, thin distally, microscopically pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.04 : 0.04 : 0.09 : 0.04 : 0.21.

Thorax greenish blue, weakly grey pollinose, with all bristles yellowish white; no acrostichals; 4 dorsocentrals of almost equal length and 2 hair-like setae anteriorly; scutellum with 2 strong marginals; no laterals; 2 lower propleural setae of different length.

Legs almost entirely light yellow, with all bristles and setae yellowish white; mid and hind coxae mostly black, segment 5 of all tarsi brown; claws black. Fore leg with long setulae; coxa with setae and bristles; femur simple, with 2 ventral rows of bristles, nearly as long as femur height; tibia and tarsus simple, without strong bristles; tarsal segment 5 weakly flattened and widened (Fig. 4); length of fore femur, tibia and tarsal segments (in mm): 0.48 : 0.39 : 0.11 : 0.05 : 0.05 : 0.05 : 0.08. Mid leg with long setulae; coxa with setae; femur with ventral rows of setae, about as long as femur height; tarsal segment 5 weakly flattened and widened (Fig. 5); length of mid femur, tibia and tarsal segments (in mm): 0.47 : 0.52 : 0.13 : 0.08 : 0.06 : 0.06 : 0.06. Hind leg with long setulae; coxa with 1 exterior bristle; femur with ventral and dorsal rows of setae, about as long as femur height; tibia with row of long dorsals; tarsal segment 5 weakly flattened and widened; length of hind femur, tibia and tarsal segments (in mm): 0.73 : 0.62 : 0.11 : 0.08 : 0.06 : 0.04 : 0.09.

Wing (Fig. 1) hyaline; veins yellow; distal part of M_{1+2} gently sinuate; R_{4+5} and M_{1+2} convergent distally, parallel at apex; ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2} (in mm), 0.26 : 0.09; crossvein dm-m straight; ratio of dm-m to distal part of M_4 , 0.14 : 0.28; anal vein fold-like; halter yellow; lower calypter yellow, with white cilia.

Abdomen blue black, grey pollinose, with all setae and bristles yellowish white, short; sternites with short setae. Hypopygium (Fig. 6) black, appendages light brown; epandrial lobe broad in basal half, narrow in distal half, with row of 4 short setae decreasing in length distally; hypandrium reduced, apically concave; phallosome broad, reaching apex of surstyli; phallus coiled, long and band-like; surstylus fingerlike, with strong dorsal bristle at base, few short setae distally (Fig. 7); cerci separated, dorsally adjoined at base, short, ovate, with long light bristles.

Female. Similar to male except lacking male secondary sexual characters.

Distribution. Iran.

Etymology. From Latin "albus", "seta" (white-bristled).

Thinophilus qeshmensis sp. n.

(Figs 8–15)

Material. Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian). Paratypes: 1♂, 2♀ (HMIM, ZISP), same data as for holotype; 2♂, 2♀ (HMIM, ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

Diagnosis. *Thinophilus qeshmensis* sp. n. is close in habitus to the Afrotropical *T. quadrisetus* group [Grichanov, 2023b] and the Oriental *T. murphy* group of species [Grootaert, 2018]. The new species differs from Afrotropical species in black (vs yellow) bristly hairs on palps. It differs from species of the *T. murphy* group in short simple setation on legs and two pairs of nearly equal in length bristles on scutellum. Males of the *T. murphy* group bear remarkable ornamentation on legs and much shorter laterals on scutellum in comparison with strong major bristles.

Description. Male (Fig. 8). Length (mm): body 7.9, antenna 1, wing 5.8/1.8. Head (Fig. 9): postcranium, frons and face greenish blue, grey pollinose; face under antennae nearly 2 times as wide as height of postpedicel, broader at clypeus; clypeus about 3/5 as long as epistome, about 2 times wider than long; palp yellow, bearing black bristly hairs; proboscis black; 2 diverging ocellars; 1 vertical, 1 postvertical, much stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate, black; middle and lower postoculars multiseriate, white, long; antennal scape yellow, pedicel blackish dorsally, yellow ventrally, postpedicel black dorsally and apically (Fig. 10); pedicel simple, convex on inner side; postpedicel rounded, with microscopic pubescence, slightly longer than high (23/19); arista-like stylus dorsal, black and thick basally, whitish and thin distally, microscopically pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.16 : 0.11 : 0.23 : 0.06 : 0.71.

Thorax metallic greenish blue, grey dusted; no acrostichals; 6 dorsocentrals decreasing in length anteriorly; scutellum with 2 strong marginals and 2 strong laterals, nearly as long as marginals; about 15 upper and about 10 lower, long fine white propleural bristles of different length.

Legs: mostly yellow; coxae black in basal half, yellow in apical half; tarsi black from tip of segment 4. Fore leg: coxa with short black setae; femur simple, with short setulae; tibia bearing 2 anterodorsal, 3 posterodorsal and 4–5 apical short setae, glabrous anteriorly on distal 1/3; basitarsus densely covered with short simple setulae anteroventrally; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorsoventrally (Fig. 11); length of femur, tibia and tarsal segments (in mm): 1.91 : 1.71 : 0.78 : 0.33 : 0.26 : 0.23 : 0.29. Mid leg: coxa with rather short black setae and setulae; femur with very short setae and setulae; 1 preapical posteroventral; tibia bearing 3 anterodorsal, 2 ventral short bristles, 5 apicals; tarsal segments 1–4 ventrally with short setae; segment 5 slightly flattened dorso-ventrally (Fig. 12); length of femur, tibia and tarsal segments (in mm): 2.02 : 2.35 : 0.99 : 0.29 : 0.24 : 0.22 : 0.26. Hind leg: coxa with 1 short black exterior bristle; femur ventrally without remarkable setae; 2 anterodorsal bristles; tibia bearing 3 anterodorsal, 4 posterodorsal bristles, no ventrals, 3 apicals; tarsal segments 1–4 ventrally with short setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 3.14 : 2.82 : 0.62 : 0.54 : 0.35 : 0.28 : 0.29.

Wing (Fig. 8) hyaline, without darker shades; veins yellow-brown, more yellowish at base; distal part of M_{1+2} sinuate; tip of

R_{4+5} parallel with M_{1+2} ; ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2} (in mm), 0.62 : 0.38; crossvein dm-m almost straight; ratio of dm-m to distal part of M_4 , 0.55 : 0.49; anal vein distinct; halter yellow; lower calypter yellow, with white cilia.

Abdomen metallic greenish blue, grey dusted; setae and hind-marginal bristles on tergites black, short; sternites with sparse short black setulae. Hypopygium (Fig. 13) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, narrow at apex, reaching apex of surstyli (Fig. 14); phallus coiled, long and band-like; surstylus straight, broad in basal half (lateral view), narrow in distal half, cleft at apex, with minute setae (Fig. 14); cerci separated, elongate-ovate, with long marginal bristles (Fig. 15).

Female. Similar to male except lacking male secondary sexual characters.

Distribution. Iran.

Etymology. The species is named after the Qeshm Island, where the holotype was collected.

Thinophilus albihirtus sp. n.
(Figs 16–23)

Material. Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap, 30.10–2.11.2021 (E. Gilasian). Paratypes: 3♂ (ZISP), same data as for holotype; 6♂ (HMIM, ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Tis, 25°24'27.4"N / 60°37'48.8"E, 0 m, light trap, 17.05.2022 (M. Mofidi, A. Hajiesmalian).

Additional material. 4♀ (HMIM), Iran, Sistan and Baluchestan Prov., Chabahar, Tis, 25°24'27.4"N / 60°37'48.8"E, 0 m, light trap, 17.05.2022 (M. Mofidi, A. Hajiesmalian); 1♀ (HMIM), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

Diagnosis. *Thinophilus albihirtus* sp. n. along with *T. nigrihirtus* sp. n. may be included into the rather loose Afrotropical and Palaearctic *T. ochripalpis* species group of large *T. indigenus* lineage [Grichanov, 2023b]. The new species differs from other species of the *T. ochripalpis* group in strongly sinuate distal section of wing vein M_{1+2} ; tarsal segments 1–4 each with 2 apicoventral setae, as long as or longer than next segment; mostly yellow tarsi, with only tarsal segment 5 mostly black; bilobate surstylus. Males of other species of the *T. ochripalpis* group have straight or inconspicuously sinuate distal section of wing vein M_{1+2} ; tarsal segments 1–4 with short apicoventral setulae; tarsi darker, with at least tarsal segments 4–5 of mid and hind tarsi brown-black; surstylus one-lobed. Males of *T. albihirtus* sp. n. differs from *T. nigrihirtus* sp. n. in fore and mid femora bearing ventral tuft of fine white cilia in basal half, at most as long as femur height; and surstylus with wide lobes. Males of *T. nigrihirtus* sp. n. have only black setulae on fore and mid femora ventrally, at most half as long as femur height; surstylus with narrow lobes.

Description. Male (Fig. 16). Length (mm): body 4.7, antenna 0.7, wing 3.7/1.1. Head (Fig. 17): postcranium, frons and face bluish green; postcranium and face white pollinose, frons shining; face under antennae 1.5 times as wide as height of postpedicel, wider at clypeus; clypeus about half as long as epistome, about 2 times wider than long; palp yellow, bearing sparse black setulae; proboscis black; 2 diverging ocellars; 1 vertical, 1 postvertical, much stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate, black; middle and lower postoculars multiseriate, white, long; antennal scape yellow, pedicel brownish dorsally, yellow ventrally, postpedicel brown dorsally and apically (Fig. 18); pedicel simple, convex on inner side; postpedicel apically browned, rounded, with

short pubescence, slightly longer than high (18/15); arista-like stylus dorsal, brown and thick basally, whitish and thin distally, shortly pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.12 : 0.06 : 0.18 : 0.03 : 0.49.

Thorax metallic blue-green, weakly grey dusted; no acrostichals; 7 dorsocentrals decreasing in length anteriorly; scutellum with 2 strong marginals and 2 small laterals; 7–8 upper and 5–6 lower, fine white propleural bristles of different length.

Legs: coxae black, yellow at apex; legs mostly yellow; tarsi white, distal half of tarsomere 5 of all tarsi black. Fore leg: coxa with short white setae; femur simple, with ventral rows of fine white curved setae in basal half, about half as long as height of femur; tibia bearing 2 anterodorsal, 2 posterodorsal and 4–5 apical short bristles, glabrous anteriorly in distal 1/3; basitarsus densely covered with short simple setulae anteroventrally; tarsal segments 1–4 with elongate apicoventral setae, nearly 2 times as long as width of tarsomeres; segment 5 slightly flattened dorso-ventrally (Fig. 19); length of femur, tibia and tarsal segments (in mm): 1.23 : 1.09 : 0.36 : 0.17 : 0.16 : 0.14 : 0.19. Mid leg: coxa with short white setae and 1 short black bristle; femur with ventral rows of short white hairs, about 1/3 as long as height of femur; tibia bearing 2 anterodorsal; 3 posterodorsal short bristles, 2 strong apicoventral bristles; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 1.33 : 1.43 : 0.49 : 0.19 : 0.19 : 0.16 : 0.17. Hind leg: coxa with 1 short black exterior bristle; femur ventrally without remarkable setae, with very short white hairs in basal half; tibia bearing 3 anterodorsal, 3 posterodorsal bristles, 3 apicals; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 1.95 : 1.87 : 0.27 : 0.28 : 0.20 : 0.18 : 0.23.

Wing (Fig. 16) hyaline, without darker shades; veins yellow-brown, more yellowish at base; distal part of M_{1+2} sinuate; tip of R_{4+5} parallel with M_{1+2} ; ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2} (in mm), 0.33 : 0.22; crossvein dm-m almost straight; ratio of dm-m to distal part of M_4 , 0.3 : 0.6; anal vein distinct; halter yellow; lower calypter yellow, with white cilia.

Abdomen metallic blue-green, weakly grey dusted; setae and hind-marginal bristles on tergites black, short; sternites with short sparse white setulae. Hypopygium (Fig. 20) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, reaching apex of surstyli; phallus coiled, long and band-like; surstylus broad, deeply split at apex (lateral view; Fig. 21), with moderately long and short setae (Fig. 22); cerci separated, dorsally adjoined at base, band-like, with long marginal bristles (Fig. 23).

Female. Similar to male except lacking male secondary sexual characters.

Distribution. Iran.

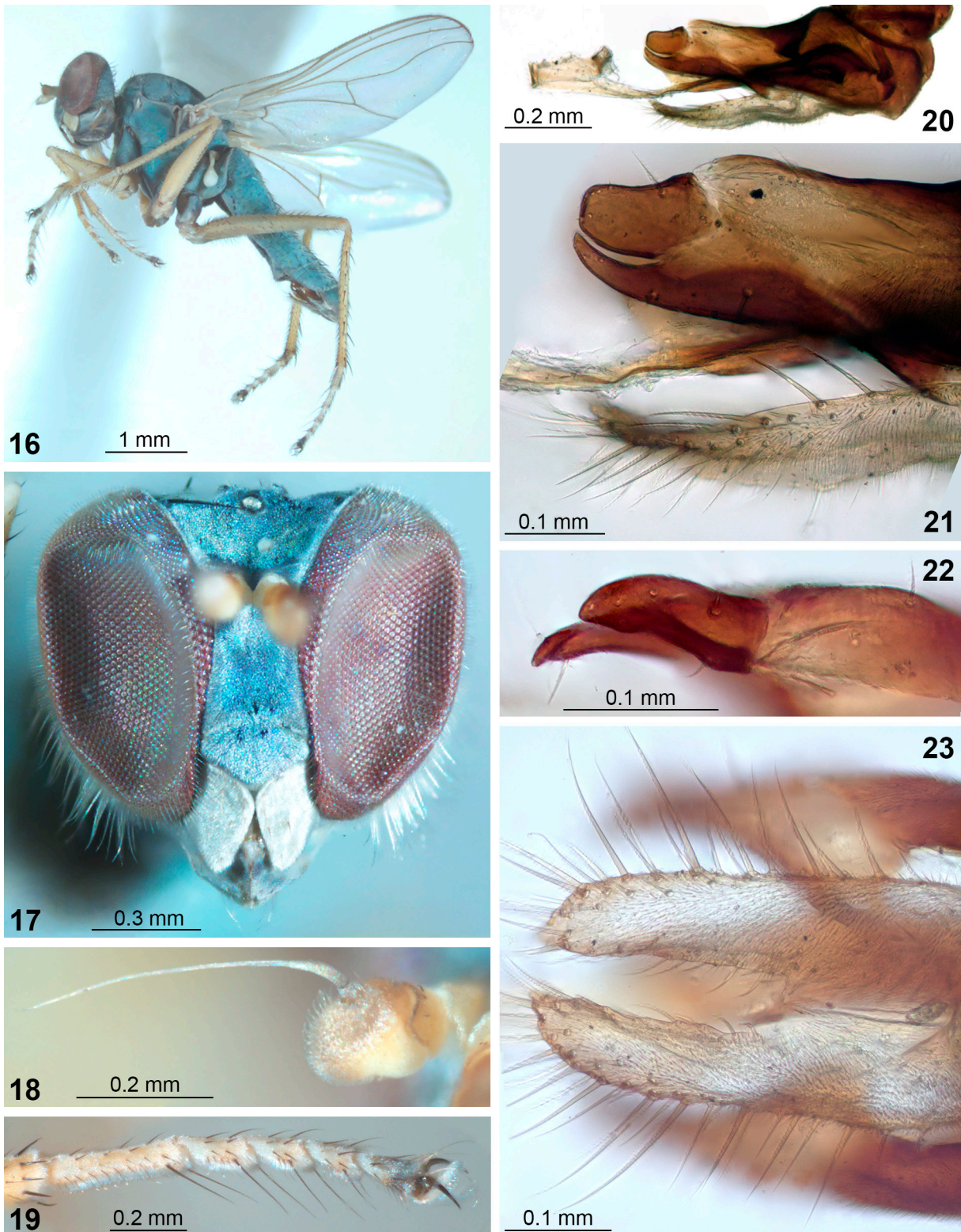
Etymology. From Latin “albus”, “hirtus”, white-haired femora.

Thinophilus nigrihirtus sp. n.
(Figs 24–32)

Material. Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian). Paratypes: 7♂ (HMIM, ZISP), same data.

Additional material. 3♀ (HMIM), same data as for holotype.

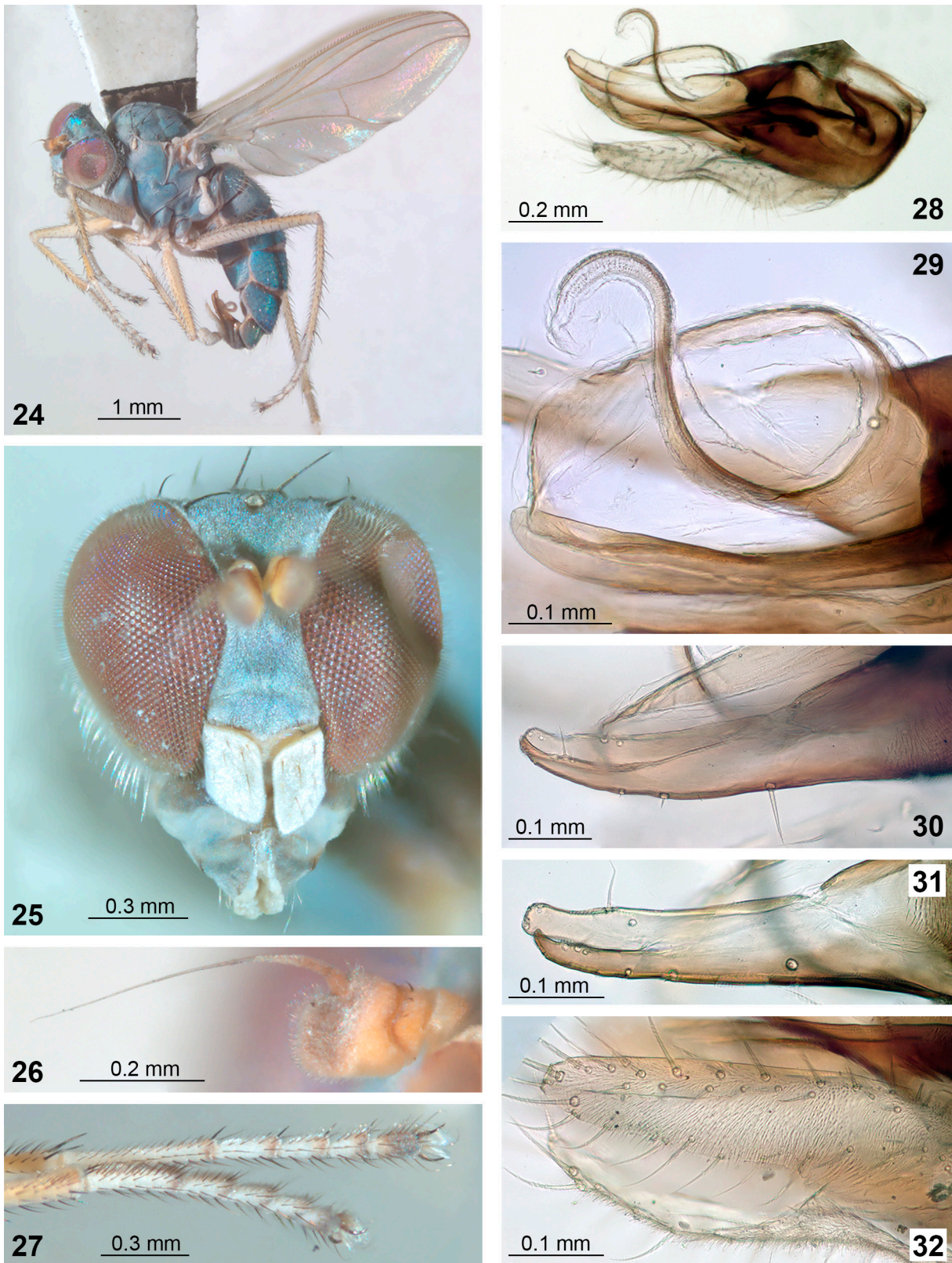
Diagnosis. *Thinophilus nigrihirtus* sp. n. is close in habitus to *T. albihirtus* sp. n., differing from the latter in only black setulae on fore and mid femora ventrally, at most half as long as femur height; and surstylus with narrow lobes. Males of *T. albihirtus* sp. n. have fore and mid femora bearing ventral tuft of fine white cilia in basal half, at most as long as femur height; and surstylus with wide lobes.



Figs 16–23. *Thinophilus albihirtus* sp. n., male, paratype, general view and details of structure.
 16 – habitus; 17 – head; 18 – antenna; 19 – fore tarsus; 20 – hypopygium after maceration, lateral view; 21 – surstylus and cercus, lateral view; 22 – surstylus, ventral view; 23 – cerci, dorsal view.

Рис. 16–23. *Thinophilus albihirtus* sp. n., самец, паратип, общий вид и детали строения.

16 – внешний вид; 17 – голова; 18 – усик; 19 – передняя лапка; 20 – гипопигий после размачивания, сбоку; 21 – сурстиль и церка, сбоку; 22 – сурстиль, снизу; 23 – церки, сверху.



Figs 24–32. *Thinophilus nigrihirtus* sp. n., male, paratype, general view and details of structure.

24 – habitus; 25 – head; 26 – antenna; 27 – fore and mid tarsi; 28 – hypopygium after maceration, lateral view; 29 – phallosome and phallus, ventral view; 30 – surstylus, lateral view; 31 – surstylus, ventral-lateral view; 32 – cerci, dorsal view.

Рис. 24–32. *Thinophilus nigrihirtus* sp. n., самец, паратип, общий вид и детали строения.

24 – внешний вид; 25 – голова; 26 – усик; 27 – передняя и средняя лапки; 28 – гипопигий после размачивания, сбоку; 29 – фаллосома и фаллус, снизу; 30 – сурстий, снизу; 31 – сурстий, снизу-сбоку; 32 – церки, сверху.

Description. Male (Fig. 24). Similar to *Thinophilus albihirtus* sp. n. in all respects except as noted. Length (mm): body 4.8, antenna 0.8, wing 3.8/1.2. Head (Fig. 25): face under antennae 1.3 times as wide as height of postpedicel; clypeus nearly half as long as epistome, more than 2 times wider than long; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.09 : 0.07 : 0.17 : 0.04 : 0.48 (Fig. 26).

Thorax: 6 dorsocentrals decreasing in length anteriorly.

Legs: fore leg: femur simple, without ventral rows of fine white curved setae, with 3 preapical posteroventral bristles; tarsal segments 1–4 with elongate apicoventral setae, about as long as width of tarsomeres; length of femur, tibia and tarsal segments (in mm): 1.19 : 0.99 : 0.34 : 0.18 : 0.17 : 0.15 : 0.16 (Fig. 27). Mid leg: femur without ventral rows of white hairs, with only black setulae; tibia bearing 3–4 apicals; tarsal segments 1–4 ventrally with short setae; length of femur, tibia and tarsal segments (in mm): 1.18 : 1.25 : 0.51 : 0.21 : 0.18 : 0.14 : 0.18 (Fig. 27). Hind leg: femur without white hairs, with only black setulae ventrally; tarsal segments 1–4 ventrally with shorter setae; length of femur, tibia and tarsal segments (in mm): 1.72 : 1.63 : 0.38 : 0.31 : 0.22 : 0.18 : 0.19.

Wing (Fig. 24): ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and M_{1+2} (in mm), 0.34 : 0.24; ratio of dm-m to distal part of M_4 , 0.36 : 0.56.

Abdomen: hypopygium (Figs 28–32) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, not reaching apex of surstyli (Fig. 29); phallus coiled, long and band-like; surstylus narrow, deeply split at apex (lateral view; Fig. 30), with moderately long and short setae (Fig. 31); cerci separated, dorsally adjoined at base, band-like, with long marginal bristles (Fig. 32).

Female. Similar to male except lacking male secondary sexual characters.

Distribution. Iran.

Etymology. From Latin “niger”, “hirtus”, black-haired femora.

Key to species of *Thinophilus* from Iran (males)

This key builds extensively on Grichanov [2022, 2023b] but has scattered modifications based on material examined for the present study in our respective collections.

1. Mesonotum with four strong dorsocentrals of almost equal length; body and legs with only whitish yellow bristles; body length less than 2 mm (*T. gallagheri* group) 2
 - Mesonotum with at least five dorsocentrals, usually greatly decreasing in length anteriorly; body and legs with mainly black bristles; body usually longer than 2 mm 3
2. Face broad, nearly 2 times as wide as height of postpedicel; postpedicel rounded, higher than long (12/9); arista-like stylus nearly apical [Grichanov, 2023b: fig. 6]; body length 1.7 mm *T. gallagheri*
 - Face narrow, not wider than height of postpedicel; postpedicel subtriangular, nearly as high as long (8/9); arista-like stylus basodorsal (Figs 1–7); body length 1.8 mm *T. albisetosus* sp. n.
3. Scutellum with two pairs of almost equal in length bristles; palp with black setae; upper postoculars uniseriate; fore coxa black in basal half, with black setulae; mid femur without preapical; wing vein M strongly sinuate (Figs 8–15); body length 7.9 mm (*T. murphy* group) *T. qeshmensis* sp. n.

- Another combination of characters 4
- 4. Palp with white setae; all tarsi entirely black or brownish at base; surstylus straight, slightly narrowed distally [Grichanov, 2023b: fig. 1]; body length 2.5–3.3 mm (*T. calopus* group) *T. argyropalpis*
 - Palp with black setae; tarsi gradually darkened towards tarsomere 5 or mostly yellow (*T. indigenus* group) 5
- 5. Mesonotum with distinct dark lateral spot at notopleura 6
 - Mesonotum monochrome, or with longitudinal stripes dorsally, without dark lateral spots, rarely with postalar dark spot 7
- 6. Mesonotum with additional spot in front of scutellum; no spot at wing apex; male genitalia as in Negrobov [1978: figs 1371–1373]; body length 2.5–3 mm *T. indigenus*
 - Mesonotum without spot in front of scutellum; wing with dark spot near the end of R_{2+3} and R_{4+5} [Negrobov, 1978: fig. 1351]; male genitalia as in Negrobov [1978: figs 1386–1388]; body length 4.75 mm *T. quadrimaculatus*
- 7. Male hind coxa with long straight apical spine [Dawah et al., 2020: fig. 5b]; body length 4–4.5 mm *T. ochripalpis*
 - Male hind coxa without spine 8
- 8. Male fore basitarsus with nearly right-angled bend; mid femur with posteroventral setae in middle part, at least half as long as femur diameter; male fore tibia with 2 or 3 strong curved posteroventral bristles at apex; male genitalia as in Negrobov [1978: figs 1364–1366]; body length 5.5–6 mm *T. flavipalpis*
 - Male fore basitarsus straight or fairly curved; mid femur with short or long setae in middle part; male fore tibia without strong curved posteroventral bristles at apex 9
- 9. Fore basitarsus with ventral row of short but strong black spines, at least half as long as article diameter; fore tarsomere 4 with strong dorsal bristle, as long as or longer than tarsomeres 4 and 5 combined; male genitalia as in Negrobov [1978: figs 1393–1396]; body length 3.7–5.4 mm *T. spinitarsis*
 - Fore basitarsus without ventral spines, with simple setulae only; fore tarsomere 4 without strong dorsal bristle 10
- 10. Fore tibia 1/3 longer than fore tarsus (4/3); fore tarsomeres 2–4 triangular, wider than long; wing crossvein dm-m half as long as distal part of M [Grichanov, 2023b: fig. 10]; body length 1.8–2 mm *T. deemingi*
 - Fore tibia not longer than fore tarsus; fore tarsomeres cylindrical, longer than wide; wing crossvein dm-m usually as long as or 2/3 as long as distal part of M 11
- 11. Fore and mid femora with ventral tuft of fine white cilia in basal half, at most as long as femur height; surstylus with wide lobes (Fig. 6); body length 4.7 mm *T. albihirtus* sp. n.
 - Fore and mid femora with only black setulae ventrally, at most half as long as femur height; surstylus with narrow lobes (Fig. 31); body length 4.8 mm *T. nigrihirtus* sp. n.



Fig. 33. Distribution of the *Thinophilus* species in Iran.

1 – Meighan, Markazi Province (*T. flavipalpis*), 2 – Asaluyeh, Bushehr Province (*T. deemingi*, *T. ochripalpis*), 3 – Larestan, Fars Province (*T. indigenus*), 4 – Mardou Island, Bandar-e Khamir, Hormozgan Province (*T. albihirtus* sp. n., *T. deemingi*, *T. gallagheri*, *T. ochripalpis*), 5 – Qeshm Island, Hormozgan Province (*T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n., *T. nigrihirtus* sp. n.), 6 – Gabrik, Hormozgan Province (*T. albisetosus* sp. n., *T. argyropalpis*, *T. gallagheri*), 7 – Sirik, Hormozgan Province (*T. ochripalpis*); 8 – Ssargad (Sarhad), Sistan and Balouchestan Province (*T. spinitarsis*), 9 – Chousdar, Sistan and Balouchestan Province (*T. argyropalpis*), 10 – Bazman, Sistan and Balouchestan Province (*T. quadrimaculatus*), 11 – Bampur, Sistan and Balouchestan Province (*T. indigenus*), 12 – Chabahar, Tis, Sistan and Balouchestan Province (*T. albihirtus* sp. n.), 13 – Chabahar, Govater, Sistan and Balouchestan Province (*T. albihirtus* sp. n., *T. albisetosus* sp. n., *T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n.).

Рис. 33. Распространение видов рода *Thinophilus* в Иране.

1 – Мейган, провинция Маркази (*T. flavipalpis*), 2 – Асалуя, провинция Бушер (*T. deemingi*, *T. ochripalpis*), 3 – Ларестан, провинция Фарс (*T. indigenus*), 4 – остров Марду, Бандар-э-Хамир, провинция Хормозган (*T. albihirtus* sp. n., *T. deemingi*, *T. gallagheri*, *T. ochripalpis*), 5 – остров Кешм, провинция Хормозган (*T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n., *T. nigrihirtus* sp. n.), 6 – Габрик, провинция Хормозган (*T. albisetosus* sp. n., *T. argyropalpis*, *T. gallagheri*); 7 – Сирик, провинция Хормозган (*T. ochripalpis*), 8 – Ссаргад (Sarhad), провинция Систан и Белуджистан (*T. spinitarsis*), 9 – Чоусдар, провинция Систан и Белуджистан (*T. argyropalpis*), 10 – Базман, провинция Систан и Белуджистан (*T. quadrimaculatus*), 11 – Бампур, провинция Систан и Белуджистан (*T. indigenus*), 12 – Чабахар, Тис, провинция Систан и Белуджистан (*T. albihirtus* sp. n.), 13 – Чабахар, Говатер, провинция Систан и Белуджистан (*T. albihirtus* sp. n., *T. albisetosus* sp. n., *T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n.).

Conclusion

As a result of this study, the *Thinophilus* species number in Iran has increased to twelve: nine species have been reported from Sistan and Baluchestan, eight from Hormozgan, two from Bushehr, one from Fars and one from

Markazi Province (Fig. 33). They are considered members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and the *T. indigenus* lineage distributed widely in the Old World [Grootaert, 2018; Grichanov, 2023b]. Three known species are firstly recorded from Iran: *T. deemingi* and

T. gallagheri have been recently described from Oman, and *T. ochripalpis* was previously known from Tanzania, Somalia, Saudi Arabia, Yemen, and Oman [Grichanov, 2023b].

In comparison, the Turkish fauna numbers five species [Tonguç et al., 2016; Grichanov, 2022]. The fauna of the Caucasus and East Mediterranean region as a whole includes 20 species of the genus [Grichanov, 2007, 2022]. Remarkably, twenty one *Thinophilus* species are known from small territory of Singapore, being common in mangroves mainly [Grootaert, 2018]. It means that new species records are anticipated in Iran.

This paper is the third contribution to the Iranian mangrove fauna of Dolichopodidae. See Grichanov, Gilasian [2023b, c] for the photographs and brief description of the collection localities in Bushehr, Hormozgan, and Sistan and Baluchestan provinces of Iran. The genus *Thinophilus* is here discovered in Iranian mangroves for the first time. Eight species have been collected in or near the mangrove forests by use of methods of mass trapping on the coast of the Persian and Oman gulfs of the Arabian Sea in 2021 and 2022.

In total, 188 species belonging to 31 genera of the family Dolichopodidae are recorded now from Iran [Grichanov, Gilasian, 2023a–f].

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