

Three new species of the genus *Argyrochlamys* Lamb, 1922 (Diptera: Dolichopodidae) from mangroves of Iran and Oman

Три новых вида рода *Argyrochlamys* Lamb, 1922 (Diptera: Dolichopodidae) из мангровых лесов Ирана и Омана

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KEY WORDS: Dolichopodinae, *Argyrochlamys*, new species, Palaearctic, Iran, Hormozgan, Bushehr, Afro-tropical, Oman.

КЛЮЧЕВЫЕ СЛОВА: Dolichopodinae, *Argyrochlamys*, новые виды, Палеарктика, Иран, Гормозган, Бушер, Афротропики, Оман.

ABSTRACT: The genus *Argyrochlamys* is discovered in Iran for the first time. Three new long-legged fly species, *Argyrochlamys hajiesmaeiliani* sp.n. and *A. nigrescens* sp.n. from Iran and Oman and *A. tomkovichi* sp.n. from Oman, all collected in or near the mangrove forests, are described and illustrated. The new species from Iran appear to be very close to *A. impudicus* Lamb, 1922, known from sandy coastal beaches in the Afrotropical and Oriental regions, differing from the latter in body size and coloration, wing venation, morphology of hypandrium. The new species can be reliably differentiated from each other by the set of morphometric characters of wing, antenna and fore leg. The new species *A. tomkovichi* sp.n. is close to *A. marshalli* Grichanov, 2010, known from Tanzania, differing from the latter in body size, characters of antenna, wing venation and in colour of coxal bristles. *Argyrochlamys decolor* (Parent, 1930) from Mauritius is considered different from *A. impudicus* (stat.n.). An identification key to eight *Argyrochlamys* species from Indian Ocean coast and islands is compiled. In total, 176 species belonging to 31 genera of the family Dolichopodidae are recorded now from Iran, and only six species from three genera are reported from Oman.

РЕЗЮМЕ: Род *Argyrochlamys* впервые обнаружен в Иране. Три новых вида, *Argyrochlamys hajiesmaeiliani* sp.n. и *A. nigrescens* sp.n. из Ирана и Омана и *A. tomkovichi* sp.n. из Омана, собранные в мангровых лесах или рядом с ними, описаны и иллюстрированы. Новые виды из Ирана, по-видимому, очень близки к *A. impudicus* Lamb, 1922, известному

с песчаных прибрежных пляжей Афротропического и Ориентального регионов, отличаясь от последнего размерами и окраской тела, жилкованием крыльев, морфологией гипандриума. Новые виды можно надежно отличить друг от друга по комплексу морфометрических признаков крыла, усика и передней ноги. Новый вид *A. tomkovichi* sp.n. близок к *A. marshalli* Grichanov, 2010, известному из Танзании, отличаясь от него размерами тела, признаками усиков, жилкованием крыльев и цветом щетинок на тазиках. *Argyrochlamys decolor* (Parent, 1930), описанный с Маврикия, признается отличным от *A. impudicus* (stat.n.). Составлен определитель восьми видов *Argyrochlamys*, населяющих побережье и острова Индийского океана. Всего в настоящее время в Иране зарегистрировано 176 видов, принадлежащих к 31 роду семейства Dolichopodidae, и только шесть видов из трех родов известны из Омана.

Introduction

The generic concept of *Argyrochlamys* Lamb, 1922 from the subfamily Dolichopodinae was revised by Brooks [2005], who figured also male and female genitalia of *A. impudicus* Lamb, 1922 and *A. cavicola* (Parent, 1929). Brooks [2005] briefly diagnosed in his monograph “*Argyrochlamys* sp. 1” from Sri Lanka that was later described as the type species of the genus *Phoomyia* Naglis et Grootaert, 2013 [Naglis et al., 2013]. Grichanov [2010] reviewed *Argyrochlamys* spe-

cies and provided a key to the then known species. This genus contained six species, *A. erythreus* Grichanov, 2004 inhabiting Eritrea and *A. marshalli* Grichanov, 2010 from Tanzania, both known only from females, *A. angolensis* Grichanov, 2004 from Angola, *A. breviseta* (Parent, 1939) from Ghana, *A. cavicola* (Parent, 1929) described from the border of Egypt with Sudan and reported from Djibouti and Oman, and *A. impudicus* Lamb, 1922 distributed in the Afrotropical (Mauritius, Oman, Seychelles) and Oriental (Chagos Archipelago, Sri Lanka and Gujarat state of India) regions [Grichanov, 2023]. Species of *Argyrochlamys* are restricted to sandy coastal beaches and sometimes collected in or near ghost crab burrows (e.g., *Ocypode* Lamarck, Ocypodidae); at present, their ecological role within these burrows is unknown [Grichanov, 2004; Brooks, 2005]. This genus was unknown in Iran, and new species records are anticipated here.

Three new species of this dolichopodine genus from Iranian and Omani mangroves are described here, being considered members of *Argyrochlamys impudicus* species group, differing from the latter in characters of body colour, morphology of antenna, wing and male genitalia. Below these new species are described, and an identification key to species of *Argyrochlamys impudicus* species group (*sensu* Grichanov [2010]) from Indian Ocean coast and islands are provided. *Argyrochlamys decolor* (Parent, 1930) from Mauritius is considered here different from *A. impudicus* (see below).

Material and methods

The paper is based on material found in the Hayk Mirzayans Insect Museum (HMIM), Tehran, Iran, and the Zoological Museum of Moscow State University (ZMUM), Moscow, Russia. Reference specimens will be also deposited in the Zoological Institute of the Russian Academy of Sciences (ZIN, St Petersburg, Russia). Deposition of types of the new species is mentioned under the new names. 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, Wood [2017] and Grichanov, 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 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.

Taxonomy

Genus *Argyrochlamys* Lamb

Argyrochlamys Lamb, 1922: 391. Type species. *Argyrochlamys impudicus* Lamb, 1922, original designation.
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REMARKS. See Brooks [2005] for redescription of the genus and synonymy, Grichanov [2010] and Naglis et al. [2013] for review and discussion.

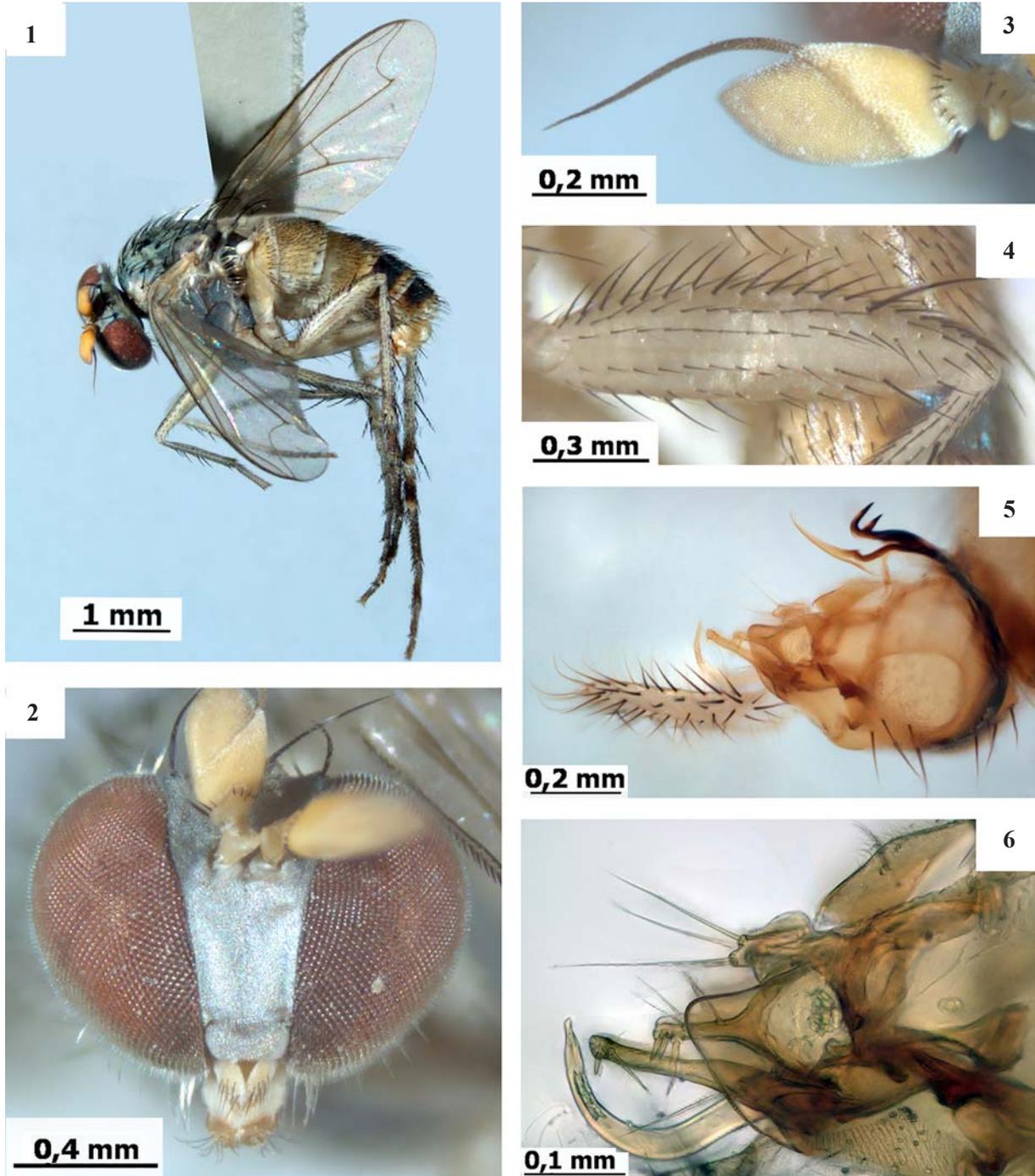
KEY TO *ARGYROCHLAMYS* SPECIES FROM INDIAN OCEAN COAST AND ISLANDS

1. Distal section of M_{1+2} in middle with nearly right-angular curvature; female postpedicel about as long as high, with distinctly dorsal stylus 2
— Distal section of M_{1+2} in middle with gentle (about 45°) curvature; female postpedicel 1.5–1.7 times longer than high, with nearly apical stylus 5
2. Distal section of M_{1+2} without stublike vein; costal section between R_1 and R_{2+3} distinctly shorter than costal section between R_{2+3} and R_{4+5} (3/4 to 9/10) 3
— Distal section of M_{1+2} with short stublike vein; costal section between R_1 and R_{2+3} at least as long as costal section between R_{2+3} and R_{4+5} 4
3. Abdomen blackish green, with only posterior margins of tergites narrowly yellow; thorax entirely dark; mid coxa yellow, brownish at base; 4.4–4.8 mm *A. impudicus*
— Abdominal tergite 1 mostly yellow and tergite 2 entirely yellow, other segments with posterior margins of tergites yellow; thorax with yellow metapleuron and scutellum; mid coxa mostly black, yellow at apex; 3 mm *A. decolor*
4. Abdomen with tergites 1 and 2 yellow, tergite 3 entirely yellow or with small brown or blackish spot dorsally, and tergites 4 and 5 mostly black; maximal face width 1.4–1.6 times as postpedicel height; distal section of M_4 2.2–2.5 times longer than dm-m; fore tarsus 1.2 times as long as fore tibia; male postpedicel 1.7–1.9 times longer than high; 3.3–3.8 mm *A. hajiesmaeiliani* sp.n.
— Abdomen with only tergite 2 mostly yellow, with small black spot dorsally and other tergites mostly black; maximal face width 1.8 times as postpedicel height; distal section of M_4 3.1 times longer than dm-m; fore tarsus 1.5 times as long as fore tibia; male postpedicel 1.5 times longer than high; 3.5 mm *A. nigrescens* sp.n.
5. Mesonotum entirely orange-yellow; fore coxa with either yellow or black cilia 6
— Mesonotum mostly dark; fore coxa with black cilia ... 7
6. Coxae with yellow cilia and bristles; female arista-like stylus as long as postpedicel; costal section between R_1 and R_{2+3} 3.2 times longer than costal section between R_{2+3} and R_{4+5} ; 3.5 mm (females only) *A. marshalli*
— Coxae with black cilia and bristles; female arista-like stylus distinctly shorter than postpedicel (20/25); costal section between R_1 and R_{2+3} 2.8 times longer than costal section between R_{2+3} and R_{4+5} *A. tomkovichii* sp.n.
7. Arista-like stylus distinctly longer than postpedicel; mid tibia without ventral setae; 3.7 mm (females only) *A. erythreus*
— Arista-like stylus 2 times shorter than postpedicel in male and slightly shorter than that in female; mid tibia with 2 ventral setae; 3.75 mm *A. cavicola*

Argyrochlamys hajiesmaeiliani
Grichanov et Gilasian, **sp.n.**
Figs 1–6.

MATERIAL. Holotype ♂, Iran, Hormozgan prov., Sirik, Azini wharf, 0 m, 26°19'39.9"N, 057°06'15.7"E, 13.V.2022, pan trap, Mofidi & Hajiesmaeilian leg. (ZIN). Holotype in good condition. Paratypes: Iran: 7♂, same data as for holotype (HMIM and ZIN); one male terminalia dissected and stored in glycerin in microvial pinned with the specimen); 1♂, Iran, Hormozgan Prov., Qeshm Island,

DoKuhak, 0 m, 26°59'5.0"N, 056°11'19"E, light trap, 4.XI.2021, E. Gilasian leg. (ZIN); 2♂, Iran, Hormozgan prov., Gabrik protected area, Keyki, 0 m, 25°41'49.7"N, 058°30'32.9"E, 15.V.2022, light trap, M. Mofidi & A. Hajiesmaeilian leg. (HMIM and ZIN); 1♂, Iran, Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, -10 m, 27°24'70"N, 052°40'9.0"E, light trap, 6–8.XI.2021, H. Naserzadeh leg. (ZIN; male terminalia dissected and stored in glycerin in microvial pinned with the specimen); 7♂, Oman, Barr al-Hikman peninsula, 300 km S Muscat, 20°44'24"N, 58°41'45.6"E, yellow pan trap, 19–24.XI.2011, P.S. Tomkovich leg. (ZMUM).



Figs 1–6. *Argyrochlamys hajiesmaeiliani*, **sp.n.**, male: 1 — habitus; 2 — head; 3 — antenna; 4 — hind femur, anterior view; 5 — hypopygium, lateral view; 6 — details of hypopygial appendages.

Рис. 1–6. *Argyrochlamys hajiesmaeiliani*, **sp.n.**, самец: 1 — внешний вид; 2 — голова; 3 — усик; 4 — заднее бедро, вид спереди; 5 — гипопигий, вид сбоку; 6 — детали придатков гипопигия.

DESCRIPTION. Male (Fig. 1). Length (mm): body 3.3–3.8, wing 2.9–3.0/1.1–1.2, antenna 0.8–0.9. Setae on body and legs are black except as noted below. *Head* (Fig. 2) wider than high; frons, face and postcranium densely white pollinose; frons 1.5 times wider than high; one strong black vertical seta bend forward, one shorter yellow postvertical, a pair of strong black ocellar setae present; eyes with short hairs; postocular setae yellow, uniseriate; upper and lower postoculars stronger than lateral setae; face glabrous, broad, widest under antennae, 1.4–1.6 times wider than height of postpedicel, clypeus small, almost reaching lower margin of eyes; antenna (Fig. 3) as long as height of head; yellow-orange; scape and pedicel simple, with short setulae; postpedicel greyish at apex, elongate-triangular, 1.7–1.9 times as long as high, with acute apex and very short hairs; arista-like stylus nearly mid-dorsal, black, about 1.3 times longer than postpedicel, with microscopic hairs; length (mm) of scape, pedicel, postpedicel, stylus (stylomeres 1 and 2), 0.10/0.07/0.41/0.11/0.40; palpus and proboscis small, palpus yellow with black setae, proboscis brownish, with yellow and brownish cilia. *Thorax* mostly greenish black, grey pollinose, with yellow humeral callus, scutellum and metapleuron; 6 strong dorsocentral setae with 5th seta shifted towards median axis; 2 rows of strong acrostichals; 2 strong notopleural, 1 strong humeral, 1 posthumeral setae present; proepisternum with 1 strong black seta above fore coxa; scutellum with 2 strong setae and 2 lateral hairs. *Legs* whitish-yellow, with apex of hind tibia and tarsus from middle of basitarsus more or less dark; all coxae yellow; fore and mid coxae with several black setae anteriorly; hind coxa with 1 strong external seta in middle; fore tibia with 2–3 strong anterodorsal, 2–3 posterodorsal bristles; fore femur, tibia and tarsomere (from first to fifth) length (mm): 0.89/0.84/0.40/0.19/0.16/0.14/0.14; mid femur with 1 anterior subapical bristle; mid tibia with 3 anterodorsal, 3 posterodorsal, 1 strong and 1 weak ventrals at middle and 4–5 apical bristles; segments 1–4 of mid tarsus each with short apical setae; mid femur, tibia and tarsomere (from first to fifth) length (mm): 1.07/1.29/0.55/0.37/0.32/0.24/0.18; hind femur (Fig. 4) with 1 anterodorsal preapical bristle, 1 small anteroventral preapical, row of sparse ventral setae, half as long as femur height, and row of long dense dorsal setae, nearly as long as femur height; hind tibia with 4 anterodorsal, 4 posterodorsal, 3–4 apical bristles; hind basitarsus with 1 short basoventral seta; tarsomeres 1–4 each with apicoventral setae; hind femur, tibia and tarsomere (from first to fifth) length (mm): 1.22/1.46/0.46/0.57/0.41/0.32/0.21. *Wing* hyaline, simple; veins brownish yellow; R₁ reaching nearly 2/5 of wing; R₂₊₃ almost straight; length of costa between R₁, R₂₊₃, R₄₊₅ and M₁₊₂ (mm), 0.93/0.77/0.05 (holotype); R₄₊₅ mainly straight, slightly curved posteriorly in distal 1/4; M₁₊₂ with right angular sinuation in middle of distal part, with short stublike vein, joining costa before wing apex; crossvein dm-m straight, forming right angles with longitudinal veins; length of dm-m and distal part of M₄, 0.32/0.71; posterior wing margin evenly convex; anal vein weak; anal lobe pronounced; anal angle obtuse; lower calypter yellow with white cilia; halteres yellow. *Abdomen* conoid (dorsal view), mostly yellow, weakly whitish pollinose; tergites 4 and 5 widely black dorsally, yellow ventrally and along posterior margin; tergite 3 with or without small brown spot dorsally in middle; tergite 6 hardly visible; segment 7 small, glabrous; segment 8 yellow, with several long dark setae; epandrium and appendages symmetric, yellow (Figs 5–6); hypandrium deeply bifurcated, with narrow curved lobes, pointed at apex; phallus narrow, pointed; distoventral epandrial lobe fused with epandrium, with 3 pedunculate setae; 1

epandrial seta; postgonite narrow, strongly curved ventrally, pointed at apex; surstylus with 2 nearly straight narrow lobes of unequal length; ventral lobe short, with 2 simple ventral setae, 1 long and 2 short thickened dorsal setae at apex; dorsal lobe with very long basidorsal seta, 1 long subapical simple seta, 2 short thick seta and few setulae at apex; cercus yellow, 0.8 times as long as epandrium, with short hairs and strong black setae, narrow, with rounded apex.

Female. Unknown.

ETYMOLOGY. The name of the new species is dedicated to one of the collectors of the type series, Dr. Abolfazl Hajiesmaeilian (Iranian Research Institute of Plant Protection, Tehran).

DISTRIBUTION. Palaearctic: Iran (Bushehr, Hormozgan); Afrotropical: Oman.

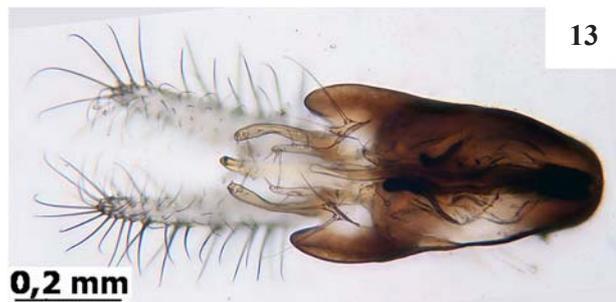
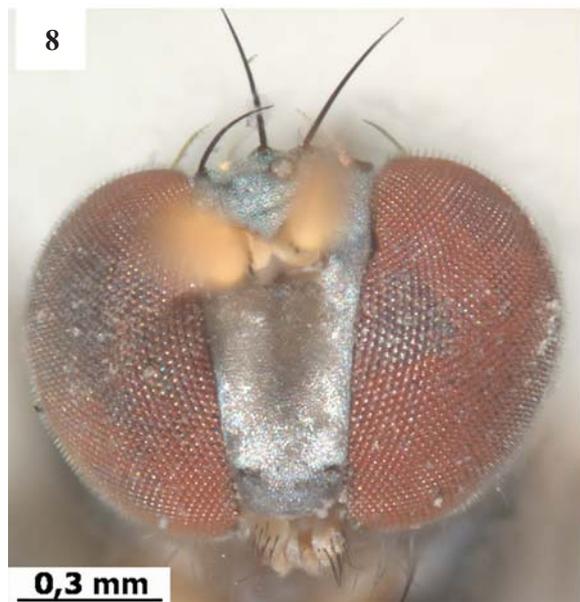
DIAGNOSIS. *Argyrochlamys hajiesmaeiliani* sp.n. belongs to the *A. impudicus* species group [Grichanov, 2010]. The new species keys to *A. impudicus*, differing from the latter in shorter body; arista-like stylus of antenna about 1.3 times longer than postpedicel; mostly yellow abdomen; distal section of M₁₊₂ with stublike vein; costal section between R₂₊₃ and R₄₊₅ 0.8 times as long as costal section between R₁ and R₂₊₃; hypandrium with deeply bifurcated symmetrical lobes; cercus 0.8 times as long as epandrium. *Argyrochlamys impudicus* differs in longer body; arista-like stylus of antenna nearly 2.5 times longer than postpedicel; mostly black abdomen; distal section of M₁₊₂ without stublike vein; costal section between R₂₊₃ and R₄₊₅ 1.2 times as long as costal section between R₁ and R₂₊₃; hypandrium with asymmetrically thick and long lobes; cercus about as long as epandrium [Lamb, 1922; Brooks, 2005]. *Argyrochlamys hajiesmaeiliani* sp.n. males have very similar habitus and hypopygium morphology with *A. nigrescens* sp.n. These species differ from each other in mainly morphometric characters (see diagnostic Table in the Discussion section). Nevertheless, the abdomen has tergites 1–3 mostly or completely yellow in *A. hajiesmaeiliani* sp.n. and only tergite 2 mostly yellow in *A. nigrescens* sp.n.

Argyrochlamys nigrescens
Grichanov et Gilasian, sp.n.

Figs 7–14.

MATERIAL. Holotype ♂, Iran, Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, –10 m, 27°24'70"N, 052°40'9.0"E, 6–8.XI.2021, yellow pan trap, E. Gilasian leg. (ZIN; male terminalia dissected and stored in glycerin in microvial pinned with the specimen). Paratype. 1♂, Iran, Hormozgan prov., Sirik, Azini wharf, 0 m, 26°19'39.9"N, 057°06'15.7"E, 13.V.2022, pan trap, Mofidi & Hajiesmaeilian leg. (HMIM).

DESCRIPTION. Male (Fig. 7). Similar to *Argyrochlamys hajiesmaeiliani* sp.n. in all respects except as noted. Length (mm): body 3.5, wing 3.4/1.2, antenna 0.9. Face (Fig. 8) widest under antennae, 1.8 times wider than height of postpedicel; antenna (Fig. 9) with postpedicel elongate-ovate, 1.6 times as long as high; arista-like stylus 1.7 times as long as postpedicel, positioned at distal 1/3 of dorsal surface; length (mm) of scape, pedicel, postpedicel, stylus (stylomeres 1 and 2), 0.10/0.06/0.30/0.12/0.39. *Thorax* mostly greenish black, with brown scutellum and yellow posterior margin of metapleuron. *Legs* yellow, with apex of hind tibia and whole tarsus black; mid and hind coxae brown in basal half; fore tibia with 3 small anterodorsal, 2 small posterodorsal bristles, 0–1 minute posteroventral seta; fore femur, tibia and tarsomere (from first to fifth) length (mm): 0.91/0.87/0.45/0.27/0.22/0.17/0.17; mid tibia with 3 anterodorsal, 3 posterodorsal, 2 weak ventrals at middle and 4 apical bristles; mid



Figs 7–14. *Argyrochlamys nigrescens* sp.n., male: 7 — habitus; 8 — head; 9 — antenna; 10 — wing; 11 — abdomen, dorsal view; 12 — hypopygium, lateral view; 13 — hypopygium, ventral view; 14 — details of hypopygial appendages.

Рис. 7–14. *Argyrochlamys nigrescens* sp.n., самец: 7 — внешний вид; 8 — голова; 9 — усик; 10 — крыло; 11 — брюшко, вид сверху; 12 — гипопигий, вид сбоку; 13 — гипопигий, вид снизу; 14 — детали придатков гипопигия.

femur, tibia and tarsomere (first and second) length (mm): 1.05/1.18/0.55/0.40/-/-; hind femur with 1 anterodorsal preapical bristle, 1 small anteroventral preapical, rather short ventral setae, and row of dense dorsal setae, at most half as long as femur height; hind femur, tibia and tarsomere (from first to fifth) length (mm): 1.21/1.55/0.38/0.59/0.47/0.29/0.24. *Wing* (Fig. 10): length of costa between R_1 , R_{2+3} , R_{4+5} and M_{1+2} (mm), 0.91/0.94/0.06; length of dm-m and distal part of M_4 , 0.24/0.74. *Abdomen* (Fig. 11): mostly black; tergite 1 with yellow posterior margin; tergite 2 mostly yellow, with small black spot dorsally in middle, brown laterally; tergite 3 with yellow anterior and posterior margin; tergites 4 and 5 black, and segment 8 black; epandrium and appendages symmetric (Figs 12–14); hypandrium black, deeply bifurcated, with narrow curved lobes, narrow at apex; phallus narrow; distoventral epandrial lobe fused with epandrium, with 3 pedunculate setae; 1 epandrial seta; postgonite narrow, strongly curved ventrally, pointed at apex; surstylus brownish, with 2 almost straight narrow lobes of unequal length; ventral lobe short, with 2 simple ventral setae, 1 long and 1–2 short thickened dorsal setae at apex; dorsal lobe with very long basidorsal seta, 1 long subapical simple seta, 2 short thick seta and few setulae at apex; cercus yellow, 0.8 times as long as epandrium, with short hairs and strong black setae, narrow, with rounded apex.

Female. Unknown.

ETYMOLOGY. The Latin name of the species refers to the mostly black abdomen.

DISTRIBUTION. Palearctic: Iran (Bushehr, Hormozgan).

DIAGNOSIS. *Argyrochlamys nigrescens* sp.n. males have very similar habitus and hypopygium morphology with *A. hajiesmaeliani* sp.n. These species differ from each other in mainly morphometric characters (see diagnostic Table in the Discussion section). Nevertheless, the abdomen has tergites 1–3 mostly or completely yellow in *A. hajiesmaeliani* sp.n., and only tergite 2 mostly yellow in *A. nigrescens* sp.n.

Argyrochlamys tomkovich Grichanov, sp.n.

Figs 15–23.

MATERIAL. Holotype ♂, Oman, Barr al-Hikman peninsula, 300 km S Muscat, 20°44'24"N, 58°41'45.6"E, yellow pan trap, 19–24.XI.2011, P.S. Tomkovich leg. (ZMUM). Holotype in good condition. Paratypes: 7♂, 1♀, same data as for holotype (ZIN, ZMUM; one male terminalia dissected and stored in glycerin in microvial pinned with the specimen).

DESCRIPTION. **Male** (Fig. 15). Length (mm): body 3.5, wing 3.0/1.1, antenna 0.9. Setae on body and legs are black except as noted below. *Head* (Fig. 16) wider than high; frons, face and postcranium densely white pollinose; frons 1.5 times wider than high; one strong black vertical seta bend forward, one shorter yellow postvertical, a pair of strong black ocellar setae present; eyes with short hairs; postocular setae yellow, uniseriate; upper and lower postoculars stronger than lateral setae; face glabrous, broad, widest under antennae, 1.5 times wider than height of postpedicel, clypeus small, not reaching lower margin of eyes; antenna (Fig. 17) about as long as height of head; yellow-orange; scape and pedicel simple, with short setulae; postpedicel elongate-triangular, 2.5 times as long as high, with acute apex and very short hairs, 2.7 times as long as arista-like stylus, which nearly apical, black, with microscopic hairs; length (mm) of scape, pedicel, postpedicel, stylus (stylomeres 1 and 2), 0.10/0.07/0.41/0.11/0.40; palpus and proboscis small, yellow, with yellow, black and brownish cilia. *Thorax* entirely orange-yellow, whitish pollinose, with black bristles and setae;

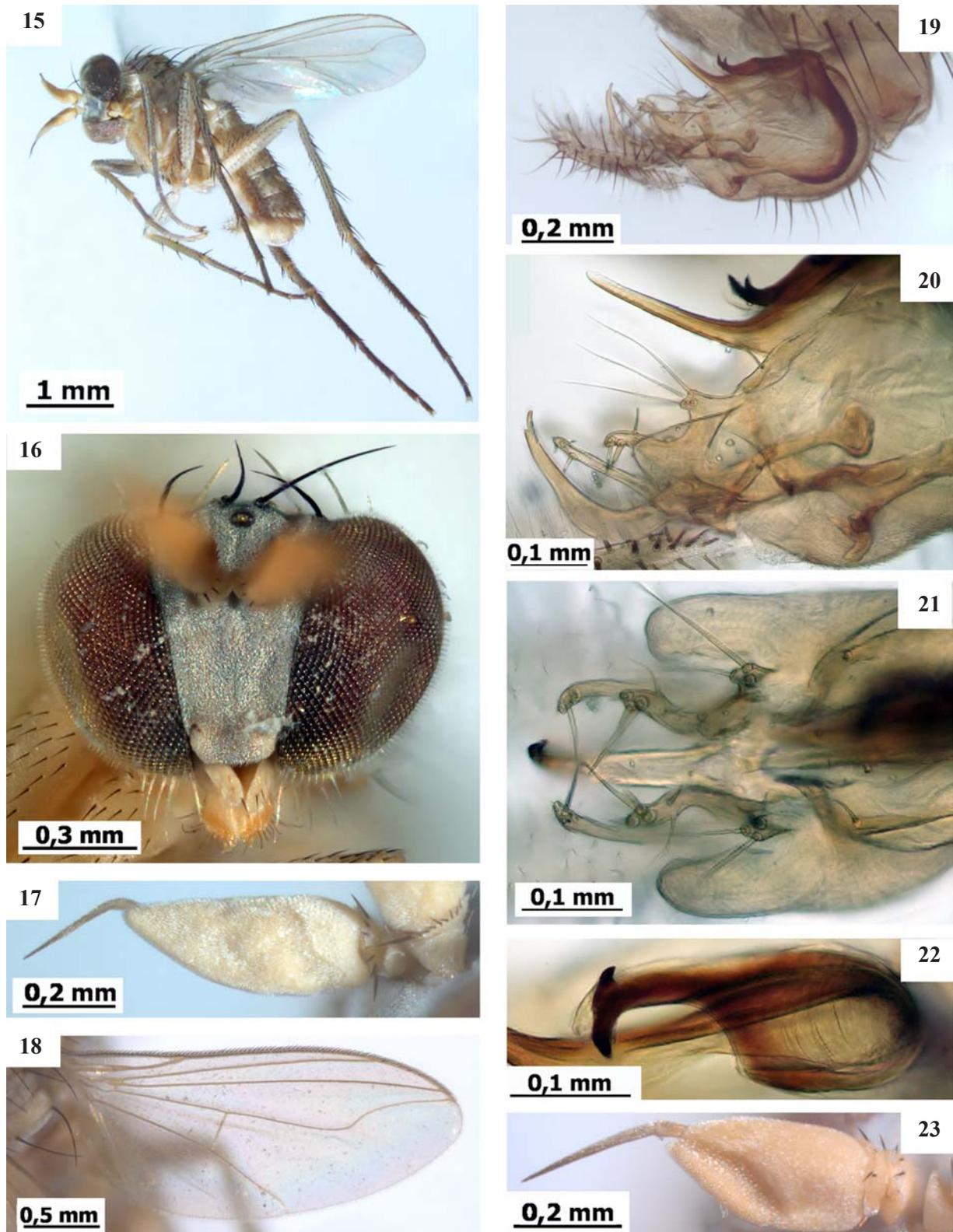
6 strong dorsocentral setae with 5th seta shifted towards median axis; 2 rows of strong acrostichals; 2 strong notopleural, 1 strong humeral, 1 posthumeral setae present; proepisternum with 1 strong seta above fore coxa; scutellum with 2 long strong setae and 2 small lateral setae. *Legs* whitish-yellow, with mid tarsomeres 4 and 5, hind tarsus from apex of basitarsus brownish to brown; all coxae yellow; fore and mid coxae with several black setae anteriorly; hind coxa with 1 strong black external seta in middle; fore tibia with 2 anterodorsal, 2 small posterodorsal, 1 posteroventral bristles; fore femur, tibia and tarsomere (from first to fifth) length (mm): 0.9/0.81/0.46/0.25/0.19/0.12/0.13; mid femur with 1 anterior subapical bristle; mid tibia with 2 anterodorsals, 3 posterodorsals, 1 strong and 1 weak ventrals at middle and 4–5 apical bristles; segments 1–4 of mid tarsus each with short apical setae; mid femur, tibia and tarsomere (from first to fifth) length (mm): 1.12/1.22/0.66/0.55/0.45/0.3/0.22; hind femur with 1 anterodorsal preapical bristle, 1 small anteroventral preapical, and row of short dorsal setae, at most 1/3 as long as femur height; hind tibia with 3 anterodorsal, 3 posterodorsal, 3–4 apical bristles; hind basitarsus with 1 short basoventral seta; tarsomeres 1–4 each with apicoventral setae; hind femur, tibia and tarsomere (from first to fifth) length (mm): 1.23/1.54/0.45/0.74/0.58/0.38/0.25. *Wing* (Fig. 18) hyaline, simple; veins yellow; R_1 reaching 2/5 of wing; R_{2+3} almost straight; length of costa between R_1 , R_{2+3} , R_{4+5} and M_{1+2} (mm), 1.25/0.49/0.09; R_{4+5} mainly straight, slightly curved posteriorly in distal 1/4; M_{1+2} with gentle sinuation in middle of distal part, joining costa before wing apex; crossvein dm-m straight, forming right angles with longitudinal veins; length of dm-m and distal part of M_4 , 0.28/0.65; posterior wing margin evenly convex; anal vein weak; anal lobe pronounced; anal angle obtuse; lower calypter yellow with white cilia; halteres yellow. *Abdomen* conoid (dorsal view), entirely orange-yellow, weakly whitish pollinose; tergite 6 hardly visible; segment 7 small, glabrous; segment 8 yellow, with several black setae; epandrium and appendages (Figs 19–22) almost symmetric, yellow; hypandrium (Fig. 22) bifurcated at apex, with thick curved lobes, pointed at apex; phallus bulbous at base, narrow apically, pointed; distoventral epandrial lobe fused with epandrium, with 3 pedunculate setae; 1 epandrial seta; postgonite narrow, strongly curved ventrally, pointed at apex, with subapical indentation; surstylus with 2 narrow lobes of unequal length; ventral lobe short, curved, with 2 simple ventral setae, 1 long and 2 short thickened dorsal setae at apex; dorsal lobe straight, with very long basidorsal seta, 1 long subapical simple seta, and few setulae at apex; cercus yellow, 0.6 times as long as epandrium, with yellow hairs and black setae, narrow, with rounded apex.

Female. Length (mm): body 3.1, wing 3.1, antenna 0.8. Similar to male in all respects except as noted: antenna (Fig. 23) with postpedicel 1.9 times as long as high, 1.2 times as long as arista-like stylus; length (mm) of scape, pedicel, postpedicel, stylus (stylomeres 1 and 2), 0.09/0.04/0.37/0.06/0.26; femur, tibia and tarsomere (from first to fifth) length (mm): fore leg: 0.94/0.87/0.43/0.23/0.18/0.14/0.15; mid leg: 1.04/1.24/0.59/0.46/0.36/0.29/0.19; hind leg: 1.16/1.54/0.43/0.66/0.57/0.39/0.21; oviscapt with ventral lobes; each hemitergite with two thick spines; cercus with long yellow setae.

ETYMOLOGY. The name of the new species is dedicated to the collector of the type series, Konstantin Tomkovich (Moscow, Russia).

DISTRIBUTION. Afrotropical: Oman.

DIAGNOSIS. *Argyrochlamys tomkovich* sp.n. belongs to the *A. impudicus* species group [Grichanov, 2010]. The



Figs 15–23. *Argyrochlamys tomkovichi*, sp.n., male (15–22), female (23): 15 — habitus; 16 — head; 17 — antenna; 18 — wing; 19 — hypopygium, lateral view; 20 — details of hypopygial appendages, lateral view; 21 — details of hypopygial appendages, ventral view; 22 — hypandrium, ventral view; 23 — antenna.

Рис. 15–23. *Argyrochlamys tomkovichi*, sp.n., самец (15–22), самка (23): 15 — внешний вид; 16 — голова; 17 — усик; 18 — крыло; 19 — гипопигий, вид сбоку; 20 — детали придатков гипопигия, вид сбоку; 21 — детали придатков гипопигия, вид снизу; 22 — гипандрий, вид снизу; 23 — усик.

new species keys to *A. marshalli*, differing from the latter in shorter female body; coxae with black cilia and bristles; female arista-like stylus distinctly shorter than postpedicel (20/25); costal section between R_1 and R_{2+3} 2.8 times longer than costal section between R_{2+3} and R_{4+5} . *A. marshalli* females have coxae with yellow cilia and bristles; arista-like stylus as long as postpedicel; costal section between R_1 and R_{2+3} 3.2 times longer than costal section between R_{2+3} and R_{4+5} [Grichanov, 2010].

Argyrochlamys decolor (Parent, 1930), **stat.n.**

Camptoneura decolor Parent, 1930: 111.

Argyrochlamys decolor: Dyte, 1975: 231.

DISTRIBUTION. Type locality: Mauritius, Tamarin Falls. The species is known only from type locality.

REMARKS. *Camptoneura decolor* was transferred to *Argyrochlamys* by Dyte [1975], who placed the species in synonymy to *A. impudicus*. However, comparing descriptions of the two species, we have found that they are certainly different. Thus, *A. decolor* was described with body size 3 mm; abdominal tergite 1 mostly yellow and tergite 2 entirely yellow, other segments with posterior margins of tergites yellow; thorax with yellow metapleuron and scutellum; mid coxa mostly black, yellow at apex. In contrast, *A. impudicus* was described with body size 4.8 mm; abdomen blackish green, with only posterior margins of tergites yellow; thorax entirely dark; mid coxa yellow, brownish at base. Therefore, we reinstate *A. decolor* as a true species, although some of the listed characters may vary. It is interesting that both species inhabit the island of Mauritius (see a record of *A. impudicus* in Grichanov et al. [2011]). The wing venation in *A. decolor* is closer to *A. impudicus*, than to new Iranian species described in this paper. Both *A. decolor* and *A. impudicus* have short vein R_{2+3} and have no stublike vein M_2 (see also diagnostic Table in the Discussion section).

Argyrochlamys impudicus Lamb, 1922

Argyrochlamys impudicus Lamb, 1922: 391; Brooks, 2005: Fig. 6; Grichanov, 2011: Fig. 61).

MATERIAL. 1 ♂, Iran, Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, -10 m, 27°24'70"N, 052°40'9.0"E, light trap, 6–8.XI.2021, H. Naserzadeh leg. (HMIM).

DISTRIBUTION. Type locality: Seychelles: Long I., Mahe. Afrotropical: Mauritius, Oman, Seychelles; Oriental:

Chagos Archipelago, India (Gujarat), Sri Lanka; Palaearctic: Iran.

REMARKS. Brooks [2005] mentioned Dyte's unpublished records of *A. impudicus* and *A. cavicola* from Oman. Nevertheless, these records may belong to the new species described in this paper and must be confirmed.

Argyrochlamys sp. A

MATERIAL. 1 ♀, Iran, Hormozgan prov., Bandar-e Khamir, Marduo Island, 3 m, 26°58'33"N, 055°40'25"E, light trap, 30.X.2021, H. Naserzadeh leg. (ZIN); 1 ♀, Iran, Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, -10 m, 27°24'70"N, 052°40'9.0"E, rotting banana trap, 6–8.XI.2021, E. Gilasian leg. (ZIN).

REMARKS. These females have about the same size and coloration of abdomen as those in male *A. hajiesmaeiliani* **sp.n.**, but may belong to different species.

Discussion

Morphology. The new Iranian *Argyrochlamys* species described in this paper are remarkably similar to each other in hypopygium morphology. Moreover, the number and length of surstylar setae seems to be variable. For example, one of the *A. hajiesmaeiliani* **sp.n.** paratypes has 2 very long basidorsal setae on dorsal lobe of left surstylus and one such seta on right surstylus; *A. nigrescens* **sp.n.** holotype has two apical setae on ventral lobe of left surstylus and three such setae on right surstylus (Fig. 13). The hypopygium of the related *A. impudicus* is peculiar in having asymmetrically thick lobes of hypandrium of different length, and the cercus about as long as epandrium (Brooks, 2005), in contrast to the newly described species with hypandrium with deeply bifurcated symmetrical lobes, and cercus shorter, 0.8 times as long as epandrium. The hypopygium of the related *A. decolor* was figured rather schematically [Parent, 1930]. Nevertheless, this and the two new Iranian species can be reliably differentiated by the following set of morphometric characters:

Character	<i>A. decolor</i>	<i>A. hajiesmaeiliani</i>	<i>A. nigrescens</i>
Body length, mm	3.0	3.3–3.8	3.5
Wing length, mm	–	2.9–3.0	3.4
Distal section of M_4 / dm-m	2.0X	2.2–2.5X	3.1X
Costal section between R_1 and R_{2+3} / costal section between R_{2+3} and R_{4+5}	0.75X	1.0–1.2X	1X
Postpedicel length / height	1.5X	1.7–1.9X	1.5X
Face maximal width / postpedicel height	–	1.4–1.6X	1.8X
Fore tarsus / fore tibia length	1.5X	1.2X	1.5X

It is worth noting, that the hypopygiums in species of closely related genus *Pseudargyrochlamys* Grichanov, 2006, are also quite similar to each other, being distinguished in the cercus length and length of setae on the distoventral epandrial lobe [Grichanov, 2004, 2020]. There are some more dolichopodid genera with species indistinguishable by male genitalia, but well differing from their relatives in male secondary sexual characters

on legs or wings (e.g., *Campsicnemus* Haliday, 1851, and *Teuchophorus* Loew, 1857, in the subfamily Sympyctinae).

Habitats. As a result of this study, three species of the genus *Argyrochlamys* have been found in Hormozgan and Bushehr provinces of Iran and two species on the coastal strip of the Al Wusta Governorate of Oman, all in or near the mangrove forests (Fig. 24).



Fig. 24. Distribution of the *Argyrochlamys* species in Iran and Oman: A — Bushehr Prov., Asaluyeh, Nayband (*A. hajiesmaeiliani*, **sp.n.**, *A. nigrescens*, **sp.n.**, *A. impudicus*, *Argyrochlamys* sp. A); B — Hormozgan prov., Bandar-e Khamir, Marduo Island (*Argyrochlamys* sp. A); C — Hormozgan Prov., Qeshm Island, DoKuhak (*A. hajiesmaeiliani*, **sp.n.**); D — Hormozgan prov., Sirik, Azini wharf (*A. hajiesmaeiliani*, **sp.n.**, *A. nigrescens*, **sp.n.**); E — Hormozgan prov., Gabrik protected area, Keyki (*A. hajiesmaeiliani*, **sp.n.**); F — Oman, Barr al-Hikman peninsula (*A. hajiesmaeiliani*, **sp.n.**, *A. tomkovichi*, **sp.n.**).

Рис. 24. Распространение видов *Argyrochlamys* species в Иране и Омане: А — остан Бушир, Эселуйе, Найбанд (*A. hajiesmaeiliani*, **sp.n.**, *A. nigrescens*, **sp.n.**, *A. impudicus*, *Argyrochlamys* sp. A); В — остан Хормозган, Бендер-Хемир, о-в Мардуо (*Argyrochlamys* sp. A); С — остан Хормозган, о-в Кешм, Докухак (*A. hajiesmaeiliani*, **sp.n.**); D — остан Хормозган, Сирик, пристань Азини (*A. hajiesmaeiliani*, **sp.n.**, *A. nigrescens*, **sp.n.**); E — остан Хормозган, заповедник Габрик, Кейки (*A. hajiesmaeiliani*, **sp.n.**); F — Оман, п-ов Барр-эль-Хикман (*A. hajiesmaeiliani*, **sp.n.**, *A. tomkovichi*, **sp.n.**).

The Azini wharf of the Sirik mangrove forest (Fig. 25) with an area of 773 ha is located in the southern Hormozgan province close to the Oman Gulf. This area has a very hot summer (more than 40°C) and arid environment with average of 100–300 mm annual rainfall [Askari et al., 2021].

The Qeshm Island (Hormozgan province) with approximately 1491 km² (122 km long, 18 km wide on average) is the largest island in the Persian Gulf (Fig. 26). It is located in the Strait of Hormuz opposite the Bandar-e Abbas (Capital city of Hormozgan province). The annual average temperature and rainfall in this area are about 27 °C and 183.2 mm respectively [Mohebbi Nodez et al., 2018].

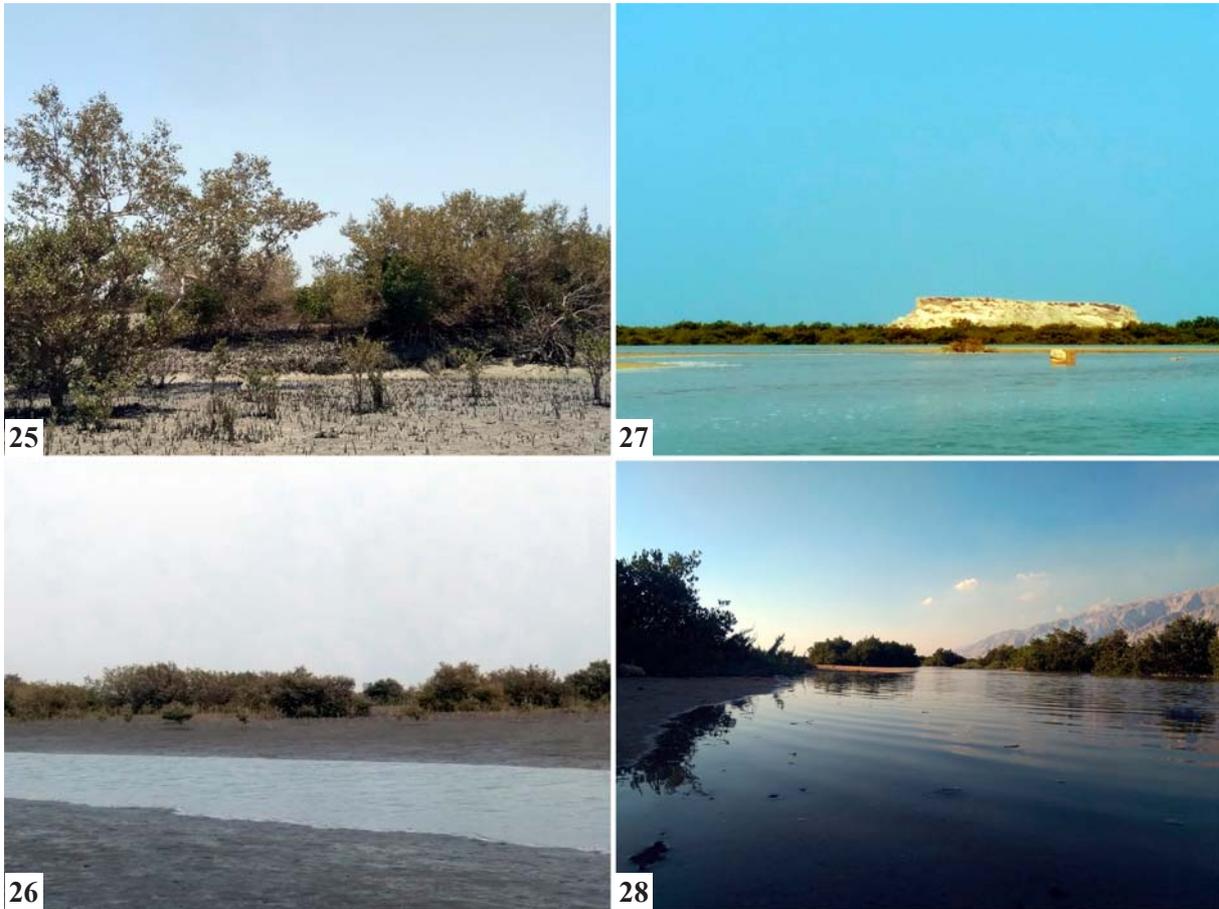
The Gabrik protected area with approximately 27 ha is located in eastern part of the Hormozgan province close to Oman Sea (Fig. 27). The annual average rainfall and temperature in this area are 149 mm and 27°C respectively [Zarehzadeh, Resaee, 2014].

The Nayband Gulf with an area of 41.3 km² (width: 7400 m; coastline: 20.75 km) is located in Eastern end of the Bushehr province close to the Persian Gulf. The

mangrove forests of this area grow along two firths of Asalouyeh (length: 5250 m) and Basatin (length: 3100 m). The Nayband Gulf is considered as a subtropical region with very hot summer (36–42°C) and moderate winter (12–16°C). The annual average rainfall is 100–150 mm which mostly occurs in winter [Amiri et al., 2010].

Barr al-Hikman is a large (30×30 km) peninsula, located on the Omani coast of the Arabian Sea. The coast contains seagrass beds, coral reefs and mangrove forests. About 88 km² of intertidal mudflat is found on the east side of the peninsula. Barr Al Hikman has a hot desert climate with hot summers and warm winters, and is strongly influenced by a complex monsoon wind regime along the coast. Precipitation is low, on average 58 mm annually, and the average winter temperature is around 24°C [Mettraux et al., 2011; de Fouw et al., 2017].

So, the *Argyrochlamys* species number has increased to ten. In total, 176 species belonging to 31 genera of the family Dolichopodidae are recorded now from Iran [Grichanov, Gilasian, 2023a, 2023b], and only six spe-



Figs 25–28. Habitats of the *Argyrochlamys* species in Iran: 25 — the Azini wharf of the Sirik mangrove forest (*Argyrochlamys hajiesmaeiliani*, **sp.n.** and *A. nigrescens*, **sp.n.**); 26 — Qeshm Island, DoKuhak (*Argyrochlamys hajiesmaeiliani*, **sp.n.**); 27 — the Gabrik protected area (*Argyrochlamys hajiesmaeiliani*, **sp.n.**); 28 — mangrove forest near the Nayband Gulf at the Asalouyeh firth (the Iranian *Argyrochlamys* species). Photos by M. Mofidi.

Рис. 25–28. Местобитания видов *Argyrochlamys* в Иране: 25 — причал Азини в мангровом лесу Сирик (*Argyrochlamys hajiesmaeiliani*, **sp.n.** и *A. nigrescens*, **sp.n.**); 26 — остров Кешм, Докухак (*Argyrochlamys hajiesmaeiliani*, **sp.n.**); 27 — заповедник Габрик (*Argyrochlamys hajiesmaeiliani*, **sp.n.**); 28 — мангровый лес у залива Найбанд в устье реки Эселуйе (местообитание иранских видов *Argyrochlamys*). Фото М. Мофиди.

cies belonging to three genera are reported from Oman [Dawah et al., 2020].

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