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RESEARCH PAPER

# Heteroptera (Hemiptera) of the Socotra Archipelago I: Introduction, Nepomorpha, Gerromorpha and Leptopodomorpha

Petr KMENT[1)] & Attilio CARAPEZZA[2)]

[1)] Department of Entomology, National Museum, Cirkusová 1740, CZ-193 00 Praha 9 – Horní Počernice, Czech Republic; e-mail: sigara@post.cz; ORCID: 0000-0002-7026-5691
[2)] University of Palermo; corresponding address: Via Sandro Botticelli, 15, I-90144 Palermo, Italy; e-mail: attilio.carapezza@unipa.it

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**Abstract.** This contribution is the first part of a series designed to summarize the present knowledge on the fauna of true bugs (Hemiptera: Heteroptera) of the Socotra Archipelago. A review of aquatic, semiaquatic and shore bugs of the infraorders Nepomorpha, Gerromorpha, and Leptopodomorpha of Socotra is provided. Nine families and 19 species are recorded from the Socotra Island (including two marine off-shore species). The following new species and new records are given: *Micronecta eupompe* Hutchinson, 1930 (Micronectidae), *Sigara hoggarica* Poisson, 1929 (Corixidae), *Hebrus kanyukovae* sp. nov., *Hebrus* sp. (Hebridae), *Microvelia gracillima* Reuter, 1882, *M. macani* Brown, 1953 (Veliidae), *Limnogonus cereiventris* (Signoret, 1862) (Gerridae), *Micracanthia ornatula* (Reuter, 1881), and *Saldula niveolimbata* (Reuter, 1900) (Saldidae). The following new faunistic records are also provided: *Micronecta eupompe* from Burkina Faso, *Anisops varius* from Jordan and Rwanda, *Mesovelia vittigera* Horváth, 1895 (Mesoveliidae) from Mali, *Micracanthia ornatula* from Guinea-Bissau, Mali, Zambia, China (Sichuan), and Bangladesh, and *Saldula niveolimbata* from Mali. The status of the type specimens is discussed and corrected for *Anisops varius* var. *scutellata* Fieber, 1851 (syntypes), *Anisops varius* var. *sugillata* Fieber, 1851 (lectotype), *Anisops hoggarica* Poisson, 1929 (syntypes), *Halobates germanus* White, 1883 (lectotype), *Halobates sewelli* Imms, 1936 (lectotype), *Limnogous leptocerus* (Reuter, 1882) (lectotype), and *Microvelia gracillima* Reuter, 1882 (holotype versus neotype).

**Key words.** Hemiptera, Heteroptera, Gerromorpha, Leptopodomorpha, Nepomorpha, faunistics, new record, new species, Socotra, Yemen, Afrotropical Region, Palaearctic Region

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## Introduction

The three smaller infraorders including true bugs more or less associated with water are Nepomorpha Popov, 1968 (aquatic bugs, 13 families), Gerromorpha Popov, 1971 (semiaquatic bugs, 8 families), and Leptopodomorpha Popov, 1971 (shore bugs, 4 families) (Nieser 2002, Andersen & Weir 2004a, Chen et al. 2005, Schuh & Weirauch 2020, Wang et al. 2021). Nepomorpha are the true aquatic (nectonic) bugs, inhabiting various types of freshwater habitats, rarely saline waters, with only a few species of the families Gelastocoridae and Ochteridae which are secondarily non-aquatic, living mostly in littoral habitats. Most aquatic bugs are predators, only some Corixoidea may be polyphagous (Schuh & Slater 1995, Andersen & Weir 2004a, Chen et al. 2005, Hädicke et al. 2017, Schuh & Weirauch 2020). Gerromorpha are predators, inhabiting the surface of both freshwater and saline waters (pleuston), a few species live also in humid terrestrial habitats (Schuh & Slater 1995, Andersen & Weir 2004a, Chen et al. 2005, Schuh & Weirauch 2020). The infraorder Leptopodomorpha includes predaceous bugs less tightly bound to water, though most species live in damp areas adjacent to water, less frequently being intertidal (Schuh & Slater 1995, Schuh & Weirauch 2020).

**General characteristics of studied area.** The Socotra Archipelago, an emerged part of the Socotra Platform, is situated in the western part of the Arabian Sea and consists of one main island, Socotra, oriented east–west (3,625 km$^2$) and three smaller islands, Samha (41 km$^2$), Darsa (10 km$^2$), and Abd el Kuri (133 km$^2$), the last one

situated about 100 km southwest of the main island. All four islands are closer to the Horn of Africa than to the Arabian Peninsula, the Socotran Platform being part of the African continent. The distance from Socotra to the nearest point on the African mainland, Cape Guardafui (NE Somalia), is 232 km, the closest point of the Arabian Peninsula (Ra's Fartaq in southern Yemen) is 351 km. The Socotra Platform contains also several submarine basins, of which Guardafui Basin between Cape Guardafui and Abd el Kuri Island (shallowest point ca. 950 m in depth) and Brothers Basin between Abd el Kuri and Samha (ca. 200 m deep) played an important role as biogeographical barriers in the past. The highest mountain of the archipelago (Skand Mt.) is situated in the eastern half of the Socotra Island in the Hagher mountain range and reaches 1,550 m a.s.l. Abd el Kuri and Samha are dominated by a limestone plateau reaching ca. 740 m a.s.l. and 680 m a.s.l., respectively, Darsa is smallest and lowest (ca. 392 m a.s.l.). The three smaller islands are characterized by arid and rocky landscape without any permanent running water or pools. On the contrary, Socotra has numerous south to north orientated wadis and streams with running water which sometimes incised deep canyons into the slopes of the Hagher massive. Socotra can be divided into three main topographical and geological regions:

i) The crystalline basement rocks (Proterozoic−Paleozoic), both alkaline and acidic, dominate the central and eastern parts of the island, exceeding 1,000 m a.s.l. in Hagher massive.

ii) Limestone plateaus (mostly Paleocene−Eocene) occur between 300 and 700 m a.s.l. (locally up to 900 m a.s.l.) and occupy the largest part of the island, being subject of karstification.

iii) Coastal plains have developed where the mountains and limestone plateaus do not reach the coast. The most extensive of them is the Noged plain, running parallel to the south coast and about 70 km in length and up to 5 km wide. The coastal plains are filled with Quaternary sediments of various origin (marine, fluvial, scree debris and aeolian sands) (Fleitmann et al. 2004, Banfield et al. 2011, Batelka 2012, Brown & Mies 2012, Culek 2013).

The archipelago is of east Gondwanan origin similarly to Madagascar and Seychelles in the south and to the neighbouring landmasses of south Arabia in the north and Africa in the west. Socotra is an ancient continental island, but in biological evolutionary terms, it is more akin to an oceanic island due its relatively long duration of isolation (at least 15 mya, possibly substantially longer) (Batelka 2012, Brown & Mies 2012, Culek 2013). Plate tectonic reconstructions indicate that prior to the Gulf of Aden rifting in the Oligocene, Socotra was located adjacent to the southern Oman coast. Until 43 mya the area of Socotra Archipelago was mostly submerged in shallow tropical sea. At 41 mya a large low and flat elevation emerged in an area of the future Gulf of Aden; since then, some part of present-day Socotra remained emerged (with high probability) up to present. However, the island underwent a series of uplifts (38–34, 20–17.6, 9–5 mya) as well as marine transgressions (26–20, 16–7, 5–3 mya) strongly affecting its area as well as the migration possibilities between Socotra, Arabian Penninsula and Africa. In the Pleistocene (ca. 3–0 mya), marginal parts of the Socotra Platform emerged and submerged about 30–50 times due to the glacial cycles; during the last period (0.5–0 mya) most of the Platform emerged during severe glacial periods, though Guardafui and Brothers Basins (minimal width ca. 62 km and 12 km, respectively) persisted and created barriers for terrestrial and freshwater biota (Culek 2013). During the Quarternary the natural conditions of the archipelago were influenced by changes of drier and wetter periods (Fleitmann et al. 2004, Scholte & De Geest 2010, Banfield et al. 2011, van Rampelbergh et al. 2013).

Socotra lies within the boundaries of the monsoonal precipitation regime (also called Indian summer monsoon). It means that Socotra has bimodal distribution of rainfall due to the seasonal migration of the Intertropical Convergence Zone. Southwest winds of summer monsoon start in the second half of April, sometimes lasting till early June, bringing rainfall mostly to the southern regions of the island and only sporadically reaching the northern regions. From July until mid-August the W wind creates cloud cover above the southern coastal and especially higher altitude plateaus; in late August and early September the SW wind generates high humidity. In the autumn transition period (early to late October), wind changes from SW towards NE direction, relative humidity decreases and temperature rises towards the end of the period. During the winter monsoon (late October to early February), winds blow from NE direction, bringing the largest annual rainfall in November. It affects the entire island though the northern regions are more influenced due to orographic rainfall. The spring transition period (mid-Februaty to first half of April) is generally dry, hot and rather cloudless, the wind direction changes from the NE towards the SW (Fleitmann et al. 2004, Culek et al. 2006, Scholte & De Geest 2010, Batelka 2012, Brown & Mies 2012). The mean annual rainfall registered on Socotra in 2002–2006 was 216 mm (Scholte & De Geest 2010). Fogs are common in the highest parts of the main massif during the summer monsoon. Vegetation, in particular tree species such as Dragon's Blood Tree *Dracaena cinnabari* Balf.f., are able to capture cloud water by their canopies, producing horizontal precipitation. Preliminary measurements suggest that at higher altitudes, fog-derived moisture may constitute up to two-thirds of total moisture, amounting up to 800 mm (Scholte & De Geest 2010). As a result, impacts of both rainy periods are different in different parts of Socotra due to the natural barrier formed by the Hagher mountain massif. The resulting spatial, altitudinal, seasonal and inter-annual variability of weather patterns further supports the habitat diversity, especially between east and west parts of the island, leading to formation of a dynamic system of wet and dry refugia enabling the survival of hygro-/xerophilous species in periods of adverse climatic conditions (Habrová et al. 2007, Banfield et al. 2011). Recorded air temperature ranged from 8.2 °C in January 2005 in Skand (1,450 m a.s.l.), Hagher Mts., to 43.5 °C in June 2005 in Hadiboh (27 m a.s.l.) (Culek et al. 2006,

Habrová et al. 2007). Mean annual records taken by the same weather stations ranged between 17.9 °C and 28.0 °C, respectively (Habrová et al. 2007).

Owing to its complex geomorphology and geological history, the limited area of Socotra holds a remarkably diverse vegetation cover which was subject to several attempts for formalized classification but the current knowledge is still far from satisfactory (see Král & Pavliš 2006, Kürschner et al. 2006, Brown & Mies 2012, De Sanctis et al. 2013, Habrová & Buček 2013, and there included references). For review of the characteristic plant communities see Brown & Mies (2012). There are about 843 species of vascular plants, including 310 species (i.e. 37%) regarded as endemic (Miller & Morris 2004, Banfield et al. 2011, Brown & Mies 2012, Domina et al. 2012, Řepka et al. 2017). Comparing the number of endemics per km$^2$ among the world's islands, the biodiversity of the archipelago equals the diversity of the Canary Islands and Jamaica, being surpassed only by the Seychelles, New Caledonia and Hawaii, which ranks the archipelago as having the fifth highest density of endemic plants (Banfield et al. 2011). Several genera include high number of endemic taxa due to insular radiations (e.g. *Boswellia* Roxb., *Helichrysum* Gärtn. or *Heliotropium* Linn.). Although one can thus expect mainly vicariant origin of the endemic plants due to the continental origin of the island, recent phylogeographic studies (using molecular methods) of some endemic taxa (e.g. in the genera *Aerva* Forssk., *Campylanthus* Roth, *Echidnopsis* Hook f. or *Thamnosma* Torr. & Frém) revealed it is caused by the long-distance dispersal of their ancestors across the sea. The majority of the flora has East-African or South-Arabian affinities (e.g. the subendemic family Dirachmaceae shared by Socotra and NE Somalia), although some disjunct distributional patterns related for example to Macaronesia are also known (Banfield et al. 2011, Brown & Mies 2012 and references therein).

The available information on terrestrial and freshwater animals of the Socotra Island was reviewed by Wranik (2003), but especially the knowledge of insects and some other invertebrates has recently increased (see e.g. Batelka 2012, Hájek & Bezděk 2012, 2014, 2017a,b, 2019; Hula & Niedobová 2020; Neubert & Bochud 2020; Purchart et al. 2020; Van Damme et al. 2020; Witt et al. 2020; Belles 2021; Schenková et al. 2021).

The Socotra Archipelago is globally recognized for its outstanding biodiversity and endemism, designated on this basis a Biosphere Reserve in 2003 and a UNESCO World Heritage Site in 2008, and is listed as one of the WWF Global 200 ecoregions which include the most biologically diverse and representative habitats (Van Damme & Banfield 2011, Scholte et al. 2011).

One must realize that most of what we see on the island is, in fact, a cultural landscape (Van Damme & Banfield 2011, Riccardi et al. 2020). The Socotra has its indigenous human population originating in Southern Arabia which settled in the island in late Holocene (possibly 6000 years BP) (Černý et al. 2009). This population was involved in farming and trade with frankincense (resin of *Boswellia* spp.), dragon's blood (resin of *Dracaena cinnabari*) and aloe (*Aloe* spp.) since ancient times, creating a highly organized agricultural land use system now abandoned (van Rensburg & Hopper 2017). There was also traditional nomadic nature-friendly grazing practice and the custom of collecting dead wood and shrubs to use for building and as firewood, leaving the forests and woodland relatively intact (Miller & Morris 2004). Despite the past human activities, Socotra was spared from massive loss of its biota, as documented by merely four endemic plant species becoming extinct (Miller & Morris 2004, Cheung & DeVantier 2006). However, the Socotra Island is not free from threats to its biodiversity and the habitat degradation certainly accelerated in the past decades. At the end of the 1990s, with the opening of the airport (Riccardi et al. 2020), Socotra began to open up to the outside world. The growing human population, constructions of network of paved roads between 2001–2008 (Riccardi et al. 2020) and increase in number and density of settlements and infrastructure across the island, waste accumulation and pollution by biocides, overgrazing by livestock, soil erosion, habitat fragmentation and destruction, as well as impact of invasive species, represent a great danger for the Socotra nature (see References below). Concerning overgrazing, population of goats and sheep raised nearly five times from beginning of 1950s to 1999, reaching about 220,000 specimens (Scholte et al. 2007), this being connected with abandonig of traditional nature-friendly grazing practice, resulting in deforestation due to the lack of natural regeneration of trees (as documented for the ecosystem engineer Dragon's Blood Tree *Dracaena cinnabari* or the Frankincense Tree *Boswellia elongata* Balf.f.). Also the global warming, bringing rise in periods of drought and growing frequency of extreme climatic events (such as cyclones), could cause additional stress on the environment, especially in combination with other factors (Van Damme & Banfield 2011, Maděra et al. 2019). For review of potential impacts of human activities as well as global warming on Socotra ecosystems see Scholte et al. (2011), Van Damme & Banfield (2011) and Brown & Mies (2012), as well as case studies by Senan et al. (2012), Rejžek et al. (2016), Maděra et al. (2019), Habrová et al. (2020), Lvončík et al. (2020), Rezende et al. (2020), Riccardi et al. (2020), and Witt et al. (2020).

**History of Heteroptera research** (for more details see Wranik 1999, 2000, 2003). The history of scientific research in Socotra starts with the first British expedition in 1834 (Wranik 2003), but the first specimens of Heteroptera were collected only by botanist Prof. Isaac Bayley Balfour in 1880 who carried out pioneering botanical, zoological and geological explorations (Balfour 1888, Distant 1903, Wranik 2003).

One year later, two German naturalists from Halle, Dr. Georg August Schweinfurth and Dr. Emil Riebeck, performed zoological and botanical research on Socotra from April to May 1881 (Wranik 2003, Neumann & Gedeon 2009). The insects collected by this expedition were examined by Taschenberg (1883) who also mentioned the first four taxa of true bugs from the island – '*Aspongopus*

*viduatus* Fbr. [= *Coridius viduatus* (Fabricius, 1794) (Dinidoridae)], *Pyrrhocoris* sp.? [Fallén, 1814 (Pyrrhocoridae)], *Velia* sp.? [Latreille, 1804 (Veliidae)], and one new form belonging to a new genus related to *Syromastus* [Berthold, 1827 (Coreidae)]'.

Witlaczil (1886) described the sea skater *Halobates incanus* Witlaczil, 1886 [= *H. hayanus* White, 1883 – Dahl (1893)] based on specimens collected in the Arabian Sea near Socotra which were collected by G. Chierchia during the circumnavigation of the Italian war ship Vettor Pisani in 1882–1885.

The first specialized and detailed zoological survey was led by William Robert Ogilvie-Grant from the British Museum and Henry O. Forbes from Liverpool Museum. Besides Socotra they also visited Abd el Kuri and acquired large collections for both museums. The scientific results of this expedition were summarized in the famous monograph '*The Natural History of Socotra and Abd al Kuri*' edited by Forbes (1903) (see Wranik 2003). The Hemiptera collected by Ogilvie-Grant and Forbes were identified by George Willis Kirkaldy. First Kirkaldy (1899a) provided short descriptions of ten new species, eight of them being Heteroptera: *Klinophilos horrifer* Kirkaldy, 1899 [= *Cimex hemipterus* (Fabricius, 1803) – Horváth (1909)] (Cimicidae), *Reduvius azrael* Kirkaldy, 1899 (Reduviidae), *Geocoris sokotranus* Kirkaldy, 1899 (Geocoridae), *Aspilocoryphus forbesii* Kirkaldy, 1899 [= *Dieuches forbesii* – Distant (1901)] (Rhyparochromidae), *Leptocoris bahram* Kirkaldy, 1899 (Rhopalidae), *Euthetus granti* Kirkaldy, 1899 (Alydidae), and *Aspongopus assar* Kirkaldy, 1899 [= *Coridius viduatus* – Distant (1903)] from Socotra, and *Chroantha hataska* Kirkaldy, 1899 [= *Ch. ornatula* (Herrich-Schaeffer, 1842) – Kirkaldy (1903a)] from Abd el Kuri. A more detailed account and descriptions were provided by Kirkaldy (1903a) in the frame of Forbes's monograph. In addition to the previous work, Kirkaldy (1903a) described *Geotomus attar* Kirkaldy, 1903 [= *Aethus attar* – Bergroth (1908)] (Cydnidae) from Socotra, synonymized *Ch. hataska* with *Ch. ornatula*, and recorded an immature specimen of *Nezara* sp. (Pentatomidae). Kirkaldy's results were revisited by Distant (1903) who synonymized *Aspongopus assar* with *Coridius viduatus*, *Leptocoris bahram* with *L. abdominalis* (Fabricius, 1803) (revalidated by Göllner-Scheiding 1983), transferred *Aspilocoryphus forbesii* to the genus *Dieuches* Dohrn, 1860, described *Holotrichius insularis* Distant, 1903 (Reduviidae), and provided three more species records neglected by Kirkaldy. In addition, Distant (1903) described *Brachynema balfouri* Distant, 1903 [= *Socantestia balfouri* – Ribes & Schmitz (1992)] (Pentatomidae) based on the material collected by Balfour's expedition and provided a list of the known Heteroptera of the Socotra Archipelago including sixteen species. The voucher specimens for the papers by Kirkaldy (1899a, 1903a) and Distant (1903) are deposited in the Natural History Museum in London (BMNH).

An Austrian expedition to South Arabia landed on the west coast of Socotra in January 1899, visiting also Abd el Kuri and Samha. The explorations were carried for two months, during which the entomologist Prof. Oskar Simony and the botanist Dr. Stefan Paulay made extensive collections of plants and animals which are now deposited in Naturhistorisches Museum in Vienna (NHMW) (Müller 1907, Wranik 2003; H. Zettel, pers. comm.). However, no records of Heteroptera were published based on the results of this expedition, except for Eyles (1973) mentioning in his revision a record of *Dieuches forbesii* from the NHMW material.

Afterwards there was a long gap in research activities until January 1953 when British entomologist George Basil Popov visited the island. Besides a monograph of Orthoptera he published also the first systematic account of vegetation in Socotra (Popov 1957, 1959; Uvarov & Popov 1957; Wranik 2003). The two species of aquatic Heteroptera collected by Popov and deposited in BMNH were described as new taxa by Brown (1956): *Rhagovelia infernalis socotrensis* Brown, 1956 (Veliidae) and *Anisops socotrensis* Brown, 1956 (Notonectidae), later downgraded to a subspecies, *A. debilis socotrensis*, by Lansbury (1964).

A multi-disciplinary expedition of British scientists was carried out on Socotra from March to June 1967; the animals were collected by Kenneth M. Guichard (Naumkin 1993, Wranik 2003) and the specimens are now deposited in BMNH (along with the materials collected by Popov). These materials were later examined by various authors providing new records of *Dieuches forbesii* (Eyles 1973), new record of *Onychotrechus rhexenor* Kirkaldy, 1903 (Gerridae) by Andersen (1980), and description of *Microspilus ursulae* Deckert, 2012 (Lygaeidae) by Deckert (2012). Moreover, Ribes & Schmitz (1992) erected a new genus, *Socantestia*, to accommodate *Brachynema balfouri*, and Linnavuori (1989a) described an additional species, *Bathycoelia alkyone* Linnavuori, 1989 (Pentatomidae), based on specimens localized only as 'Socotra'.

After the withdrawal of the British from Yemen in 1967, Socotra became part of the socialistic People's Democratic Republic of Yemen (= South Yemen), which made it virtually closed to foreigners and further scientific research. In 1982, the University of Aden sent a scientific mission to Socotra accompanied by East German zoologist Wolfgang Wranik (from University of Rostock), who later visited the island many times for fieldwork until 2001. Wolfgang Wranik also took part in the multi-disciplinary surveys of 1998/1999 during which many experts visited the island (e.g., Hans Pohl); the collected terrestrial invertebrates were deposited in Hessisches Landesmuseum Darmstadt (Germany). Wranik's zoological experience resulted in several comprehensive papers (Wranik 1998, 1999, 2000) including the first field guide to the fauna of the Socotra Archipelago which listed and/or provided colour photographs of 39 species of true bugs, some of them representing first records, but others identified only to genus level or unidentified (Wranik 2003). In 2016, Wranik's insect collection was acquired by the National Museum in Praha (NMPC) (J. Hájek, pers. comm.).

In the meantime, the Dutch entomologist Antonius van Harten visited Socotra in April 1993 on behalf of the Yemeni German Plant Protection Project and sampled a small

but interesting collection of insects which was studied by Rauno E. Linnavuori, resulting in description of four new species, *Peritropis selene* Linnavuori, 1994, *Yotvata erifyle* Linnavuori, 1994, *Y. hadibo* Linnavuori, 1994, and *Volumnus rufus* Linnavuori, 1997 (all Miridae), and fifteen new records (Linnavuori 1994a, 1997). Moreover, Pierre Moulet described *Oncocephalus linnavuorii* Moulet, 2001 (Reduviidae) based on the same material and also some specimens provided by W. Wranik (Moulet 2001), and recorded *O. asiranus* Miller, 1954 (Moulet 2004). Based on additional material collected by A. van Harten in October 1998 and H. Pohl in February 1999, Linnavuori & van Harten (2000) described *Plinthisus daneghanus* Linnavuori & van Harten, 2000 (Rhyparochromidae), and Linnavuori & van Harten (2002a) first recorded *Taylorilygus figuratus* Linnavuori, 1975 (Miridae).

The Lithuanian lepidopterist Aidas Saldaitis collected in Socotra in February, early March and November 2008, March 2009, and January 2010, using artificial light (different kinds of black lights) in frame of the collaborative project 'The Lepidoptera of Socotra Islands/Yemen – an integrative study of the fauna for reconstruction of evolutionary scenarios and for determination of conservation needs' (see Borth et al. 2011; A. Saldaitis, pers. comm.). Small material of Heteroptera aquired during these expeditions was deposited in the Institut Royal des Sciences Naturelles de Belgique (ISNB) in Bruxelles and was available for our study.

In the 2000s, Italian research activities started in Socotra as a part of the complex United Nations Development Programme. Between the years 2007 and 2010, six scientific surveys were organized by the University of Pavia to collect data in the framework of the 'Socotra Conservation and Development Project' focused on improvement of sustainable development and the biodiversity conservation of the Socotra Archipelago. The few Heteroptera sampled during these surveys are preserved in ethanol and were made available to our study; they are deposited in the collection of Attilio Carapezza (Palermo, Italy). In April 2008, the Director of the Department of Botany of the University of Palermo, Prof. Franco Raimondo, organized an expedition to Socotra aimed at investigating some floristic and vegetational features of the island, including the interaction between plants and insects; A. Carapezza took part to this expedition collecting a large material of Heteroptera. The first result of the investigation was the description of *Stenozygum jordiribesi* Carapezza, 2011 (Pentatomidae) (Carapezza 2011). In February 2014, A. Carapezza had the possibility of carrying out a further entomological exploration of the island. In February–March 2009 another Italian entomologist, Pietro Lo Cascio, visited the Socotra Archipelago collecting insects on Socotra and on the two smaller islands Samha and Darsa; the Heteroptera he sampled were kindly donated to A. Carapezza.

Czech expeditions to Socotra Island began in 1999 and were supported by several projects, in the first years through the patronage of the Czech Developmental Programme of Yemen (September 1999, February–March 2000, October 2000, April 2001 – Vladimír Bejček, Karel Šťastný; November–December 2003 – Jan Farkač, David Král and Petr Kabátek; May 2004 – Antonín Reiter). Later the main role among Czech projects was taken by Mendel University in Brno, Faculty of Forestry and Wood Technology, focusing on botany, agroforestry, and sustainable development on the island (see e.g., Král & Pavliš 2006; Habrová et al. 2007, 2009, 2020; Maděra et al. 2019; Lvončík et al. 2020); however, some insect samples were collected as well (e.g., June 2009 – Vladimír Hula, Luboš Purchart; February 2010 – L. Purchart, Jan Vybíral). Within this frame a specialized project focused on biodiversity of invertebrates (project INGO) took place in 2010–2012. In 2010, two research trips took place (May to June 2010 – V. Hula and Jana Niedobová; November 2010 – L. Purchart, Jan Bezděk, Jiří Hájek, Jan Batelka, Peter Hlaváč, and Josef Suchomel). In 2012, the last Czech expedition followed from May to June (participants: V. Hula, J. Niedobová, L. Purchart, J. Bezděk, J. Hájek, Igor Malenovský, and Petr Kment). During the expeditions, a wide spectrum of terrestrial and freshwater habitats was sampled through most of the Socotra Island (except for the coastal marine habitats and deep caves), and the material of insects collected constituted the basis of many already published papers (see e.g., Hájek & Bezděk 2012, 2014, 2017a). The Heteroptera material collected during the Czech expeditions is deposited in the collections of the National Museum in Praha and Moravian Museum in Brno (MMBC) and together with the material of A. Carapezza already served as base for description of several new species: *Lanchnophorus seminitens* Kment & Carapezza, 2017 (Rhyparochromidae) (Kment et al. 2017), *Ochterus papaceki* Kment & Carapezza, 2020 (Ochteridae) (Kment et al. 2020), *Socotredocla spinosa* Moulet, 2020, *Reduvius nigroluteus* Moulet, 2022, and *Stenolemus inopinatus* Moulet, 2022 (all Reduviidae) (Moulet 2020, 2022). Finally, Roca-Cusachs & Kment (2022) provided the first record of *Joppeicus paradoxus* Puton, 1881 (Joppeicidae) from Socotra.

To summarize the current state of knowledge, the cited authors from Taschenberg (1883) to Roca-Cusachs & Kment (2022) recorded altogether 68 species of Heteroptera, classified in 58 genera and 24 families from Socotra Island. Out of this number, two genera (*Socantestia* Ribes & Schmitz, 1992 and *Socotredocla* Moulet, 2022) and 22 species (i.e. 32%) are considered endemic (see Appendix). Two additional species, *Batyhcoelia alkyone* and *Euthetus granti*, originally considered endemic of Socotra, were later found also in southern Yemen (Linnavuori & van Harten 2002a and Linnavuori 1987, respectivelly). *Chroantha ornatula* (Pentatomidae) remains the single true bug species recorded so far from Abd el Kuri Island.

## Material and methods

During the expeditions, aquatic, semiaquatic and shore habitats were sampled using a kitchen strainer, supplemented by individual collecting on wet sand, muddy banks and hygropetric microhabitats, as well as sampling of shortly grazed vegetation on shores and in spring fens using suction (or vacuum) sampler (see e.g. Stewart & Wright 1995,

Brook et al. 2008), and intensive light trapping using both normal and UV-light. The altitudinal zones of Socotra are used according to Brown & Mies (2012): coastal zone (0–200 m a.s.l.), low-elevation zone (200–400 m a.s.l.), medium elevation zone (400–700 m a.s.l.), montane zone (700–1200 m a.s.l.), and high-montane zone (1200–1550 m a.s.l.).

In quoting the labels of the holotype, a slash (/) is used to divide data on different rows of one label, a double slash (//) is used to divide data on different labels, authors' comments are given in square brackets [], and the abbreviation 'p' is used to indicate the printed text. Localities of paratypes and other specimens are standardized. The names of the localities follow Bezděk et al. (2012), aberrant forms of the names from older locality labels are provided with the standard alternative given in square brackets.

The specimens examined or cited are deposited in the following collections:

| | |
|---|---|
| ACPI | Attilio Carapezza Collection, Palermo, Italy; |
| AMNH | American Museum of Natural History, New York, USA; |
| BMNH | Natural History Museum, London, United Kingdom; |
| BPBM | Bernice P. Bishop Museum, Honolulu, Hawaii, USA; |
| HNHM | Hungarian Natural History Museum, Budapest, Hungary; |
| ISNB | Institut Royal des Sciences Naturelles, Bruxelles, Belgium; |
| MGAB | Grigore Antipa National Museum of Natural History, Bucharest, Romania; |
| MIZT | Museo ed Instituto di Zoologia di Torino, Torino, Italy; |
| MMBC | Moravian Museum, Brno, Czech Republic; |
| MNHN | Muséum National d'Histoire Naturelle, Paris, France; |
| MZHF | Finnish Natural History Museum, Helsinki, Finland; |
| NHMW | Naturhistorisches Museum in Wien, Wien, Austria; |
| NHRS | Swedish Museum of Natural History, Stockholm, Sweden; |
| NMPC | National Museum, Praha, Czech Republic; |
| NTMD | Northern Territory Museum of Art and Science, Darwin, Australia; |
| NZSI | National Zoological Collection, Zoological Survey of India, Calcutta, India; |
| RLRF | Rauno Linnavuori Collection, Raisio, Finland; |
| RMNH | Naturalis Biodiversity Center, Leiden, the Netherlands; |
| USNM | National Museum of Natural History, Smithsonian Institution, Washington D.C., USA; |
| WWRG | Wolfgang Wranik Collection, Rostock, Germany; |
| ZMHB | Museum für Naturkunde, Berlin, Germany. |

Measurements were taken using Leica MZ75 (Petr Kment) and Leica M205 C (Attilio Carapezza) stereomicroscopes provided with an ocular micrometer and subsequently standardized to absolute values. Non-coated specimens were examined by a Hitachi S-3700N environmental scanning electron microscope at the Department of Palaeontology, National Museum, Praha. Habitus photographs were taken using a Canon MP-E 65 mm macro lens attached to a Canon EOS 550D camera (photos by Petr Kment) or to a Canon 40D camera (photo by Attilio Carapezza), light microscope photographs were taken using an Olympus BX44 microscope with a Canon EOS 1100D camera attached. The photographs were stacked from multiple layers using the Helicon Focus 5.1 Pro software. Parameres of dissected *Hebrus* paratype were mounted in dimethyl hydantoin formaldehyde resin (DMHF, a water-soluble mounting medium) on a separate piece of card.

The system and nomenclature used follow Andersen (1995), Jansson (1995), Lindskog (1995), J. T. Polhemus (1995) and Aukema et al. (2013), but the family status of Micronectidae is accepted according to Nieser (2002) and Wang et al. (2021). The catalogue parts were confirmed according to the original papers and corrections to the previous catalogues are given if needed. Despite the Socotra Archipelago being generally accepted as part of the Afrotropical Region (Culek 2013), we accept here arbitrary inclusion of Socotra and Yemen in the Palaearctic Region following the Palaearctic catalogue by Aukema & Rieger (1995); the boundaries of Palaearctic, Afrotropical, and Oriental Region we use follow that book.

Abbreviation used: ap – apterous, ma – macropterous; L – larva(e).

## List of species

### Infraorder Nepomorpha
### Family Micronectidae

#### *Micronecta* (*Dichaetonecta*) *eupompe* Hutchinson, 1930

(Figs 1, 5–9)

*Micronecta eupompe* Hutchinson, 1930a: 455–456, figs 10a–c (original description). Holotype: ♂, Ethiopia: water-hole N of Makki R.[iver], Lake Zwai [= Ziway], ca. 6000 ft [= 1828 m] (BMNH).

*Micronecta* (*Dichaetonecta*) *eupompe*: Hutchinson (1940): 355 (subgeneric placement).

**Material examined. SOCOTRA:** Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 11 ♂♂ 20 ♀♀, SOCOTRA expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), 18.i.2014, 16 ♂♂ 15 ♀♀, A. Carapezza lgt. (ACPI); Dixam plateau, wadi Zerig, beginning of track for Skand Mt. (12°29′15″N 53°59′20″E), 20.i.2014, 1 ♂ 1 ♀, A. Carapezza lgt. (ACPI). – **BURKINA FASO:** Ouagadougou, Haute Volta, ix.1936, 54 ♂♂ 109 ♀♀, Škulina lgt., A. Wróblewski 1983 det., P. Kment revid. (NMPC). **CHAD:** Environs du Tsad, i.1937, 18 ♂♂ 28 ♀♀, Škulina lgt., A. Wróblewski 1983 det. (NMPC). **DEMOCRATIC REPUBLIC OF THE CONGO:** Congo belge, Ituri, i.1937, 1 ♂ 1 ♀, Škulina lgt., A. Wróblewski 1983 det. (NMPC). **IVORY COAST:** Mandaloa, ix.1936, 3 ♀♀, Škulina lgt., A. Wróblewski 1983 det. (NMPC). **NIGER:** Maradi, Nigere, Sahara merid., x.1936, 16 ♂♂ 26 ♀♀, Škulina lgt., A. Wróblewski 1983 det. (NMPC).

**Identification.** Hutchinson (1930a) (original description, figures); Hutchinson (1932a) (redescription, figures).

**Habitat.** In Socotra, the species was collected in medium-elevation zone, in a large pool with sparse littoral vegetation in a drying wadi (Fig. 53). According to Linnavuori (1981), it lives in pools and rivers in the Sahel and Sudan savannahs. In Kenya, it was found in a permanent shaded pool with aquatic vegetation (Hynes 1955). In Zimbabwe, it was collected in pans (small, temporary seasonal lakes) with rich littoral vegetation as well as in small pools (Weir 1966). Lansbury (1961a) recorded it from a swampy marsh with shallow water in Namibia. It was collected at light in Namibia and Sudan (Poisson 1957a, Linnavuori 1971).

**Distribution.** ***Afrotropical Region:*** Burkina Faso (this paper), Chad (Linnavuori 1980, without exact record, 1981), Ethiopia (Hutchinson 1930a), Democratic Republic of the Congo (Poisson 1965a), Guinea (Poisson 1954a), Ivory Coast (Linnavuori 1980, without exact record, 1981), Kenya (Hynes 1955), Mauritania (Poisson 1939), Namibia (Poisson 1957a, Lansbury 1961a), Niger (Poisson 1950a; Linnavuori 1980, without exact record, 1981), Senegal (Poisson & Sallier Dupin 1970), Sudan (Linnavuori

1971), South Sudan (Linnavuori 1971), Tanzania (Poisson 1960a, 1963), Uganda (Hutchinson 1932a, Jaczewski 1932, Poisson 1963), and Zimbabwe (Weir 1966). ***Palaearctic Region:*** Socotra (this paper). **New species for the Socotra Archipelago and Burkina Faso.**

## Family Corixidae

### *Sigara* (*Tropocorixa*) *hoggarica* Poisson, 1929

(Fig. 2)

*Sigara* (*Arctocorisa*) *hoggarica* Poisson, 1929: 91–93, figs 6–8 (original description). Syntypes: ♂♂ ♀♀, Algeria: Mouyidir, Tiguelguemine (2 ♀♀), Tahoun Arak (1 ♀), and Hoggar, Aguelmane Imerrha (1 ♂ without abdomen, 1 ♀) (MNHN: coll. Bergevin, USNM: additional slides – viz Jansson 1995: 54).

*Corixa* (*Tropocorixa*) *choprai* Hutchinson, 1940: 456–458, pl. XXIX: figs 385–396 (original description). Holotype: ♂, India: Himachal Pradesh, Simla Hills, Kandaghat (?NZSI). Synonymized by Jansson (1995: 54).

*Sigara brevixipha* Brown, 1951: 259–261, figs 20a–j, 21a–d (original description). Holotype: ♂, Saudi Arabia: Hejaz, Ashaira, Sail Kabir (BMNH). Synonymized by Linnavuori (1964: 336).

**Material examined. SOCOTRA:** Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E, pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 3 ♂♂ 1 L5 1 L3, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), 18.i.2014, 30 ♂♂ 13 ♀♀ 2 L, A. Carapezza lgt. (ACPI); Dixam plateau, wadi Zerig, beginning of track for Skand Mt. (12°29′15″N 53°59′20″E), 20.i.2014, 7 ♂♂ 2 ♀♀, A. Carapezza lgt. (ACPI).

**Identification.** Poisson (1929) (description, figures); Poisson (1934a) (original description repeated, figures); Poisson (1936): 214–215 (diagnosis, figures); Linnavuori & Hosseini (2000) (key, diagnosis, figures); Linnavuori et al. (2011) (diagnosis, habitus photo).

**Habitat.** In Socotra, the species was collected in the medium elevation zone in a large pool with sparse littoral vegetation in a drying wadi (Fig. 53). Outside Socotra, it was collected in ponds, shallow pools with sandy bottom, rivers, rocky streams without vegetation, brook with gravelly bottom, rocky pools in a dried-out wadi, shallow irrigation dikes as well as in rice-field (Brown 1951; Hynes 1955; Linnavuori 1964, 1971, 1981, 1986a, 1994b, 2009; Linnavuori & van Harten 1997; Alahmed et al. 2009; Linnavuori et al. 2011). Also collected at light (Linnavuori 2009, Linnavuori et al. 2011). Alahmed et al. (2009) reported *S. hoggarica* as an efficient predator of mosquito larvae.

**Distribution.** ***Afrotropical Region:*** Chad (Dispons 1965), Ethiopia (Hynes 1955), Mauritania (Villiers 1951), Niger (Poisson 1950a, Linnavuori 1981), Sudan (Linnavuori 1971). ***Palaearctic Region:*** North Africa: Algeria (Poisson 1929, 1948b), Canary Islands (Baena & Báez 1990, Roca-Cusachs et al. 2020), Egypt (Priesner & Wagner 1961, as *S. brevixipha*; Linnavuori 1964), Libya (Poisson 1948b); Near East: Iraq (Linnavuori 1994b), Iran (Linnavuori 2004, 2009; Ghahari et al. 2013), Israel (Baena & Báez 1990, Jansson 1995, both without exact record), Oman (Aukema et al. 2013, without exact record), Saudi Arabia (Brown 1951, 1953b, both as *S. brevixipha*; Linnavuori 1986a; Alahmed et al. 2009), Socotra (this paper), United Arab Emirates (Linnavuori et al. 2011), Yemen (Brown 1951, as *S. brevixipha*; Linnavuori 1989b; Linnavuori & van Harten 1997). ***Oriental Region:*** Pakistan: Balochistan (Hutchinson 1940, as *S. choprai*), India: Himachal Pradesh (Hutchinson 1940, as *S. choprai*). **New to the Socotra Archipelago.**

**Notes.** The record from Asian Turkey by Nieser & Moubayed (1985) is erroneous (cf. Fent et al. 2011).

Poisson (1936: 214) incorrectly treated *S.* (*T.*) *lundbladiana* Hutchinson, 1932 as a synonym of *S. hoggarica* (see Jansson 1995: 54).

### *Sigara* (*Vermicorixa*) *lateralis* (Leach, 1817)

(Fig. 3)

*Corixa lateralis* Leach, 1817: 17 (original description). Neotype (designated by Jansson 1986: 84): ♂, Great Britain: S England (BMNH).

*Corixa hieroglyphica* Dufour, 1833: 214 (original description). Syntype(s): France, Saint-Sever (not located – see Jansson 1986: 84). Synonymized by Kirkaldy (1900a: 10).

*Corisa fieberi* Wallengren, 1855: 143 (original description). Syntypes(s): Sweden, Skåne, Trolle-Ljungby, Blekesjö (lost – see Jansson 1986: 84). Synonymized by Douglas (1875: 137) with *C. hieroglyphica*.

*Corisa vaga* Wallengren, 1855: 143 (original description). Syntypes(s): Sweden, Skåne, Trolle-Ljungby (lost – see Jansson 1986: 84). Synonymized by Douglas (1875: 137) with *C. hieroglyphica*.

*Arctocorisa kilimandjaronis* Kirkaldy, 1908: 23 (original description). Lectotype (designated by Jansson 1986: 84): ♂, Tanzania, Kilimanjaro, Natronsjärne [= soda lakes] (NHRS). Downgraded to subspecies of *S. hieroglyphica* by Hutchinson (1932b: 328), synonymized by Jansson (1986: 84).

*Sigara lateralis nakurui* Poisson, 1959 in Lindberg (1959): 130 (original description). Lectotype (designated by Jansson 1986: 85): ♂, Cape Verde Islands, São Vicente Island, Mindelo (MZHF). Synonymized by Jansson (1986: 84, 85).

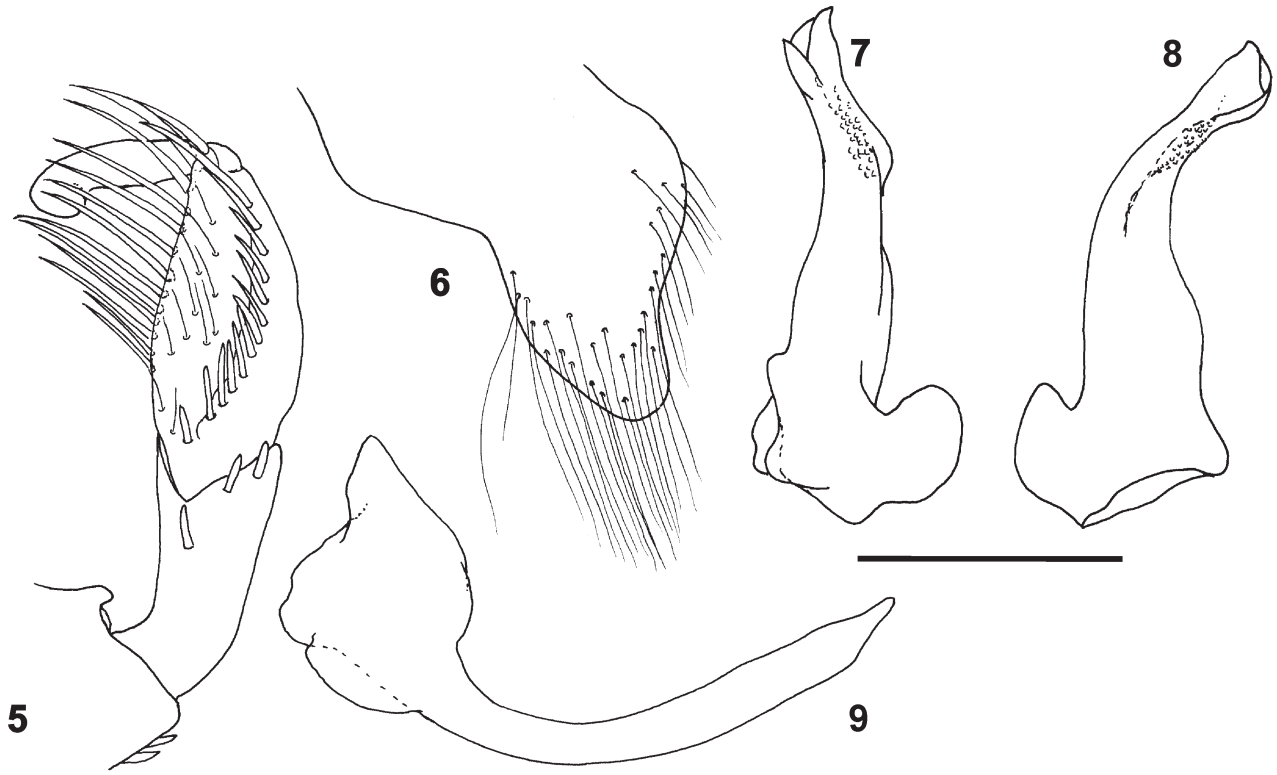
**Published records.** Wranik (1999): Diksamplateau; Wranik (2000, 2003): Socotra (no exact record).

**Material examined. SOCOTRA:** Mountain way to Noged, xi.1997, 2 ♂♂, W. Wranik lgt. (WWRG → NMPC).

**Identification.** Lundblad (1928, as *Arctocorisa kilimandjaronis*) (redescription, figures); Jansson (1986) (key, diagnosis, figures); Linnavuori et al. (2011) (diagnosis, habitus photo).

**Habitat.** In Socotra collected only once without providing details on its habitat. In Europe and Asian Russia, it occurs in various types of stagnant and slowly running waters (though avoiding dystrophic ones), being tolerant to salinity and pollution (e.g., Wróblewski 1980, Savage 1989, Kanyukova 2006). In the Near East, it is common in pools, slowly flowing brooks and rivers (Jaczewski 1936; Linnavuori 1986a, 1994a, 2009; Linnavuori et al. 2011). In the Cape Verde Islands, it was collected in a salty lagoon (Lindberg 1959). Kirkaldy (1908) gives the collecting circumstances at Kilimanjaro as 'brine pools and Kibonoto [= Kibongoto] low lands'; Jansson (1986) specified the habitat at Kilimanjaro as 'soda lakes'. In Kenya, it was collected in the Great Rift Valley at the north end of the alkaline Nakuru Lake [1754 m a.s.l.] as well as in a pool in gravel-pit near the lake (Hutchinson 1932b), and also in the nearby freshwater Naivasha Lake [1884 m a.s.l.] (Jaczewski 1933). Species with excellent migratory abilities known from many islands of the Mediterranean and Macaronesia (see Jansson 1986 and Distribution below), commonly collected at light (e.g., Priesner & Alfieri 1953; Linnavuori 1986a, 1994a; Linnavuori et al. 2011).


Figs 1–4. 1 – *Micronecta eupompe* Hutchinson, 1930, ♂, wadi Zerig (2.77 mm); 2 – *Sigara hoggarica* Poisson, 1929, ♂, wadi Zerig (6.01 mm); 3 – *Sigara lateralis* (Leach, 1817), ♂, mountain way to Noged (4.80 mm); 4 – *Ochterus papaceki* Kment & Carapezza, 2020, ♂, wadi Matyaf (body length 4.58 mm). (Orig. A. Carapezza: Fig. 1, P. Kment: Figs 2–3, M. Tkoč: Fig. 4).




Figs 5–9. *Micronecta eupompe* Hutchinson, 1930, ♂, wadi Zerig. 15 – fore leg; 16 – free lobe of 8th tergite; 17–18 – left paamere (two different views); 19 – right paramere. Scale bar: 0.2 mm. (Orig. A. Carapezza).

**Distribution.** ***Afrotropical Region:*** Cape Verde Islands (Lindberg 1959), Kenya (Hutchinson 1932b, Jaczewski 1933, both as *S. hieroglyphica kilimandjaronis*; Poisson 1963, as *S. lateralis kilimandjaronis*), Tanzania (Kilimanjaro env.) (Kirkaldy 1908, as *Arctocorisa kilimandjaronis*). ***Palaearctic Region:*** Europe: Albania (Josifov 1970), Austria (Rabitsch 2005), Belgium (Stoffelen et al. 2013), Bosnia Herzegovina (Protić 1998), Bulgaria (Josifov 1960), Byelorussia (Lukashuk 1997, Kanyukova 2006), Croatia (Protić 1998, Kment & Beran 2011), Czech Republic (Hoberlandt 1977), Denmark (Skipper & Tolsgaard 2013), Estonia (Coulianos 2005), Finland (Rintala & Rinne 2010), France (Dufour 1833, as *C. hieroglyphica*; Poisson 1957e; Elder 2017), Germany (Hoffmann & Melber 2003), Great Britain (Leach 1817, Savage 1989), Greece (Zimmermann 1982), Hungary (Boda et al. 2015), Ireland (Savage 1989), Italy (Servadei 1967), Kazakhstan (European Territory) (Jansson 1986: in map), Liechtenstein (Bernhardt 1992), Luxembourg (Gerend 1993), Malta (Schembri 1993, Carapezza & Mifsud 2015), Moldavia (Derzhansky 1997), Montenegro (Gligorović et al. 2016), Netherlands (Aukema et al. 2002), North Macedonia (Protić 1998), Norway (Coulianos 1998), Poland (Wróblewski 1980), Portugal (Nieser 1983, Kment 2006), Romania (Paina 1975), Russia (Central and South European Territory) (Kanyukova 2006), Serbia (Protić 1998), Slovakia (Reduciendo-Klementová et al. 2015), Slovenia (Protić 1998, Gogala 2003), Spain (Nieser & Montes 1984), Sweden (Wallengren 1855, as *C. fieberi* and *C. vaga*; Coulianos & Ossiannilsson 1976), Switzerland (Heckmann & Blöchlinger 2011), Ukraine (incl. Crimea) (Putshkov & Putshkov 1996, Kanyukova 2006), Turkey (European part) (Hoberlandt 1952, Fent et al. 2011). North Africa: Algeria (Benslimane et al. 2019), Azores (Ribes & Borges 2005), Canary Islands (Roca-Cusachs et al. 2020), Egypt (Jaczewski 1936, Linnavuori 1964), Libya (Eckerlein & Wagner 1970; El-Meghrabi 2009, as *S. alateralis*), Madeira (Lindberg 1961, as *S. l. nakurui*; Hoberlandt 1967, as *S. l. nakurui*), Morocco (Gheit 1995, Taybi et al. 2018), Salvagens Islands (Poisson 1957e), Tunisia (Carapezza 1997, Slimani et al. 2015). Near East and Central Asia: Afghanistan (Hoberlandt 1961), Armenia (Kanyukova 2006, Berchi et al. in press), Azerbaijan (Kanyukova 2006, Berchi et al. in press), Egypt: Sinai (Royer 1914, Priesner & Alfieri 1953, Gadalla 1999), Cyprus (Lindberg 1948), Georgia (Kanyukova 2006, Berchi et al. in press), Iran (Ghahari et al. 2013), Iraq (Brown 1951, Linnavuori 1994b), Israel (Linnavuori 1960), Jordan (Katbeh et al. 2000), Kazakhstan (Asian Part) (Beskokotov 1996, Kanyukova 2006, Esenbekova 2008), Lebanon (Nieser & Moubayed 1985, Jansson 1995, no exact record), Kirgizia (Kanyukova 2006), Saudi Arabia (Brown 1951, Linnavuori 1986a), Socotra (Wranik 2000, 2003), Syria (Brown 1953a), United Arab Emirates (Linnavuori et al. 2011), Tajikistan (Kiritshenko 1959, 1964; Kanyukova 2006), Turkmenistan (Kanyukova 2006), Turkey (Asian Part) (Hoberlandt 1952, Fent et al. 2011), Uzbekistan (Kanyukova 2006),

Yemen (Brown 1951, Linnavuori 1989b). East Palaearctic: China: Northern, Northwestern, and Southwestern Territory (Jansson 1995), Hebei (Liu & Bu 2009), Inner Mongolia (Nonnaizab 1999), Shaanxi (Bu & Liu 2016), Xinjiang (Hutchinson 1940, Jaczewski 1961, Kanyukova et al. 2016), Japan (Hokkaido, Honshu) (Hayashi et al. 2001, 2016), Mongolia (Jaczewski 1961, Jaczewski & Wróblewski 1975, Kanyukova 1976), Russia (Far East, West Siberia) (Kanyukova 1973, 2001, 2006; Vinokurov et al. 2010). ***Oriental Region:*** India (Jammu and Kashmir) (Hutchinson 1940, Thirumalai 2007), Pakistan (Khyber Pakhtunkhwa) (Heiss et al. 2021a).

The records from Namibia (Hesse 1925, as *Corixa hieroglyphica*) are considered erroneous (Hutchinson 1929, 1932b). Also the records from Ethiopia (Ogaden) and Somalia (Obbia) by de Carlini (1892, as *Corisa hieroglyphica*) cannot be accepted without revision (see also Hutchinson 1932b). The disjunct distribution of *S. lateralis* in Sub-Saharan Africa was discussed by Hutchinson (1933). Also the records from India outside Kashmir (see Thirumalai 2007) require revision (see Hutchinson 1940).

## Family Ochteridae

### *Ochterus papaceki* Kment & Carapezza, 2020

(Fig. 4)

*Ochterus papaceki* Kment & Carapezza, 2020 in Kment et al. (2020): 25–30, figs 1–6, 9–12 (original description). Holotype: ♂, Yemen, Socotra, Noged plain, lower part of Wadi Matyaf (12°27′13.50″N 54°18′13.95″E) (NMPC).

**Published records.** Kment et al. (2020): Hallah Arhar [= Halla area, Arher], Noged, and lower part of wadi Matyaf.
**Identification.** Kment et al. (2020) (description, figures, key).
**Habitat.** In Socotra, the species was collected at Arher by hand or by suction sampler from wet places with shortly grazed grasses on sand, surrounding a small brook situated among sand dunes and groups of *Tamarix nilotica* (Ehrenb.) Bunge about 50 m from sea coast (Fig. 49). In wadi Matyaf, the species was collected by hand on wet sandy banks of the estuarine area of the river about 800 m from sea coast. Both localities belong to the coastal zone of Socotra (Kment et al. 2020).
**Distribution.** ***Afrotropical Region:*** Tanzania: Tanganyika (Kment et al. 2020); ***Palaearctic Region:*** Socotra (Kment et al. 2020).

## Family Notonectidae

### *Anisops debilis socotrensis* Brown, 1956

(Fig. 10)

*Anisops socotrensis* Brown, 1956: 142–144, figs 3a–f, 4a–e (original description). Holotype: ♂, Socotra, Hadibo [= Hadiboh] (BMNH).
*Anisops debilis socotrensis*: Lansbury (1964): 100 (downgraded to subspecies of *A. debilis* Gerstaecker, 1873).

**Published records.** Brown (1956): Hadibo [= Hadiboh], pool in stream; Moa bbadh [= Maabad] plain, 20 miles E of Hadibo; Wranik (1999): Socotra (no exact locality); Wranik (2003): Socotra (no exact records).

**Material examined. SOCOTRA:** Diksam [= Dixam, ca. 500–1000 m a.s.l.], xi.1997, 1 spec., 21.ii.2000, 1 spec., W. Wranik lgt. (WWRG → NMPC); Diksam Teich [= Dixam, pond], ix.1998, 2 spec., W. Wranik lgt. (WWRG → NMPC); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14. vi.2012, 2 ♂♂ 27 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); Dixam plateau, Firmihin, small brook under Firmihin (12°28′36″N 54°01′06″E), 490 m a.s.l., 14.–15.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), 18.i.2014, 19 ♂♂ 16 ♀♀ 1 L, A. Carapezza lgt. (ACPI); Dixam plateau, wadi Zerig, beginning of track for Skand Mt. (12°29′15″N 53°59′20″E), 20.i.2014, 9 ♂♂ 16 ♀♀, A. Carapezza lgt. (ACPI); Firmihin, [ca. 390–760 m a.s.l.], ii.1999, 1 spec., iii.1999, 1 spec., W. Wranik lgt. (WWRG → NMPC); Hadibo [= Hadiboh, 10–20 m a.s.l.], 15.ii.2000, 3 spec., W. Wranik lgt. (WWRG → NMPC); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1170 m a.s.l., 18.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Halla area, Arher (12°33′00″N 54°27′36″E), freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Homhil, [ca. 300–600 m a.s.l.], ix.1998, 1 spec., W. Wranik lgt. (WWRG → NMPC); Homhil protected area (12°34′27″N 54°18′32″E), 364 m a.s.l., 28.–29.xi.2003, 1 ♀, J. Farkač lgt., 1 ♀, D. Král lgt., Yemen – Socotra 2003 Expedition: Jan Farkač, Petr Kabátek & David Král (JFPC, NMPC); Homhil Wadi, 600 m a.s.l., 5.vi.2008, 2 ♂♂, A. Carapezza lgt. (ACPI); Noged plain, Qaareh waterfall (12°20′10″N 53°37′56″E), 57 m a.s.l., 5.–6.xii.2003, 1 spec., Yemen – Socotra 2003 Expedition: Jan Farkač, Petr Kabátek & David Král (MMBC); Qadub, coastal salt-marsh at road (12°38′18″N 53°57′18″E), 8 m a.s.l., 14.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Wadi Kilisan, [365 m a.s.l.], ix.1998, 1 ♂ 5 spec., W. Wranik lgt., R. Linnavuori det., P. Kment revid. (WWRG → NMPC).

**Identification.** Brown (1956) (description, figures); Lansbury (1964) (measurements, figures); Wranik (2003) 439 (habitus photo).
**Habitat.** Part of the type series was collected in a pool in a stream (Brown 1956). During the recent collecting effort, a large population was found in a large pool with sparse littoral vegetation in a drying wadi (Fig. 53). Additional specimens were collected in small brooks from coastal (5 m a.s.l., Fig. 49) up to montane zone in Hagher Mts. (1170 m a.s.l., Fig. 50) as well as at light.
**Distribution.** ***Palaearctic Region:*** Socotra (Brown 1956).

There are four additional valid subspecies of *A. debilis* (see Lansbury 1964, Linnavuori 1971, J. T. Polhemus 1995): *A. debilis debilis* Gerstaecker, 1873 is widely distributed in the continental Subsaharan Africa from Mauritania, Mali, Niger, Chad, Sudan and Ethiopia to South Africa (Hutchinson 1929, 1930a; Poisson 1936, 1937, 1939, 1949a, 1950a, 1951c, 1952b, 1954a, 1955b, 1957a, 1960b, 1961, 1963, 1965a, 1968a,b; Brooks 1951; Lansbury 1961a,b, 1964; Weir 1966; Poisson & Sallier Dupin 1970; Linnavuori 1971, 1975, 1981), in North Africa: Algeria (Poisson 1953) and Arabian Peninsula: Saudi Arabia (J. T. Polhemus 1995), United Arab Emirates (Brown 1950, as Oman; Linnavuori et al. 2011), and Yemen (Lansbury 1966).

*Anisops debilis canariensis* Noualhier, 1893 occurs in Macaronesia: Canary Islands (Lindberg 1953, Nieser & Montes 1984, Baena & Báez 1990, Roca-Cusachs et

al. 2020), Cape Verde Islands (Lindberg 1959, Poisson 1966), Madeira (Poisson 1966, Hoberlandt 1967, Nieser & Montes 1984), as well as in Morocco (Lansbury 1961b), and Mauritania (Poisson 1939). The record from Ghana (Poisson 1966) is apparently erroneous, as it referes to Lindberg's (1922) record of *A. canariensis* from the Greek island of Corfu, which actually belongs to *A. crinitus* Brooks, 1951 (Cianferoni 2019).

*Anisops debilis perplexus* Poisson, 1929 occurs in SW Europe: Portugal (Nieser & Montes 1984), Spain (Nieser & Montes 1984), Italy (Sicily) (Carapezza 1988); Macaronesia: Cape Verde Islands (Lansbury 1964), Madeira (Lansbury 1964); North Africa: Algeria (Poisson 1929, 1948b; Brooks 1951), Egypt (Linnavuori 1964, Eckerlein & Wagner 1970), Libya (Poisson 1948b, Brooks 1951, Lansbury 1964, Eckerlein & Wagner 1970), Morocco (Lansbury 1964; Gheit 1994, 1995; Taybi et al. 2018), Tunisia (Carapezza 1997, Slimani et al. 2015); Near East: Iran (Lansbury 1964, Ghahari et al. 2013), Iraq (Linnavuori 1994b), Israel (Larsen & Blaustein 2005), Jordan (Katbeh et al. 2000), Saudi Arabia (Linnavuori 1986a), ?Turkey (Asian Part) (see Fent et al. 2011), Yemen (Linnavuori 1989b; Linnavuori & van Harten 1997, 2002a); Afrotropical Region: Senegal (J. T. Polhemus 1995), Djibouti (Brooks 1951, as *A. coutieri*), Niger (Linnavuori 1981), and Sudan (Linnavuori 1971).

*Anisops debilis sudanica* Lansbury, 1964 is confined to Sudan and South Sudan (Lansbury 1964, Linnavuori 1971). As there is a considerable overlap in distribution of the individual 'subspecies', it is evident that this complex of taxa requires a modern revision.

### *Anisops varius* Fieber, 1851

(Fig. 11)

*Anisops varius* Fieber, 1851: 59 (original description). Lectotype (designated by Lansbury 1966: 42): ♀ (f. *sugillata*), Sudan: Ambukhol (ZMHB).

*Anisops varius* var. *scutellata* Fieber, 1851: 59 (original description). Syntypes (see Lansbury 1966: 42, as paralectotypes): 1 ♂ 3 ♀♀, Egypt: Sinai Peninsula (ZMHB).

*Anisops varius* var. *sugillata* Fieber, 1851: 59 (original description). Lectotype (designated by Lansbury 1966: 42): ♀, Sudan: Ambukhol (ZMHB). Junior objective synonym of *A. varius*, synonymized by Hutchinson (1929: 393, 396).

*Anisops perpulcher* Stål, 1855: 89 (original description). Syntype(s): South Africa: "terra Natalensi" [= Natal] (NHRS). Synonymized by Kirkaldy (1899b: 106).

*Notonecta nanula* Walker, 1870: 2381 (original description). Syntype(s): Egypt: Shoobra [= Cairo, Shubra] (BMNH). Synonymized by Horváth (1888: 189).

*Anisops perpulcher* var. *kalahariensis* Schumacher, 1913: 83 (original description). Syntypes: 1 ♂ 3 ♀♀, Botswana: Kalahari, Lobatsi [= Lobatse] (ZMHB, viz J. T. Polhemus 1995: 67). Synonymized by Hutchinson (1929: 393).

*Anisops perpulcher* var. *plumbeus* Schumacher, 1913: 83 (original description). Syntypes: 3 ♂♂ 3 ♀♀, South Africa: Klein-Namaland, Kamaggas (ZMHB, viz J. T. Polhemus 1995: 67). Synonymized by Hutchinson (1929: 393).

*Anisops hoggarica* Poisson, 1929: 89–91, figs 4–5 (original description). Syntypes: 3 ♂♂ 2 ♀♀, Algeria: Mouyidir, Tiguelguemine and Tahoun Arak (depository?). Synonymized by Linnavuori (1989b: 3).

**Published record.** Wranik (2000, 2003, as *A. varia*): Socotra (no exact locality).

**Material examined. SOCOTRA:** S Sokotra Isld., wadi Difarroha [= Di Farho, ca. 100–130 m a.s.l.], south side, 15.i.2010, 1 ♂ 1 spec., A. Saldaitis lgt., Achat Saldaitis I.G.31.512 (ISNB, NMPC); Dirhashas [= Di Hashus, ca. 950–990 m a.s.l.], ix.1998, 6 spec. 2 L, W. Wranik lgt. (WWRG → NMPC); Firmihin, [ca. 390–760 m a.s.l.], iii.1999, 3 spec., W. Wranik lgt. (WWRG → NMPC); Diksam [= Dixam, ca. 500–1000 m a.s.l.], 21.ii.2000, 3 spec. 7 L, W. Wranik lgt. (WWRG → NMPC); C Sokotra Isld., Diksam [= Dixam, ca. 500–1000 m a.s.l.] canyon, 23.iii.2009, 1 spec., A. Saldaitis lgt., Achat A. Saldaitis I.G.31.268 (ISNB); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC); Firmihin, [ca. 390–760 m a.s.l.], ii.1999, 1 spec., W. Wranik lgt. (WWRG → NMPC); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1170 m a.s.l., 18.vi.2012, 1 spec., Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Homhil Wadi, 600 m a.s.l., 5.vi.2008, 1 ♂ 3 ♀♀, A. Carapezza lgt. (ACPI); Wadi Dirhor, 8.vi.2008, 11 ♂♂ 10 ♀♀, A. Carapezza lgt. (ACPI); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), 18.i.2014, 5 ♂♂ 5 ♀♀ 1 L, A. Carapezza lgt. (ACPI); Dixam plateau, wadi Zerig, beginning of track for Skand Mt. (12°29′15″N 53°59′20″E), 20.i.2014, 6 ♂♂ 9 ♀♀, A. Carapezza lgt. (ACPI). – **ALGERIA:** Algerien Hoggar, Guelta de Imlaoulauéne, 9.v.1973, Eckerlein lgt., N. Nieser & P.-P. Chen det. (NMPC). **BURKINA FASO:** Haute Volta, Onagadougou [= Ouagadougou], ix.1936, 1 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **CHAD:** Environs du Tsad, 1937, 71 spec.; Lac Tsad [= Lake Chad], 1 spec., all Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **DEMOCRATIC REPUBLIC OF THE CONGO:** Congo b., Ituri, i.1937, 3 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **ISRAEL:** Jerusalem, 1.iv.1987, 1 ♀, A. Carapezza lgt. & det. (ACPI). **JORDAN:** Wadi Rum, 29.xii.1995, 4 ♂♂ 2 ♀♀, A. Carapezza lgt. & det. (ACPI); Dead Sea, 29.xii.1995, 1 ♂, A. Katbeh lgt., A. Carapezza det. (ACPI). **MALI:** Sangha, Bandiagara Mts., x.1936, 1 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **NIGER:** Nigere, Maradi, x.1936, 2 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **RWANDA:** Ruanda, 1 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC). **TANZANIA: Tanganyika:** Tanganyika, iii.1937, 1 spec., Škulina lgt., N. Nieser & P.-P. Chen det. (NMPC).

**Identification.** Brooks (1951) (key, redescription, figure); Lansbury (1966) (figures); Wranik (2003): 439 (habitus photo); D. A. Polhemus & J. T. Polhemus (2013) (diagnosis, figures).

**Habitat.** In Socotra, the species was collected from coastal to montane zone (ca. 100–1170 m a.s.l.). Once it was collected in a large pool with sparse littoral vegetation in a drying wadi (Fig. 49), once in a mountain brook (Fig. 50), and twice at black light (A. Saldaitis, pers. comm.); the remaining records lack habitat information. In Egypt, it was found common in small artificial brackish water pools for goats (Linnavuori 1964). In Senegal, the species was collected in small pools in steppe as well as in a garden (Jaczewski 1926). In Sudan, it was collected in large and rather deep pools (Linnavuori 1971). In Ethiopia and Kenya, it was found only in permanent water at high as well as low altitudes (Hynes 1955). In Zimbabwe, it was collected in pans (small, temporary seasonal lakes) with rich littoral vegetation as well as in small pools (Weir 1966). Lansbury (1961a) reported the species in Namibia and South Africa from the following habitats: water-hole with micaceous mud and no vegetation, gravelly and muddy streams from a spring, small shallow ephemeral pool with muddy bottom, and rapid milky stream over rocks and gravel. According to Linnavuori (1981) it is found in both oligotrophic and eutrophic pools and rivers.


Figs 10–11. 10 – *Anisops debilis socotrensis* Brown, 1956, Arher (body length 6.67 mm); 11 – *Anisops varius* Fieber, 1851, Di Hashus (7.55 mm). (Orig. P. Kment).

**Distribution.** ***Afrotropical Region:*** Benin (Poisson 1951c, as *A. varia scutellata*), Botswana (Schumacher 1913, as *A. perpulcher* and *A. perpulcher* var. *kalahariensis*; Hutchinson 1929), Burkina Faso (Linnavuori 1981), Chad (Brooks 1951, Dispons 1965), Comoros (Poisson 1957d, 1959a), Democratic Republic of the Congo (Poisson 1949a, 1965a, as both *A. v. varia* and *A. v. scutellata*, 1968a; Brooks 1951; Poisson & Sallier Dupin 1969), Eritrea (Brooks 1951), Ethiopia (de Carlini 1892, as *A. perpulcher*; Poisson 1936; Mancini 1939a, 1956, 1961; Hynes 1955), Guinea (Poisson 1960b), Ivory Coast (Poisson 1948b, no exact locality), Kenya (Hutchinson 1929, 1930b, 1932b; Brooks 1951; Hynes 1955), Lesotho (Poisson 1957a), Madagascar (Kirkaldy 1899b; Poisson 1957d, 1959a), Malawi (Hutchinson 1929), Mali (Brooks 1951), Mauritania (Poisson 1939; Villiers 1951, as *A. varia hoggarica*), Mozambique (Brooks 1951, Lansbury 1961b), Namibia (Schumacher 1913, as *A. perpulcher*; Hutchinson 1929; Poisson 1957a; Lansbury 1961a; Linnavuori 1989b), Niger (Poisson 1941a, as *A. hoggarica*; Brooks 1951; Linnavuori 1981), Nigeria (Linnavuori 1981, as *A. varia scutellata*, 1989b), Rwanda (this paper), Senegal (Jaczewski 1926, Poisson 1939, Brooks 1951, Poisson & Sallier Dupin 1970, both as *A. v. varia* and *A. v. hoggarica*), Seychelles (Kirkaldy 1899b; Distant 1909b, 1913; D. A. Polhemus & J. T. Polhemus 2013), Somalia (Mancini 1964, as *A. v.* var. *scutellata*), South Africa (Stål 1855, as *A. perpulcher*; Schumacher 1913, as *A. perpulcher* and *A. plumbeus*; Hutchinson 1929; Brooks 1951; Poisson 1955a, as *A. varia scutellata*; Poisson 1957a, as *A. v. varia* and *A. v. scutellata*; Lansbury 1961a,b; Linnavuori 1989b), Sudan (Fieber 1851, as *A. sugillata*; Hutchinson 1929; Lansbury 1961b; Linnavuori 1971), Tanzania (Poisson 1960a, 1963), Uganda (Poisson 1960a, Lansbury 1961b), Zimbabwe (Hutchinson 1929; Poisson 1955a, as *A. varia scutellata*; Weir 1966). ***Palaearctic Region:*** North Africa: Algeria (Poisson 1929, 1948b, 1953; Linnavuori 1981, as *A. v. hoggarica*), Egypt (Walker 1870, as *Notonecta nanula*; Horváth 1888; Brooks 1951; Priesner & Alfieri 1953; Lansbury 1961b; Linnavuori 1964, 1989b), Morocco (Gheit 1994, 1995), Near East: Egypt: Sinai (Fieber 1851, as *A. scutellata*; Priesner & Alfieri 1953), Israel (Furth 1983), Jordan (this paper), Saudi Arabia (Brown 1951, as *A. v. varia*; Linnavuori 1986a), Socotra (Wranik 2000, 2003), Syria (Brooks 1951, Lansbury 1961b), Yemen (Brown 1951, as *A. v. scutellata*; Linnavuori 1989b). **New species for Jordan and Rwanda.**

**Nomenclatorial notes.** Fieber (1851) described *A. varius* to include two distinct forms, '*A. sugillata*' from Sudan and '*A. scutellata*' from Sinai, neither of them considered the nominotypical form. Hutchinson (1929), acting as

the first reviser, chose *A. sugillata* as the 'nominotypical form', thus making the two names objective synonyms. Lansbury (1966) accepted Hutchinson's (1929) opinion and designated a lectotype in the following statement: 'Lectotype female (*sugillata*), one male and three paralectotype females (*scutellata*) in the Institut für Spezielle Zoologie und Zoologisches Museum, Berlin.' However, this lectotype designation has no influence on the three type specimens of *A. scutellata* which remain syntypes. J. T. Polhemus (1995) swapped the type localities of *A. sugillata* and *A. scutellata* by mistake.

J. T. Polhemus (1995: 67) mentioned the holotype of *Anisops hoggarica* from Tahoun Arak as being lost. However, there is no mention of the holotype in the original description. Poisson (1934a: 135) cited the 3 ♂♂ and 2 ♀♀ as 'types', i.e. syntypes.

## Infraorder Gerromorpha
## Family Mesoveliidae

### *Mesovelia vittigera* Horváth, 1895
(Fig. 12)

*Mesovelia vittigera* Horváth, 1895: 160 (original description). Syntype(s): ♀, Egypt: Cairo and Abukir [= Abu Qir] (HNHM).

*Mesovelia orientalis* Kirkaldy, 1901: 808–809 (original description). Syntype(s): Indonesia: Sumatra, Padan Panjan (?USNM). Synonymized by Horváth (1915a: 551), synonymy confirmed by Jaczewski (1936: 196).

*Mesovelia proxima* Schouteden, 1905 in Bergroth & Schouteden (1905): 388 (original description). Syntypes: ♂♀, Democratic Republic of the Congo: Kinchassa [= Kinshasa] (ISNB). Synonymized by Horváth (1915a: 551).

**Published record.** Wranik (2000, 2003): Socotra (no exact locality).

**Material examined. SOCOTRA:** Dixam plateau, Tudhen (12°32′42″N 53°59′54″E), helocrene with *Juncus*, suction sampler, 1135 m a.s.l., 1 ♀ (ap) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 1 ♂ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), 18.i.2014, 2 ♂♂ 4 ♀♀, A. Carapezza lgt. (ACPI); Firmihin, [ca. 390–760 m a.s.l.], iii.1999, 2 ♂♂ (ap), W. Wranik lgt., R. Linnavuori det., P. Kment revid. (WWRG → NMPC); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1170 m a.s.l., 18.vi.2012, 7 ♂♂ 4 ♀♀ (ap) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NHMW, NMPC); Halla area, Arher (12°33′00″N 54°27′36″E), freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 3 ♂♂ 1 ♀ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Homhil protected area, Ain Tsahrin spring (12°34′12″N 54°18′30″E), shaded pool next to the brook, 435 m a.s.l., 11.vi.2012, 7 ♂♂ 7 ♀♀ (ap) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC); Qadub, coastal salt-marsh at road (12°38′18″N 53°57′18″E), 8 m a.s.l., 14.vi.2012, 3 ♂♂ 1 ♀ (ap) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC). – **ANGOLA:** Carumbo, Mus. do Dundo No. 20 131, 21.viii.1957, 1 ♀ (ap), M.H.B. lgt., P. Kment det. (NMPC). Cazombo, Nhá Bica / Zambeze (11), Mus. do Dundo No. 4983.3, 18.ii.1955, 1 ♀ (ma), no collector, P. Kment det. (NMPC). Guanza de Chemin de Fer de Benguala, Ang. No. 1609.2, 1.ix.1949, 1 ♂ (ap), A. B. Machado lgt., P. Kment det. (NMPC). Luachimo, Mus. do Dundo No. 3514.7, 16.iii.1954, 1 ♂ (ap), A. B. Machado lgt.; Luachimo, Mus. do Dundo No. 20 124, 6.vii.1957, 1 ♀ (ma), M.H.B. lgt.; both P. Kment det. (NMPC). Route Turismo, Mus. do Dundo No. 20 186, 9.vii.1957, 1 ♀ (ap), 8.viii.1957, 1 ♀ (ap), M.H.B. lgt., P. Kment det. (NMPC). **BURKINA FASO: Kadiogo Province:** 'Onagadougou, Haute Volta' [= Ouagadougou], ix.[19]36, 11 ♂♂ 39 ♀♀ (ma), Škulina lgt., P. Kment det. (NMPC). **CENTRAL AFRICAN REPUBLIC: Ombella-Mpoko Province:** 35 km S Banguí, Salanga env., 350 m a.s.l., 20.xii.2008–1.i.2009, 7 ♂♂ 2 ♀♀ (ma), A. Kudrna Jr. lgt., P. Kment det. (NMPC). **CHAD:** 'Environs du Tsad', 1937, 2 ♂♂ 18 ♀♀ (ma), Škulina lgt., P. Kment det. (NMPC). **MALI: Mopti Region:** Sangha, Bandiagara Montes, Soudan Fr., x.1936, 1 ♀ (ma), Škulina lgt., P. Kment det. (NMPC). **NIGER:** Sahara merid., Maradi, x.1936, 2 ♂♂ 7 ♀♀ (ma), Škulina lgt., P. Kment det. (NMPC). **SUDAN: Darfur:** Jebel Marra, Crater Lake, xi.1964, 1 ♂ (ma), A. Eve. lgt., P. Kment det. (NMPC); Jebel Marra, Taratonga stream, xi.1964, 1 ♂ 4 ♀♀, (ma), A. Eve. lgt., P. Kment det. (NMPC). **Khartoum:** Chartum [= Khartoum], 1 ♂ 4 ♀♀ (ma), coll. Baum, P. Kment det. (NMPC). – **YEMEN: Sana'a Governorate:** Beni Mansour vill. env., 15°06.1–4′N 43°52.8–53.2′E, 1520–1550 m a.s.l., stream valley, 3. + 5. + 19.xi.2010, 1 ♀ (ma), J. Hájek lgt., P. Kment det. (NMPC).

Fig 12. *Mesovelia vittigera* Horváth, 1915, apterous ♂, wadi Zerig (2.45 mm). (Orig. P. Kment).

**Identification.** Poisson (1957e) (redescription, key, figures), J. T. Polhemus & D. A. Polhemus (2000) (key, redescription, figures); Wranik (2003) (habitus photo); Andersen & Weir (2004a,b) (redescription, key, figures); Kanyukova (2006) (key, diagnosis, figures); Linnavuori et al. (2011) (diagnosis, habitus photo); Yang & Murphy (2011) (key, figure); D. A. Polhemus & J. T. Polhemus (2013) (diagnosis, figures); Berchi et al. (2016) (key, figures).

**Habitat.** Species widely distributed in Socotra from the coastal to the montane zone. It was collected in a shallow pool in coastal salt-marsh at Qadub, in hygropetric conditions among wet moss on a limestone rock and in a shaded pool full of tamarind leaves next to a small brook at Homhil, in a helocrene overgrown with grass and rush, *Juncus*

*socotranus* (Buchenau) Snogerup, at Tudhen (collected by suction sampler; Fig. 52), as well as on various brooks from the sea coast (5 m a.s.l. at Arher; Fig. 49) to Hagher Mts. (1170 m a.s.l. in wadi Madar; Fig. 50), at the latter locality found in tufts of *Juncus socotranus* at the bank.

In East Africa, Hynes (1955) collected *M. vittigera* in a wide variety of habitats containing still or slowly flowing water, and over a wide range of altitudes. The bugs were most common where leaves of water lily (Nymphaeaceae) or pond weed (Potamogetonaceae) broke the surface, or where there was dense emergent herbaceous vegetation. Apterous specimens were found only in such habitats. Winged specimens usually occurred together with the apterous ones, but were also found singly or in small numbers in other types of habitat, including temporary pools far from permanent water. In Africa, the Near East and tropical Asia the species was found in a variety of freshwater habitats, chiefly in stagnant waters with plenty of vegetation along the edges, in permanent lakes, ponds, pools, marshes, brooks, canals, irrigation dikes, and slowly running waters, as well as in temporary lakes, artifical reservoirs, fishponds, rice fields, temporary rain pools, wet slimy rock walls near waterfalls, and muddy areas near banks of freshwater marshlands. There are also a few records from brackish water in pools, estuarine habitats, and mangrove swamps with salinities of up to 5 ppt (parts-per-trillion) (Jaczewski 1926; Lindberg 1959; Linnavuori 1964, 1971, 1981, 1986a, 1994b; Weir 1966; Yano et al. 1982; Gapud 1986; Andersen & Foster 1992; Andersen & Weir 2004b; J. T. Polhemus & D. A. Polhemus 2006). Macropterous specimens are collected also at light (Lundblad 1934, as *M. orientalis*; Linnavuori et al. 2011).

**Distribution.** ***Afrotropical Region:*** Angola (Hoberlandt 1951a, this paper), Benin (Poisson 1951c, Linnavuori 1981), Botswana (Jaczewski 1932, no exact locality), Burkina Faso (Linnavuori 1981, this paper), Cameroon (Poisson 1948a, Linnavuori 1981), Cape Verde Islands (Lindberg 1959), Central African Republic (Linnavuori 1981, this paper), Chad (Linnavuori 1981, this paper), Comoros (Poisson 1957d, 1959a), Democratic Republic of the Congo (Bergroth & Schouteden 1905; Horváth 1915a; Poisson 1949a, 1968a; Linnavuori 1973a), Eritrea (Mancini 1961), Ethiopia (Mancini 1954, 1956, 1961; Hynes 1955), Gabon (Poisson 1948a), Ghana (Linnavuori 1981), Guinea (Horváth 1915a, Poisson 1960b, Bertrand 1962), Ivory Coast (Poisson 1937, 1960b, 1968b; Bertrand 1962; Linnavuori 1975, 1981), Kenya (Jaczewski 1933, Hynes 1955, Poisson 1963), Lesotho (Poisson 1957a), Madagascar (Horváth 1915a; Poisson 1963, as *M. v. orientalis*), Mali (this paper), Mauritania (Villiers 1951), Mauritius (Mamet 1957), Namibia (Jaczewski 1932, no exact locality; Poisson 1957a), Niger (Poisson 1950a, Hoberlandt 1954, Linnavuori 1981, this paper), Nigeria (Linnavuori 1981), Republic of the Congo (Bertrand 1962, Poisson 1967), Reunion (Poisson 1957b), Rwanda (Heiss et al. 2022), Senegal (Jaczewski 1926, Poisson 1961, Poisson & Sallier Dupin 1970), Seychelles (D. A. Polhemus & J. T. Polhemus 2013), Somalia (Mancini 1939b, Hynes 1955, Sallier Dupin 1973), South Africa (Jaczewski 1932, no exact locality; Poisson 1957a; Damgaard et al. 2012), South Sudan (Linnavuori 1971), Sudan (Linnavuori 1971, this paper), Tanzania (Kirkaldy 1908, as *M.* ? *proxima*; Poisson 1963), Togo (Linnavuori 1981), Uganda (Jaczewski 1932, 1933), Zambia (Jaczewski 1932, no exact locality), Zimbabwe (Jaczewski 1932, no exact locality; Weir 1966). ***Palaearctic Region:*** Europe: Albania (Horváth 1924), Bulgaria (Josifov 1986, Berchi et al. 2016), Croatia (Kment 2001, Damgaard et al. 2012), France (Poisson 1957e, Dusoulier & Moulet 2014, Elder 2017), Greece (Zimmermann 1982), Italy (Servadei 1967, Heiss et al. 2022), Malta (Schembri 1993, Carapezza & Mifsud 2015), Montenegro (Štusák 1980), Portugal (Nieser 1969, Nieser & Montes 1984, Kment 2006), Spain (Poisson 1957e, Nieser & Montes 1984), Turkey (European part) (Banbal & Fent 2016). The records from Romania and Moldova (Ilie & Davideanu 2002) are erroneous (see Berchi et al. 2016). North Africa: Algeria (Benslimane et al. 2019), Canary Islands (Lindberg 1953, Nieser & Montes 1984, Baena & Báez 1990, Roca-Cusachs et al. 2020), Egypt (Horváth 1895, 1915a; Lindberg 1922; Jaczewski 1936; Priesner & Alfieri 1953; Linnavuori 1964; Gadalla & Saleh Ahmed 2000; Saleh Ahmed & Gadalla 2005b), Libya (Poisson 1948b, Eckerlein & Wagner 1970), Morocco (Gheit 1995, Taybi et al. 2018), Tunisia (Nieser 1983, Carapezza 1997, Slimani et al. 2016). Near East: Egypt: Sinai (Priesner & Alfieri 1953, Gadalla & Saleh Ahmed 2000, Saleh Ahmed & Gadalla 2005b), Iraq (Linnavuori 1994b), Iran (Ghahari et al. 2013), Israel (Horváth 1913, 1915a; Lindberg 1922; Linnavuori 1960; Furth 1983; Heiss et al. 2022), Jordan (Katbeh et al. 2000, Carapezza 2002), Lebanon (Horváth 1915a), Oman (Aukema et al. 2013, no exact locality), Saudi Arabia (Brown 1951, Linnavuori 1986a), Socotra (Wranik 2000, 2003), United Arab Emirates (Linnavuori et al. 2011), Turkey (Asian Part) (Hoberlandt 1952, Fent et al. 2011), Yemen (Brown 1951; Linnavuori 1989b; Linnavuori & van Harten 1997, 2002a). Also recorded from Syria (Horváth 1929, Andersen 1995, Damgaard et al. 2012), however, the original records we traced refer to Israel (Horváth 1913, 1915a). East Palaearctic: China (Chen & Andersen 1993, Chen et al. 1993, Jorigtoo & Qi 1996, Hua 2000), Japan (Miyamoto 1964, Hayashi et al. 2016, Hayashi & Miyamoto 2018), Korea (Miyamoto & C. E. Lee 1963, as *M. orientalis*; C. E. Lee & Kwon 1991; C. E. Lee et al. 1993; S. Lee et al. 2013), Russia (Far East) (Kanyukova 1979), Taiwan (Horváth 1915a, Yano et al. 1982). ***Oriental Region:*** Bangladesh (Distant 1910, as *M. mulsanti*), Cambodia (D. A. Polhemus 2017, Zettel et al. 2017), India (incl. Andaman and Nicobar Islands) (Distant 1910, as *M. mulsanti*; Horváth 1915a; Lundblad 1934; Thirumalai 2002), Indonesia (Kirkaldy 1901, Horváth 1915a, Dover 1928, Lundblad 1934, Chen et al. 2005), Laos (Damgaard et al. 2012, no exact record), Malaysia (Fernando & Cheng 1974, Zettel & Tran 2009, Yang & Murphy 2011), Myanmar (Buzzetti et al. 2006), Pakistan (Hamid & Ahmed 1972, as *M. orientalis*), Philippines (Bergroth 1918, Andersen 1967, Yano et al. 1981,

Gapud 1986, Chen et al. 2005, Zettel 2014, Heiss et al. 2022), Singapore (Yang & Murphy 2011), Sri Lanka (Distant 1904, as *M. mulsanti*; Horváth 1915a), Thailand (Chen et al. 2006), Vietnam (Ngo et al. 2016). ***Australasian Region:*** Australia: Northern Territory, Queensland, Christmas Island (Cassis & Gross 1995; Andersen & Weir 2004a,b; Damgaard et al. 2012), Mariana Islands (J. T. Polhemus & D. A. Polhemus 2000, no exact record; Evenhuis et al. 2010), New Caledonia (Damgaard et al. 2012), Palau (J. T. Polhemus & D. A. Polhemus 2006), Papua New Guinea (Horváth 1915; J. T. Polhemus & D. A. Polhemus 2000, 2006), Samoan Islands (J. T. Polhemus & D. A. Polhemus 2000, no exact record), Solomon Islands (D. A. Polhemus et al. 2008), Vanuatu (Nieser & Chen 2005). **New species for Mali.**

**Note.** A large genetic difference was found between populations of *M. vittigera* from Europe and Africa on one side and populations from Australia and New Caledonia on the other side. This could be due to poor sampling in Africa, the Middle East and Central Asia, but it could also be due to existence of a cryptic species complex as known in some other *Mesovelia* (Damgaard et al. 2012).

## Family Hebridae

### *Hebrus* (*Hebrus*) *kanyukovae* sp. nov.

(Figs 13–15, 17–24, 26–31)

**Type material.** Holotype: ♂ (ma), 'YEMEN, SOCOTRA Island / Halla area, ARHER freshwater / spring in sand dune, *Tamarix* / *nilotica* shrubs, 9-10.+15.vi.2012 / 12°33.0′N, 54°27.6′E, 5 m [p] // SOCOTRA expedition 2012 / J. Bezděk, J. Hájek, V. Hula, / P. Kment, I. Malenovský, / J. Niedobová & L. Purchart leg. [p] // ♂ [p] // HOLOTYPUS / *HEBRUS* (*Hebrus*) / *KANYUKOVAE* / sp. nov. / det. Kment & Carapezza 2022 [p, red label]' (NMPC). Paratypes: **SOCOTRA:** Hallah Arhar [= Halla area, Arher] (spring), 15 m, 12°33.0′N 54°27.6′E, 11.xi.2010, 1 ♀ (ma), J. Bezděk lgt. (MMBC), 1 ♂ 1 ♀ (ma), J. Hájek lgt. (NHMW: in pure ethanol); Halla area, Arher (12°33′00″N 54°27′36″E), freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 1 ♂ 7 ♀♀ (ma), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (5 ♀♀ NMPC, 1 ♀ ACPI, 1 ♀ NHMW); Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 1 ♀ (ma), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC). All the paratypes bear the following label: 'PARATYPUS / *HEBRUS* (*Hebrus*) / *KANYUKOVAE* / sp. nov. / det. Kment & Carapezza 2022 [p, red label]'.

**Additional material examined.** Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 1 ♀ (ma), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Halla area, Arher (12°33′00″N 54°27′36″E), freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC).

**Description.** ***Colouration*** (Figs 13–14). Head and thorax yellowish brown (holotype) to brown (paratypes), posterior areas of head and pronotum usually slightly paler. Bucculae, labium, acetabula, and longitudinal carinae forming rostral groove yellowish to pale brown, always paler than dorsal body surface. Antennal segments I and II yellowish to pale brown, apex of I and ca. apical quater to third of II brown, segments III, IVa and IVb brown. Legs yellowish, apices of femora, and bases and apices of tibiae and tarsi infuscated with brown (Fig. 13). Veins of corium dark brown; basal portion of clavus milky white, posterior portion of clavus and membranous portion of corium beige, without sharp transition between white and beige areas. Membrane brown with three oval whitish spots (Fig. 13) – one approaching each anterolateral angle, third situated medially behind middle of membrane. Abdomen black.

***Structure.*** Body elongate (Figs 13–14), about 2.3 times longer than wide across humeral angles. Vertex with median sulcus developed (Figs 17–18). Bucculae ventrally straight, posterior margin truncate (Fig. 19). Labium reaching metacoxae. Ratio of lengths of antennal segments I–IVb (holotype): 1.79 : 1.29 : 1.50 : 1.00 : 1.36. Posterior portion of metanotal elevation ('scutellum') slightly turned upwards, more or less pentagonal, apical marging varying from widely rounded (holotype, Figs 17, 20) to more or less triangular (Figs 22–23), always bearing small apical process medially (Figs 17, 20–23); disc of metanotal elevation depressed medially, with median carina well developed in posterior half but weakly developed or obsolete in anterior half (Figs 17, 20–23). Macropterous, hemelytra of both sexes nearly reaching apex of abdomen, only posterior margin of last tergite free (Figs 13–14). Metafemora distinctly curved in male (Figs 13, 27, 29), only slightly curved in females (Fig. 14). Metatibiae of males straight, not swollen, basally attenuated, their ventral surface straight in posterior three quaters of their length (Figs 26–29). Paramere as in Figs 30–31, dorsal surface bearing dense long setae and one pointed tubercle medially, pointed apex of large lateral process slightly turned upwards.

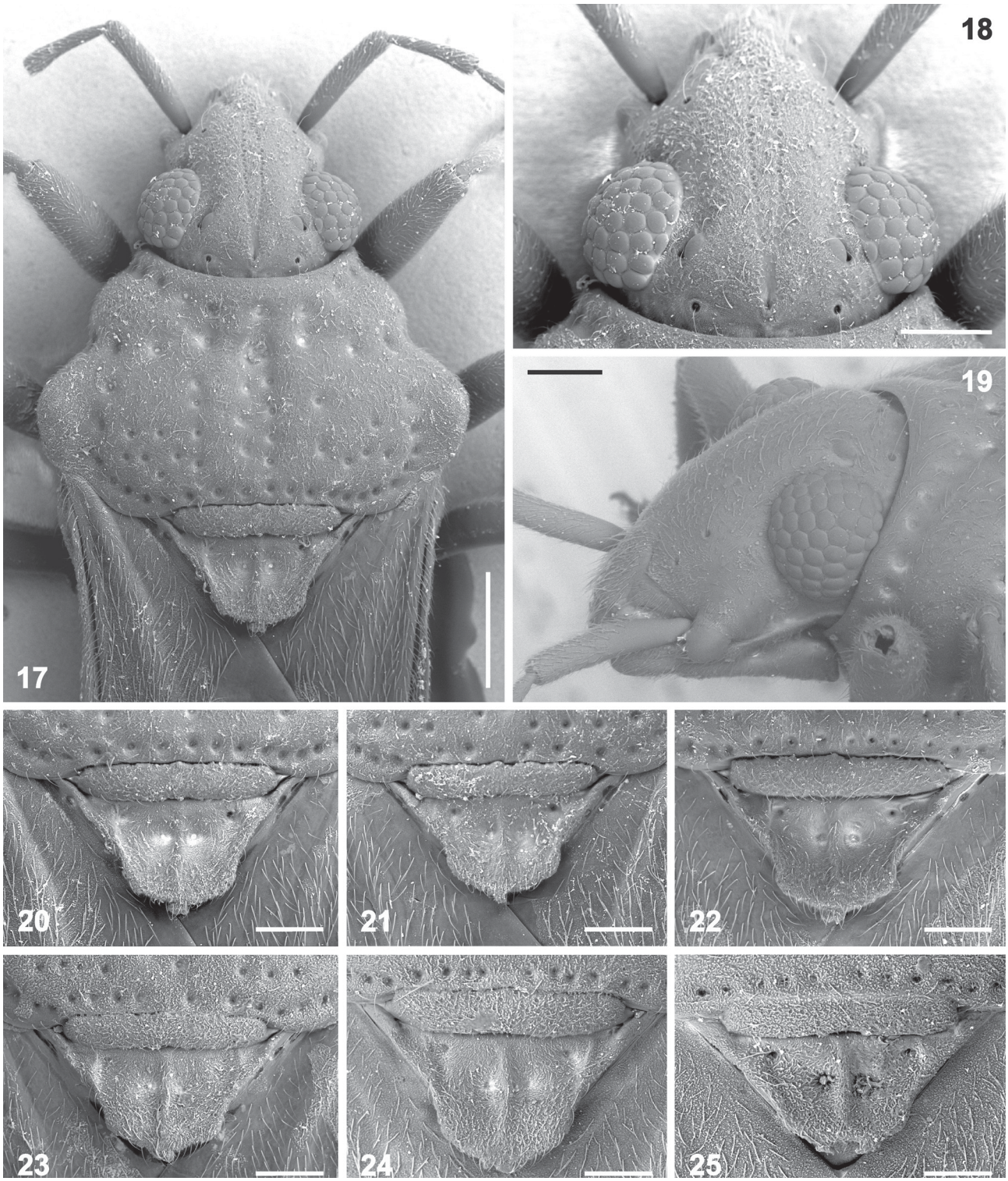
***Pubescence*** whitish, on head and pronotum very short and adpressed, apparent only under large magnification; corium and beige posterior portion of clavus with longer, adpressed, well visible setae. Ventral surface of body covered with short silver setae, somewhat longer on apex of abdomen. Antennae and legs with short, semierect, yellowish setae. Male metatibiae with one row of about 13 long, stout, erect setae medially on dorsal surface, setae directed posteriad, middle ones longest (Figs 26–29: ds), and one row of long but finer and denser, semierect setae distinctly longer than metatibia diameter on inner surface starting ca. in basal quater and shortening in apical quater (Figs 29–32: is).

***Measurements.*** *Males* (n = 2; holotype / paratype). Body length: 1.77 / 1.66; pronotum: anterior width (across anterolateral angles) 0.39 / 0.39), humeral width (across humeral angles) 0.78 / 0.72); length of antennal segments: I – 0.25 / 0.23, II – 0.18 / 0.16), III – 0.21 / –, IVa – 0.14 / –, IVb – 0.19 / –; metafemur: length 0.48 / 0.48; metatibia: length 0.62 / 0.58; metatarsus: length 0.21 / 0.23.

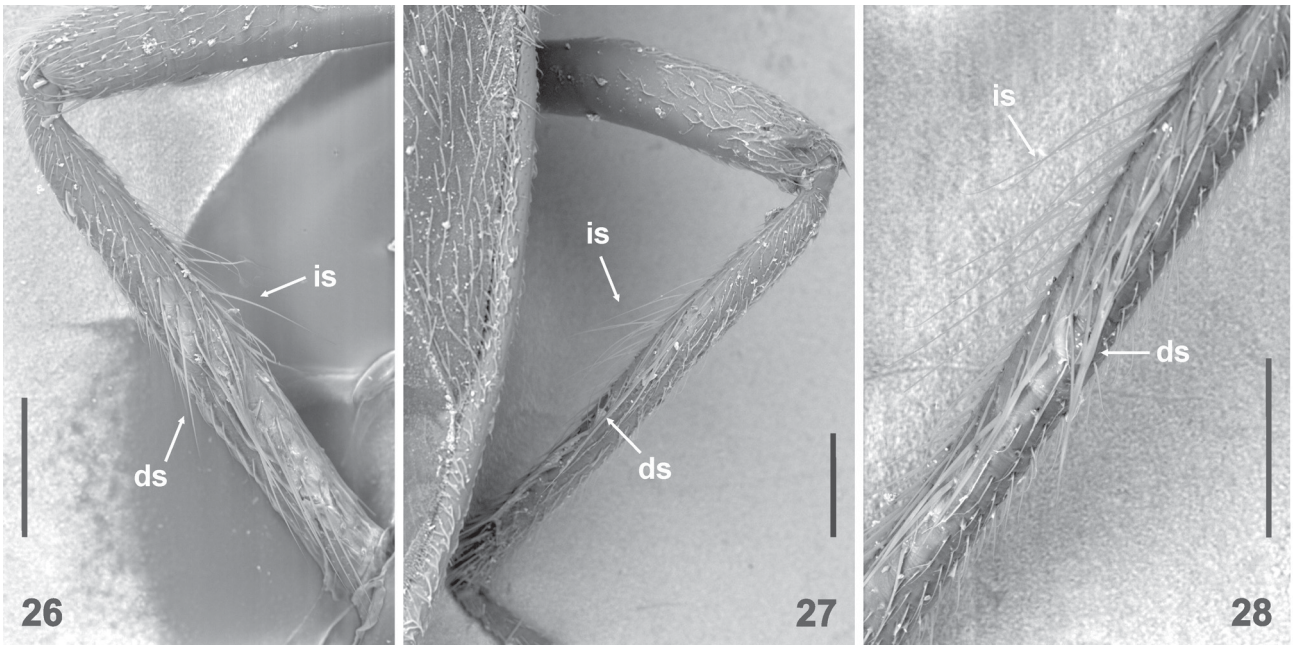
*Females* (n = 8; median (minimum–maximum)). Body length: 1.85 (1.73–1.95); pronotum: anterior width 0.40 (0.39–0.43), humeral width 0.81 (0.78–0.90); length of antennal segments: I – 0.20 (0.19–0.23), II – 0.16 (0.16–0.18), III – 0.19 (0.19–0.21), IVa – 0.16 (0.14–0.16), IVb – 0.19 (0.18–0.21).

**Variability.** One female from the locality wadi Zerig (Fig. 15) differs in posterior margin of metanotal elevation more triangulate (Fig. 24), resembling those of *H. campestris* Linnavuori, 1971, and is also slightly larger than the


Figs 13–16. 13–14 – *Hebrus kanyukovae* sp. nov.: 13 – ♂, holotype (body length 1.77 mm); 14 – ♀, paratype, Arher (1.95 mm). 15 – *Hebrus* cf. *kanyukovae*, ♀, wadi Zerig (2.07 mm); 16 – *Hebrus* (*Hebrus*) sp., ♀, Tudhen (1.95 mm). (Orig. P. Kment).




Figs 17–25. 17–19 – *Hebrus kanyukovae* sp. nov., ♂, holotype: 17 – fore body, dorsal view (magnification 100×); 18–19 – head (18 – dorsal view, 230×; 19 – lateral view, 190×). 20–25 – metanotal elevation, dorsal view (250×): 20–23 – *H. kanyukovae* sp. nov.: 20 – ♂, holotype; 21 – ♂, paratype; 22–23 – ♀♀, paratypes, Arher; 24 – *H.* cf. *kanyukovae*, ♀, wadi Zerig; 25 – *Hebrus* (*Hebrus*) sp., ♀, Tudhen. Scale bars: 0.1 mm (Figs 18–25), 0.2 mm (Fig. 17). (Orig. P. Kment).




Figs 26–28. *Hebrus kanyukovae* sp. nov., ♂, metatibia: 26–27 – paratype (magnification: 26 – 270×, 27 – 200×), 28 – holotype (350×). Abbreviations: ds – dorsal setae, is – inner setae. Scale bars: 0.1 mm. (Orig. P. Kment).

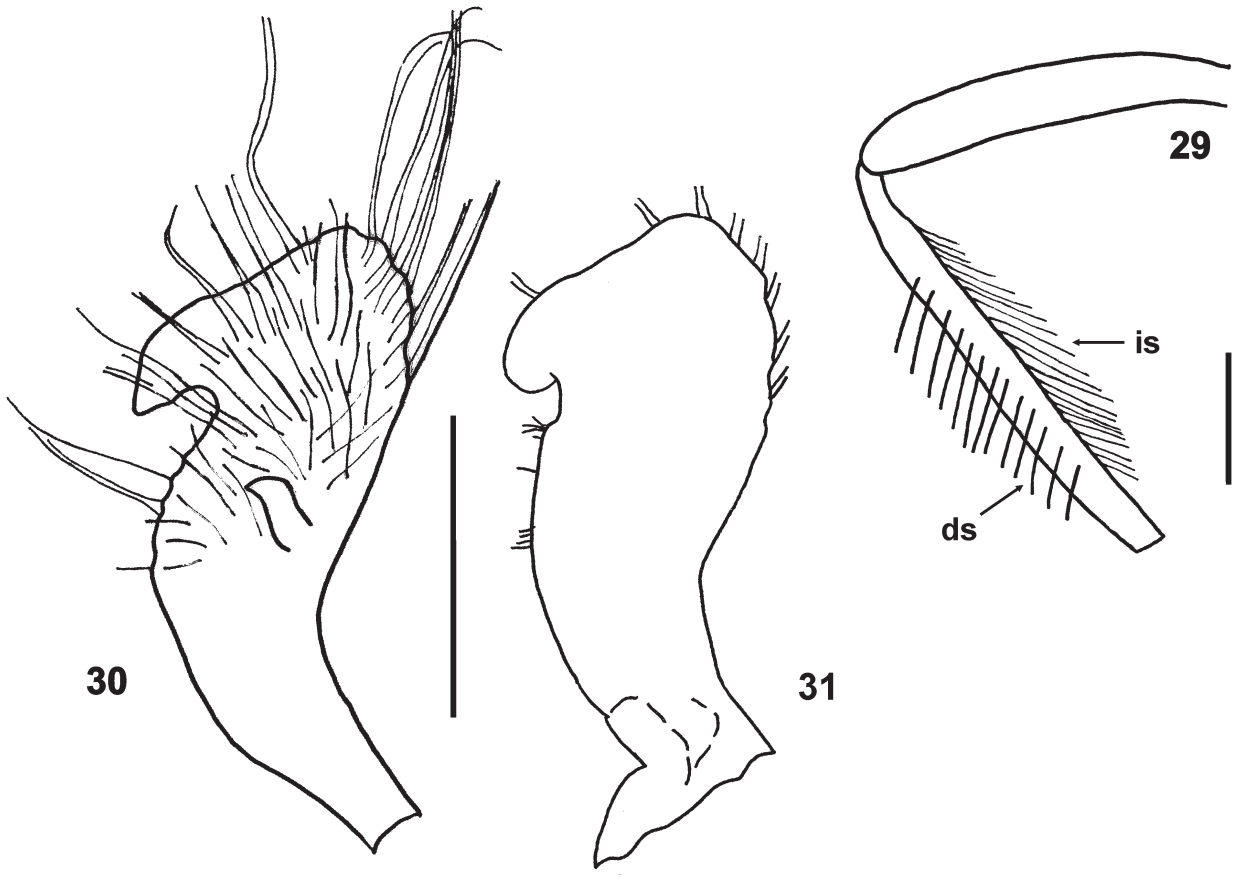
remaining specimens (body length 2.07 mm; pronotum: anterior width 0.45 mm, humeral width 0.96 mm; length of antennal segments I – 0.25, II – 0.19, III, IVa and IVb missing). Though we tentatively identify the female as *H. kanyukovae*, we leave it outside the type series.

**Differential diagnosis.** Considering the fauna of the genus *Hebrus* Curtis, 1833 in the regions showing some biogeographical relationships to Socotra, there are 84 described species-group taxa accommodated in six subgenera (*Hebrus* s. str. – 59 species and subspecies, *Hebrusella* Poisson, 1944 – 13 species and subspecies, *Paratimasiellus* Poisson, 1956 – 1 species, *Paratimasius* Poisson, 1952 – 3 species, *Subhebrus* Poisson, 1956 – 1 species, *Timasielloides* Poisson, 1952 – 7 species and one unavailable form): Africa with 73 species (Poisson 1934b, 1944, 1949b, 1950b, 1951b, 1952a, 1953, 1955b, 1956a,b, 1957a,c, 1959a,b, 1960a,b, 1964a,b; Hoberlandt 1951a; Linnavuori 1971, 1973a, 1981; Cobben 1982a,b; Cobben & Linnavuori 1983; J. T. Polhemus 1989; D. A. Polhemus 1992; Kment et al. 2016), Arabian Peninsula, Near East and Iran with 8 species (three of them also occurring in north-east Africa) (Brown 1951; Linnavuori 1971, 1986a, 1994b; Andersen 1995; Kanyukova 1997; Kment & Kanyukova 2010; Aukema et al. 2013), and India and Sri Lanka with 7 species (Distant 1909a; Paiva 1919; Andersen 1995; Zettel 2000, 2002, 2006; Thirumalai 2002).

Using the key to the subgenera by Andersen (1981) the species belong to *Hebrus* s. str., being characterized by metanotal elevation subtriangular with posterior margin straight, antennal tubercles not produced externally, and false joint structure of antennal segment IV in form of constricted zone. We compared the new species with the original descriptions and redescriptions of the 57 species of *Hebrus* s. str. (see references above) but none of them fits. *Hebrus kanyukovae* sp. nov. is distinguished from all the compared species by the following combination of characters: colouration of body yellowish brown to brown; macropterous; basal half of clavus milky white, posterior one beige, not divided by sharp transition; metanotal elevation trapezoid, posterior margin widely rounded to shortly triangular, medially not incised but bearing short rectangular process (Figs 17, 20–23); male metafemora only slightly curved; male metatibiae straight, not swollen, bearing one row of stout setae on dorsal surface and one row of finer setae on inner surface (Figs 26–29).

There are two species sharing the double row (dorsal and inner) of long setae on male metatibia in the Palaearctic, *H. pilipes* Kanyukova, 1997 distributed from Crimea and Turkey to Afghanistan, Tajikistan and China: Xinjiang (Kanyukova 1997, Kment & Jindra 2006, Kment & Kanyukova 2010, Fent et al. 2011, Kanyukova et al. 2016, Kment et al. 2016), and *H. pusillus arabicus* Linnavuori, 1971 from Sudan, Iran, Iraq, Oman, Saudi Arabia, United Arab Emirates, and Yemen (Linnavuori 1986a, 1994b; Linnavuori & van Harten 1997, 2002a; Linnavuori et al. 2011; Kment et al. 2016). *Hebrus pilipes* differs in presence of sharp horizontal transition line between white and brownish portions of clavus, male metafemora more curved (see Kanyukova 1997: fig. 3), male metatibiae swollen in anterior third, with their inner surface undulated, bearing several rows of long erect setae (see Kanyukova 1997: fig. 9), and metanotal elevation posteriorly straight, without apical rectangular tubercle, with median carina developed throughout the central depression (see Kanyukova 1997: fig. 18). *Hebrus pusillus arabicus* generally shares the same colour pattern, but differs in having metatibia distinctly curved slightly behind its middle, and long setae on metatibia shorter, especially concerning the inner row, whose setae are about as long as metatibia diameter.

**Etymology.** We dedicate the species to Elena V. Kayukova




Figs 29–31. *Hebrus kanyukovae* sp. nov., ♂: 29 – hind leg, schematic; 30–31 – paramere (30 – dorsal view, 31 – ventral view, setae omitted): Abbreviations: ds – dorsal setae, is – inner setae. Scale bars: 0.05 mm (Figs 30–31), 0.2 (Fig. 29). (Orig. P. Kment).

(Zoological Museum, Far Eastern State University, Vladivostok, Russia), an eminent specialist in aquatic and semiaquatic Heteroptera and author of an important revisional work on the genus *Hebrus* in the Palaearctic Region.
**Habitat.** At Arher, the species was collected by suction sampler from wet places with shortly grazed grasses on sand, surrounding a small brook situated among sand dunes and groups of *Tamarix nilotica* about 50 m from sea coast (Fig. 49). In wadi Zerig, the species was collected at a large pool on shore with growth of *Juncus socotranus* (Fig. 53). The type locality is situated in the coastal zone (5 m a.s.l.), wadi Zerig in medium elevation zone (655 m a.s.l.).
**Distribution.** ***Palaearctic Region:*** Socotra (this paper).

### *Hebrus* (*Hebrus*) sp.
(Figs 16, 25)

**Material examined. SOCOTRA:** Dixam plateau, Tudhen (12°32′42″N 53°59′54″E), helocrene with *Juncus*, suction sampler, 1135 m a.s.l., 2 ♀♀ (ma) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC).

**Measurements.** *Females* (n = 2). Body length: 1.85 / 2.05; pronotum: anterior width (across anterolateral angles) 0.41 / 0.43, humeral width (across humeral angles) 0.82 / 0.90; length of antennal segments: I – 0.21 / 0.23, II – 0.16 / 0.18), III – 0.19 / –, IVa – 0.14 / –, IVb – 0.19 / –.
**Habitat.** It was collected by suction sampler in a helocrene overgrown with grasses and *Juncus socotranus* at Tudhen (1135 m a.s.l.) in the montane zone.
**Note.** The examined specimens differ in their blackish colouration with only base of clavus whitish (Fig. 16) and metanotal elevation posteriorly with wide and shallow incision (Fig. 25) from *H.* (*H.*) *kanyukovae* sp. nov. and certainly represent a different species. In sharing the above mentioned characters the two females resemble several species of *Hebrus* s. str. known from Ethiopia as illustrated by Cobben (1982a): *H.* (*H.*) *bimaculatus* Cobben, 1982, *H.* (*H.*) *katompei* Poisson, 1950, *H.* (*H.*) *pseudopusillus* Cobben, 1982 or *H.* (*H.*) *spinitibialis* Cobben, 1982. However, in absence of male specimens the precise identification of the species is impossible.

## Family Veliidae

### *Microvelia* (*Picaultia*) *gracillima* Reuter, 1882
(Figs 32–35)

*Microvelia gracillima* Reuter, 1882: 38–39 (original description). Holotype: sex unknown, Ghana: Addah (MZHF). (See nomenclatorial note below.)
*Microvelia* (*Picaultia*) *gracillima*: Andersen & Weir (2003): 339 (subgeneric placement).
*Microvelia azorica* Lindberg, 1941: 18–20, figs 1a–c (original description). Holotype: ♂, Azores: Flores Is., Mato, Ribeira dos Algares (MZHF). Synonymized by Lindberg (1954: 3).

**Material examined. SOCOTRA:** Dixam plateau, Tudhen (12°32′42″N

53°59′54″E), helocrene with *Juncus*, suction sampler, 1135 m a.s.l., 1 ♂ 2 ♀♀ (ma), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Hagher Mts., Scand [= Skand] Mt. env. (12°34′36″N 54°01′30″E), open helocrene in montane evergreen forest, 1450 m a.s.l., 16.–18.vi.2012, 18 ♂♂ 15 ♀♀ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (ACPI, NMPC, MMBC, NHMW).

**Identification.** Poisson (1941b) (key, redescription, figures), Hoberlandt (1951a) (redescription, figures); Hoberlandt (1951b) (key); Schmitz (1976) (redescription, figures); Linnavuori (1986a): 38 (figures); Saleh Ahmed & Gadalla (2005a): 221, 224 (key, diagnosis, figures).

**Habitat.** In Socotra collected twice at higher altitudes of Hagher Mts. (montane and high-montane zone), in a helocrene overgrown with grass and *Juncus socotranus* in pastures with sparse shrubs and small trees at Tudhen (1135 m a.s.l., collected by suction sampler; Fig. 52), and on miniature pools (10–20 × 10–20 cm) scattered among waterlogged grasses in an open helocrene surrounded by dense montane evergreen forest at Skand Mt. (1450 m a.s.l.; Fig. 51). Many copulating couples were observed at Skand locality.

In East Africa, Hynes (1955) collected this small species frequently and on very varied types of habitat. At high altitudes (over 1600 m a.s.l.) in Kenya and Ethiopia, both apterous and macropterous specimens were found on slow streams, ditches and lakes, where they occurred among vegetation. At lower altitudes, down almost to the sea level, only fully macropterous specimens were found. These occurred on both permanent and temporary rivers and pools, and the species appeared on temporary pools very far from permanent water soon after rain. It can travel distances of at least 80 km, even though they may be aided in their flight by turbulence under rain clouds.

According to Linnavuori (1971, 1981, 1994b), it lives among dense vegetation in rivers and pools; often collected at light. In Senegal, the species was collected in small pools in the steppe as well as in a garden (Jaczewski 1926). In Zimbabwe, it was collected in small ephemeral pools without emergent vegetation situated in the open grassland (Weir 1966). In the Cape Verde Islands, it was collected mainly in running, more rarely in stagnant waters, such as still, vegetated water in meanders of brooks or in pools (Lindberg 1959). In the Azores, the type series of *M. azorica* was collected in a freshwater pool between rocks on the sea coast (Lindberg 1941).

**Distribution.** ***Afrotropical Region:*** Angola (Hoberlandt 1951a), Benin (Linnavuori 1981), Burkina Faso (Linnavuori 1981), Cameroon (Poisson 1948a, Linnavuori 1981), Cape Verde Islands (Lindberg 1959), Central African Republic (Linnavuori 1981), Chad (Linnavuori 1981), Comoros (Poisson 1957d, 1959a), Democratic Republic of the Congo (Kirkaldy 1900b; Bergroth & Schouteden 1905; Poisson 1942, 1954b, 1968a; Linnavuori 1973a), Eritrea (Mancini 1961), Ethiopia (Mancini 1954, 1961; Hynes 1955), Ghana (Reuter 1882, Linnavuori 1981), Guinea (Poisson 1960b, Bertrand 1962), Ivory Coast (Poisson 1968b; Linnavuori 1975, 1981; Schmitz 1976), Kenya (Hynes 1955), Madagascar (Poisson 1949b, 1951a), Mali (Poisson 1960b), Namibia (Poisson 1957a), Niger (Poisson 1941b, 1950a), Nigeria (Linnavuori 1981), Republic of the Congo (Bertrand 1962, Poisson 1967), St. Helena Island (Schmitz 1976), Senegal (Jaczewski 1926, Poisson 1941b), Somalia (Mancini 1949, 1954; Hynes 1955; Linnavuori 1986b), South Africa (Poisson 1957a), South Sudan (Linnavuori 1971), Sudan (Linnavuori 1971), Tanzania (Poisson 1960a), Togo (Linnavuori 1981), Uganda (Poisson 1941b), Zimbabwe (Weir 1966). ***Palaearctic Region:*** North Africa: Algeria (Poisson 1953), Azores (Lindberg 1941, as *M. azorica*; Lindberg 1960, as *M. gracillima* f. *azorica*), Canary Islands (Lindberg 1953, Baena & Báez 1990, Roca-Cusachs et al. 2020), Egypt (Saleh Ahmed & Gadalla 2005b, no exact record; Heiss et al. 2022), Madeira (Lindberg 1960, as *M. gracillima* f. *azorica*; Lindberg 1961, as *M. gracillima*; Hoberlandt 1967, as *M. g. azorica*). Near East: Egypt: Sinai (Saleh Ahmed & Gadalla 2005a,b), Iraq (Linnavuori 1994b), Israel (Furth 1983), Saudi Arabia (Linnavuori 1986a), Socotra (this paper). **New species for the Socotra Archipelago.**

**Nomenclatorial note.** Schmitz (1976: 329) failed to locate the type material of *M. gracillima* in MZHF and NHMW and designated a neotype: 'Côte d'Ivoire (J. Decelle, VII-VIII.1962, coll. Mus. Tervuren)'. However, in case of discovery of the original type material such neotype designation would be invalid. The status of the types of *M. gracillima* requires further investigations.

### *Microvelia* (*Picaultia*) *macani* Brown, 1953

(Figs 36–37)

*Microvelia hozari macani* Brown, 1953a: 584–586, figs C, D, G, I (original description). Syntypes: 6 ♂♂ 3 ♀♀, Iraq: Baghdad (BMNH).

*Microvelia macani*: Linnavuori (1986a): 38 (upgraded to species).

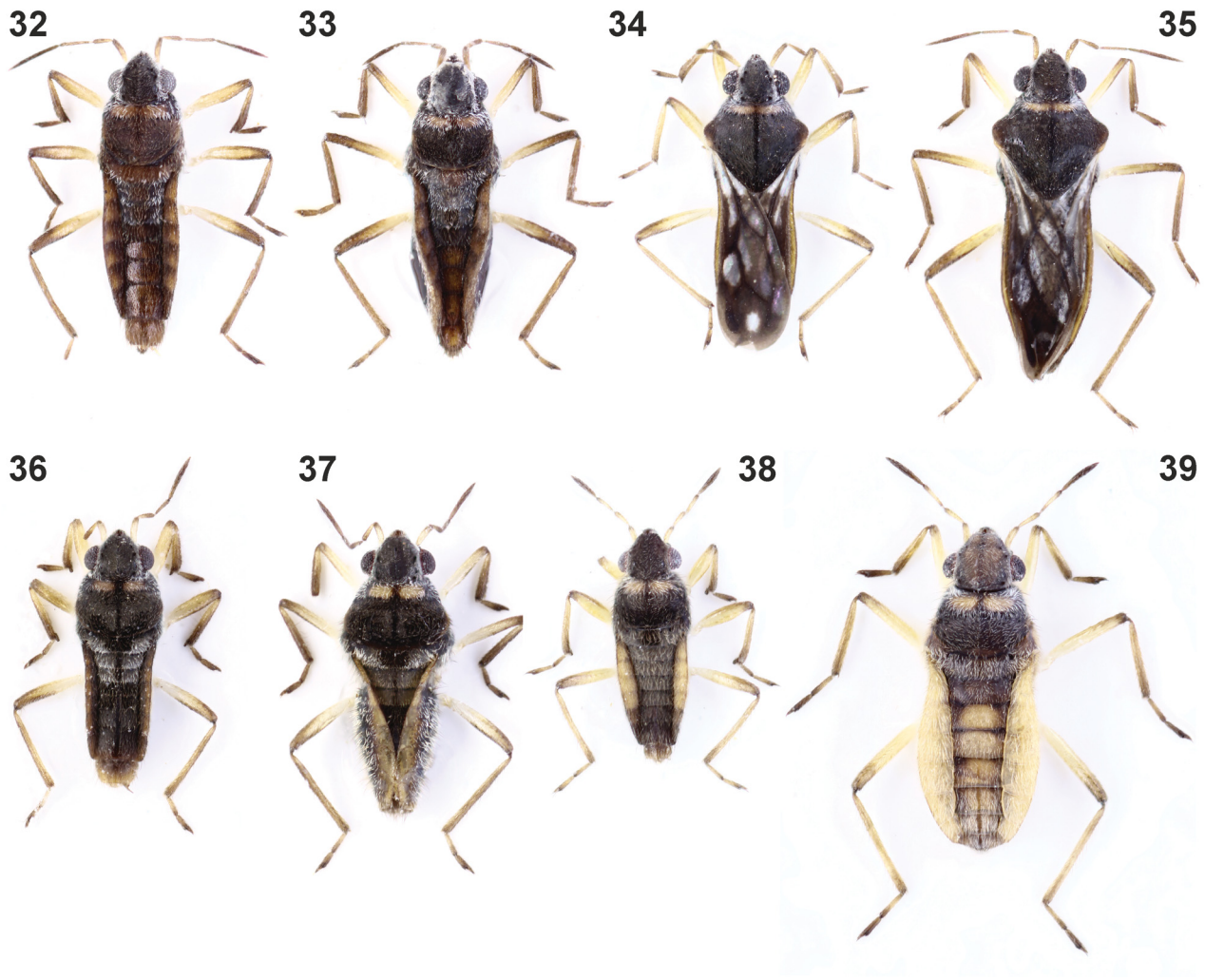
*Microvelia* (*Picaultia*) *macani*: Andersen & Weir (2003): 339 (subgeneric placement).

*Microvelia perexigua* Linnavuori, 1960: 54–56, figs 15a–e (original description). Holotype: ♂ (apterous), Israel: Gvuloth (RLRF → AMNH – see Kment & Carapezza 2017). Synonymized by Linnavuori (1986a: 38).

**Material examined. SOCOTRA:** Hadibo [= Hadiboh, 10–20 m a.s.l.], 15.ii.2000, 3 spec., W. Wranik lgt. (WWRG → NMPC); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1170 m a.s.l., 18.vi.2012, 1 ♂ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Hallah Arhar [= Halla area, Arher] (12°33′00″N 54°27′36″E), spring, 15 m a.s.l., 11.xi.2010, 3 ♂♂ 3 ♀♀ (ap) 1 ♀ (ma), J. Bezděk lgt. (MMBC); Homhil protected area, Ain Tsahrin spring (12°34′12″N 54°18′30″E), 435 m a.s.l., 11.vi.2012, 13 ♂♂ 14 ♀♀ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (ACPI, NHMW, NMPC, MMBC); Zemhon [= Zemhom] area (12°30′58″N 54°06′39″E), 270–350 m a.s.l., at light, 3.–4.ii.2010, 2 ♀♀ (ma), L. Purchart & J. Vybíral lgt. (MMBC, NMPC).

**Identification.** Brown (1953a, as *M. hozari macani*) (description, figures); Linnavuori (1960, as *M. perexigua*) (description, figures); Linnavuori (1986a): 38–40 (upgraded to species, new synonymy, redescription, figures); Linnavuori & Hosseini (2000): 41–43 (key, diagnosis, figures); Saleh Ahmed & Gadalla (2005a): 221–222, 225 (key, diagnosis, figures); Linnavuori et al. (2011): 92, 96 (diagnosis, habitus figure).

**Habitat.** In Socotra collected in coastal to montane zone:




Figs 32–39. 32–35 – *Microvelia gracillima* Reuter, 1882: 32–33 – apterous morph from Skand Mt.: 32 – ♂ (body length 1.76 mm), 33 – ♀ (1.86 mm); 34–35 – macropterous morph from Tudhen: 34 – ♂ (1.76 mm), 35 – ♀ (1.96 mm). 36–37 – *M. macani* Brown, 1953, apterous morph from Homhil, Ain Tsahrin: 36 – ♂ (1.57 mm), 37 – ♀ (1.76 mm). 38–39 – *M. popovi* Brown, 1951, apterous morph from Firmihin: 37 – ♂ (1.37 mm), 38 – ♀ (1.96). (Orig. P. Kment).

in a shaded pool covered with tamarind leaves next to a small brook at Homhil (435 m a.s.l.) and on two brooks, at the sea coast (5 m a.s.l. at Arher; Fig. 49) as well as in Hagher Mts (1170 m a.s.l. in wadi Madar; Fig. 50), at the latter locality in tufts of *Juncus socotranus* at the bank. Two macropterous specimens were also collected at light.

Outside Socotra, the species was collected in marshes, ponds, pools and brooks among rich vegetation (e.g. of *Phragmites*, *Typha*, *Juncus* and sedges) and also in irrigation systems (Linnavuori 1986a, 1994b, 2009; Linnavuori & van Harten 1997; Saleh Ahmed & Gadalla 2005a; Linnavuori et al. 2011). Macropterous specimens were also intercepted by light traps and Malaise trap (Linnavuori 2004, Linnavuori et al. 2011).

**Distribution.** ***Palaearctic Region:*** Near East: Azerbaijan (Berchi et al. in press), Egypt: Sinai (Saleh Ahmed & Gadalla 2005a,b), Iran (Linnavuori & Hosseini 2000; Linnavuori 2004, 2009; Ghahari et al. 2013), Iraq (Brown 1953a, Linnavuori 1994b), Israel (Linnavuori 1960, as *M. perexigua*), Saudia Arabia (Brown 1953a, as *M. hozari macani*, 1953b, as *M. hozari*; Linnavuori 1986a), Socotra (this paper), United Arab Emirates (Linnavuori et al. 2011), Yemen (Linnavuori & van Harten 1997, 2002a). **New species for the Socotra Archipelago.**

### *Microvelia* (*Picaultia*) *popovi* Brown, 1951

(Figs 38–39)

*Microvelia popovi* Brown, 1951: 231–233, figs 6a–d, 7a–i (original description). Holotype: ♂, Saudi Arabia: Hejaz, Wadi Dama (BMNH).

*Microvelia* (*Picaultia*) *popovi*: Andersen & Weir (2003): 339 (subgeneric placement).

*Microvelia priesneri* Hoberlandt, 1951b: 271–275 (original description, key). Holotype: ♂ (apterous), Egypt: Alexandria (NMPC – see Kment & Kolínová 2014: 846). Synonymized by Linnavuori (1986a: 38).

**Published record.** Wranik (2000, 2003): Socotra (no exact locality).

**Material examined. SOCOTRA:** Al Haghier [= Hagher] Mts., Scant [= Skand] Mt. env. (12°34.6′N 54°01.5′E), open helocrene in montane evergreen forest, 1450 m a.s.l., 12.–13.xi.2010, 6 ♂♂ 6 ♀♀ (ap) 1 L, J. Hájek lgt. (NMPC, MMBC, NHMW); Dixam plateau, Firmihin, small brook under Firmihin (12°28′36″N 54°01′06″E), 490 m a.s.l., 14.–15.vi.2012, 11 ♂♂ 14 ♀♀ (ap) 2 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (ACPI, NMPC, MMBC, NHMW); Firmihin, [ca. 390–760 m a.s.l.], iii.1999,


Figs 40–42. *Rhagovelia infernalis socotrensis* Brown, 1956: 40 – apterous ♂, Halla Arher (body length 3.61 mm); 41 – apterous ♀, wadi Madar (3.56 mm); 42 – macropterous ♂, Firmihin (4.22 mm). (Orig. P. Kment).

25 ♂♂ 26 ♀♀ (ap) 2 L, W. Wranik lgt., R. Linnavuori det., P. Kment revid. (WWRG → NMPC, MMBC, NHMW); Noged, Deiqub [= Deiqab, 115 m a.s.l.], 16.ii.2000, 19 ♂♂ 16 ♀♀ 4 L, W. Wranik lgt. (WWRG → NMPC, NHMW). – **SUDAN: Kassala Province:** Erkowit, 26.vi.1962, 1 ♂ 1 ♀ (ap), R. Remane lgt., L. Hoberlandt det., P. Kment revid. (NMPC).

**Identification.** Brown (1951) (description, figures); Hoberlandt (1951b, as *M. priesneri*) (key, description, figures); Priesner & Wagner (1961, as *M. priesneri*) (description of macropterous form, figure); Wranik (2003) (habitus photo); Saleh Ahmed & Gadalla (2005a) (key, diagnosis, figures).

**Habitat.** In Socotra collected at three sites in coastal to high-montane zone (115–1450 m a.s.l.). It was found in a shaded pool on a small brook under Firmihin (490 m a.s.l.) and on a small open helocrene surrounded by dense montane evergreen forest at Skand Mt. (1450 m a.s.l.; Fig. 51). In Egypt, the species was collected among floating green algae in small artificial brackish water pools for watering goats (Linnavuori 1964). One macropterous specimen was collected at light in Jordan (Carapezza 2002).

**Distribution.** ***Afrotropical Region:*** Sudan (Heiss et al. 2022; this paper). ***Palaearctic Region:*** North Africa: Egypt (Hoberlandt 1951b, Priesner & Alfieri 1953, Linnavuori 1960, Priesner & Wagner 1961, all as *M. priesneri*; Saleh Ahmed & Gadalla 2005a,b). Near East: Egypt: Sinai (Saleh Ahmed & Gadalla 2005a), Jordan (Carapezza 2002), Saudi Arabia (Linnavuori 1986a), and Socotra (Wranik 2000, 2003).

### *Rhagovelia* (*Rhagovelia*) *infernalis socotrensis* Brown, 1956

(Figs 40–42)

*Rhagovelia infernalis socotrensis* Brown, 1956: 140–142, figs 1c, 2c (original description). Holotype: ♀ (apterous), Yemen: Socotra, stream at Hadiboh (BMNH).

**Published records.** Taschenberg (1883, as '*Velia* sp.?'): Socotra (no exact locality); Brown (1956): stream at Hadibo [= Hadiboh]; Wranik (1999, 2000, 2003): Socotra (no exact locality).

**Material examined. SOCOTRA:** Diksam [= Dixam, ca. 500–1000 m a.s.l.], xi.1997, 1 L, W. Wranik lgt. (WWRG → NMPC); Dixam plateau, Firmihin, small brook under Firmihin (12°28′36″N 54°01′06″E), 490 m a.s.l., 14.–15.vi.2012, 3 ♂♂ 5 ♀♀ (ap) 1 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Dirhashas [= Di Hashus, ca. 950–990 m a.s.l.], ix.1998, 1 ♂ 3 ♀♀ (ma) 6 ♂♂ 9 ♀♀ (ap) 3 L, W. Wranik lgt., R. Linnavuori det., P. Kment revid. (WWRG → NMPC); Firmihin, [ca. 390–760 m a.s.l.], iii.1999, 1 ♂ (ma) 3 L, W. Wranik lgt. (WWRG → NMPC); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1170 m a.s.l., 18.vi.2012, 6 ♂♂ 9 ♀♀ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); Halla area, Arher (12°33′00″N 54°27′36″E), freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 1 ♂ 1 ♀ (ap), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Homhil, [ca. 300–600 m a.s.l.], ix.1998, 4 ♀♀ (ap) 1 L, W. Wranik lgt. (WWRG → NMPC); Homhil protected area, Ain Tsahrin spring (12°34′12″N 54°18′30″E), 435 m a.s.l., 11.vi.2012, 10 ♂♂ 9 ♀♀ (ap) 7 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); Homhil Wadi, 600 m a.s.l., 5.vi.2008, 1 ♂ (ma) 39 ♂♂ 59 ♀♀ (ap), A. Carapezza lgt. (ACPI, BPBM); Wadi Ayhaft (12°36′30″N 53°58′54″E), 200 m a.s.l., 7.–8.xi.2010, 1 ♂ 1 ♀ (ma) 1 ♂ 3 ♀♀ (ap), J. Hájek lgt. (NMPC, NHMW); Wadi Daneghan [= Dineghen, 5–900 m a.s.l.], 2 ♀♀ (ap), W. Wranik lgt. (WWRG → NMPC); Wadi Dirhor, [300–570 m a.s.l.], 8.vi.2008, 4 ♂♂ 2 ♀♀ (ma) 23 ♂♂ 21 ♀♀ (ap), A. Carapezza lgt. (ACPI, BPBM); Wadi Kilisan, [365 m a.s.l.], ix.1998, 2 ♀♀ (ap) 4 L, W. Wranik lgt. (WWRG → NMPC).

**Identification.** Lundblad (1936) (key, redescription of *Rh. i. infernalis*, description of *Rh. i. africana*, figures), Brown (1956) (description, figures); Wranik (1999, 2000) (habitus photo of larva); Wranik (2000, 2003) (habitus photo of adult).

**Habitat.** Collected on surface of a spring and several small brooks (e.g. Fig. 50) in coastal to montane zone (5−1170 m a.s.l.). Linnavuori (1971) collected *Rh. infernalis africana* in South Sudan in mountain and rain-forest cold brooks. In contrast, Hynes (1955) found *Rh. i. africana* in Kenya and Somalia only at altitudes below 200 m where it occurred on both permanent and temporary rivers.

**Distribution.** ***Palaearctic Region:*** Socotra (Brown 1956).

The nominotypical subspecies *R. infernalis infernalis* (Butler, 1876) was described from Rodrigues (Butler 1876, as *Velia infernalis*; Lundblad 1936) and subsequently recorded from Reunion (Poisson 1957b), Mauritius (Mamet 1957, as *Rh. infernalis*; Sallier Dupin 1976), and the Comoros (Poisson 1957d, 1959a, with note on variation). *Rhagovelia infernalis andranombyi* Poisson, 1952 was described from Madagascar (Poisson 1952a). *Rhagovelia infernalis africana* Lundblad, 1936 is widely distributed in continental Subsaharan Africa: Burkina Faso (Sallier Dupin 1979), Central African Republic (Sallier Dupin 1979), Chad (Sallier Dupin 1979), Democratic Republic of the Congo (Poisson 1942, 1954b, 1963, 1968a; Poisson & Sallier Dupin 1969), Ethiopia (Mancini 1961), Guinea (Bertrand 1962), Ivory Coast (Bertrand 1962, Poisson 1968b, Sallier Dupin 1979), Kenya (Hynes 1955, Lundblad 1936, Poisson 1963), Niger (Sallier Dupin 1979), Nigeria (Sallier Dupin 1979), Republic of the Congo (Bertrand 1962), Rwanda (Poisson 1955b), Somalia (Hynes 1955), South Africa (Poisson 1957a), South Sudan (Linnavuori 1971), Swaziland (Poisson 1963), Uganda (Poisson 1963), Tanzania (Poisson 1960a, 1963; Sallier Dupin 1976), Togo (Sallier Dupin 1979), and Zimbabwe (Poisson 1963) as well as in the Palaearctic Region: Israel (Nieser 1995), Cyprus and possibly also in Greece (Rhodes Isl.) (Fent et al. 2011).

Sallier Dupin (1976) recorded *Rh. i. infernalis* and *Rh. i. africana* from the same locality – Kinola, Mts. Uluguru, Tanzania, and listed the distribution of both subspecies as follows: *Rh. i. infernalis* from Rodrigues, Mauritius, South Africa (Cape, Transvaal), Zaïre [= Democratic Republic of the Congo], Guinea, and Ivory Coast, and *Rh. i. africana* from Swaziland, Rhodesia [= Zambia and Zimbabwe], Tanzania, Kenya, Uganda (Sallier Dupin 1976). The records of Sallier Dupin (1976) require a critical revision.

## Family Gerridae

### *Halobates germanus* White, 1883

(Fig. 43)

*Halobates germanus* White, 1883: 50–52, Pl. I: fig. 6 (original description). Lectotype (designated by Andersen & Weir 1994: 900, as holotype): ♀, Pacific Ocean (BMNH).

? *Halobates germanus* var. *bankae* Griffini, 1895: 3 (original description). Syntypes: 1 ♂ 1 ♀, Indonesia: "Stretto di Banka" [= Bangka Strait] (MIZT). Synonymized by Herring (1961: 240).

*Halobates sewelli* Imms, 1936: 71–77 (original description). Lectotype (designated by Andersen & Weir 1994: 900, as holotype): ♂, Arabian Sea: entrance to the Gulf of Oman, about half-way between the coasts of India and Arabia (BMNH). Synonymized by Herring (1961: 253).

**Published records.** Maps in Herring (1961), Cheng (1973), Schmidt & Müller (1973) and Cheng et al. (2012) show distribution points in the Arabian Sea in proximity of Socotra, however, we failed to trace any exact record from that area.

**Identification.** Herring (1961) (key, redescription, figures), Schmidt & Müller (1973) (redescription, figures), Andersen & Foster (1992) (key), Andersen & Weir (1994) (key, redescription, figures), Cheng et al. (2001) (key, figures), Andersen & Weir (2004a) (key, figures), Zettel (2005) (key).

**Habitat.** *Halobates germanus* is a pelagic, open ocean species, though it prefers to stay closer to land than *H. micans* Eschscholtz, 1822 and *H. sericeus* Eschscholtz, 1822 resulting in many records from near-shore stations (Herring 1961; Cheng 1973, 1989; Schmidt & Müller 1973; Andersen & Weir 1994).

**Distribution.** Widely distributed in the Red Sea, Indian and West Pacific Ocean from the Gulf of Aqaba (between the Sinai Peninsula and Saudi Arabia) towards Mozambique, Madagascar and Mascarenes in the south, to Japan in the north, and to the Society Islands and northern Australia in the east (Herring 1961; Miyamoto 1964; Cheng 1973,

1982; Schmidt & Müller 1973; Andersen & Weir 1994; Andersen 1995; Hayashi et al. 2016; Román-Palacios et al. 2020).

**Nomenclatural note.** White (1883) described *H. germanus* based on three specimens of both sexes, originating from the following localities: 'Celebes Sea', 'between the Admiralty Islands and Japan', and 'Mare della China' [= China Sea]. Andersen & Weir (1994), despite being aware of this fact, cited the type material of *H. germanus* as 'holotype. ♀, 'Pacific 90·4' (BMNH). Imms (1936) described *H. sewelli* based on 4 ♂♂ 13 ♀♀ and 13 larvae collected at the 'Entrance to the Gulf of Oman, about half-way between the coasts of India and Arabia' and 1 ♂ 12 ♀♀ and 6 larvae collected in 'Red Sea, Genaba, near Farsan Is.', without any mention of holotype. Andersen & Weir (1994) cited the type material of *H. sewelli* as follows: 'holotype. ♂, 'Arabian Sea, Gulf of Oman' (BMNH)'. We consider the mention of holotype of both species by Andersen & Weir (1994) a valid lectotype designation under the Article 74.5 (ICZN 1999) because the term 'holotype' was used explicitly for one of the syntypes.

### *Halobates hayanus* White, 1883

(Fig. 44)

*Halobates hayanus* White, 1883: 52–54, Pl. I: fig. 8 (original descriptions, figures). Holotype: ♂, Yemen: Red Sea near Aden (BMNH).

*Halobates frauenfeldanus* White, 1883: 57–58, Pl. II: fig. 3 (original description, figures). Syntype(s): ♂♀, India: Indian Ocean near Nicobar Islands (NHMW). Synonymized by Herring (1961: 284).

*Halobates incanus* Witlaczil, 1886: 179–181, fig. 2 (original description, figure). Syntypes: ♂♂ ♀♀ larvae (about 30 spec.), Yemen: Arabian Sea NE and SE of Socotra (?NHMW). Synonymized by Dahl (1893: 7).

*Halobates australiensis* Malipatil, 1988: 157–158, figs 1–5 (original description, figures). Holotype: ♂, Australia: Northern Territory, Wessel Islands, Marchinbar Island, bay south of Sphink Head (11°12′S 136°41′E) (NTMD). Synonymized by Andersen (1991: 45), confirmed by Andersen & Weir (1994: 894–895); synonymy with *H. calyptus* Herring, 1961 by J. T. Polhemus & D. A. Polhemus (1991a: 7) is erroneous (see Andersen & Weir 1994: 895).

**Published records.** Arabian Sea, collected on two localities, NE and SE of Socotra (Witlaczil 1886, as *H. incanus*).

**Identification.** Herring (1961) (key, redescription, figures), Schmidt & Müller (1973) (redescription, figures), Andersen & Foster (1992) (key), Andersen & Weir (1994) (key, redescription, figures), Cheng et al. (2001) (key, figures), Andersen & Weir (2004a) (key, figures), Zettel (2005) (key, figures).

**Habitat.** It was collected in the mangrove zone in the Red Sea in Mersa Halaib, Sudan (depth of the water about 1 m); a number of specimens were observed early in the morning, adults on the sea side, larvae on the shore side of the zone (Linnavuori 1971). At Al Luhayah, Yemen, one specimen was collected together with several specimens of *H. melleus* Linnavuori, 1971 in mangrove (*Avicennia marina* (Forssk.) Vierh.) zone (Linnavuori & van Harten 1997). At Sharm Ubhar, Saudi Arabia, the larvae of the species were abundant in small patches in the shelter of a lone rock close to the shore (Brown 1951). In Singapore, numerous first instar larvae were collected from a tidal pool, together with a pair of mating adults (Cheng & Fernando 1969).

**Distribution.** According to Cheng (1989) *H. hayanus* is a coastal, inshore species widely distributed along coastal areas or among island groups, ranging from the Red Sea, across the Arabian Sea, South China Sea, Indian Ocean to the West Pacific Ocean. ***Afrotropical Region:*** Egypt/Sudan: Mersa Halaib [disputed area] (Bergevin 1930, Priesner & Alfieri 1953, Linnavuori 1971), Eritrea (Schmidt & Müller 1973), Djibouti (Poisson 1965b, no exact record). ***Palaearctic Region:*** Near East: Egypt: Sinai (Linnavuori 1973b, Saleh Ahmed & Gadalla 2005b, Román-Palacios et al. 2020), Saudi Arabia (Brown 1951, as *H.* (?) *hayanus* based on larvae only; M. J. J. Chang, this paper: Fig. 44), Socotra (Witlaczil 1886, as *H. incanus*); Yemen (White 1883, Linnavuori & van Harten 1997). East Palaearctic: China (Román-Palacios et al. 2020, no exact record). ***Oriental Region:*** East Timor (J. T. Polhemus & D. A. Polhemus 2006), India: Andaman and Nicobar Islands (White 1883, Witlaczil 1886, both as *H. frauenfeldanus*; Thirumalai 2002), Indonesia (Herring 1961, Tran & Yang 2004, Román-Palacios et al. 2020), Malaysia (Herring 1961, Cheng & Fernando 1969, Fernando & Cheng 1974, Zettel & Tran 2009), Philippines (Zettel 2014, Bendanillo et al. 2016, Román-Palacios et al. 2020), Singapore (Esaki 1926, Cheng & Fernando 1969, Fernando & Cheng 1974), Sri Lanka (Witlaczil 1886, as *H. frauenfeldanus*), Thailand (Sites & Vitheepradit 2010, Román-Palacios et al. 2020, both with no exact record), Vietnam (Zettel & Chen 1996). ***Australian Region:*** Australia: Northern Territory, Queensland, Western Australia (Herring 1961; Linnavuori 1971; Nichols & Johns 1973; Malipatil 1988, as *H. australiensis*; Cassis & Gross 1995; Andersen & Weir 1994, 2004a; Román-Palacios et al. 2020), Papua New Guinea (Esaki 1926, Herring 1961, Damgaard et al. 2000, Román-Palacios et al. 2020).

### *Limnogonus* (*Limnogonus*) *cereiventris* (Signoret, 1862)

(Fig. 45)

*Gerris cereiventris* Signoret, 1862: J.–30 (original description). Lectotype (designated by Andersen 1975: 65, 67): ♀ (macropterous), Madagascar (NHMW).

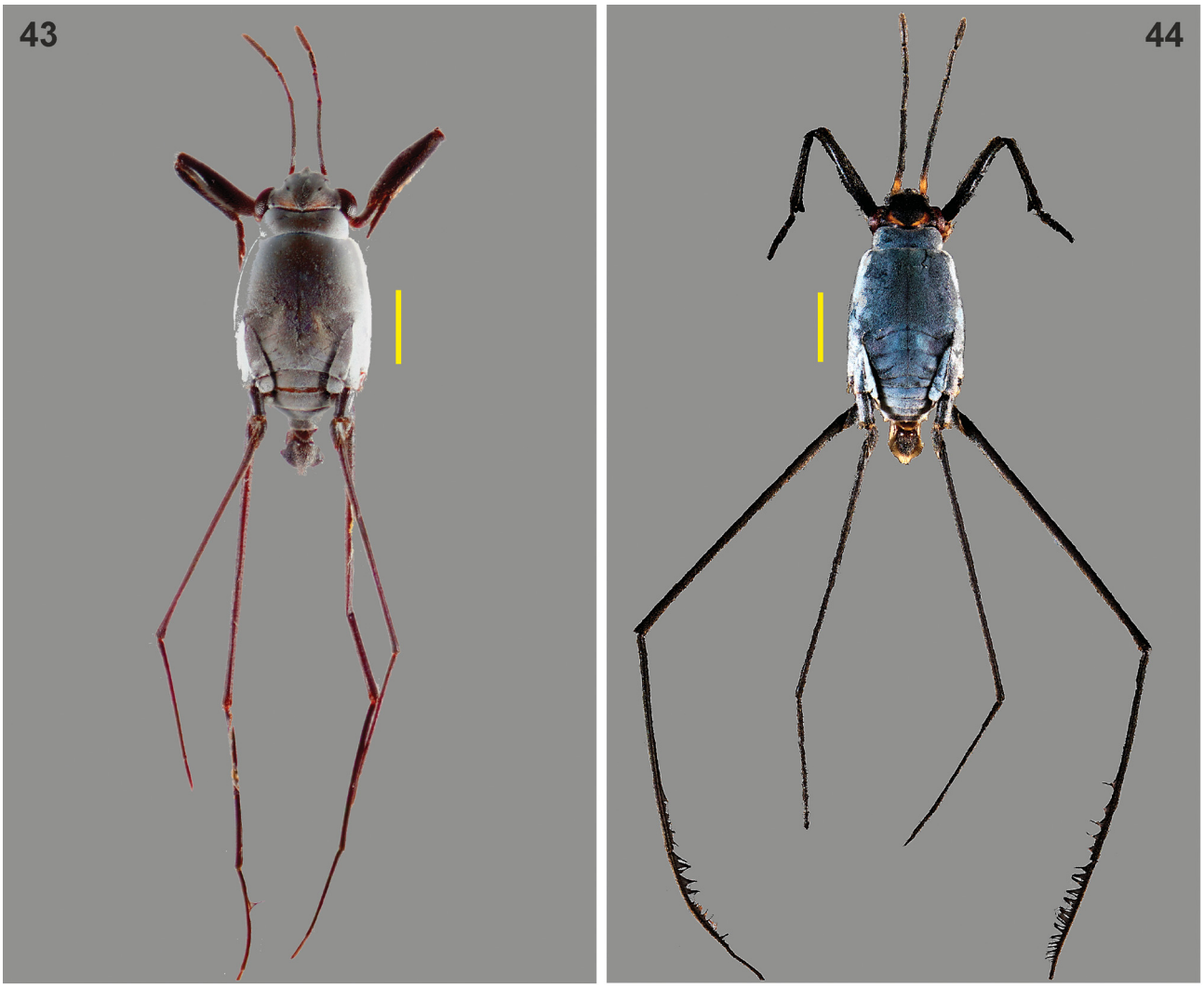
*Limnogonus cereiventris*: Bergroth (1893): 203 (new combination).

*Gerris* (*Lamprotrechus*) *leptocerus* Reuter, 1882: 40 (original description). Lectotype (designated by Andersen 1995: 105, as holotype): ♀ (macropterous), Ghana: Addah (HNHM). Downgraded to subspecies by Poisson (1949b: 99–100), synonymized by Andersen (1975: 67).

*Gerris ægyptiaca* Puton, 1890: 228 (original description). Syntypes: Egypt: 'Egypte' and Suez (MNHN). Synonymized by Horváth (1926: 1).

*Tenagogonus bottegoi* de Carlini, 1895: 121–122 (original description). Syntypes: 2 ♀♀, Somalia, Lugh [= Lunq] to Bardera [= Baardere] (USNM). Synonymized by Kirkaldy (1908: 21, with *G. ægyptiaca*).

**Material examined. SOCOTRA:** Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 4 ♂♂ 10 ♀♀ (ma), Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC); Hadibo [= Hadiboh] env., [10–20 m a.s.l.], 4.vi.2008, 1 ♂ 1 ♀ (ma) 8 ♂♂ 5 ♀♀ (ap), A. Carapezza lgt. (ACPI). – **BURKINA FASO:** Ouagadougou, ix.1936, 3 ♂♂ 3 ♀♀ (ma), Škulina lgt., P. Kment det. (NMPC). **CAPE VERDE ISLANDS: Santiago Island:** irrigation reservoir in Ribeta Grande valley, 14°55′22.0″N 23°36′06.8″, 17.v.2013, 1 ♀ (ma), J. Bojková lgt., P. Kment det. (NMPC). **DEMOCRATIC REPUBLIC OF THE CONGO:** Congo belge, P.N.A., Bugazia, 920




Figs 43–44. 43 – *Halobates germanus* White, 1883, ♂, Indian Ocean near Madagascar; 44 – *Halobates hayanus* White, 1883, Saudia Arabia: Thuwal, mangroves of King Abdullah University of Science and Technology. Scale bars: 1 mm. (Orig. Marc Jia Jin Chang).

m a.s.l., 17.v.1935, 1 ♂ (ma), Mission H. Damas: 135, R. Poisson det. 1951 as *L. leptocerus*, P. Kment revid. (NMPC). **ETHIOPIA: Ogaden:** Ex tug between Guadere–Mustahil, 5.xii.1954, 1 ♂ (ma), I. Lansbury lgt., P. Kment det. (NMPC). **GHANA:** Labadi, No. 52, 14.viii.1965, 1 ♂ (ma), D. Leston lgt., P. Kment det. (NMPC). **MADAGASCAR:** E coast, Toamasina Province, Mahambo (17°28′38.49″N 49°27′50.84″E), 16.iii.2010, 4 spec. (ma) 1 spec. (ap), J. Votýpka lgt., Chen & Nieser det. (NMPC); Rogez, 800 m a.s.l., 1 ♂ 1 ♀ (ma), L. Hoberlandt det., P. Kment revid. (NMPC). **NIGER:** Maradi, Sahara merid, x.1936, 1 ♀ (ma), Škulina lgt., P. Kment det. (NMPC). **SOUTH SUDAN: Upper Nile:** Tonga, 19.xi.1953, 6 ♂♂ (ma), E. T. M. Reid lgt., P. Kment det. (NMPC). **SUDAN: Khartoum:** Chartum [= Khartoum], v.1931, 1 ♂ (ma), coll. Baum, P. Kment det. (NMPC).

**Identification.** Andersen (1975) (key, redescription, figures), D. A. Polhemus & J. T. Polhemus (2013) (key, redescription, figures).

**Habitat.** In Socotra, the species was collected twice, in the coastal zone near Hadiboh (ca. 10–20 m a.s.l.) and in the medium-elevation zone in a large pool with sparse littoral vegetation in a drying wadi (Fig. 53). In East Africa, Hynes (1955) found *L. cereiventris* only at altitudes below 1400 m. There it was very common and occurred along the banks of rivers, on irrigation dikes, wadis and temporary pools. The insects did not form shoals even when large numbers were present. Remarkable features of this species were that in the dry country it was found on puddles and temporary pools within a few days of their filling, and that it flew readily from the water surface when pursued. All but one of the specimens seen were fully winged; the one being a female taken in copula with a winged male on a permanent irrigation dike. Mating pairs were often seen on temporary pools. It would seem that the species maintains itself on permanent water and flies far and wide over the dry semi-desert at the onset of rains, and may breed successfully on temporary pools. Some of the pools on which it was found were over 80 km from permanent water, so individuals must be able to travel a long distance.

Other authors collected this species in Africa in different localities, along the banks of rivers, on irrigation dykes, wadis and temporary pools and puddles; also at light (Andersen 1975). Jaczewski (1926, as *Gerris leptocerus*; 1936, as *L. leptocerus*), Lindberg (1959, as *L. cereiventris leptocerus*), and Linnavuori (1964, 1971, both as *L. c. leptocerus*; 1981) reported it in rivers, brooks, ponds, pools, and irrigation canals with rich vegetation, among fields as well as in the desert, also in pools and a mangrove

lagoon with brackish water, and even in a swimming pool of sulphur baths. In Zimbabwe, it was collected in pans (small temporary seasonal lakes) with rich littoral vegetation (Weir 1966). Macropterous specimens are collected by light traps (Linnavuori 1971). According to Saleh Ahmad (2001), the species has two generations in NE Egypt, overwintering in adult stage.

**Distribution.** ***Afrotropical Region:*** Benin (Andersen 1975, Linnavuori 1981), Burkina Faso (Andersen 1975; this paper), Burundi (Andersen 1975), Cameroon (Linnavuori 1981), Cape Verde Islands (Lindberg 1959, as *L. c. leptocerus*; this paper), Chad (Andersen 1975, Linnavuori 1981), Comoros (Poisson 1957d, 1959a, 1965b; Andersen 1975), Democratic Republic of the Congo (Poisson 1954b, 1963, 1965a, 1968a; Poisson & Sallier Dupin 1969, all as *L. c. leptocerus*; Andersen 1975; this paper), Ethiopia (Mancini 1954; Hynes 1955, both as *L. leptocerus*; Andersen 1975; this paper), Ghana (Reuter 1882, as *Gerris leptocerus*; Linnavuori 1981; this paper), Guinea (Poisson 1960b, as *L. c. leptocerus*), Ivory Coast (Poisson 1968b, as *L. c. leptocerus*; Andersen 1975; Linnavuori 1981), Kenya (Mancini 1939b; Hynes 1955, both as *L. leptocerus*; Poisson 1963), Madagascar (Signoret 1862; Poisson 1949b, 1963, 1965b; Andersen 1975; this paper), Mali (Andersen 1975), Mauritius (Kirkaldy 1899b; Mamet 1957, as *L. leptocerus*; Poisson 1965b; Andersen 1975), Mozambique (Poisson 1934b, as *L. leptocerus*; Andersen 1975), Niger (Poisson 1941a, as *L. leptocerus*; Poisson 1950a, as *L. c. leptocerus*; Andersen 1975; Linnavuori 1981; this paper), Nigeria (Andersen 1975, Linnavuori 1981), Republic of the Congo (Bertrand 1962), Reunion (Signoret 1862; Kirkaldy 1899b; Poisson 1957b, 1965b), Rodriguez (China 1924, as *L. dolosa*; Damgaard et al. 2010, 2014), São Thomé (Andersen 1975), Senegal (Jaczewski 1926, as *Gerris* (*Limnogonus*) *leptocerus*; Bertrand 1962; Poisson & Sallier Dupin 1970, both as *L. c. leptocerus*; Andersen 1975), Seychelles (Distant 1909b, 1913; Poisson 1965b; D. A. Polhemus & J. T. Polhemus 2013), Somalia (de Carlini 1895, as *T. bottegoi*; Mancini 1939b; Hynes 1955, both as *L. leptocerus*; Linnavuori 1977), South Africa (Andersen 1975), South Sudan (Horváth 1926, Linnavuori 1971; this paper), Sudan (Linnavuori 1971, Andersen 1975; this paper), Tanzania (Kirkaldy 1908, as *L. aegyptiacus*; Poisson 1960a, as *L. c. leptocerus*; Andersen 1975), Togo (Linnavuori 1981), Uganda (Poisson 1960a, as *L. c. leptocerus*; Andersen 1975), Zambia (Poisson 1957a, as *L. c. leptocerus*; Andersen 1975), Zimbabwe (Weir 1966). ***Palaearctic Region:*** North Africa: Egypt (Puton 1890, as *G. aegyptiaca*; Horváth 1926, as *L. leptocerus*; Jaczewski 1936; Linnavuori 1964; Andersen 1975; Saleh Ahmad 2001; Saleh Ahmed & Gadalla 2005b); Near East: Egypt: Sinai (Saleh Ahmed & Gadalla 2005b, no exact record), Israel (Horváth 1913, as *L. aegyptiacus*; Linnavuori 1960), Saudi Arabia (Linnavuori 1986a), Socotra (this paper). **New species for the Socotra Archipelago.**

**Notes.** Signoret (1862) described *Gerris cereiventris* in a paper dealing with fauna of Réunion, but without any mention of type material or type locality. Andersen (1975: 65, 67) clarified the situation, designating one macropterous female from Madagascar as lectotype and another macropterous female from Bourbon [= Réunion] as paralectotype.

Reuter (1882) described *G. leptocerus* without any mention of types or the type locality. Andersen (1975: 66) examined a probable syntype of the species, listing it as follows: 'type (?), winged ♀, Addah (*leptocerus*; Budapest)'. Andersen (1995: 105) listed that specimen as holotype. We consider the mention of holotype by Andersen (1995) a valid lectotype designation under the Article 74.5 (ICZN 1999) because the term 'holotype' was used explicitly for one of the syntypes.

*Limnogonus dolosus* Bergroth, 1893, described from the Seychelles: La Dique, was synonymized with *L. cereiventris* by Kirkaldy (1899b: 102), an opinion accepted by Andersen (1975). However, D. A. Polhemus & J. T. Polhemus (2013: 70–71) restored *L. dolosus* as a valid species and provided its redescription.

Poisson (1941c: 151) mentioned also Algeria and Tunisia in connection with this species in an ambiguous statement: 'remonte jusqu'en Égypte et exceptionellement sur les confins tunisiens et algériens [= it extends as far north as Egypt and exceptionally along the borders of Algeria and Tunisia]'. Andersen (1975) listed those records with question mark, while Andersen (1995) and Damgaard et al. (2014: S20) listed them as accepted. However, we are not aware of any exact record from those countries (see Carapezza 1997, Slimani et al. 2016).

### *Onychotrechus rhexenor* Kirkaldy, 1903

(Fig. 46)

*Onychotrechus rhexenor* Kirkaldy, 1903b: 44–45 (original description). Holotype: ♂ (macropterous), India: Karnataka, Kanara (BMNH).

**Published record.** Andersen (1980): Hadibo [= Hadiboh] plain, 2000 ft [= 610 m a.s.l.] (BMNH). Wranik (2003, as *Gerris* sp. larva): Socotra (no exact locality).

**Material examined. SOCOTRA:** Firmihin, [ca. 390–760 m a.s.l.], iii.1999, 1 ♂ (ap), W. Wranik lgt. (WWRG → NMPC).

**Identification.** Andersen (1980) (key, redescription, larva, figures).

**Habitat.** There are only two specimens recorded from Socotra, referring to the medium-elevation and montane zone, but without details on sampled habitat (Andersen 1980, this paper). A hygropetric species; in India it was found resting or walking on wet, inclined and seeping rock faces and on rocks close to mountain streams, covered by algae and a thin sheet of trickling water. Both larvae and copulating adults were collected on wet cliffs far from surface waters. When disturbed the insects jump from rock to rock, and only rarely were captured by sweeping net through water. Both specimens from Socotra are apterous, but in South India the macropterous morph occurred with high frequency and was also taken at light (Andersen 1980).

**Distribution.** ***Palaearctic Region:*** Socotra (Andersen 1980, 1995). ***Oriental Region:*** India: Chhattisgarh, Karnataka, Kerala, Maharashtra, Rajasthan, Tamil Nadu (Kirkaldy 1903b, Andersen 1980, Thirumalai 2002, Subramanian et al. 2014, Jehamalar & Chandra 2016).


Figs 45–46. 45 – *Limnogonus cereiventris* (Signoret, 1862): 45 – macropterous ♀, wadi Zerig (body length 9.12 mm). 46 – *Onychotrechus rhexenor* Kirkaldy, 1903, apterous ♂, Firmihin (4.71 mm). (Orig. P. Kment).

**Note.** *Onychotrechus rhexenor* as well as all other members of Eotrechinae are confined exclusively to the Oriental Region (Andersen 1980, 1982: fig. 622). The extension of the species to Socotra is very unusual, so doubts about the authenticity of the material occurred. However, finding the apterous male from Firmihin in the collection of Wolgang Wranik, which included only materials from Socotra and continental Yemen, makes the possibility of mislabelling of both existing specimens highly unlikely. The colouration of the Firmihin specimen fits the illustrations of *O. rhexenor* by Andersen (1980: fig. 14) but application of the tarsal characters was problematic; we follow the opinion of Andersen (1980) in identifying the Socotran specimens as *O. rhexenor*, but a future taxonomic revision is needed.

## Infraorder Leptopodomorpha
## Family Saldidae

### *Micracanthia ornatula* (Reuter, 1881)

(Fig. 47)

*Salda ornatula* Reuter, 1881: 160–161 (original description). Holotype: ♂, 'Nubia superioris' [= S Egypt or N Sudan] (NHRS).

*Micracanthia ornatula*: Lindskog (1995): 126 (new combination).

*Salda dixoni* Distant, 1904: 405 (original description, figures). Syntypes: India: Maharashtra, Bor Ghat [= Bhor Ghat] (1 spec.) and Myanmar: Rangoon [= Yangon] (1 spec.) (BMNH). Synonymized by Drake & Hoberlandt (1951: 9).

*Salda* (*Chartoscirta*) *dixoni* var. *luteifuscula* Breddin, 1912: 86 (original description). Syntype(s): Sri Lanka: Hatton (lost?, see Drake & Hottes 1950: 177). Synonymized by Drake & Hoberlandt (1951: 9).

*Acanthia balnearum* Bergroth, 1918: 123–124 (original description). Syntypes: ♂♀, Philippines: Luzon, Laguna, Los Baños (?lost). Synonymized by Drake & Hottes (1950: 177, with *S. dixoni*) and Drake & Hoberlandt (1951: 9, with *S. ornatula*).

*Saldula minor* Hamid & Sultana, 1972: 282–284, figs 2, 3B, 4D,F,H,J,L (key, original description, figures). Holotype: ♂, Pakistan: Karachi, 5 mi. before Korangi Creek (USNM). Synonymized by Lindskog (1995: 126), confirmed by Vinokurov & Kment (2015: 371).

*Micracanthia minor*: Vinokurov (2012): 851 (new combination).

**Material examined. SOCOTRA:** Dixam plateau, wadi Zerig (12°29′36″N 53°59′30″E), pool at road bridge, *Juncus* marsh, 655 m a.s.l., 13.–14.vi.2012, 1 ♂, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Halla area, Arher (12°33′00″N 54°27′36″E), shortly grazed grassland around freshwater spring in sand dune, 5 m a.s.l., 9.–10.vi.2012, 1 ♂ 1 ♀, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Homhil protected area (12°34′30″N 54°18′30″E), shortly grazed grassland along small brook in drying-up wadi, 360 m a.s.l., 10.–11.vi.2012, 3 ♀♀, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Kazazhan area (12°33′46″N 54°19′48″E), shrubland on limestone, ca. 550 m a.s.l., 10.vi.2012, 1 ♀, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC); Qadub, coastal salt-marsh at road (12°38′18″N 53°57′18″E), shores of pools and shortly grazed grassland around, hand collected + suction sampler, 8 m a.s.l., 14.vi.2012, 31 ♂♂ 18 ♀♀ 8 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); ca. 3 km NE of Shuab (12°34′06″N 53°23′54″E), *Avicennia marina* mangrove and sandy coast, 3 m a.s.l., 20.–21.vi.2012, 14 ♂♂ 6 ♀♀ 2 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC). – **BURKINA FASO:** Ouagadougou, ix.1936, 7 ♂♂ 6 ♀♀, Škulina lgt., P. Kment det. (NMPC). **CAPE VERDE ISLANDS: Santiago:** Sao Jorge, 16.–20.ix.1983, 1 ♀; x.1983, 1 ♂ 2 ♀♀, A. van Harten lgt., R. H. Cobben det. (RMNH). **DEMOCRATIC REPUBLIC OF THE CONGO: North Kivu:** Rutshuru, 11.v.1936, 1 ♀, L. Lippens lgt., L. Hoberlandt det. 1958 as *S. ornatula f. dixoni*, P. Kment revid. (NMPC); P.N.A. [= Parc National Albert], May ya moto, 950 m a.s.l., 16.xi.1934, 1 ♂, G. F. de Witte lgt. (761), R. H. Cobben det. (RMNH). **ETHIOPIA:** Jimma, 13 km towards Agaro, 22.x.1969, 1 ♀, R. G. Cobben lgt. & det. (RMNH). **GUINEA-BISSAU:** Cachen, Bula, at pool, 29.viii.1992, 1 ♀, S. Persson lgt., P. Lindskog det. (NHRS). **IVORY COAST:** Adiopodoumé, iv.–v.1964, 1 ♂ 4 ♀♀ 2 L, R. H. Cobben lgt. & det. (RMNH); Bouaké, 20.–23.iii.1969, 1 ♂, R. H. Cobben lgt. & det. (RMNH). **MALI:** Kogoni, x.1966, 1 ♀, G. Schmitz lgt., R. H. Cobben det. (RMNH). **NIGER:** Maradi, Sahara merid, x.1936, 3 ♂♂, Škulina lgt., C. J. Drake det. as *S. ? balnearum*, P. Kment revid. (NMPC). **REUNION:** Cilaos, 17.xi.1990, 2 ♀♀, E. Heiss lgt., P. Lindskog det. (NHRS). **SOUTH AFRICA:** C.P., Wilderness, 12.–13.iii.1968, 1 ♀, P. J. Spangler lgt., R. H. Cobben det. (RMNH); Transvaal, Pienaars River Dam, 19.xi.1968, 4 ♂♂ 3 ♀♀, J. Munting lgt., R. H. Cobben det. (RMNH). **SUDAN: Red Sea State:** Kassala Prov., Khor Arba'at, 40 km N of Port Sudan, 16.iv.1962, 1 ♂, R. Remane lgt., P. Kment det. (RMNH). **River Nile State:** Hudeiba, 28.ix.1961, 1 ♀, R. Remane lgt., R. H. Cobben det. (RMNH). **TANZANIA: Tanganyika:** Kalimawe, 24.i.1965, 1 ♂, E. S. Brown lgt., R. H. Cobben det. (RMNH); Lake Rukwa, Ag. Hab. 49, 3.xi.1963, 1 ♀, E. S. Brown lgt., R. H. Cobben det. (RMNH). **ZAMBIA:** Copperbelt, 40 km NW Kapiri Mposhi, 8.–9.xii.2002, 1 ♂ 1 ♀, A. Kudrna Jr. lgt., P. Kment det. (NMPC). – **CHINA: Sichuan:** Leshan, river-bank, loc. CH-13, 17.vii.1985, 4 ♂♂ 1 ♀, P. Linskog lgt. & det. (NHRS). **TAIWAN:** Formosa, Tainan, 7.v.1912, 1 ♀, H. Sauter lgt., R. H. Cobben det. 1961 (RMNH). – **BANGLADESH:** Khulna, viii.1969, 2 ♂♂ 2 spec., J. Krystl lgt., R. H. Cobben det. (RMNH). **INDIA: Delhi:** Delhi, I.A.R.S., ix.1958, at light, 1 ♀; 24.xii.1958, swept on grass, 1 ♂, R. Menon lgt., R. H. Cobben det. (RMNH). **Karnataka:** Bangalore, 916 m a.s.l., m. V. light trap, 1.iv.1977, 9 spec., K. D. Shorpada lgt., R. H. Cobben det. (RMNH). **Rajasthan:** Pilani, light coll., 1965, 35 spec., H. I. Kundo lgt., R. H. Cobben det. (RMNH). **Tamil Nadu:** Coimbatore, light trap, xii.1961, 4 ♀♀, Agarwal lgt., R. H. Cobben det. (RMNH). **INDONESIA: Sumatra:** Tg. [= Tanjung] Morawa, lamp, iv.1951, 2 ♂♂ 2 ♀♀ 1 spec., R. H. Cobben det. 1959 (RMNH). **MALAYSIA: Sabah:** Jesselton, 3.ii.1969, 1 ♂, P. J. L. Roche lgt., R. H. Cobben det. 1981 (RMNH). **PAKISTAN: Sindh:** Karachi env., 8.i.1975, 2 ♂♂ 1 ♀, 22.–30.9.1975, 2 ♂♂ 1 ♀, E. Heiss lgt., P. Lindskog det. (NHRS); Thatta, 17.i.1975, 1 ♀, E. Heiss lgt., P. Lindskog det. (NHRS). **PHILIPPINES: Mindanao:** Zamboanga, 17.viii.1952, 1 ♂ 1 ♀, L. D. Brongersma & W. J. Roosdorp lgt., R. H. Cobben det. 1961 (RMNH). **Negros:** W Bacolod, Lizares, Bago Riv., 550 m a.s.l., 17.iii.1994, 1 ♂ 1 ♀, H. Zettel lgt. (40), P. Lindskog det. (NHRS). **SINGAPORE:** Singapore, 11.iii.1969, 2 ♂♂ 5 ♀♀, D. H. Murphy lgt., R. H. Cobben det. (RMNH). **SRI LANKA:** Sabaragamuwa Prov., Deerwood, Kuruwita, 6 mls NNW Ratnapura, Loc. 90:1, at light, 17.–22.ii.1962, 1 ♂, Lund University Ceylon Expedition 1962, Brink, Andersson & Cederholm lgt., P. Linskog det. (NHRS); W. Prov., Yakkala, 18 mls NE Colombo, Loc. 10, at light, 14.–31.i.1962, 1 ♂, Lund University Ceylon Expedition 1962, Brink, Andersson & Cederholm lgt., P. Linskog det. (NHRS); Ratnapura, below Adam's peak, on light, 1.v.1980, 1 ♀, I. Sivec lgt., R. H. Cobben det. (RMNH); Point Pedro, Jaffna, 8.xi.1980, 1 ♀, M. Gogala lgt., R. H. Cobben det. (RMNH). **THAILAND:** k. Bangkhen, Bangkok, 16.ix.1962, 1 ♂, Valuli lgt., J. D. Lattin det. 1965 (RMNH); Bangkhen nabij, Bangkok, lamp, ii.1966, 1 ♀, J. Leeuwangh lgt., R. H. Cobben det. (RMNH); W[est], Kanchanaburi (9), at light, 6.xii.1990, 1 ♀, M. Jäch lgt., P. Lindskog det. (NHRS). **VIETNAM:** Cochinchina, at MeKong river, i.1914, 3 ♀♀, K. Friedrichs lgt., R. H. Cobben det. (RMNH).

**Identification.** Cobben (1960, as *Saldula ornatula*) (key, diagnosis, figure); J. T. Polhemus & D. A. Polhemus (1991b) (key); Linnavuori et al. (2011) (diagnosis, habitus photo); J. T. Polhemus & D. A. Polhemus (2012) (key to genera, diagnosis, figures).

**Habitat.** Widely distributed, euryecious species found from coastal to medium-elevation zone (3–655 m a.s.l.), collected abundantly on sand wet with seeping sea water in a coastal lagoon, on mud and among shortly grazed grasses in coastal salt-marshes (see Fig. 49), but also on shores of pools and in shortly grazed grassland in drying-up wadis (using suction sampler) and even collected from short vegetation on a karstic plateau far from water at Kazazhan.

In Africa and the Cape Verde Islands, the species lives on shores of fresh waters as well as brackish ones (Lindberg 1959, Cobben 1960, Linnavuori 1981). In the United Arab Emirates, it was collected on rocks along a mountain water stream (Linnavuori et al. 2011). In Iran, this species was collected in the following habitats: small fields near an oasis watered by a salty brook, and small salty swamps in the oasis (locality Sekand), and gravel-sandy alluvial semi-desert (locality Minab) (Vinokurov & Kment 2015). In the Philippines, Gapud (1986) considered *M. ornatula* a highly adaptable species, being collected along the banks of relatively exposed streams and rivers, on rocks dispersed


Figs 47–48. 47 – *Micracanthia ornatula* (Reuter, 1881), ♂, Qadub (body length 2.84 mm); 48 – *Saldula niveolimbata* (Reuter, 1900), ♀, Skand Mt. (3.43 mm).

along these banks, or on muddy ground along freshwater marshes largely devoid of vegetation. In Malaysia, it was collected at the edges of small pools in a mangrove swamp (Dover 1929). It commonly comes to light (Linnavuori 1974, 1981; Yano et al. 1982; Linnavuori et al. 2011; J. T. Polhemus & D. A. Polhemus 1999), one specimen was also taken on the deck of a steamer at some distance off shore in Manila Bay, Philippines (Drake & Viado 1952). **Distribution** (see also Schuh et al. 1987: 339). ***Afrotropical Region:*** Angola (Drake 1960), Benin (Drake 1956, no exact record), Burkina Faso (Cobben & J. T. Polhemus 1966, J. T. Polhemus & D. A. Polhemus 2012), Cape Verde Islands (Lindberg 1959), Central African Republic (Linnavuori 1981), Chad (Drake & Hottes 1950, Drake 1963, Linnavuori 1981), Democratic Republic of the Congo (Drake 1963), Ethiopia (Drake 1956, no exact record; this paper), Ghana (Drake 1956, no exact record), Guinea Bissau (this paper), Ivory Coast (J. T. Polhemus 1981, Heiss et al. 2021b), Kenya (J. T. Polhemus 1981, J. T. Polhemus & D. A. Polhemus 2012), Madagascar (J. T. Polhemus & D. A. Polhemus 1991b, 2012), Mali (this paper), Mauritius (Mamet 1957), Namibia (Drake 1956), Niger (Linnavuori 1981), Nigeria (Linnavuori 1981), Reunion (J. T. Polhemus & D. A. Polhemus 1991b, 2012), Senegal (Drake & Hottes 1950), Sierra Leone (Cobben & J. T. Polhemus 1966, J. T. Polhemus & D. A. Polhemus 2012), South Africa (Drake 1956, J. T. Polhemus 1981), Sudan (Wagner 1963, Linnavuori 1974), Tanzania (Cobben & J. T. Polhemus 1966), Uganda (Drake 1960, no exact record), Zambia (this paper), Rhodesia [i.e. Zambia and Zimbabwe] (Drake 1960, no exact record). ***Palaearctic Region:*** North Africa: Egypt (Lindberg 1922, Priesner & Alfieri 1953, Linnavuori 1964). Near East: Oman (Vinokurov & Kment 2015), Saudia Arabia (Linnavuori 1986a, Heiss et al. 2021b), Socotra (this paper), United Arab Emirates (Linnavuori et al. 2011), Yemen (Linnavuori & van Harten 2002a); Iran (Linnavuori 2004, Ghahari et al. 2013, Vinokurov & Kment 2015). East Palaearctic: China: Fujian, Hainan, Jiangsu, Sichuan, Yunnan (Chen & Lindskog 1994, Hua 2000, Vinokurov 2015, Vinokurov et al. 2018; Sichuan – this paper), Japan (Drake & Hottes 1950, J. T. Polhemus & D. A. Polhemus 2012, Hayashi et al. 2016, Hayashi & Miyamoto 2018), Korea (C. E. Lee & Kwon 1991, S. Lee et al. 2013), Taiwan (Drake & Hottes 1950, Yano et al. 1982, Chen & Lindskog 1994). ***Oriental Region:*** Bangladesh (this paper), East Timor (J. T. Polhemus & D. A. Polhemus 2012), India (Distant 1904, 1910, both as *S. dixoni*; Vinokurov 2012; Heiss et al. 2021b), Indonesia (Drake & Hottes 1950), Laos (J. T. Polhemus & D. A. Polhemus 2012, no exact record), Malaysia (Dover 1929, as *S. dixoni*; Drake & Hottes 1950; J. T. Polhemus & D. A. Polhemus 2012), Myanmar (Distant 1904, as *S. dixoni*), Nepal (Vinokurov 2012, Vinokurov & Kment 2015), Pakistan (Hamid & Sultana 1972, as *S. minor*; J. T. Polhemus & D. A. Polhemus 2012; Vinokurov 2012, as

*M. minor*), Philippines (Bergroth 1918, as *A. balnearum*; Drake & Hottes 1950; Drake & Viado 1952; Gapud 1986), Singapore (J. T. Polhemus & D. A. Polhemus 2012), Sri Lanka (Breddin 1912, as *S. dixoni* var. *luteifuscula*; Distant 1910, as *S. dixoni* Drake & Hottes 1950), Thailand (J. T. Polhemus & D. A. Polhemus 1999, without exact record; this paper), Vietnam (Vinokurov 2012). ***Australian Region:*** Australia (J. T. Polhemus & D. A. Polhemus 1999, without exact record), Mariana Islands: Guam (Usinger 1946, as *S. balnearum*), New Caledonia (J. T. Polhemus & D. A. Polhemus 2012), Papua New Guinea (J. T. Polhemus & D. A. Polhemus 1999, without exact record), Solomon Islands (Drake & Hottes 1950, Drake & Viado 1952, D. A. Polhemus et al. 2008). **New species for the Socotra Archipelago, Guinea-Bissau, Mali, Zambia, Bangladesh and China (Sichuan).**

**Note.** *Micracanthia ornatula* is not listed from Australia by Cassis & Gross (1995). The record from Mongolia (Hoberlandt 1971) seems erroneous (see Vinokurov 1979).

### *Saldula niveolimbata* (Reuter, 1900)

(Fig. 48)

*Acanthia niveo-limbata* Reuter, 1900: 156–157 (original description). Syntypes: Senegal: Rufisque (?MGAB).

*Salda insignis* Distant, 1913: 170, Pl. 12: fig. 9 (original description, figure). Holotype: ♂, Seychelles: cultivated country near sea-level at Cascade (BMNH, see Cobben & J. T. Polhemus 1966: 394). Synonymized by Cobben & J. T. Polhemus (1966: 393).

*Saldula marianarum* Usinger, 1946b: 100–101 (original description). Holotype: ♂, Mariana Islands: Guam, Agama Swamp (BPBM). Synonymized by J. T. Polhemus (1981: 616).

**Material examined. SOCOTRA:** Al Haghier [= Hagher] Mts., Scant [= Skand] Mt. env. (12°34′36″N 54°01′30″E ), 1450 m a.s.l., 12.–13.xi.2010, 1 ♀, J. Hájek lgt. (NMPC); Hagher Mts., Scand [= Skand] Mt. env. (12°34′36″N 54°01′30″E), open helocrene in montane evergreen forest, 1450 m a.s.l., 16.–18.vi.2012, 3 ♂♂ 6 ♀♀ 3 L, Socotra expedition 2012: J. Bezděk, J. Hájek, V. Hula, P. Kment, I. Malenovský, J. Niedobová & L. Purchart lgt. (NMPC, MMBC, NHMW); Hagher Mts., wadi Madar (12°33′12″N 54°00′24″E), brook in montane shrubland, 1180–1230 m a.s.l., 12.–14.xi.2010, 2 ♂♂ 1 ♀, J. Hájek lgt. (NMPC). – **DEMOCRATIC REPUBLIC OF THE CONGO:** Kivu, Rutshuru, Kanzarue river, 1200 m a.s.l., 15.vii.1935, 1 ♀, G. F. de Witte lgt., R. H. Cobben det. (RMNH). **GHANA:** Ashanti region, Kwadaso (6°55′N 1°39′W), 259 m a.s.l., Nr. 367 – light trap on field, 2.vi.1969, 1 ♀, S. Endrődy-Younga lgt., J. T. Polhemus det. (NHRS). **IVORY COAST:** Bingerville, ix.1963, 1 ♀, xi.1963, 1 ♂, J. Decelle lgt., R. H. Cobben det. (RMNH); Bouaké, 20.–23.iv.1964, 1 ♂, R. H. Cobben lgt. & det. (RMNH). **MALI:** Kogoni, x.1966, 1 ♀, G. Schmitz lgt., R. H. Cobben det. (RMNH). **NIGERIA:** Jos, 13.x.1955, 1 ♀, Bechyne lgt., R. H. Cobben det. 1961 (RMNH); W. State, Ile-Ife, 3.ii.1976, 1 ♀, Akingbohungbe lgt., R. H. Cobben det. (RMNH). – **PHILIPPINES: Palawan:** 10 km NE Quezon, Tumarbon Falls, 3.– 4.iv.1994, 1 ♂, H. Zettel lgt. (58), P. Lindskog det. (NHRS). – **NEW CALEDONIA:** Yaoué, drying streambed between small bolders near dry sector, 12.xii.1965, 1 ♀, R. H. Cobben det. 1971 (RMNH).

**Identification.** Cobben & J. T. Polhemus (1966) (new synonymy, figures); J. T. Polhemus & D. A. Polhemus (1991b) (key); J. T. Polhemus & D. A. Polhemus (2012) (key to genera, diagnosis, figures), D. A. Polhemus & J. T. Polhemus (2013) (diagnosis, figures).

**Habitat.** In Socotra collected only in two mountain localities: the high-montane zone in Hagher Mts. on a small open helocrene with waterlogged vegetation and scattered miniature pools, surrounded by a dense montane evergreen forest at Skand Mt. (1450 m a.s.l.; Fig. 51), and in motane zone along a brook at wadi Madar (1180–1230 m a.s.l.; Fig. 50).

In tropical Africa, the species lives on various shores (Linnavuori 1981) and it was also collected at light (Linnavuori 1974, 1981; J. T. Polhemus 1981). In the Cape Verde Islands, it was found at foot of a wet mountain precipice (1300 m a.s.l.) as well as on bank of a river (ca. 400 m a.s.l.) (Lindberg 1959). In Madagascar, it was collected in a small clearing in montane rainforest by flight-intercept yellow pan trap (J. T. Polhemus & D. A. Polhemus 1991b). In the Seychelles, it occurs in a wide variety of lowland littoral habitats along the margins of streams, marshes and ponds (D. A. Polhemus & J. T. Polhemus 2013). In Singapore, it was found in wet sandy areas (J. T. Polhemus & D. A. Polhemus 2012). Cobben (1987) considered it a pioneer species, often collected in the field and in light traps together with *Micracanthia ornatula*.

**Distribution** (see also Schuh et al. 1987: 339). ***Afrotropical Region:*** Angola (Drake 1960), Burkina Faso (J. T. Polhemus 1981), Cape Verde Islands (Lindberg 1959), Democratic Republic of the Congo (Drake 1963), Ghana (J. T. Polhemus 1981), Ivory Coast (Linnavuori 1981), Kenya (J. T. Polhemus & D. A. Polhemus 2012), Madagascar (J. T. Polhemus & D. A. Polhemus 1991b), Mali (this paper), Namibia (Drake 1956), Nigeria (Linnavuori 1981), Senegal (Reuter 1900), Seychelles (Distant 1913, as *S. insignis*; J. T. Polhemus 1981; J. T. Polhemus & D. A. Polhemus 2012; D. A. Polhemus & J. T. Polhemus 2013), Sierra Leone (Cobben & J. T. Polhemus 1966), South Sudan (Linnavuori 1974), Tanzania (Cobben & J. T. Polhemus 1966, J. T. Polhemus 1981). ***Palaearctic Region:*** Near East: Socotra (new record). East Palaearctic: China (Yunnan) (Chen 1987, Chen & Lindskog 1994, Hua 2000). ***Oriental Region:*** Indonesia (Cobben 1987, no exact locality), Laos (J. T. Polhemus & D. A. Polhemus 1999, no exact record), Malaysia (J. T. Polhemus & D. A. Polhemus 2012), Philippines (Cobben 1987, no exact locality; this paper), Singapore (J. T. Polhemus & D. A. Polhemus 2012), Vietnam (Cobben & J. T. Polhemus 1966, J. T. Polhemus & D. A. Polhemus 2012). ***Australasian Region:*** Australia (Cobben 1987, no exact locality), Mariana Islands: Guam (Usinger 1946, as *S. marianarum*), New Caledonia (Cobben 1987, no exact locality; this paper), Palau (Drake 1961, as *S. marianarum*), Samoa Islands (J. T. Polhemus 1981, J. T. Polhemus & D. A. Polhemus 2012). **New species for the Socotra Archipelago and Mali.**

**Note.** Not listed from Australia by Cassis & Gross (1995).

## Discussion

Up to now, six families of aquatic and semiaquatic bugs (i.e., Corixidae, Ochteridae, Notonectidae, Mesoveliidae, Veliidae and Gerridae) and ten species have been reported from the Socotra Archipelago (Taschenberg 1883; Witlaczil 1886; Brown 1956; Herring 1961; Andersen 1980; Wranik 1999, 2000, 2003; Kment et al. 2020). The recent research confirmed occurrence of eight of the previously


Figs 49–53. 49 – Arher, a spring near the sea coast (5 m a.s.l.), habitat of *Ochterus papaceki* Kment & Carapezza, 2020, *Anisops debilis socotrensis* Brown, 1956, *Mesovelia vittigera* Horváth, 1895, *Hebrus kanyukovae* sp. nov., *Microvelia macani* Brown, 1953, *Rhagovelia infernalis socotrensis* Brown, 1956 and *Micracanthia ornatula* (Reuter, 1881). 50 – Wadi Madar (1,170 m a.s.l.), habitat of *Anisops d. socotrensis*, *A. varius* Fieber, 1851, *Mesovelia vittigera*, *Microvelia macani*, and *Rhagovelia i. socotrensis*. 51 – Skand Mt., helocrene under the top (1,450 m a.s.l.), habitat of *Microvelia gracillima* Reuter, 1882 and *Saldula niveolimbata* (Reuter, 1900). 52 – Tudhen, helocrene (1,135 m a.s.l.), habitat of *Mesovelia vittigera*, *Hebrus* sp., and *Microvelia gracillima* Reuter, 1882. 53 – Wadi Zerig with a large pool (655 m a.s.l.), habitat of *Micronecta eupompe* Hutchinson, 1930, *Sigara hoggarica* Poisson, 1929, *Anisops d. socotrensis*, *A. varius*, *Hebrus kanyukovae* sp. nov., *Limnogonus cereiventris* (Signoret, 1862), and *Micracanthia ornatula*. (Orig. P. Kment: Figs 49–52; J. Hájek: Fig. 53).

recorded species as well as nine new records, *Micronecta eupompe* Hutchinson, 1930 (Micronectidae), *Sigara hoggarica* Poisson, 1929 (Corixidae), *Hebrus kanyukovae* sp. nov., *Hebrus* sp. (Hebridae), *Microvelia gracillima* Reuter, 1882, *M. macani* Brown, 1953 (Veliidae), *Limnogonus cereiventris* (Signoret, 1862) (Gerridae), *Micracanthia ornatula* (Reuter, 1881), and *Saldula niveolimbata* (Reuter, 1900) (Saldidae), including the first records of the families Micronectidae, Hebridae and Saldidae. As a result, there are currently nine families and 19 species of aquatic, semiaquatic and shore bugs in Socotra, all of them from the main island or its off-shore waters: Nepomorpha with 4 families and 6 species, Gerromorpha with 4 families and 11 species, and Leptopodomorpha represented by 2 species of Saldidae.

The two previously recorded marine *Halobates* species, *H. germanus* and *H. hayanus*, were not found again due to lack of sampling effort in intertidal and marine habitats. These habitats will require attention in the future investigations of Socotran fauna, as there are additional species known from coasts of the Red and Arabian Sea which may occur there as well, namely *Hermatobates djiboutensis* (Coutière & Martin, 1901) (Hermatobatidae) (Coutière & Martin 1901, Linnavuori 1973b, Andersen 1995), *Halobates melleus* Linnavuori, 1971 (Gerridae) (Linnavuori 1971, Andersen 1995), and *Omania coleoptrata* Horváth, 1915 (Omaniidae) (Horváth 1915b, China 1938, as *Dollfusella minutissima*; Lindskog 1995, Luo et al. 2022).

Comparison of Socotran water bug fauna with the adjacent mainland is problematic due to poor knowledge of their fauna. Much better situation is in Yemen whose fauna was studied in papers by White (1883), Brown (1951), Lansbury (1966), Linnavuori (1989b), Linnavuori & van Harten (1997, 2002a,b), and Perez Goodwyn (2006). As a result, the available catalogues list 15 families and 41 species of Nepomorpha, Gerromorpha and Leptopodomorpha known from Yemen (see Aukema & Rieger 1995, Aukema et al. 2013, Kment et al. 2020). On the other hand, the fauna of Somalia is very poorly known, the country is much undersampled and the checklist of its fauna has never been compiled. Searching the literature in the course of writing of this paper we came accross records of 15 families and 47 species-group taxa of Nepomorpha (9 families, 31 species and subspecies), Gerromorpha (5 families, 15 species and subspecies) and Leptopodomorpha (represented by a single species of Saldidae, *Capitonisalda aethiopica* (de Carlini, 1895)) (see de Carlini 1892, 1895; Montandon 1899, 1903; Mancini 1939b,c, 1949, 1954, 1964; Poisson 1949c, 1953, 1957f, 1966; Hynes 1955; Linnavuori 1971, 1977, 1982, 1986b; Sallier Dupin 1973, 1976; Perez Goodwyn 2006). However, this account is hardly complete and scattered records may yet be found in additional papers.

With 17 species recorded, the freshwater true bug fauna of Socotra is evidently less diverse in comparison to both Yemen and Somalia. It includes only small forms (up to 10 mm in length), all being either macropterous or pterygodimorphic, well suited to live in habitats strongly influenced by seasonal droughts. This diversity pattern is caused not only by the size of the island and its distance from the adjacent mainland, but also by the absence of larger permanent freshwater bodies and, in case of large species (such as *Laccotrephes* Stål, 1866 (Nepidae) and *Lethocerus* Mayr, 1853 (Belostomatidae)), also by the lack of suitable prey, as there are no indigenous freshwater fish and amphibians in the island (Wranik 2003). On the other hand, the variable climatic conditions of the island (see Introduction) cause that some freshwater habitats are always present in Socotra, which enables long-time survival of water bug populations including three endemic taxa. It is also noteworthy that representatives of the gerromorphan family Hydrometridae have not yet been recorded from the archipelago as this taxon has many widespread species and also a large number of island endemics (e.g., Andersen 1982).

Concerning the zoogeographic relationships, the largest portion of the species has Afrotropical distribution (*Ochterus papaceki*, *Micronecta eupompe*), often with extension to the Near East (*Anisops varius*, *Microvelia gracillima*, *Limnogonus cereiventris*). The two endemic subspecies also belong to this category, as the remaining subspecies of *Anisops debilis* and *Rhagovelia infernalis* are also widespread in tropical Africa and the Near East. Also the *Hebrus* sp. may belong here, as it seems habitually similar to some species known from Ethiopia (see Cobben 1982a). Three species have very wide Palaeotropical distribution – *Mesovelia vittigera* and *Micracanthia ornatula* extend also to southern areas of the Palaearctic Region, while in case of *Saldula niveolimbata*, Socotra represents a remarkable connecting point between its disjunct distributional areas in tropical Africa and in the Oriental and Australasian Region. *Sigara hoggarica* is a Sahelo-Sindian species distributed from Mauritania in the west to India: Himachal Pradesh in the east. Three other species have Palaearctic origin: *Sigara lateralis* is widely distributed in the Palaearctic Region, extending to mountains of East Africa, Pakistan and north-west India, *Microvelia popovi* occurs in North Africa and the Near East, and *M. macani* is limited to the Near East. The endemic *Hebrus kanyukovae* sp. nov. is similar in habitus to the West Palaearctic *H. pilipes* and *H. pusillus arabicus* distributed in Sudan and the Near East. However, without a phylogenetic analysis of this species-rich genus, any hypothesis about its relationships would be a speculation. Both marine *Halobates* species are distributed in the Red Sea, Indian and West Pacific Ocean. The most unusual distributional pattern is that of *Onychotrechus rhexenor*, which is known only from tropical India and Socotra (Andersen 1980, 1982: fig. 622). However, similar disjunction between India and Socotra is known among Socotran plants and is explained by the influence of north-eastern winter monsoon (see Banfield et al. 2011).

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## References

ALAHMED A. M., ALAMR S. A. & KHEIR S. M. 2009: Seasonal activity and predatory efficacy of the water bug *Sigara hoggarica* Poisson (Hemiptera: Corixidae) against the mosquito larvae *Culex quinquefasciatus* (Diptera: Culicidae) in Riyadh City, Saudi Arabia. *Journal of Entomology* **6 (2)**: 90–95.

ANDERSEN N. M. 1967: A contribution to the knowledge of Philippine semiaquatic Hemiptera-Heteroptera. *Entomologiske Meddelelser* **35**: 260–282.

ANDERSEN N. M. 1975: The *Limnogonus* and *Neogerris* of the Old World with character analysis and a reclassification of the Gerrinae (Hemiptera: Gerridae). *Entomologica Scandinavica*, *Supplementum* **7**: 1–96.

ANDERSEN N. M. 1980: Hygropetric water striders of the genus *Onychotrechus* Kirkaldy with description of a related genus (Insecta, Hemiptera, Gerridae). *Steenstrupia* **6 (10)**: 113–146.

ANDERSEN N. M. 1981: Semiaquatic bugs: phylogeny and classification of the Hebridae (Heteroptera: Gerromorpha) with revisions of *Timasius*, *Neotimasius* and *Hyrcanus*. *Systematic Entomology* **6**: 377−412.

ANDERSEN N. M. 1982: *The semiaquatic bugs (Hemiptera, Gerromorpha). Phylogeny, adaptations, biogeography and classification. Entomograph, Vol. 3.* Scandiavian Science Press Ltd., Klampenborg, 455 pp.

ANDERSEN N. M. 1991: Marine insects: genital morphology, phylogeny and evolution of sea skaters, genus *Halobates* (Hemiptera: Gerridae). *Zoological Journal of the Linnean Society* **103**: 21–60.

ANDERSEN N. M. 1995: Infraorder Gerromorpha Popov, 1971 – semiaquatic bugs. Pp. 17–114. In: AUKEMA B. & RIEGER Ch. (eds): *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

ANDERSEN N. M. & FOSTER W. A. 1992: Sea skaters of India, Sri Lanka, and the Maldives, with a new species and a revised key to Indian Ocean species of *Halobates* and *Asclepios* (Hemiptera, Gerridae). *Journal of Natural History* **26 (3)**: 533–553.

ANDERSEN N. M. & WEIR T. A. 1994: The sea skaters, genus *Halobates* Eschscholtz (Hemiptera: Gerridae), of Australia: taxonomy, phylogeny and zoogeography. *Invertebrate Taxonomy* **8**: 861–909.

ANDERSEN N. M. & WEIR T. A. 2003: The genus *Microvelia* Westwood in Australia (Hemiptera: Heteroptera: Veliidae). *Invertebrate Systematics* **17 (2)**: 261–348.

ANDERSEN N. M. & WEIR T. A. 2004a: *Australian water bugs. Their biology and identification* (*Hemiptera-Heteroptera, Gerromorpha & Nepomorpha*)*. Entomograph, Vol. 14*. Apollo Books, Stenstrup & CSIRO Publishing, Collingwood, 344 pp.

ANDERSEN N. M. & WEIR T. A. 2004b: Mesoveliidae, Hebridae, and Hydrometridae of Australia (Hemiptera: Heteroptera: Gerromorpha), with a reanalysis of the phylogeny of semiaquatic bugs. *Invertebrate Systematics* **18 (4)**: 467–522.

AUKEMA B., CUPPEN J. G. M., NIESER N. & TEMPELMAN D. 2002*: Verspreidingsatlas Nederlandse wantsen (Hemiptera: Heteroptera). Deel I: Dipsocoromorpha, Nepomorpha, Gerromorpha & Leptopodomorpha*. [*Distribution atlas of Dutch true bugs (Hemiptera: Heteroptera). Vol. I: Dipsocoromorpha, Nepomorpha, Gerromorpha & Leptopodomorpha*]. European Invertebrate Survey – Nederland, Leiden, 169 pp (in Dutch).

AUKEMA B. & RIEGER Ch. (eds) 1995: *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

AUKEMA B., RIEGER Ch. & RABITSCH W. 2013: *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 6. Supplement*. The Netherlands Entomological Society, Amsterdam, xxiv + 629 pp.

BAENA M. & BÁEZ M. 1990: Los Heterópteros acuáticos de las Islas Canarias (Heteróptera; Nepoinorplia [sic!], Gerromopha). *Vieraea* **19**: 233–244.

BALFOUR I. B. 1888: Botany of Socotra. *Transactions of the Royal Society of Edinburgh* **31**: 1–446.

BANBAL T. & FENT M. 2016: New records for the Gerromorpha and Nepomorpha (Hemiptera: Heteroptera) fauna of Turkey. *Journal of the Entomological Research Society* **18 (3)**: 121–128.

BANFIELD L. M., VAN DAMME K. & MILLER A. G. 2011: Evolution and biogeography of the flora of the Socotra archipelago (Yemen). Pp. 197–225. In: CAUJAPÉ-CASTELLS J. (ed.): *The Biology of Island Floras*. Cambridge University Press, Bramwell, 522 pp.

BATELKA J. 2012: Socotra Archipelago – a lifeboat in the sea of changes: advancement in Socotran insect biodiversity survey. Pp. 1–26. In: HÁJEK J. & BEZDĚK J. (eds.): Insect biodiversity of the Socotra Archipelago. *Acta Entomologica Musei Nationalis Pragae* **52 (supplementum 2)**: i–vi + 1–557.

BELLES X. 2021: A synopsis of the spider beetles (Coleoptera: Ptinidae) of Socotra, with the description of a new genus and two new species. *Zoology in the Middle East* **67 (2)**: 133–143.

BENDANILLO F. E., YURONG R. R., ROBLE N. D., YEE J. C. & SOTO F. B. 2016: Species composition, abundance and distribution of seawater bugs (order Hemiptera: class Insecta) in Badian, Cebu, Philippines. *Journal of Aquatic Science* **4 (1)**: 1–10.

BENSLIMANE N., CHAKRI Kh., HAIAHEM D., GUELMAMI A., SAMRAOUI F. & SAMRAOUI B. 2019: Anthropogenic stressors are driving a steep decline of hemipteran diversity in dune ponds in north-eastern Algeria. *Journal of Insect Conservation* **23**: 475–488.

BERCHI G. M., COPILAŞ-CIOCIANU D., KMENT P. & MUMLADZE L. in press: Water bugs (Heteroptera: Gerromorpha, Nepomorpha) of the Caucasus ecoregion. *European Zoological Journal*

BERCHI G. M., KMENT P., COPILAŞ-CIOCIANU D., RÁKOSY D. & DAMGAARD J. 2016: Water treaders of Romania and adjacent countries and their phylogenetic relationships (Hemiptera: Heteroptera: Mesoveliidae). *Annales Zoologici* (Warszawa) **66 (2)**: 193–212.

BERGEVIN E. de 1930: Note sur trois espèces d'Hémiptères recueillis en Egypte et description d'une nouvelle espèce *d'Urentius* (Hémiptère Tingitidae) et d'une nouvelle variété d'*Ommatissus binotatus* Fieb. (Homoptère Cixiidae). *Bulletin de la Société Royale Entomologique*

*d'Égypte* **14 (1)**: 17–20.
BERGROTH E. 1893: Mission scientifique de M. Ch. Alluaud aux Iles Séchelles (mars, avril, mai 1892). Hétéroptères. *Revue d'Entomologie* **12**: 197–209.
BERGROTH E. 1908: Enumeratio Pentatomidarum post catalogum bruxellensum descriptarum. *Memoires de la Société Entomologique Belgique* **15**: 131–200.
BERGROTH E. 1918: Studies in Philippine Heteroptera, I. *Philippine Journal of Science* **13 (2)**: 43–126.
BERGROTH E. & SCHOUTEDEN H. 1905: Note sur les Hémiptères recueillis à Kinchassa par M. Waelbroeck. *Annales de la Société Entomologique Belgique* **49**: 379–389.
BERNHARDT K.-G. 1992: Die Wanzen (Heteroptera) des Fürstentums Liechtenstein. I. Teil: Die Wanzenfauna des ausseralpinen Raumes. *Bericht der Botanisch-Zoologischen Gesellschaft Liechtenstein-Sargans-Werdenberg* **19**: 295–325.
BERTRAND H. 1962: Mission H. Bertrand (1956–1957) en Afrique occidentale et équatoriale. Hydrocorises. *Bulletin de l'Institut Fondamental d'Afrique Noire, Série A: Sciences Naturelles* **24 (3)**: 880–885.
BESKOKOTOV Yu. A. 1996: Kadastr nasekomykh zapovednika Aksu-Dzhabagly. [List of insects of Aksu-Dzhabagly Nature Reserve.] Pp. 103–194. In: *Trudy Zapovednika Aksu-Dzhabagly. Vol. 7*. Konzhyk, Almaty (in Russian).
BEZDĚK J., PURCHART L., KRÁL K. & HULA V. 2012: List of local Socotran geographical names used in entomological literature. Pp. 27–67. In: HÁJEK J. & BEZDĚK J. (eds.): Insect biodiversity of the Socotra Archipelago. *Acta Entomologica Musei Nationalis Pragae* **52 (supplementum 2)**: i–vi + 1–557.
BODA P., BOZÓKI T., VÁSÁRHELYI T., BAKONYI G. & VÁRBÍRÓ G. 2015: Revised and annotated checklist of aquatic and semiaquatic Heteroptera of Hungary with comments on biodiversity patterns. *ZooKeys* **501**: 89–108.
BORTH R., IVINSKIS P., SALDAITIS A. & YAKOVLEV R. 2011: Cossidae of the Socotra Archipelago (Yemen). *ZooKeys* **122**: 45–69.
BREDDIN G. 1912: Nabidae und Saldidae aus Ceylon, gesammelt von Dr. W. Horn. (Hem.). *Archiv für Naturgeschichte A* **77 (6)**: 85–86.
BROOK A. J., WOODCOCK B. A., SINKA M. & VANBERGEN A. J. 2008: Experimental verification of suction sampler capture efficiency in grasslands of differing vegetation height and structure. *Journal of Applied Ecology* **45**: 1357–1363.
BROOKS G. T. 1951: A revision of the genus *Anisops* (Notonectidae, Hemiptera). *University of Kansas Science Bulletin* **34**: 301–519.
BROWN E. S. 1950: A small collection of hemipteran, mostly aquatic, from Oman. *Annals and Magazine of Natural History, Series 12* **3**: 474–480.
BROWN E. S. 1951: Aquatic and semiaquatic insects. Pp. 221–273. In: *Expedition to S.W. Arabia, 1937–1938*. British Museum (Natural History), London.
BROWN E. S. 1953a: Notes on aquatic Hemiptera from Syria and Iraq. *Annals and Magazine of Natural History, Series 12* **6**: 579–600.
BROWN E. S. 1953b: Additional records of aquatic Hemiptera from Arabia. *Annals and Magazine of Natural History, Series 12* **6**: 432–433.
BROWN E. S. 1956: Aquatic Hemiptera from Socotra. *Annals and Magazine of Natural History, Series 12* **9**: 140–144.
BROWN G. & MIES B. A. 2012: Vegetation ecology of Socotra. In: WERGER M. J. A. (ed.): *Plant and Vegetation. Vol. 7*. Springer, Doderecht, Heidelberg, New York & London, ix + 379 pp.
BU W.-J. & LIU G.-Q. (eds.) 2016: *Insect fauna of the Qinling Mountains. 2. Hemiptera: Heteroptera*. World Publishing Xi'an Co., Xi'an, [12]+13+679 pp., 5 plates (in Chinese, English summary).
BUTLER A. G. 1876: Preliminary notice of new species of Orthoptera and Hemiptera collected in the Island of Rodriguez by the Naturalists accompanying the Transit-of-Venus Expedition. *Annals and Magazine of Natural History, Series 4* **17**: 409–412.
BUZZETTI F. M., NIESER N. & DAMGAARD J. 2006: Notes on water bugs from South East Asia and Australia (Heteroptera: Nepomorpha & Gerromorpha). *Atti dell'Accademia Roveretana degli Agiati, Serie VIII* **6B**: 31–45.
CARAPEZZA A. 1988: Settanta Eterotteri nuovi per la fauna siciliana (Insecta, Heteroptera). *Naturalista Siciliano, Serie Quarta* **12 (3–4)**: 107–126.
CARAPEZZA A. 1997: Heteroptera of Tunisia. *Naturalista Siciliano, Serie Quarta* **21 (Supplemento A)**: 1–312.
CARAPEZZA A. 2002: Heteroptera of Jordan: New taxa and new records (Hemiptera Heteroptera). *Naturalista Siciliano, Serie Quarta* **26**: 35–76.
CARAPEZZA A. 2011: *Stenozygum* (s. str.) *jordiribesi* sp. nov., a new species of Strachiini from the island of Socotra (Hemiptera: Heteroptera, Pentatomidae, Pentatominae). *Heteropterus Revista de Entomología* **11**: 201–207.
CARAPEZZA A. & MIFSUD D. 2015: New records of true bugs (Hemiptera, Heteroptera) from the Maltese Islands. *Bulletin of the Entomological Society of Malta* **7**: 27–50.
CARLINI A. de 1892: Rincoti raccolti nel paese dei Somali dall' ing. L. Bricchetti-Robecchi noc note su altri dell'Africa centrale. *Annali del Museo Civico di Storia Naturale di Genova, Serie 2* **12**: 527–538.
CARLINI A. de 1895: VII. Rincoti. In: Esplorazione del Giuba e dei suoi affluenti compiuta dal Cap. V. Bottego durante gli anni 1892–93 sotto gli auspici della Societa Geografica Italiana. *Annali del Museo Civico di Storia Naturale di Genova, Serie 2* **15**: 103–125.
CASSIS G. & GROSS G. F. 1995: Hemiptera: Heteroptera (Coleorrhyncha to Cimicomorpha). In: HOUSTON W. W. K. & MAYNARD G. V. (eds): *Zoological Catalogue of Australia. Vol. 27.3A*. Melbourne, CSIRO Publishing, xv + 506 pp.
ČERNÝ V., PEREIRA L., KUJANOVÁ M., VAŠÍKOVÁ A., HÁJEK M., MORRIS M. & MULLIGAN C. J. 2009: Out of Arabia – the settlement of Island Soqotra as revealed by mitochondrial and Y chromosome genetic diversity. *American Journal of Physical Anthropology* **138**: 439–447.
CHEN P.-P. 1987: Three species of Saldidae recorded as new to China. *Entomotaxonomia* **9 (2)**: 163–166 (in Chinese, English summary).
CHEN P.-P. & ANDERSEN N. M. 1993: A checklist of Gerromorpha from China (Hemiptera). *Chinese Journal of Entomology* **13**: 69–75.
CHEN P.-P., ANDERSEN N. M. & NIESER N. 1993: Checklist of Chinese Gerromorpha. *Contributions from Tianjin Natural History Museum* **10**: 24–28 (in Chinese and English).
CHEN P.-P. & LINDSKOG P. 1994: A namelist of Leptopodomorpha from China (Hemiptera). *Chinese Journal of Entomology* **14**: 405–409.
CHEN P.-P., NIESER N. & SANGPRADUB N. 2006: Records of aquatic bugs (Heteroptera, Gerromorpha, Nepomorpha) mainly from Northeast Thailand, with descriptions of four new species *Denisia* **19**: 775–794.
CHEN P.-P., NIESER N. & ZETTEL H. 2005: *The aquatic and semi-aquatic bugs* (*Heteroptera: Nepomorpha* & *Gerromorpha*) *of Malesia*. *Fauna Malesiana Handbook,* Vol. 5. Brill, Leiden – Boston, x + 546 pp.
CHENG L. 1973: The ocean-strider *Halobates* (Heteroptera: Gerridae). *Journal of Marine Biological Association, India* **15**: 386–390.
CHENG L. 1982: *Halobates* from the coastal water of China. *Oceanologia et Limnologia Sinica* **13 (4)**: 346–349 (in Chinese, English summary).
CHENG L. 1989: Biogeography and phylogeny of the sea-skater *Halobates*. *Chinese Journal of Oceanology and Limnology* **7 (3)**: 233–239.
CHENG L., DAMGAARD M. & GARROUSTE R. 2012: The sea-skater *Halobates* (Heteroptera: Gerridae) – probable cause for extinction in the Mediterranean and potential for re-colonization following climate change. *Aquatic Insects* **34 (Supplement 1)**: 45–55.
CHENG L. & FERNANDO C. H. 1969: A taxonomic study of the Malayan Gerridae (Hemiptera: Heteroptera) with notes on their biology and distribution. *Oriental Insects* **3 (2)**: 97–160.
CHENG L., YANG Ch. M. & ANDERSEN N. M. 2001: Guide to the aquatic Heteroptera of Singapore and Peninsular Malaysia. I. Gerridae and Hermatobatidae. *Raffles Bulletin of Zoology* **49 (1)**: 129–148.
CHEUNG C. P. S. & DeVANTIER L. M. (eds) 2006: *Socotra – A natural history of the islands and their people*. Odyssey Books and Guides, Airphoto International Ltd., Hong Kong, 408 pp.
CHINA W. E. 1924: The Hemiptera-Heteroptera of Rodriquez, together with description of a new species of *Cicada* from that Island. *Annals and Magazine of Natural History, Series 9* **14**: 427–453.
CHINA W. E. 1938: Mission Robert Ph. Dollfus en Égypte. XVI. Hemiptera. – I. A new genus and species of Acanthiidae (Saldidae) from the Sinai Peninsula. *Mémoirs de l'Institute d'Egypte* **7**: 255–258.
CIANFERONI F. 2019: Review of the aquatic Hemiptera from Cepha-

lonia, with a checklist for the Ionian Islands, Greece (Heteroptera: Gerromorpha, Nepomorpha, Leptopodomorpha). *Zootaxa* **4576 (1)**: 46–60.

COBBEN R. 1960: Fam. Saldidae C. Pp. 209–263. In: STICHEL W. 1958–1960: *Illustrierte Bestimmungstabellen der Wanzen*. *II. Europa (Hemiptera-Heteroptera Europae), Vol. 3.* Wolfgang Stichel, Berlin – Hermsdorf, 428 pp.

COBBEN R. 1982a: The Hebrid fauna of the Ethiopian Kaffa province, with considerations on species grouping (Hebridae, Heteroptera). *Tijdschrift voor Entomologie* **125 (1)**: 1–24.

COBBEN R. 1982b: A new hebrid species from a cave in Zaïre (Hebridae, Heteroptera). *Revue Zoologique Africaine* **96 (4)**: 797–802.

COBBEN R. 1987: New African Leptopodomorpha (Heteroptera: Saldidae, Omaniidae, Leptopodidae), with an annotated checklist of Saldidae from Africa. II. New taxa of Saldidae (except the genus *Saldula*), Omaniidae, Leptopodidae, and a checklist of African shorebugs. *Revue Zoologique Africaine* **101**: 3–30.

COBBEN R. & LINNAVUORI R. E. 1983: Some new Hebridae from the Ivory Coast (Heteroptera, Gerromorpha). *Annales Entomologici Fennici* **49 (3)**: 83–86.

COBBEN R. & POLHEMUS J. T. 1966: African Saldidae in the Snow Entomological Museum (Hemiptera). *Journal of the Kansas Entomological Society* **39 (3)**: 382–396.

COULIANOS C.-C. 1998: Annotated catalogue of the Hemiptera-Heteroptera of Norway. *Fauna Norvegica, Series B* **45**: 11–40.

COULIANOS C. C. 2005: Annotated checklist and distribution of true bugs (Hemiptera-Heteroptera) of Estonia. *Proceedings of the Estonian Academy of Sciences, Biology and Ecology* **54**: 136–165.

COULIANOS C.-C. & OSSIANNILSSON F. 1976: Catalogus Insectorum Sueciae. VII. Hemiptera-Heteroptera. 2nd Ed. *Entomologisk Tidskrift* **97**: 135–173.

COUTIÈRE H. & MARTIN J. 1901: Sur un nouvel Hémiptère halophile. *Bulletin du Muséum d'Histoire Naturelle* **4**: 172–177.

CULEK M. 2013: Geological and morphological evolution of the Socotra Archipelago (Yemen) from the biogeographical view. *Journal of Landscape Ecology* **6 (3)**: 84–108.

CULEK M., KRÁL K., HABROVÁ H., ADOLT R., PAVLIŠ J. & MADĚRA P. 2006: Socotra's annual weather pattern. Pp 42–45. In: CHEUNG C. & DEVANTIER L. (eds): *Socotra – A natural history of the islands and their people*. Odyssey Books and Guides, Airphoto International Ltd., Hong Kong, 408 pp.

DAHL F. 1893: Die *Halobates*-Ausbeute der Plankton-Expedition. In: *Ergebnisse der im Atlantischen Ocean ausgeführten Plankton-Expedition der Humboldtstiftung, Bd. II. G. a. α.* Lipsius & Tischer, Kiel and Leipzig, 9 pp.

DAMGAARD J., ANDERSEN N. M., CHENG L. & SPERLING F. A. H. 2000: Phylogeny of sea skaters, *Halobates* Eschscholtz (Hemiptera, Gerridae), based on mtDNA sequence and morphology. *Zoological Journal of the Linnean Society* **130**: 511–526.

DAMGAARD J., BUZZETTI F. M., MAZZUCCONI S. A., WEIR T. A. & ZETTEL H. 2010: A molecular phylogeny of the pan-tropical pond skater genus *Limnogonus* Stål 1868 (Hemiptera–Heteroptera: Gerromorpha-Gerridae). *Molecular Phylogenetics and Evolution* **57**: 669–677.

DAMGAARD J., MOREIRA F. F. F., HAYASHI M., WEIR T. A. & ZETTEL H. 2012: Molecular phylogeny of the pond treaders (Insecta: Hemiptera: Heteroptera: Mesoveliidae), discussion of the fossil record and a checklist of species assigned to the family. *Insect Systematics and Evolution* **43**: 175–212.

DAMGAARD J., MOREIRA F. F. F., WEIR T. & ZETTEL H. 2014: Molecular phylogeny of the pond skaters (Gerrinae); discussion of the fossil record and a checklist of species assigned to the subfamily (Hemiptera: Heteroptera: Gerridae). *Insect Systematics and Evolution* **45**: 251–281 + S1–S43 [on-line supplement with catalogue of Gerrinae].

DECKERT J. 2012: An aposematic coloured Lygaeinae from Socotra (Heteroptera: Lygaeidae). *Entomologische Zeitschrift* (Stuttgart) **122 (3)**: 99–100.

DERZHANSKY V. V. 1997: *List of the Heteroptera of the Republic of Moldova*. Academy of Sciences of Moldova & Institute of Zoology and Russian Academy of Sciences, Zoological Institute, St. Petersburg, 23 pp.

DE SANCTIS M., ADEEB A., FARCOMENI A., PATRIARCA C., SAED A. & ATTORRE F. 2013: Classification and distribution patterns of plant communities on Socotra Island, Yemen. *Applied Vegetation Science* **16**: 148–165.

DISPONS P. 1965: Hémiptères Réduviides et Hémiptères Cryptocérates récoltés par J. Mateu dans l'Ennedi. *Bulletin de l'Institut Français d'Afrique Noire* **27 (1)**: 270−280.

DISTANT W. L. 1901: Rhynchotal notes.- XI. Heteroptera: Fam. Lygaeidae. *Annals and Magazine of Natural History, Series 7* **8**: 497–510.

DISTANT W. L. 1903: Rhynchotal notes.–XIX. *Annals and Magazine of Natural History, Series 7* **12**: 469–480.

DISTANT W. L. 1904: Rhynchota.–Vol. II. (Heteroptera). Pp. 243–503. In: BLANFORD W. T. (ed.): *The Fauna of British India, including Ceylon and Burma*. Taylor & Francis, London, xvii + 503 pp. [Published in two parts: pp. 243–503 in April 1904, see the Preface, p. iii.]

DISTANT W. L. 1909a: Oriental Rhynchota Heteroptera. *Annals and Magazine of Natural History, Series 8* **3**: 491–507.

DISTANT W. L. 1909b: No. IV. – 'Sealark' Rhynchota. In: The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner, M. A. Vol. II. *Transactions of the Linnean Society of London* **13**: 29–48 + pl. 4.

DISTANT W. L. 1910: Rhynchota.–Vol. V. Heteroptera: Appendix. In: SHIPLEY A. E. & MARSHALL G. A. K. (eds): *The Fauna of British India, including Ceylon and Burma*. Taylor & Francis, London, xii + 362 pp.

DISTANT W. L. 1913: Rhynchota. Part I. Heteroptera. In: GARDINER J. S. (ed.): The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner, M. A. *Transactions of the Linnean Society of London* **16**: 139–191.

DOMINA G., BAZAN G. & RAIMONDO F. M. 2012: Vascular flora evolution in the Soqotra Archipelago (Indian Ocean). *Biodiversity Journal* **3**: 331–336.

DOUGLAS J. W. 1875: Notes on some species of *Corixa*. *Entomologist's Monthly Magazine* **12**: 137–138.

DOVER J. 1928: Notes on a collection of aquatic Rhynchota from the Buitenzorg Museum. *Treubia* **10**: 65–72.

DOVER J. 1929. IV. Papers on Malayan Aquatic Biology. viii. On Saldidae (Hemiptera) in the Malay Peninsula. *Journal of the Federated Malay States Museums* **14 (3–4)**: 398.

DRAKE C. J. 1956: Hemiptera (Heteroptera): Saldidae. Pp. 430–433. In: HANSTRÖM B., BRINCK P. & RUDEBECK G. (eds): *South African Animal Life. Vol. III.* Almqvist & Wiksell, Stockholm, 492 pp.

DRAKE C. J. 1960: Angolan Saldidae (Hemiptera). *Publicações Culturais da Companhia de Diamantes de Angola* **51**: 71–78.

DRAKE C. J. 1961: Hemiptera: Saldidae. *Insects of Micronesia* **7 (6)**: 287–305.

DRAKE C. J. 1963: New shorebugs from Central Africa (Hemiptera: Saldidae). *Revue de Zoologie et de Botanique Africaines* **67 (1–2)**: 1–4.

DRAKE C. J. & HOBERLANDT L. 1951: Catalogue of genera and species of Saldidae (Hemiptera). *Acta Entomologica Musei Nationalis Pragae* **26 (376)** [1950]: 1–12.

DRAKE C. J. & HOTTES F. C. 1950: Three new species of Saldidae (Hemiptera). *Proceedings of the Biological Society of Washington* **63**: 177–184.

DRAKE C. J. & VIADO G. B. 1952: Saldoidea of the Philippines (Hemiptera). *Philippine Journal of Science* **80 (3)** [1951]: 339–342.

DUFOUR L. 1833: Recherches anatomiques et physiologiques sur les Hémiptères, accompagnées de considérations relatives a l'histoire naturelle et a la classification de ces insectes. *Mémoires Présentés par Divers Savans a l'Académie Royale des Sciences de l'Institut de France* **4**: 129–462.

DUSOULIER F. & MOULET P. 2014: Nouvelles localités et synthèse des connaissances sur la distribution de *Mesovelia vittigera* Horváth, 1895 en France (Hemiptera Heteroptera Mesoveliidae). *Entomologiste* (Paris) **70 (2)**: 97–100.

ECKERLEIN H. & WAGNER E. 1970: Die Heteropterenfauna Libyens. *Acta Entomologica Musei Nationalis Pragae* **39** [1969]: 155–194.

ELDER J.-F. 2017: Les Hétéroptères aquatiques et semi-aquatiques de France: analyse bibliographique commentée des connaissances actuelles sur la distribution des espèces par département. (Heteroptera, Nepomorpha, Gerromorpha). *Ephemera* **18 (2)** [2016]: 69–133.

EL-MEGHRABI M. S. 2009: Survey of some heteropterous insects in Libya. *Journal of Productivity and Development* **14 (3)**: 747–758.

ESAKI T. 1926: The water-striders of the subfamily Halobatinae in the Hungarian National Museum. *Annales Musei Nationalis Hungarici* **23**: 117–164.

ESENBEKOVA P. A. 2008: Poluzhestkokrylye (Heteroptera) Korgalzhynskogo zapovednika i prilegayushchikh territoriy. (Hemipterans (Heteroptera) of Korgaldzhyn Strict Nature Reserve and adjoining territories). *Tethys Entomological Research* **16**: 59–78 (in Russian, English and Kazakh summaries).

EVENHUIS N. L., ELDREDGE L. G., ARAKAKI K., OISHI D., GARCIA J. N. & HAINES W. P. 2010: Terrestrial arthropod surveys on Pagan Island, Northern Marianas. *Contributions to the Pacific Biological Survey* **15**: 1–71.

EYLES A. C. 1973: *Monograph of the genus Dieuches Dohrn (Heteroptera: Lygaeidae)*. A. C. Eyles, Dunedin, New Zealand, 465 pp.

FENT M., KMENT P., ÇAMUR-ELİPEK B. & KIRGIZ T. 2011: Annotated catalogue of Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha, and Leptopodomorpha (Hemiptera: Heteroptera) of Turkey, with new records. *Zootaxa* **2856**: 1–84.

FERNANDO C. H. & CHENG L. 1974: A preliminary study on the fauna and distribution of aquatic Hemiptera in Malaya and Singapore. *Federation Museums Journal* **19**: 21–46.

FIEBER F. X. 1851: *Rhynchotographien*. Calve, Prague, 64 pp. [Preprint of: *Abhandlungen der Böhmischen Gesellschaft der Wissenschaften* **7** [1852]: 469–486.]

FLEITMANN D., MATTER A., BURNS S. J., Al-SUBBARY A. & Al-AOWAH M. A. 2004: Geology and Quaternary climate history of Socotra. Pp. 27–43. In: KRUPP F. (ed.): *Fauna of Arabia. Vol. 20*. Senckenbergische Naturforschende Gesellschaft, Frankfurt am Main & King Abdulaziz City for Science and Technology, Riyadh, 548 pp.

FORBES H. O. (ed.) 1903: *The natural history of Socotra and Abd-el--Kuri*. The Free Public Museums, Henry Young and Sons, Liverpool, R. H. Porter, London, xlvii + 598 pp. + pls. i–xxvii.

FURTH D. G. 1983: Aquatic entomofauna of a Dead Sea oasis. *Hydrobiologia* **102**: 3–25.

GADALLA S. M. 1999: Two new records of order Hemiptera and a list of hemipterous species collected from Sinai peninsula. *Bulletin of the Entomological Society of Egypt* **77**: 75–86.

GADALLA S. M. & SALEH AHMED R. 2000: Contribution to the study of Heteroptera, Gerromorpha (Semiaquatic Bugs). III. Water treaders (Family: Mesoveliidae) from Egypt. *Bulletin of the Entomological Society of Egypt* **78**: 189–204.

GAPUD V. P. 1986: Philippine water bugs. *Guide to Philippine Flora and Fauna* **8**: 1–47.

GEREND L. 1993: Beitrag zur Kenntnis der einheimischen Wasserwanzen (Hemiptera, Heteroptera). Nachweis mehrerer für die Fauna Luxemburgs neuer Arten. *Bulletin de la Société des Naturalistes Luxembourgeois* **94**: 129–136.

GHAHARI H., MOULET P., OSTOVAN H. & LINNAVUORI R. E. 2013: An annotated catalog of the Iranian Dipsocoromorpha, Enicocephalomorpha, Gerromorpha, Leptopodomorpha and Nepomorpha (Hemiptera: Heteroptera). *Zootaxa* **3641 (4)**: 301–342.

GHEIT A. 1994: New water-bugs recorded for the Moroccan fauna (Heteroptera, Hydrocorisae). *Bulletin de la Société Entomologique de France* **99 (5)**: 515–516.

GHEIT A. 1995: Catalogue des Hémiptères Hydrocorises et Amphibiocorses des Provinces Nord Marocaines (1re note). *Entomologiste* (Paris) **51 (5)**: 241–249.

GLIGOROVIĆ B., SAVIĆ A., PROTIĆ Lj. & PEŠIĆ V. 2016: Ecological patterns of water bug (Hemiptera: Heteroptera) assemblages in karst springs: a case study from central Montenegro. *Oceanological and Hydrobiological Studies* **45 (4)**: 554–563.

GOGALA A. 2003: Heteroptera of Slovenia, I: Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha. *Annals for Istrian and Mediterranean Studies, Seria Historia Naturalis* **13 (2)**: 229–240.

GÖLLNER-SCHEIDING U. 1983: General-Katalog der Familie Rhopalidae (Heteroptera). *Mitteilungen aus dem Zoologichen Museum in Berlin* **59 (1)**: 37–189.

GRIFFINI A. 1895: Gli *Halobates* del viaggio della "Magenta„. *Bollettino dei Musei di Zoologia ed Anatomia Comparata della R. Università di Torino* **10 (213)**: 1–5.

HABROVÁ H. & BUČEK A. 2013: Overview of biotope types of Socotra Island. *Journal of Landscape Ecology* **6 (3)**: 60–83.

HABROVÁ H., ČERMÁK Z. & PAVLIŠ J. 2009: Dragon's blood tree – threatened by overmaturity, not by extinction: Dynamics of a *Dracaena cinnabari* woodland in the mountains of Soqotra. *Biological Conservation* **142**: 772–778.

HABROVÁ H., KRÁL K. & MADĚRA P. 2007: The weather pattern in one of the oldest forest ecosystems on Earth – Dragon's blood tree forest (*Dracaena cinnabari*) on Firmihin – Soqotra Island. [10 unpaginated pp.] In: ROŽNOVSKÝ J., LITSCHMANN T. & VYSKOT I. (eds.): *Klima lesa. Sborník referátů z mezinárodní vědecké konference. Křtiny 11.–12.4.2007*. Česká bioklimatologická společnost, Praha, 44 pp. http://www.cbks.cz/konfer07/prispevky/HabrovaKralMadera.pdf

HABROVÁ H., VAHALÍK P., DRÁPELA K. & ALI A. S. S. 2020: Distribution and population characteristics of the Cucumber Tree (*Dendrosicyos socotranus* Balf.f.). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 725–736.

HÄDICKE Ch. W., RÉDEI D. & KMENT P. 2017: The diversity of feeding habits recorded for water boatmen (Heteroptera: Corixoidea) world-wide with implications for evaluating information on the diet of aquatic insects. *European Journal of Entomology* **114**: 147–159.

HÁJEK J. & BEZDĚK J. (eds.) 2012: Insect biodiversity of the Socotra Archipelago. *Acta Entomologica Musei Nationalis Pragae* **52 (supplementum 2)**: i–vi + 1–557.

HÁJEK J. & BEZDĚK J. (eds.) 2014: Insect biodiversity of the Socotra Archipelago II. *Acta Entomologica Musei Nationalis Pragae* **54 (supplementum 2)**: i–vi + 1–440.

HÁJEK J. & BEZDĚK J. (eds.) 2017a: Insect biodiversity of the Socotra Archipelago III. *Acta Entomologica Musei Nationalis Pragae* **57 (supplementum)**: i–vi + 1–225.

HÁJEK J. & BEZDĚK J. (eds.) 2017b: Insect biodiversity of the Socotra Archipelago – underlined and counted. *Acta Entomologica Musei Nationalis Pragae* **57 (supplementum)**: 1–39.

HÁJEK J. & BEZDĚK J. 2019: Annotated catalogue of beetles (Coleoptera) of the Socotra Archipelago. *Zootaxa* **4715 (1)**: 1–76.

HAMID A. & AHMED A. A. 1972: Studies on *Mesovelia orientalis* Kirkaldy (Heteroptera), Mesoveliidae) from Sind, West Pakistan. *Pakistan Journal of Zoology* **4 (1)**: 45–51.

HAMID A. & SULTANA Sh. 1972: Two new species of Saldidae from West Pakistan (Hemiptera: Heteroptera). *Pakistan Journal of Scientific and Industrial Research* **15 (4–5)**: 282–284.

HAYASHI M. & MIYAMOTO S. 2018: Hemiptera. Pp. 329–427. In: KAWAI T. & TANIDA K. (eds): *Aquatic Insects of Japan: Manual with Keys and Illustrations. The second edition*. Tokai University Press, Kanagawa, 1752 pp (in Japanese).

HAYASHI M., OHGI K., KANAI K. & MIYAMOTO S. 2001: New records of two water boatmen (Heteroptera, Corixidae) from Japan. *Japanese Journal of Systematic Entomology* **7**: 121–122.

HAYASHI M., TOMOKUNI M., YOSHIZAWA K. & ISHIKAWA T. (eds) 2016: *Catalogue of the insects of Japan. Vol. 4, Paraneoptera*. Entomological Society of Japan & Touka-shobo, Fukuoka, 629 pp.

HECKMANN R. & BLÖCHLINGER H. 2011: Die Wanzenfauna (Hemiptera: Heteroptera) des Kantons Thurgau, Teil 1. Dipsocoromorpha, Nepomorpha, Gerromorpha, Leptopodomorpha und Cimicomorpha. *Mitteilungen der Thurgauischen Naturforschenden Gesellschaft* **65**: 77–173.

HEISS E., ECKELT A., LEDERWASCH M. & UNTERASINGER R. 2021a: Die Heteropterensammlung Ernst Heiss im Tiroler Landesmuseum Ferdinandeum. Teil II: Nepomorpha. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* **73**: 81–116.

HEISS E., ECKELT A., LEDERWASCH M. & UNTERASINGER R. 2021b: Die Heteropterensammlung Ernst Heiss im Tiroler Landesmuseum Ferdinandeum. Teil I: Leptopodomorpha: Familien Aepophilidae, Saldidae, Leptopodidae, Omaniidae. *Beiträge zur Entomofaunistik* **22**: 43–76.

HEISS E., ECKELT A., LEDERWASCH M. & UNTERASINGER R. 2022: Die Heteropterensammlung Ernst Heiss im Tiroler Landesmuseum Ferdinandeum. Teil IX: Gerromorpha II: Familien Mesoveliidae, Hebridae, Hydrometridae, Hermatobatidae, Veliidae. *Linzer Biologische Beiträge* **54 (1)**: 149–173.

HERRING J. L. 1961: The genus *Halobates* (Hemiptera: Gerridae). *Pacific Insects* **3 (2–3)**: 223–305.

HESSE A. J. 1925: Contributions to a knowledge of the fauna of South-West Africa. IV. A list of the heteropterous and homopterous Hemiptera of South-West Africa. *Annals of the South African Museum* **23 (1)**: 1–190.

HOBERLANDT L. 1951a: Semiaquatic Heteroptera collected in Lunda, North East Angola (Portuguese West Africa) by Dr A. de Barros Machado in 1946-1949. *Publicações Culturais da Companhia de Diamantes de Angola* **10** [1950]: 7–50.

HOBERLANDT L. 1951b: New species of *Microvelia* from Egypt, with a key to the Egyptian species of the genus [Hemiptera-Heteroptera: Veliidae]. *Bulletin de la Société Fouad Ier de Entomologie* **35**: 271–275.

HOBERLANDT L. 1952: Results of the zoological scientific expedition of the National Museum in Praha to Turkey. 2. Hemiptera-Heteroptera I. The aquatic and semiaquatic Heteroptera of Turkey. *Acta Entomologica Musei Nationalis Pragae* **26 (352)** [1948–1950]: 1–74 + pls. I–XVII.

HOBERLANDT L. 1954: Contribution à l'étude de la zone d'inondation du Niger (Mission G. Remaudière). XI. – Hémiptères-Hétéroptères. *Bulletin de l'Institut Français d'Afrique Noire* **16 (3)**: 917−934.

HOBERLANDT L. 1961: Ergebnisse der Deutschen Afghanistan-Expedition 1956 der Landessammlungen für Naturkunde in Karlsruhe. *Beiträge zur Naturkundlichen Forschung in Südwestdeutschland* (Karlsruhe) **19**: 197–222.

HOBERLANDT L. 1967: On some species of Heteroptera collected in the Madeiran Islands. *Acta Faunistica Entomologica Musei Nationalis Pragae* **12**: 43–50.

HOBERLANDT L. 1971: Results of the zoological explorations by Dr. Z. Kaszab in Mongolia. 191. Heteroptera (2): Saldidae. *Acta Faunistica Entomologica Musei Nationalis Pragae* **14**: 143–152.

HOBERLANDT L. 1977: Heteroptera. Pp. 61–82. In: DLABOLA J. (ed.): Enumeratio Insektorum Bohemoslovakiae. *Acta Faunistica Entomologica Musei Nationalis Pragae, Supplementum* **4**: 1–158.

HOFFMANN H.-J. & MELBER A. 2003: Verzeichnis der Wanzen (Heteroptera) Deutschlands. Pp. 209–272. In: KLAUSNITZER B. (ed.): Entomofauna Germanica. Vol. 6. *Entomologische Nachrichten und Berichte, Beiheft* **8**: 1–344.

HORVÁTH G. 1888: Matériaux pour servir à l'étude des Hémiptères de la faune Paléarctique. *Revue d'Entomologie* **7**: 168–189.

HORVÁTH G. 1895: Hemiptères nouveaux d'Europe et des pays limitrophes. *Revue d'Entomologie* **14**: 152–165.

HORVÁTH G. 1909: Adnotationes synonymicae de Hemipteris nonnullis extraeuropaeis. *Annales Musei Nationalis Hungarici* **7**: 631–632.

HORVÁTH G. 1913: Aquatic and semi-aquatic Rhynchota from the Lake of Tiberias and its immediate vicinity. *Journal of the Asiatic Society of Bengal* **9 (11)**: 477–480.

HORVÁTH G. 1915a: Monographie des Mésovéliides. *Annales Musei Nationalis Hungarici* **13**: 535–556.

HORVÁTH G. 1915b: Novum genus peculiare Acanthiidarum. *Annales Musei Nationalis Hungarici* **13**: 598–599.

HORVÁTH G. 1924: Remarques sur trois espèces du genre *Mesovelia* M. R. *Annales Musei Nationalis Hungarici* **21**: 135–136.

HORVÁTH G. 1926: Zoological results of the Swedish expedition to Central Africa 1921. Insecta. 25. Aquatic and semi-aquatic Hemiptera. *Arkiv för Zoologi* **18A (31)**: 1–5.

HORVÁTH G. 1929: *General catalogue of the Hemiptera. Fascicle II. Mesoveliidae*. Smith College, Northampton, MA, 15 pp.

HUA L.-Zh. 2000: XVIII. Order Hemiptera. Pp. 162–216. In: HUA L.-Zh.: *List of Chinese Insects. Vol. I*. Guangdong, P. R. of China, 448 pp.

HULA V. & NIEDOBOVÁ J. 2020: The Mediterranean Recluse Spider *Loxosceles rufescens* (Dufour, 1820): a new invasive for Socotra Island (Yemen). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 719–723.

HUTCHINSON G. E. 1929: A revision of the Notonectidae and Corixidae of South Africa. *Annals of the South African Museum* **25 (3)**: 359–474.

HUTCHINSON G. E. 1930a: Report on Notonectidæ, Pleidæ, and Corixidæ (Hemiptera), Mr. Omer-Cooper's Investigation of the Abyssinian Fresh Waters. (Dr. Hugh Scott's Expedition.). *Proceedings of the Zoological Society of London* **29**: 437–466.

HUTCHINSON G. E. 1930b: Fisheries survey of Lakes Albert and Kioga: Report on Notonectidæ and Corixidæ. *Annals and Magazine of Natural History, Series 10* **6**: 57–65.

HUTCHINSON G. E. 1932a: On Corixidae from Uganda. *Stylops* **1 (2)**: 37–40.

HUTCHINSON G. E. 1932b: XXXIV. – Reports on the Percy Sladen expedition to some Rift Valley Lakes in Kenya in 1929. – II. Notonectidæ, Pleidæ, and Corixidæ from the Rift Valley Lakes in Kenya. *Annals and Magazine of Natural History, Series 10* **9**: 323–329.

HUTCHINSON G. E. 1933: The zoo-geography of the African aquatic Hemiptera in relation to past climatic change. *Internationale Revue der Gesamten Hydrobiologie und Hydrographie* **28 (5–6)**: 436–468.

HUTCHINSON G. E. 1940: A revision of the Corixidae of India and adjacent regions. *Transactions of the Connecticut Academy of Arts and Sciences* **33**: 339–476 + pls. i–xxxvi.

HYNES H. B. N. 1955: Biological notes on some East African aquatic Heteroptera. *Proceedings of the Royal Entomological Society London (A)* **30 (4–6)**: 43–54.

ICZN 1999: *International Code of Zoological Nomenclature. Fourth edition*. International Trust for Zoological Nomenclature, London, 306 pp.

ILIE D. M. & DAVIDEANU A. 2002: The first record of *Mesovelia vittigera* Horváth 1895 (Heteroptera, Mesoveliidae) species in Romania and Moldavia Republic. Pp. 103– 106. In: TOMESCU N. & POPA V. (eds): *Volum omagial Vasile Radu*. Presa Universitară Clujeană, Cluj-Napoca.

IMMS A. D. 1936: On a new species of *Halobates*, a genus of pelagic Hemiptera. Pp. 71–78. In: *John Murray Expedition, 1933–4, Scientific Reports. Vol. 4 (2)*. British Museum (Natural History), London.

JACZEWSKI T. 1926: Notes on some West-African Heteroptera. *Annales Musei Zoologici Polonici* **5 (2)**: 62–106, pls. ii–iii.

JACZEWSKI T. 1932: Notes on the aquatic Heteroptera of the Ethiopian region. *Stylops* **1 (5)**: 100–104.

JACZEWSKI T. 1933: Scientific results of the Cambridge Expedition to the East African Lakes, 1930–1.–12. Aquatic Heteroptera. *Journal of the Linnean Society of London, Zoology* **38**: 343–346.

JACZEWSKI T. 1936: Contributions to the knowledge of Aquatic Heteroptera of Egypt. *Annales Musei Zoologici Polonici* **11**: 171–211, pls. xxvii–xxviii.

JACZEWSKI T. 1961: Further notes on aquatic Heteroptera of the Mongolian People's Republic and some adjacent regions. *Fragmenta Faunistica* **9 (1)**: 1–9.

JACZEWSKI T. & WRÓBLEWSKI A. 1975: Further notes on aquatic Heteroptera from Mongolia. *Polskie Pismo Entomologiczne* **45**: 51–61.

JANSSON A. 1986: The Corixidae (Heteroptera) of Europe and some adjacent regions. *Acta Entomologica Fennica* **47**: 1–94.

JANSSON A. 1995: Family Corixidae Leach, 1815 – water boatmen. Pp. 26–56. In: AUKEMA B. & RIEGER Ch. (eds): *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

JEHAMALAR E. E. & CHANDRA K. 2016: Additional records of aquatic and semi-aquatic Heteroptera (Insecta: Hemiptera) from Chhattisgarh, India. *Records of the Zoological Survey of India* **116 (2)**: 99–109.

JORIGTOO & QI B.-Y. 1996: (Study on the aquatic and semiaquatic bugs from Inner Mongolia. China (I) – Hydrometridae & Mesoveliidae. *Journal of Inner Mongolia Normal University (Natural Science Edition)* **3**: 71–73 (in Chinese, English summary).

JOSIFOV M. 1960: Vidov s'stav i razprostranenie na nasekomite ot razreda Heteroptera v B'lgariya, chast I. (Artenzusammensetzung und Verbreitung der Insekten von der Ordnung Heteroptera in Bulgarien). *Izvestiya na Zoologicheskiya Institut* (Sofiya) **9**: 107–177 (in Bulgarian, Russian and German summaries).

JOSIFOV M. 1970: Ergebnisse der Albanien-Expedition 1961 des Deutschen Entomologischen Institutes. 82. Beitrag. Heteroptera. *Beiträge zur Entomologie* **20 (7–8)**: 825–956.

JOSIFOV M. 1986: Über die Verbreitung mancher Heteropterenarten auf der Balkanhalbinsel und der Insel Zypern. *Acta Zoologica Bulgarica* **31**: 42–48.

KANYUKOVA E. V. 1973: K faune i biologii vodnykh klopov (Heteroptera) Zapadnoy Sibiri. (On the fauna and biology of water bugs

(Heteroptera) of Western Siberia.) *Entomologicheskoe Obozrenie* **52**: 814–819 (in Russian, English summary).

KANYUKOVA E. V. 1976: Vodnye klopy (Heteroptera) Mongol'skoy Narodnoy Respubliki. (Aquatic and semiaquatic bugs (Heteroptera) of the Mongolian People's Republic). *Nasekomye Mongolii* [= *Insects of Mongolia*] **4**: 11–20.

KANYUKOVA E. V. 1979: Vodomerki semeystva Mesoveliidae (Heteroptera) fauny SSSR. [Water striders of the family Mesoveliidae (Heteroptera) of the fauna of the Soviet Union]. Pp. 19–23. In: LER P. A. (ed.): *Nazemnye chlenistonogie Dal'nego Vostoka*. [*Terrestrial Arthropoda of the Far East*]. Akademiya Nauk SSSR, Vladivostok (in Russian).

KANYUKOVA E. V. 1997: Hebridae of Russia and adjacent countries (Heteroptera). *Zoosystematica Rossica* **6 (1–2)**: 223–236.

KANYUKOVA E. V. 2001: New records of Nepomorpha and Gerromorpha from the Far East (Heteroptera). *Zoosystematica Rossica* **9 (1)** [2000]: 155–156.

KANYUKOVA E. V. 2006: *Vodnye poluzhestkokrylye nasekomye (Heteroptera: Nepomorpha, Gerromorpha) fauny Rossii i sopredelnykh stran*. [*Aquatic and semiaquatic (Heteroptera: Nepomorpha, Gerromorpha) of the fauna of Russia and neighbouring countries*]. Dal'nauka, Vladivostok, 296 pp (in Russian, English abstract).

KANYUKOVA E. V., LUO Zh.-H. & VINOKUROV N. N. 2016: Issledovaniya poluzhestkokrylykh Sin'tszyana, Severo-Zapadnyy Kitay. III. Vodnye klopy i vodomerki (Heteroptera: Nepomorpha, Gerromorpha). (Studies of the true bugs of Xinjiang, Northwestern China. III. Water bugs and semiaquatic bugs (Heteroptera: Nepomorpha, Gerromorpha)). *Entomologicheskoe Obozrenie* **95 (3)**: 543–554 (in Russian, English summary). [English translation published in: *Entomological Review*, 2016, **96 (6)**: 701–709.]

KATBEH A., CARAPEZZA A. & AKKAWI M. 2000: Heteroptera of Jordan: Specimens preserved in the University of Jordan insect Museum (Insecta). *Atti dell'Accademia Roveretana degli Agiati, Serie VII* **10B**: 111–137.

KIRITSHENKO A. N. 1959: Nastoyashchie poluzhestkokrylye (Hemiptera – Heteroptera) zapovednika "Tigrovaya Balka". [True bugs (Hemiptera – Heteroptera) of "Tigrovaya Balka" Nature Reserve.] *Trudy Akademiya Nauk Tadzhikskoy SSR, Institut Zoologii i Parazitologii* **115**: 97–110 (in Russian).

KIRITSHENKO A. N. 1964: *Poluzhestkokrylye (Hemiptera-Heteroptera) Tadzhikistana*. [*True bugs (Hemiptera-Heteroptera) of Tajikistan*.] Izdatel'stvo Akademii Nauk Tadzhikskoy SSR, Dushanbe, 258 pp (in Russian).

KIRKALDY G. W. 1899a: IX. Descriptions of ten new species of Hemiptera. Pp. 45–47. In: FORBES H. O. (ed.) (1899−1900): Expedition to Socotra: new genera and species. *Bulletin of Liverpool Museum* **2 (1)** [May 1899]: 1–13, **2 (2)** [September 1899]: 35–47, **3 (1)** [August 1900]: 1−24.

KIRKALDY G. W. 1899b: Missions de M. Ch. Alluaud aux iles de la région Malgache. Hémiptères (Gerridae, Corixidae, Notonectidae). *Annales de la Société Entomologique de France* **68**: 101–109.

KIRKALDY G. W. 1900a: Synonymy: Rhynchota. *Entomologist* (London) **33**: 10.

KIRKALDY G. W. 1900b: Hémiptères. Hydrocorises. Pp. 431–435. In: SEVERIN M. (ed.): Insectes du Congo. *Annales de la Société Entomologique de Belgique* **44**: 423–435.

KIRKALDY G. W. 1901: On some Rhynchota, principally from New Guinea (Amphibicorisae and Notonectidae). *Annali del Museo Civico di Storia Naturale di Genova, Serie 2.ª* **20**: 804–810.

KIRKALDY G. W. 1903a: Hemiptera. Pp. 381–394 + pl. xxiii. In: FORBES H. O. (ed.): *The natural history of Socotra and Abd-el-Kuri*. The Free Public Museums, Henry Young and Sons, Liverpool, R. H. Porter, London, xlvii + 598 pp. + pls. i–xxvii.

KIRKALDY G. W. 1903b: Miscellanea Rhynchotalia. No. 6. *Entomologist* (London) **36**: 44–45.

KIRKALDY G. W. 1908: 12. Hemiptera. 3. Gerridae, Corixidae and Notonectidae. Pp. 21–24. In: SJÖSTEDT Y. (ed.): *Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition nach dem Kilimandjaro, dem Meru und den umgebenden Massaisteppen Deutsch Ostafrikas 1905–1906. Vol. 2 (12)* [1910]. Palmquist, Stockholm. [Author reprints were issued in 1908 – viz Aukema & Rieger (1995: 169).]

KMENT P. 2001: *Mesovelia vittigera* Horváth and *Microvelia pygmaea* (Dufour) (Heteroptera: Gerromorpha) in Croatia. *Acta Entomologica Slovenica* **9 (1)**: 80–82.

KMENT P. 2006: A contribution to the faunistics of aquatic and semiaquatic bugs (Heteroptera: Nepomorpha, Gerromorpha) in Portugal, with the review of biology of the Nearctic corixid *Trichocorixa verticalis* (Fieber, 1851). *Boletín de la Sociedad Entomológica Aragonesa* **38**: 359–361.

KMENT P. & BERAN L. 2011: Check-list of water bugs (Hemiptera: Heteroptera: Nepomorpha) in Croatia with two new records and three rediscoveries. *Natura Croatica* **20 (1)**: 159–178.

KMENT P. & CARAPEZZA A. 2017: List of true bug taxa described by Rauno E. Linnavuori (Hemiptera: Heteroptera). *Entomologia Americana* **122 (4)** [2016]: 528–621.

KMENT P., CARAPEZZA A. & JINDRA Z. 2020: Taxonomic catalogue of the family Ochteridae with description of *Ochterus papaceki* sp. nov. from Socotra Island and Tanzania (Hemiptera: Heteroptera). *Acta Entomologica Musei Nationalis Pragae* **60 (1)**: 23–64.

KMENT P., CARAPEZZA A., JINDRA Z. & KONDOROSY E. 2017: Review of the genus *Lanchnophorus* (Hemiptera: Heteroptera: Rhyparochromidae) with description of three new species and other nomenclatural changes. *Zootaxa* **4226 (1)**: 47–74.

KMENT P. & JINDRA Z. 2006: New and interesting records of true bugs (Heteroptera) from Turkey, southeastern Europe, Near and Middle East. *Acta Entomologica Musei Nationalis Pragae* **45** [2005]: 3–16.

KMENT P., JINDRA Z. & BERCHI G. M. 2016: Review of West-Palaearctic Hebridae with description of a new species and redescription of *Hebrus fulvinervis* (Hemiptera: Heteroptera). *Zootaxa* **4147 (3)**: 201–239.

KMENT P. & KANYUKOVA E. V. 2010: New faunistic records of Hebridae (Hemiptera: Heteroptera) from the Mediterranean and the Near and Middle East. *Acta Musei Moraviae, Scientiae Biologicae* **95 (2)**: 11–18.

KMENT P. & KOLÍNOVÁ Z. 2014: Catalogue of type specimens of true bugs (Hemiptera: Heteroptera) deposited in the National Museum, Prague, Czech Republic. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha, and Leptopodomorpha. *Acta Entomologica Musei Nationalis Pragae* **53 (2)**: 821–890.

KRÁL K. & PAVLIŠ J. 2006: The first detailed land-cover map of Socotra Island by Landsat/ETM+ data. *International Journal of Remote Sensing* **27**: 3239–3250.

KÜRSCHNER H., HEIN P., KILIAN N. & HUBAISHAN M. A. 2006: Diversity and zonation of the forests and woodlands of the mountains of northern Socotra, Yemen. *Englera* **28**: 11–55.

LANSBURY I. 1961a: Notes on the water-bugs of South and South-West Africa. *Entomologist's Monthly Magazine* **97**: 84–86.

LANSBURY I. 1961b: Notes on the genus *Anisops* (Hemiptera, Notonectidae) in the Hungarian National History Museum. *Annales Historico-Naturales Musei Nationalis Hungarici, Pars Zoologica* **53**: 505–506.

LANSBURY I. 1964: Notes on *Anisops debilis* Gerstaeker 1873 (Hem.-Heteroptera, Notonectidae) and its closely related forms. *Entomologist's Monthly Magazine* **94** [1963]: 97–108.

LANSBURY I. 1966: Notes on the Notonectidae (Hemiptera – Heteroptera) of Aden and the Yemen. *Annals and Magazine of Natural History, Series 13* **9**: 37–43.

LARSEN E. & BLAUSTEIN L. 2005: New backswimmer (Heteroptera: Notonectidae) records for Israel. *Zoology in the Middle East* **36**: 114–115.

LEACH W. E. 1817: On the classification of the natural tribe of insects Notonectides with descriptions of British species. *Transactions of the Linnean Society of London* **12**: 10–18.

LEE Ch. E. & KWON Y. J. 1991: Annotated check list of Hemiptera from Korea. Part I. Enicocephalomorpha, Nepomorpha, Leptopodomorpha & Gerromorpha. *Nature and Life* **21 (1)**: 1–10.

LEE Ch. E., KWON Y. J. & MIYAMOTO S. 1993: A checklist of Heteroptera from Chejudo. *Nature and Life* **23 (1)**: 1–56.

LEE S., JEONG S., DUWAL R. K. & SONG H. 2013: *National list of species of Korea. Insect (Hemiptera I)*. National Institute of Biological Resources, Incheon, 238 pp.

LINDBERG H. 1922: Verzeichnis der von John Sahlberg und Uunio Saalas, in den Mittelmeergebieten gesammelten semiaquatilen und aquatilen Heteropteren. *Notulae Entomologicae* **2**: 15–19 + 46–49.

LINDBERG H. 1941: Die Hemipteren der Azorischen Inseln. Nebst Anhang: Zur Kenntnis der Hemipterenfauna von Madeira. *Commentationes Biologicae* **8 (8)**: 1–32.

LINDBERG H. 1948: On the insect fauna of Cyprus. Results of the expedition of 1939 by Harald, Hakan and P. H. Lindberg I-II. I. Introduction + II. Heteroptera und Homoptera Cicadina der Insel Zypern. *Commentationes Biologicae* **10 (7)**: 1–175.

LINDBERG H. 1953: Hemiptera insularum canariensium. (Systematik, Ökologie und Verbreitung der Kanarischen Heteropteren und Cicadinen). *Commentationes Biologicae* **14 (1)**: 1–304.

LINDBERG H. 1954: Zur Kenntnis der Hemipterenfauna der Azorischen Inseln. *Commentationes Biologicae* **13 (18)**: 1–9.

LINDBERG H. 1959: Hemiptera insularum caboverdensium. Systematik, Ökologie und Verbreitung der Heteropteren und Cicadinen der Kapverdischen Inseln. In: LINDBERG H. (ed.): Ergebnisse der Zoologischen Expedition von Professor Håkan Lindberg nach den Kapverde-Inseln im Winter 1953–54. *Commentationes Biologicae* **19 (1)** [1958]: 1–246.

LINDBERG H. 1960: Hemiptera from the Azores and Madeira. *Boletim do Museu Municipal do Funchal* **13**: 85–94.

LINDBERG H. 1961: Hemiptera insularum madeirensium. *Commentationes Biologicae* **24 (1)**: 1–110.

LINDSKOG P. 1995: Infraorder Leptopodomorpha. Pp. 115–141. In: AUKEMA B. & RIEGER Ch. (eds): *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

LINNAVUORI R. 1960: Hemiptera of Israel I. *Annales Zoologici Societatis Zoologicae Botanicae Fennicae 'Vanamo'* **22 (1)**: 1−71.

LINNAVUORI R. 1964: Hemiptera of Egypt, with remarks on some species of the adjacent Eremian region. *Annales Zoologici Fennici* **1 (4)**: 306–356.

LINNAVUORI R. 1971: Hemiptera of the Sudan, with remarks on some species of the adjacent countries. 1. The aquatic and subaquatic families. *Annales Zoologici Fennici* **8 (3)**: 340–366.

LINNAVUORI R. 1973a: A collection of Heteroptera from Katanga, with remarks on some species from other parts of the Ethiopian Region. *Annales Entomologici Fennici* **39 (2)**: 70–94.

LINNAVUORI R. 1973b: Studies on the Hemipterous fauna of Israel and Sinai. *Israel Journal of Entomology* **8**: 35–54.

LINNAVUORI R. 1974: Hemiptera of the Sudan, with remarks on some species of the adjacent countries. Families Cryptostemmatidae, Cimicidae, Polyctenidae, Joppeicidae, Reduviidae, Pachynomidae, Nabidaea [*sic*!], Leptopodidae, Saldidae, Henicocephalidae and Berytidae. *Annales Entomologici Fennici* **40 (3)**: 116–138.

LINNAVUORI R. 1975: Studies on African Heteroptera. *Tijdschrift voor Entomologie* **118 (2)**: 43–65.

LINNAVUORI R. 1977: Additional notes on the Hemipterous fauna of Somalia. *Bollettino della Società Entomologica Italiana* **109 (4–6)**: 61–65.

LINNAVUORI R. E. 1980: Hemiptera of the Sudan, with remarks on some species of the adjacent countries. 8. Additions and corrections. Biogeography. *Acta Entomologica Fennica* **36**: 1–53.

LINNAVUORI R. E. 1981: Hemiptera of Nigeria, with remarks on some species of the adjacent countries. 1. The aquatic and subaquatic families, Saldidae and Leptopodidae. *Acta Entomologica Fennici* **37**: 1–39.

LINNAVUORI R. E. 1982: Some Hemipterous fauna from Somalia and Ethiopia. *Monitore Zoologico Italiano* **16 (Suppl.)**: 1–33.

LINNAVUORI R. E. 1986a: Heteroptera of Saudi Arabia. Pp. 31–197. In: BÜTTIKER W. & KRUPP F. (eds.): *Fauna of Saudi Arabia. Vol. 8*. Pro Entomologia c/o Natural History Museum, Basel, 461 pp.

LINNAVUORI R. E. 1986b: Notes on the Hemipterous fauna of Somalia and Ethiopia. *Monitore Zoologico Italiano, Nuova Serie, Supplemento* **21 (6)**: 109–127.

LINNAVUORI R. E. 1987: Alydidae, Stenocephalidae and Rhopalidae of West and Central Africa. *Acta Entomologica Fennica* **49**: 1–36.

LINNAVUORI R. E. 1989a: New taxa of Heteroptera and Auchenorrhyncha from the Middle East and the Ethiopian Region. *Annales Entomologici Fennici* **55 (1)**: 1–9.

LINNAVUORI R. E. 1989b: Heteroptera of Yemen and South Yemen. *Acta Entomologica Fennica* **54**: 1–40.

LINNAVUORI R. E. 1994a: Heteroptera from Socotra. *Entomologica Fennica* **5 (3)**: 151–156.

LINNAVUORI R. E. 1994b: Hemiptera of Iraq. IV. Heteroptera, the aquatic and subaquatic families, Saldidae and Leptopodidae. *Entomologica Fennica* **5 (2)**: 87–95.

LINNAVUORI R. E. 1997: Taxonomic studies on the Miridae (Heteroptera) of Africa and the Middle East. *Acta Universitatis Carolinae, Biologica* **40 (4)** [1996]: 321–350.

LINNAVUORI R. E. 2004: Heteroptera of the Hormozgan province in Iran. II. Nepomorpha, Gerromorpha, Leptopodomorpha, Cimicomorpha (Nabidae, Anthocoridae, Miridae). *Acta Universitatis Carolinae, Biologica* **48 (2)**: 85–98.

LINNAVUORI R. E. 2009: Studies on the Nepomorpha, Gerromorpha, Leptopodomorpha, and Miridae excluding Phylini (Hemiptera: Heteroptera) of Khuzestan and the adjacent provinces of Iran. *Acta Entomologica Musei Nationalis Pragae* **49 (1)**: 1–32.

LINNAVUORI R. E. & HARTEN A. van 1997: Notes on Heteroptera (Insecta: Hemiptera) of Yemen. Pp. 169–236. In: KRUPP F. & MAHNERT V. (eds): *Fauna of Saudi Arabia. Vol. 16*. National Comission for Wildlife Conservation and Development (NCWCD), Riyadh & Pro Entomologia c/o Natural History Museum, Basel, 355 pp.

LINNAVUORI R. E. & HARTEN A. van 2000: Additional notes on the Heteroptera (Insecta: Hemiptera) of Yemen. Pp. 165–175. In: KRUPP F. & MAHNERT V. (eds): *Fauna of Arabia. Vol. 18*. National Commission for Wildlife Conservation and Development (NCWCD), Riyadh & Pro Entomologia c/o Natural History Museum, Basel, 407 pp.

LINNAVUORI R. E. & HARTEN A. van 2002a: Additional notes on the Heteroptera (Insecta: Hemiptera) of Yemen II. Pp. 157–188. In: HACKER H. H. & PEKS H. (eds): *Esperiana, Buchreihe zur Entomologie. Vol. 9*. Delta Druck und Verlag, Schwanfeld, 606 pp.

LINNAVUORI R. E. & HARTEN A. van 2002b: New genus and species of Leptopodidae (Heteroptera) from Yemen. *Acta Universitatis Carolinae Biologica* **46**: 321–324.

LINNAVUORI R. E. & HOSSEINI R. 2000: *Heteroptera of Guilan with remarks on species of the adjacent areas. Part 1.* Guilan University Publication, Rasht, [1999], 94 pp.

LINNAVUORI R. E., KMENT P. & CARAPEZZA A. 2011: Order Hemiptera, suborder Heteroptera. Infraorders Nepomorpha, Gerromorpha, and Leptopodomorpha. Pp. 72–107. In: HARTEN A. van (ed.): *Arthropod fauna of the United Arab Emirates. Vol. 4*. Multiply Marketing Consultancy Services, Abu Dhabi, 816 pp.

LIU G.-Q. & BU W.-J. 2009: *Hemiptera: Heteroptera. The Fauna of Hebei, China*. China Agricultural Science and Technology Press, Beijing, 528 pp. + pls. I–VIII.

LUKASHUK A. O. 1997: *Annotated list of the Heteroptera of Belarus and Baltia*. Berezinsky Biospheric Nature Reserve & Institute of Zoology and Russian Academy of Sciences, Zoological Institute, St. Petersburg, 45 pp.

LUNDBLAD O. 1928: Zur näheren Kenntnis einiger in Ostafrika von Professor Dr. Yngwe Sjöstedt gesammelter Corixiden. *Archiv für Zoologi* **20 A (8)**: 1–11 + pl. I.

LUNDBLAD O. 1934: Zur Kenntnis der aquatilen und semiaquatilen Hemipteren von Sumatra, Java und Bali. *Archiv für Hydrobiologie, Supplementum* **12** [1933]: 1–195, 263–487 + 20 pls.

LUNDBLAD O. 1936: Die altweltlichen Arten der Veliidengattungen *Rhagovelia* und *Tetraripis*. *Arkiv för Zoologi A* **28 (21)**: 1–63 + pls. 1–13.

LUO J.-Y., WANG Y.-H., CHEN P.-P. & XIE Q. 2022: First record of the intertidal dwarf bug family Omaniidae from China, with description of a new species (Heteroptera: Leptopodomorpha). *Zootaxa* **5195 (5)**: 449-467.

LVONČÍK S., VAHALÍK P., BONGERS F., PEIJNENBURG J., HUŠKOVÁ K., JANSEN van RENSBURG J., HAMDIAH S. & MADĚRA P. 2020: Development of a population of *Boswellia elongata* Balf. F. in Homhil nature sanctuary, Socotra island (Yemen). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 623–635.

MADĚRA P., VOLAŘÍK D., PATOČKA Z., KALIVODOVÁ H., DIVÍN J., REJŽEK M., VYBÍRAL J., LVONČÍK S., JENÍK D.,

HANÁČEK P., AMER A. S. & VAHALÍK P. 2019: Sustainable land use management needed to conserve the Dragon's Blood Tree of Socotra Island, a vulnerable endemic umbrella species. *Sustainability* **11 (3557)**: 1–20.

MALIPATIL M. B. 1988: Two new species of *Halobates* Eschscholtz (Hemiptera: Gerridae) from Australia. *Journal of the Australian Entomological Society* **27**: 157–160.

MAMET J. R. 1957: A revised and annotated list of the Hemiptera (Heteroptera and Homoptera, excluding Sternorrhyncha) of Mauritius. *Mauritius Institute Bulletin* **5 (2)**: 31–81.

MANCINI C. 1939a: Hemiptera. Pp. 195–224. In: ZAVATTARI E. (ed.): *Missione biologica nel paese dei Borana. Vol. III. Raccolte zoologiche. Parte seconda*. Reale Accademia d'Italia, Roma, 466 pp.

MANCINI C. 1939b: Hemiptera. Pp. 292–314. In: Spedizione zoologica del marchese Saverio Patrizi nel Basso Giuba e nell'Oltregiuba. *Annali del Museo Civico di Storia Naturale di Giacomo Doria* **58**: 1–380 + 16 pls.

MANCINI C. 1939c: Osservazioni sugli *Ochterus* del Museo Civico di Storia Naturale di Genova. (Hemipt.) *Bollettino della Società Entomologica Italiana* **67**: 123–126.

MANCINI C. 1949: Spedizione zoologica del marchese Saverio Patrizi nel Basso Giuba e nell'Oltregiuba. VI–VII 1934. Hemiptera. Nota II. *Annali del Museo Civico di Storia Naturale „Giacomo Doria"* **63**: 218–234.

MANCINI C. 1954: Missione biologica Sagan-Omo diretta dal prof. Edoardo Zavattari (1939). *Annali del Museo Civico di Storia Naturale Giacomo Doria* **66** [1952–1954]: 166–204.

MANCINI C. 1956: Emitteri dell'Abissinia raccolti dal M.se Saverio Patrizi e da altri. Nota I. *Fragmenta Entomologica* **2 (8)**: 65–96.

MANCINI C. 1961: Emitteri dell'Abissinia raccolti dal M.se Saverio Patrizi e Da Altri. Nota II. *Annali del Museo Civico di Storia Naturale „Giacomo Doria"* **72**: 31–46.

MANCINI C. 1964: Missione 1957 del Prof. Giuseppe Scortecci in Migiurtinia (Somali sett.). Hemiptera Heteroptera. *Atti della Societa Italiana di Scienze Naturali e del Museo Civico di Storia Naturale in Milano* **103**: 297–304.

MILLER A. G. & MORRIS M. 2004: *Ethnoflora of the Soqotra Archipelago.* Royal Botanic Garden, Edinburgh, 759 pp.

MIYAMOTO S. 1964: Semiaquatic Heteroptera of the south-west islands, lying between Kyushu and Formosa. *Sieboldia* **3 (2)**: 193–219.

MIYAMOTO S. & LEE Ch. E. 1963: Water striders of Korea (Hemiptera, Heteroptera). *Kontyu* **31**: 33–47.

MONTANDON A. L. 1899: Hemiptera Cryptocerata. 8. Fam. Mononychinae. Notes et descriptions d'espèces nouvelles. *Buletinul Societăţii de Sciinţe din Bucuresci-România* **8**: 392–407.

MONTANDON A. L. 1903: Trois nouvelles espèces du genre *Ranatra* L. appartenant aux collections du Musée Civique de Gênes. *Bullettino della Società Entomologica Italiana* **35**: 20–25.

MOULET P. 2001: Quatre *Oncocephalus* Klug, 1830 nouveaux et description de la forme macroptere de *O. pennatulus* (Heteroptera, Reduviidae, Stenopodainae). *Nouvelle Revue d'Entomologie (Nouvelle Série)* **18 (4)**: 353–368.

MOULET P. 2004: Contribution a l'étude des Stenopodainae paléarctiques (Heteroptera, Reduviidae). *Nouvelle Revue d'Entomologie (Nouvelle Série)* **20 (3)** [2003]: 281–297.

MOULET P. 2020: New genus and species of Reduviinae (Heteroptera, Reduviidae) from Socotra. *Munis Entomology and Zoology* **15 (2)**: 326–330.

MOULET P. 2022: Description of two new Reduviidae from Socotra Island (Heteroptera) *Bulletin de la Société Entomologique de France* **127 (1)**: 11–17.

MÜLLER D. H. 1907: Zur Geschichte der südarabischen Expedition. *Denkschriften der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Klasse* **71 (1)**: I–V.

NAUMKIN V. V. 1993: *Island of the Phoenix – An ethnographic study of the people of Socotra*. Ithaca Press, Reading, 421 pp.

NEUBERT E. & BOCHUD E. 2020: The continental malacofauna of Arabia and adjacent areas, VII. The family Achatinidae (Coeliaxinae, Subulininae) in the Socotran Archipelago (Gastropoda, Pulmonata). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 623–635.

NEUMANN V. & GEDEON K. 2009: Die Forschungsreise Emil Riebecks nach Sokotra. *Abhandlungen und Berichte aus dem Museum Heineanum* **8**: 85–100.

NGO L. C., LANGELLOTTO G. A., TRAN L. T., VU Q., NGUYEN T. T. T., BARRION A. T. & CHEN Y. H. 2016: Arthropod diversity and abundance in wild rice, *Oryza rufipogon*, in the Mekong Delta, Vietnam. *Annals of the Entomological Society of America* **109 (4)**: 542–554.

NICHOLS P. D. & JOHNS R. B. 1983: The metal and lipid composition of the sea skaters *Halobates hayanus* from Australian waters and *Rheumatobates aestuarius* (from Baja, CA). *Comparative Biochemistry and Physiology* **75B (4)**: 617–623.

NIESER N. 1969: Donnés faunistiques concernant les Hétéroptères aquatiques II, Hétéroptères aquatiques d'Évora, Portugal. *Entomologische Berichten* (Amsterdam) **29 (1)**: 1–6.

NIESER N. 1983: Faunistical notes on aquatic Heteroptera. VI. Records from Portugal and some Mediterranean localities. *Ciência Biológica, Ecology and Systematics* **5**: 105–115.

NIESER N. 1995: Gerromorpha from Israel (Heteroptera semiaquatica). Pp. 153–155. In: NITZU E. (ed.): *Soil fauna of Israel 1*. Editura Academiei Române, Bucureşti, 155 pp.

NIESER N. 2002: Guide to aquatic Heteroptera of Singapore and Peninsular Malaysia. IV. Corixoidea. *Raffles Bulletin of Zoology* **50 (1)**: 263–274.

NIESER N. & CHEN P.-P. 2005: The water bugs (Hemiptera: Nepomorpha and Gerromorpha) of Vanuatu. *Tijdschrift voor Entomologie* **148 (2)**: 307–327.

NIESER N. & MONTES C. 1984: *Lista faunistica y bibliografica de los Heteropteros acuaticos (Nepomorpha & Gerromorpha) de España y Portugal*. Asociacion Española de Limnologia, Madrid, 69 pp.

NIESER N. & MOUBAYED Z. 1985: Les Hétéroptères aquatiques du Liban. I. Inventaire faunistique. *Annales de Limnologie* **21 (3)**: 247–252.

NONNAIZAB 1999: Hemiptera. Pp. 51–86. In: NONNAIZAB (ed.): *Insects of Inner Mongolia China*. Inner Mongolia People's Publishing House, Hohhot, 12 + 506 pp

PAINA M. I. 1975: Liste Heteropterelor acvatice si semiacvatice (O. Heteroptera) din R. S. Romania. [List of aquatic and semiaquatic Heteroptera from the S. R. Rumania [sic!].] *Nymphaea* **3**: 99–115 (in Romanian, English summary).

PAIVA C. A. 1919: VII. Aquatic and semi-aquatic Rhynchota from the Satara and Poona Districts. Pp. 152–156 + pl. III. In: ANNANDALE N. (ed.): The fauna of certain small streams in the Bombay Presidency. *Records of the Indian Museum* **16 (1)**: 109–161 + pls. I–VII.

PEREZ GOODWYN P. J. 2006: Taxonomic revision of the subfamily Lethocerinae Lauck & Menke (Heteroptera: Belostomatidae). *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)* **695**: 1–71.

POISSON R. 1929: Résultats scientifiques de la Mission du Hoggar (1928). Hémiptères aquatiques. 1re Note. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* **20 (4)**: 87–96.

POISSON R. 1934a: Hemipteres aquatiques. In: SEURAT L.-G. (ed.): Etudes Zoologiques sur le Sahara Central. *Mémoires de la Société d'Histoire Naturelle de l'Afrique du Nord* **4**: 134–144.

POISSON R. 1934b: Contribution à l'étude de la faune du Mozambique. Voyage de M. P. Lesne (1928−1929). Hémiptères aquatiques. *Bulletin de la Société Zoologique de France* **59**: 87−103.

POISSON R. 1936: Hemiptera. I. Aquatica. Pp. 191–218. In: *Mission scientifique de l'Omo. Tome III. Zoologie*. Muséum National d'Histoire Naturelle, Paris [1935].

POISSON R. 1937: Voyage de M. P.-P. Grassé en Afrique Occidentale Française. Hemiptera aquatica. *Annales de la Société Entomologique de France* **106**: 115–132.

POISSON R. 1939: Hémiptères aquatiques africains: Mauritanie et région du Tchad (Note préliminaire). *Bulletin de la Société Entomologique de France* **1939**: 42–44.

POISSON R. 1941a: Voyage de M. L. Chopard en Cote d'Ivoire (1938–1939). Hémiptères aquatiques. *Revue Française d'Entomologie* **8 (2)**: 77–82.

POISSON R. 1941b: Contribution à la connaissance des espèces africaines du genre *Microvelia* Westwood. (Missions de Ch. Alluaud et R. Jeannel en Afrique orientale). *Revue Française d'Entomologie* **8 (4)**: 161–188.

POISSON R. 1941c: Contribution à l'étude des *Gerris* de France et de l'Afrique du Nord (Hémiptères Gerridae). *Bulletin de la Société Scientifique de Bretagne* **17 (3–4)** [1940]: 140–173.

POISSON R. 1942: Sur quelques Veliidae du Congo belge (Hémiptères Hydrocorises). *Revue de Zoologie et de Botanique Africaines* **36 (2)**: 149–164.

POISSON R. 1944: Contributions à la connaissance des espèces africaines du genre *Hebrus* Curtis 1833. *Revue Française de Entomologie* **10 (3–4)**: 89−112.

POISSON R. 1948a: Hydrocorises du Cameroun (Mission J. Carayon 1947). *Revue Française de Entomologie* **15 (3)**: 167−177.

POISSON R. 1948b: Les Hémiptères aquatiques du Sahara Central. Pp. 203–210. In: BERNARD F. & PEYERIMHOFF P. DE (eds): *Mission scientifique du Fezzân (1944–1945). V. Zoologie*. Institut de recherches Sahariennes de l'Université d'Alger, Alger.

POISSON R. A. 1949a: Hémiptères aquatiques. In: *Exploration du Parc National Albert. Mission G. F. de Witte (1933–1935). Fascicule 58*. Institut des Parcs Nationaux du Congo belge, Bruxelles, 96 pp.

POISSON R. A. 1949b: Contribution à l'étude des Hydrocorises de Madagascar (Mission J. Millot 1946). *Mémoires de l'Institut Scientifique de Madagascar, Série A. Biologie Animale* **1 (2)** [1948]: 89–120.

POISSON R. A. 1949c: Sur quelques espèces nouvelles d'Hydrocorises de l'Afrique Orientale [Hem. Heteropt.]. *Bulletin de la Société Entomologique de France* **54 (6)**: 81–86.

POISSON R. 1950a: Contribution à l'étude de l'Aïr. (Mission L. Chopard et A. Villiers). Hémiptères aquatiques. *Mémoires de l'Institut Français d'Afrique Noire* **10**: 316–317.

POISSON R. 1950b: Sur quelques espèces nouvelles d'Hydrocorises des collections du Musée du Congo belge. *Revue de Zoologie et de Botanique Africaines* **43 (1–2)**: 67–91.

POISSON R. A. 1951a: Contribution à l'étude des Hydrocorises de Madagascar (Missions J. Millot 1947–1948). 2e Note. *Mémoires de l'Institut Scientifique de Madagascar, Série A. Biologie Animale* **5 (1)**: 79–130.

POISSON R. A. 1951b: Contribution à l'étude des Helotrephidae, *Microvelia* Westwood (Veliidae), *Hebrus* Curtis (Hebridae) de la faune éthiopienne (Hémiptères-Hétéroptères). *Commentationes Biologicae* **12 (4)**: 1–22.

POISSON R. 1951c: Mission A. Villiers au Togo et au Dahomey (1950). IV. Hémiptères Cryptocérates (1). *Bulletin de l'Institut Français d'Afrique Noire* **13 (4)**: 1131–1140.

POISSON R. A. 1952a: Contribution à l'étude des Hydrocorises de Madagascar (Missions J. Millot et R. Paulian 1949). 2e Note. *Mémoires de l'Institut Scientifique de Madagascar, Série E* **1 (1)**: 23–70.

POISSON R. A. 1952b: XIII. – Hydrocorises. In: La Réserve Naturelle Intégrale du Mt Nimba. Fascicule I. *Mémoires de l'Institut Français d'Afrique Noire* **19**: 277–287.

POISSON R. 1953: Les Hydrocorises du Tassili des Ajjer (Sahara central). Pp. 1–22. In: BERNARD F. (ed.): *Mission scientifique au Tassili des Ajjer (1949). Volume I. Recherches zoologiques et medicales*. Institut de Recherches Sahariennes de l'Université d'Alger, Alger, 302 pp.

POISSON R. 1954a: XXX: Hydrocorises (2e contribution). In: La réserve naturelle intégrale du Mont Nimba. Fascicule II. *Mémoires de l'Institut Français d'Afrique Noire* **40**: 359–370.

POISSON R. 1954b: Hémiptères aquatiques. In: *Exploration du Parc National de l'Upemba. Mission G. F. de Witte en collaboration avec W. Adam, A. Janssens, L. van Meel et R. Verheyen (1948–1949). Fascicule 31*. Institut des Parcs Nationaux du Congo belge, Bruxelles, 53 pp.

POISSON R. 1955a: Hydrocorises recueillis par M. Omer-Cooper en Rhodésie et au Transvaal. *Revue de Zoologie et de Botanique Africaines* **52 (3–4)**: 261–279.

POISSON R. 1955b: Contributions à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953). *Annales du Musée du Congo Belge, Tervuren, in-8°, Zoologie* **36**: 394–409.

POISSON R. 1956a: Quelques Hydrocorises nouveaux de l'Afrique du Sud (Mission Suédoise Brinck et Rüdebeck). *Bulletin de la Société Scientifique de Bretagne* **30** [1955]: 129–138.

POISSON R. 1956b: Contribution à l'étude des Hydrocorises de Madagascar (Heteroptera). 4e Mémoire. *Mémoires de l'Institut Scientifique de Madagascar, Série E* **7**: 243–265.

POISSON R. 1957a: Hemiptera Heteroptera: Hydrocoridae & Geocorisae-Gerroidea. Pp. 327–373. In: HANSTRÖM B., BRINCK P. & RUDEBECK G. (eds.): *South African Animal Life. Vol. IV.* Almqvist & Wiksell, Stockholm, 508 pp.

POISSON R. 1957b: Les Hydrocorises de l'Ile de la Reunion. *Mémoires de l'Institut Scientifique de Madagascar, Série E* **8**: 389–398.

POISSON R. 1957c: Nouvelle contribution à la connaissance des Hydrocorises du Congo belge. *Revue de Zoologie et de Botanique Africaines* **56 (1–2)**: 167–188.

POISSON R. A. 1957d: Contribution a l'étude des Hydrocorises des Comores (Mission J. Millot, 1953). *Naturaliste Malgache* **9 (1)**: 123–124.

POISSON R. 1957e: *Hétéroptères aquatiques. Faune de France. Vol. 61*. Fédération Française des Sociétés de Sciences Naturelles, Paris, 263 pp.

POISSON R. A. 1957f: Recherches sur les Hétéroptères Nepidae. *Doriana* **2 (78)**: 1–6.

POISSON R. A. 1959a: Contribution à l'étude des Hydrocorises des Comores (Missions J. Millot 1953−54). *Mémoires de l'Institut Scientifique de Madagascar, Série E* **10**: 199–224.

POISSON R. A. 1959b: 'Aquatic Heteroptera'. Pp. 125–131. In: LINDBERG H.: Hemiptera Insularum Caboverdensium. Systematik, Ökologie und Verbreitung der Heteropteren und Cicadinen der Kapverdischen Inseln. In: LINDBERG H. (ed.): Ergebnisse der Zoologischen Expedition von Professor Håkan Lindberg nach den Kapverde-Inseln im Winter 1953–54. *Commentationes Biologicae* **19 (1)** [1958]: 1–246.

POISSON R. A. 1960a: Mission zoologique de l'I.R.S.A.C. en afrique orientale. (P. Basilewsky et N. Leleup, 1957). XXXIV. Hémiptères aquatiques. *Annales du Musée du Congo Belge, Tervuren, in-8°, Zoologie* **81**: 450–452.

POISSON R. A. 1960b: Mission de M. H. Bertrand (1956–1957) en Afrique occidentale et en Afrique équatoriale. Hydrocorises. *Bulletin de l'Institut Français d'Afrique Noire, Série A* **22 (3)**: 984–1007.

POISSON R. 1961: XXXIV. Heteroptera aquatica. In: Le Parc National du Niokolo-Koba. Fascicule II. *Mémoires de l'Institut Français d'Afrique Noire* **62**: 321–323.

POISSON R.-A. 1963: Mission de M. H. Bertrand (1958–1959–1960) en Afrique éthiopienne et à Madagascar. Hydrocorises. *Bulletin de l'Institut Français d'Afrique Noire, Série A* **25 (4)**: 1170–1207.

POISSON R. A. 1964a: Sur quelques espèces nouvelles d'Hydrocorises des collections du Musée Royal de l'Afrique Centrale. *Revue de Zoologie et de Botanique Africaines* **69 (1–2)**: 113–120.

POISSON R. A. 1964b: Deux espèces nouvelles d'Hémiptères aquatiques de l'Afrique éthiopienne. *Annales Entomologici Fennici* **30 (4)**: 214–218.

POISSON R. A. 1965a: Hémiptères aquatiques. In: *Exploration du Parc National de la Garamba. Mission H. de Saeger. Fascicule 46(1)*. Institut des Parcs Nationaux du Congo et du Rwanda, Bruxelles, [1964], 15 pp.

POISSON R. A. 1965b: Catalogue des Insectes Hétéroptères Gerridae Leach, 1807, africano-malgaches. *Bulletin de l'Institut Français d'Afrique Noire, Série A* **27 (4)**: 1466–1503.

POISSON R. A. 1966: Catalogue des Insectes Hétéroptères Notonectidae Leach, 1815, africano-malgaches. *Bulletin de l'Institut Français d'Afrique Noire, Série A* **28 (2)**: 729–768.

POISSON R. A. 1967: Contribution à la faune du Congo (Brazzaville). Mission A. Villiers et A. Descarpentries. LXIII. Hémiptères Hétéroptères Hydrocorises. *Bulletin de l'Institut Français d'Afrique Noire, Série A* **29 (3)**: 1321–1333.

POISSON R. A. 1968a: Aquatic Heteroptera. In: SYMOENS J.-J. (ed.): *Hydrobiological survey of the Lake Bangweulu Luapula River Basin. Volume XIV, fascicule 11*. Cercle Hydrobiologique de Bruxelles, Bruxelles, 51 pp.

POISSON R. A. 1968b: Contributions à la connaissance de la faune entomologique de la Côte-d'Ivoire (J. Decelle 1961–1964). XXVI. – Hémiptères aquatiques. *Annales du Musée Royal du Congo Belge Tervuren (Belgique): Serie in-8° – Sciences Zoologiques* **165**: 399–403.

POISSON R. A. & SALLIER DUPIN F. DE 1969: Hétéroptères aquatiques du bassin de la Luanza. Pp. 1–25 + 2 maps. In: SYMOENS J.-J. (ed.): *Exploration hydrobiologique su bassin du Lac Bangweolo et du Luapula. Vol. XIV, fasc. 12*. Cercle hydrobiologique de Bruxelles, Bruxelles.

POISSON R. A. & SALLIER DUPIN F. DE 1970: Contribution à l'étude

biologique du Sénégal septentrional. III. Hétéroptères aquatiques. *Bulletin de l'Institut Fondamental d'Afrique Noire, Série A: Sciences Naturelles* **32 (3)**: 832–841.

POLHEMUS D. A. 1992: The first records of the families Ochteridae and Hebridae (Heteroptera) from the granitic Seychelles, with descriptions of two new species. *Journal of the New York Entomological Society* **100 (3)**: 418–423.

POLHEMUS D. A. 2017: An initial survey of aquatic and semi-aquatic Heteroptera (Insecta) from the Cardamom Mountains and adjacent uplands of southwestern Cambodia, with descriptions of four new species. *Tijdschrift voor Entomologie* **160**: 89–138.

POLHEMUS D. A., ENGLUND R. A., ALLEN G. R., BOSETO D. & POLHEMUS J. T. 2008: Freshwater biotas of the Solomon Islands. Analysis of richness, endemism and threats. *Bishop Museum Technical Report* **45**: 1–126.

POLHEMUS D. A. & POLHEMUS J. T. 2013: Aquatic and Semi-Aquatic Heteroptera. Pp. 68–100 + pls. 1–2. In: GERLACH J. (ed.): *Hemiptera, Hymenoptera and other Insects of the Seychelles Islands*. Siri Scientific Press, Manchester, 400 pp. + 4 pls.

POLHEMUS J. T. 1981: African Leptopodomorpha (Hemiptera: Heteroptera): a checklist and descriptions of new taxa. *Annals of the Natal Museum* **24 (2)**: 603–619.

POLHEMUS J. T. 1989: A necessary new name in the family Hebridae (Heteroptera: Gerromorpha). *Journal of the New York Entomological Society* **97 (1)**: 116.

POLHEMUS J. T. 1995: Family Notonectidae Latreille, 1802 – backswimmers. Pp. 63–73. In: AUKEMA B. & RIEGER Ch. (eds): *Catalogue of the Heteroptera of the Palaearctic Region. Vol. 1. Enicocephalomorpha, Dipsocoromorpha, Nepomorpha, Gerromorpha and Leptopodomorpha*. The Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

POLHEMUS J. T. & POLHEMUS D. A. 1991a: Three new species of marine water-striders from the Australasian region, with notes on other species (Gerridae: Halobatinae, Trepobatinae). *Raffles Bulletin of Zoology* **39 (1)**: 1–13.

POLHEMUS J. T. & POLHEMUS D. A. 1991b: A revision of the Leptopodomorpha (Heteroptera) of Madagascar and nearby Indian Ocean Islands. *Journal of the New York Entomological Society* **99 (3)**: 496–526.

POLHEMUS J. T. & POLHEMUS D. A. 1999: Introduction to the Leptopodomorpha of Thailand and adjacent countries. *Amemboa* **3**: 14–21.

POLHEMUS J. T. & POLHEMUS D. A. 2000: The genus *Mesovelia* Mulsant & Rey in New Guinea (Heteroptera: Mesoveliidae). *Journal of the New York Entomological Society* **108 (3–4)**: 205–230.

POLHEMUS J. T. & POLHEMUS D. A. 2006: The marine Heteroptera of the Far Eastern New Guinea and adjacent archipelagoes (Insecta, Gerromorpha). *Denisia* **19**: 927–982.

POLHEMUS J. T. & POLHEMUS D. A. 2012: Guide to the aquatic Heteroptera of Singapore and Peninsular Malaysia. VIII. Leptopodomorpha, families Saldidae, Leptopodidae, and Omaniidae. *Raffles Bulletin of Zoology* **60 (2)**: 329–341.

POPOV G. 1957: The vegetation of Socotra. *Journal of the Linnean Society, Botany* **55**: 706–720.

POPOV G. 1959: The desert locust (*Schistocerca gregaria* Forskal) in the island of Socotra. *Journal of Animal Ecology* **28**: 89–95.

PRIESNER H. & ALFIERI A. 1953: A review of the Hemiptera Heteroptera known to us from Egypt. *Bulletin de la Société Entomologique d'Egypt* **37**: 1–119.

PRIESNER H. & WAGNER E. 1961: Supplement to "A review of the Hemiptera Heteroptera known to us from Egypt". *Bulletin de la Société Fouad Ier Entomologie* **45**: 323–339.

PROTIĆ Lj. 1998: Catalogue of the Heteroptera fauna of Yugoslav countries. Part one. *Prirodnjački Muzej u Beogradu, Posebna Izdanja* **38**: 1–215.

PURCHART L., HULA V. & FRIC Z. F. 2020: Comparison of the biogeographic origin of three terrestrial arthropod groups in the Socotra Archipelago (Yemen). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 623–635.

PUTON A. 1890: Une douzaine d'Hémiptères nouveaux et notes diverses. *Revue d'Entomologie* **9**: 227–236.

PUTSHKOV V. G. & PUTSHKOV P. V. 1996: *Heteroptera of the Ukraine: Check list and distribution*. Ukrainian Academy of Sciences, Institute of Zoology & Institute of Zoology and Russian Academy of Sciences, Zoological Institute, St. Petersburg, 108 pp.

RABITSCH W. 2005: Heteroptera (Insecta). Pp. 1–64. In: SCHUSTER R. (ed.): *Checklisten der Fauna Österreichs, No. 2*. Österreichische Akademie der Wissenschaften, Wien, 96 pp

RAMPELBERGH M. van, FLEITMANN D., VERHEYDEN S., CHENG H., EDWARDS L., De GEEST P., De VLEESCHOUWER D., BURNS S. J., MATTER A., CLAEYS Ph. & KEPPENS E. 2013: Mid- to late Holocene Indian Ocean Monsoon variability recorded in four speleothems from Socotra Island, Yemen. *Quaternary Science Reviews* **65**: 129–142.

REDUCIENDO-KLEMENTOVÁ B., KMENT P. & SVITOK M. 2015: Checklist of water bugs (Hemiptera: Heteroptera: Nepomorpha, Gerromorpha) of Slovakia. *Zootaxa* **4058 (2)**: 227–243.

REJŽEK M., SVÁTEK M., ŠEBESTA J., ADOLT R., MADĚRA P. & MATULA R. 2016: Loss of a single tree species will lead to an overall decline in plant diversity: Effect of *Dracaena cinnabari* Balf. f. on the vegetation of Socotra Island. *Biological Conservation* **196**: 165–172.

RENSBURG J. J. van & HOPPER K. 2017: Incense and imagery: mapping agricultural and water management systems on the island of Socotra, Yemen. *Proceedings of the Seminar for Arabian Studies* **47**: 129–138.

ŘEPKA R., MADĚRA P., ČERMÁK M. & FORREST A. 2017: *Carex socotrana*, a new endemic species from Socotra Island. *Novon* **25**: 467–472.

REUTER O. M. 1881: Analecta hemipterologica. Zur Artenkenntnis, Synonymie, und geographischen Verbreitung palaearktischer Heteropteren. *Berliner Entomologische Zeitschrift* **25**: 155–196.

REUTER O. M. 1882: Ad cognitionem Heteropterorum Africae occidentalis. *Öfversigt af Finska Vetenskaps-Societetens Förhandlingar* **25** [1882–1883]: 1–43.

REUTER O. M. 1900: Description d'une espèce et d'une variété nouvelles du genre *Acanthia* Latr. [Hém. Héter.]. *Bulletin de la Société Entomologique de France* **1900**: 156–157.

REZENDE M., RICCARDI T., MALATESTA L., ATTORRE F. & VAN DAMME K. 2020: Land productivity dynamics in Socotra Island (Yemen). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 737–746.

RIBES J. & BORGES P. A. V. 2005: Hemiptera – Heteroptera. Pp. 191–193. In: BORGES P. A. V., VIEIRA V., DINIS F. & JARROCA S. (eds.): Lista dos Artrópodes (Arthropoda). Pp. 163–221. In: BORGES P. A. V., CUNHA R., GABRIEL R., MARTINS A. F., SILVA L. & VIEIRA V. (eds.): *A list of the terrestrial fauna (Mollusca and Arthropoda) and flora (Bryophyta, Pteridophyta and Spermatophyta) from the Azores*. Direccao Regional de Ambiente and Universidade dos Acores, Horta, Angra do Heroísmo and Ponta Delgada, 317 pp.

RIBES J. & SCHMITZ G. 1992: Révision du genre *Brachynema* Mulsant & Rey, 1852 (Heteroptera, Pentatomidae, Pentatominae). *Bulletin & Annales de la Société Royale Belge d'Entomologie* **128**: 105–166.

RICCARDI T., MALATESTA L., VAN DAMME K., SULEIMAN A. S., FARCOMENI A., REZENDE M., VAHALÍK P. & ATTORRE F. 2020: Environmental factors and human activity as drivers of tree cover and density on the Island of Socotra, Yemen. *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 703–718.

RINTALA T. & RINNE V. 2010: *Suomi luteet*. [*Finnish bugs*]. Tibiale, Helsinki, 352 pp.

ROCA-CUSACHS M. & KMENT P. 2022: *Joppeicus paradoxus* (Hemiptera: Heteroptera: Joppeicidae): a new alien species in the European Union? *Zootaxa* **5195 (3)**: 256–266.

ROCA-CUSACHS M., SUÁREZ D., OSORIO V., GARCÍA-BECERRA R., GARCÍA-PÉREZ J., HERNÁNDEZ-TEIXIDOR D., PÉREZ-DELGADO A. J., PÉREZ-VALCÁRCEL J., PARÍS M., OROMÍ P. & GOULA M. 2020: Updated check-list and geographic database of new chorological data of true bugs (Insecta, Hemiptera, Heteroptera) from the Canary Islands. *Arquivos Entomolóxicos* **22**: 169–218.

ROMÁN-PALACIOS C., DAMGAARD J., CHENG L., MOREIRA F. F. F., IKAWA T., WEIR T. A. & ZETTEL H. 2020: Molecular phylogeny of sea-skaters (*Halobates* Eschscholtz, 1822), relationship between Halobatini and Metrocorini, and a catalogue of the subfamily Halobatinae (Hemiptera: Heteroptera: Gerridae). *Insect Systematics*

*and Evolution* **51**: 139–240.

ROYER M. 1914: Hémipteres du Sinai, de Petra et de la Palestine méridionale (voyage de P. de Peyerimhoff, Février-Mars 1902). *Annales de la Société Entomologique de France* **83**: 131–135.

SALEH AHMAD R. 2001: Contribution to the study of Heteroptera, Gerromorpha (semiaquatic bugs) II. Chromosomal analysis of *Limnogonus cereiventris* (Signoret, 1862) (Gerridae) (water striders) with notes on the wing polymorphism. *Journal of the Egyptian-German Society of Zoology, Entomology* **34E**: 7–17.

SALEH AHMED R. & GADALLA S. M. 2005a: Contribution to the study of Heteroptera, Gerromorpha (Semiaquatic Bugs). V. Water Crickets (Family Veliidae) from Egypt. *Journal of Asia-Pacific Entomology* **8 (3)**: 219–226.

SALEH AHMED R. & GADALLA S. M. 2005b: Contribution to the study of Heteroptera, Gerromorpha (Semiaquatic Bugs). VII. Check-list of Gerromorpha of Egypt, with a new record. *Journal of Asia-Pacific Entomology* **8 (4)**: 339–344.

SALLIER DUPIN F. DE 1973: Hétéroptères hydrocorises de l'Afrique orientale. *Monitore Zoologico Italiano, Nuova Serie, Supplemento* **5 (1)**: 1–14.

SALLIER DUPIN F. DE 1976: Note sur des Hétéroptères aquatiques africains de la famille des Veliidae. *Revue Zoologique Africaine* **90 (3)**: 658–668.

SALLIER DUPIN F. DE 1979: Etude d'une collection d'Hétéroptères aquatiques de l'Afrique centrale. Description de *Rhagovelia linnavuorii* sp. n. *Annales Entomologici Fennici* **45 (1)**: 29–31.

SAVAGE A. A. 1989: *Adults of the British aquatic Hemiptera Heteroptera. A key with ecological notes*. Freshwater Biological Association, Ambleside, 173 pp.

SCHEMBRI S. 1993: An annotated catalogue of the Heteropteran bugs of the Maltese Islands. *Memorie della Società Entomologica Italiana* **71 (2)** [1992]: 467–503.

SCHENKOVÁ J., KMENT P., MALENOVSKÝ I. & TÓTHOVÁ A. 2021: *Myxobdella socotrensis* sp. nov., a new parasitic leech from Socotra Island, with comments on the phylogeny of Praobdellidae (Hirudinida: Arhynchobdellida). *Parasitology International* **82 (102310)**: 1–10.

SCHMIDT H. E. & MÜLLER R. 1973: Marine water striders of the genus *Halobates* (Hemiptera: Gerridae) from the Red Sea and Gulf of Aden. *Israel Journal of Zoology* **22**: 1–12.

SCHMITZ G. 1976: 1. Fam. Veliidae. Pp. 321–345. In: SCHMITZ G. (ed.): La faune terrestre de l'Île de Sainte-Hélène. Troisième partie. *Annales de Musée Royal de l'Afrique Centrale, Serie in-8°, Sciences Zoologiques* **215**: 1–533.

SCHOLTE P., AL-OKAISHI A. & SULEYMAN A. S. 2011: When conservation precedes development: a case study of the opening up of the Socotra archipelago, Yemen. *Oryx* **45 (3)**: 401–410.

SCHOLTE P. & DE GEEST P. 2010: The climate of Socotra Island (Yemen): a first-time assessment of the timing of the monsoon wind reversal and its influence on precipitation and vegetation patterns. *Journal of Arid Environments* **74**: 1507–1515.

SCHOLTE P., MILLER A., SHAMSAN A. R., SULEIMAN A.S., TALEB N., MILLROY T., ATTORRE F., PORTER R., CARUGATI C. & PELLA F. 2007: *Goats: Part of the problem or the solution to biodiversity conservation on SOCOTRA?* Technical Report, SCDP, Hadiboh, Socotra, 11 pp. [Not seen, *fide* MADĚRA et al. (2019).]

SCHUH R. T., GALIL B. & POLHEMUS J. T. 1987: Catalog and bibliography of Leptopodomorpha (Heteroptera). *Bulletin of the American Museum of Natural History*, **185**: 243–406.

SCHUH R. T. & SLATER J. A. 1995: *True bugs of the World (Hemiptera: Heteroptera): Classification and natural history*. Cornell University Press, Ithaca, NY, 336 pp.

SCHUH R. T. & WEIRAUCH CH. 2020: *True bugs of the World (Hemiptera: Heteroptera). Classification and Natural history. Second edition*. Monograph Series. Vol. 8. Siri Scientific Press, Manchester, 767 pp + 32 pls.

SCHUMACHER F. 1913: Ein Beitrag zur Kenntnis der Rhynchoten-Fauna Südafrikas, insbesondere von Deutsch-Südwestafrika, Klein-Namaland und den Kalaharigebiet, auf Grund der Expeditionsergebnisse von Herrn Professor L. Schultze und dem Material des Königl. Zoologischen Museums zu Berlin. In: SCHULTZE L. (ed.): Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und zentralen Südafrika ausgeführt in den Jahren 1903–1905 mit Unterstützung der Kgl. Preussischen Akademie der Wissenschaften zu Berlin. Fünfter Band. Systematik, Tiergeographie und Anthropologie. *Denkschriften der Naturforschenden Gesellschaft zu Jena* **17 (2)**: 47–88.

SENAN A. S., TOMASETTO F., FARCOMENI A., SOMASHEKAR R. K. & ATTORRE F. 2012: Determinants of plant species invasions in an arid island: evidence from Socotra Island (Yemen). *Plant Ecology* **213 (9)**: 1381–1392.

SERVADEI A. 1967: *Rhynchota (Heteroptera, Homoptera Auchenorrhyncha). Fauna d'Italia. Vol. 9*. Calderini, Bologna, 851 pp.

SIGNORET V. 1862: Annexe J. Hémiptères. Pp. J26–J31 + pls. XX–XXI. In: MAILLARD L. (ed.): *Notes sur l'ile de la Réunion (Bourbon)*. Dentu, Paris, 344 pp + annexes A–P [211 pp] + table of contents [4 pp.] + errata [2 pp.] + pls. I–XXVII.

SITES R. W. & VITHEEPRADIT A. 2010: Recovery of the freshwater lentic insect fauna in Thailand following the tsunami of 2004. *Raffles Bulletin of Zoology* **58 (2)**: 329–348.

SKIPPER L. & TOLSGAARD S. 2013: Danmarks taeger – en oversigt. [Danish true bugs – an overview.] Pp. 376–391. In: SKIPPER L.: *Danmarks blomstertaeger. Damnarks Dyreliv.* [*Danish plant bugs. Fauna of Denmark*.] Vol. 12. Apollo Booksellers, Vester Skerninge, 407 pp (in Danish).

SLIMANI N., CHEN P.-P., NIESER N., MOULET P., RIBEIRO J. R. I., BOUMAÏZA M. & GUILBERT E. 2016: Annotated check-list of semi-aquatic bugs of Tunisia, with detailed faunistic survey of north Tunisia (Hemiptera: Heteroptera: Gerromorpha). *Entomologica Americana* **122 (1–2)**: 55–71.

SLIMANI N., MOULET P., CHEN P.-P., NIESER N., PLUOT-SIGWALT D., BOUMAÏZA M. & GUILBERT E. 2015: Checklist, distribution, and a new record of Nepomorphan water bugs (Hemiptera: Heteroptera) in northern Tunisia. *Zootaxa* **3981 (2)**: 151–176.

STÅL C. 1855: Hemiptera från Kafferlandet. [Hemiptera from Kaffraria.] *Öfversigt af Kungliga Vetenskapsakademiens Förhandlingar* **12 (2)**: 89–100 (in Latin, Swedish title).

STEWART A. J. A. & WRIGHT A. F. 1995: A new inexpensive suction apparatus for sampling arthropods in grassland. *Ecological Entomology* **20 (1)**: 98–102.

STOFFELEN E., HENDERICKX H., VERCAUTEREN T., LOCK K. & BOSMANS R. 2013: *De water- en oppervlaktewantsen van België. Fauna van België*. [*Aquatic and semiaquatic true bugs of Belgium. Fauna of Belgium*]. Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, 254 pp (in Dutch).

ŠTUSÁK J. M. 1980: A contribution to the knowledge of Heteropterous fauna of Balkan Peninsula. *Acta Faunistica Entomologica Musei Nationalis Pragae* **16**: 123–128.

SUBRAMANIAN K. A., BASU S. & ZETTEL H. 2014: A new species of *Onychotrechus* Kirkaldy, 1903 (Hemiptera, Heteroptera, Gerridae) from Dooars, West Bengal, India, and a key to males of all species. *Deutsche Entomologische Zeitschrift* **61 (2)**: 133–139.

TASCHENBERG O. 1883: Beiträge zur Fauna der Insel Sokotra, vorzüglich nach dem von Herrn Dr. Emil Riebeck aus Halle a. S. gesammelten Materiale zusammengestellt. *Zeitschrift für Naturwissenschaft* **56**: 157–185.

TAYBI A. F., MABROUKI Y., CHAVANON G., BERRAHOU A. & MILLÁN A. 2018: New data on the distribution of aquatic bugs (Hemiptera) from eastern Morocco with notes on chorology. *Zootaxa* **4459 (1)**: 139–163.

THIRUMALAI G. 2002: A check list of Gerromorpha (Hemiptera) from India. *Records of the Zoological Survey of India* **100 (1–2)**: 55–97.

THIRUMALAI G. 2007: A synoptic list of Nepomorpha (Hemiptera: Heteroptera) from India. *Zoological Survey of India Occasional Paper* **273**: 1–84.

TRAN A. D. & YANG CH. M. 2004: The aquatic bugs (Heteroptera) of the Anambas and Natuna Islands, Indonesia. *Raffles Bulletin of Zoology, Supplement* **11**: 55–58.

USINGER R. L. 1946: Hemiptera. Heteroptera of Guam. In: Insects of Guam – II. *Bulletin of the Bernice P. Bishop Museum* **189**: 11–103.

UVAROV B. P. & POPOV G. B. 1957: The Saltatorial Orthoptera of Socotra. *Journal of the Linnean Society of London, Zoology* **43**: 359–389.

VAN DAMME K. & BANFIELD L. 2011: Past and present human impacts on the biodiversity of Socotra Island (Yemen): implications for future conservation. In: Biodiversity Conservation in the Arabian Peninsula. *Zoology in the Middle East, Supplementum* **3**: 31–88.

VAN DAMME K., VAHALÍK P., KETELAAR R., JEZIORSKI P., BOUWMAN J., MORRIS M., SULEIMAN A. S. & DUMONT H. J. 2020: Dragonflies of Dragon's Blood Island: Atlas of the Odonata of the Socotra Archipelago (Yemen). *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 571–605.

VILLIERS A. 1951: Contribution à l'étude du peuplement de la Mauritanie. Notes sur divers Hémiptères Hétéroptères. *Bulletin de l'Institut Français d'Afrique Noire* **13**: 129–138.

VINOKUROV N. N. 1979: Poluzhestkokrylye semeystva Saldidae (Heteroptera) Mongolskoy Narodnoy Respubliki. (Bugs of the family Saldidae (Heteroptera) of the Mongolian People's Republic.) *Nasekomye Mongolii* [= *Insects of Mongolia*] **6**: 25–33 (in Russian, English title).

VINOKUROV N. N. 2012: Novye i maloizvestnye vidy poluzhestkokrylykh sem. Saldidae (Heteroptera) iz Indii i sopredel'nykh stran. (New and little known species of the family Saldidae (Heteroptera) from India and adjacent countries). *Entomologicheskoe Obozrenie* **91 (2)**: 298–309 (in Russian, English summary). [English translation published in *Entomological Review*, 2012, **92 (8)**: 851–860].

VINOKUROV N. N. 2015: A new species and new data on distribution of the shore bugs of China (Hemiptera: Heteroptera: Saldidae). *Acta Entomologica Musei Nationalis Pragae* **55 (2)**: 569–584.

VINOKUROV N. N., CAI W.-Zh. & CHEN P.-P. 2018: Synopsis of the shore bugs of China (Hemiptera: Heteroptera: Leptopodomorpha: Saldidae). *Zootaxa* **4486 (2)**: 129–145.

VINOKUROV N. N., KANYUKOVA E. V. & GOLUB V. B. 2010: *Katalog poluzhestkokrylykh nasekomykh (Heteroptera) Aziatskoy chasti Rossii*. (*Catalogue of the Heteroptera of the Asian part of Russia*.) Nauka, Novosibirsk, 323 pp (in Russian, English abstract).

VINOKUROV N. N. & KMENT P. 2015: Contribution to the faunistics of shore bugs (Hemiptera: Heteroptera: Leptopodomorpha) in the Palaearctic Region and the Himalayas. *Zootaxa* **4028 (3)**: 367–387.

WAGNER E. 1963: Ergebnisse der Zoologischen Nubien-Expedition 1962. Teil XVII. Heteropteren. *Annalen des Naturhistorischen Museums in Wien* **66**: 477–487.

WALKER F. 1870: A list of the Hemiptera collected by J. K. Lord, Esq., in Egypt, along the African shore of the Red Sea and in Arabia; with descriptions of the species new to science. *Zoologist, Series 2* **5**: 2378–2381.

WALLENGREN H. D. J. 1855: Skandinaviens Corisæ. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* **11** [1854]: 140–151 (in Swedish and Latin).

WANG Y.-H., MOREIRA F. F. F., RÉDEI D., CHEN P.-P., KUECHLER S. M., LUO J.-Y., MEN Y., WU H.-Y. & XIE Q. 2021: Diversification of true water bugs revealed by transcriptome-based phylogenomics. *Systematic Entomology* **46**: 339–356.

WEIR J. S. 1966: Ecology and zoogeography of aquatic Hemiptera from temporary pools in Central Africa. *Hydrobiologia* **28**: 123−128.

WHITE F. B. 1883: Report on the pelagic Hemiptera. In: THOMSON S. W. & MURRAY J. (eds): *Report on the scientific Results of H.M.S. Challenger during the years 1873–76. Zoology, Vol. VII, part IX*. Her Majesty's Stationery Office, 82 pp + pls I–III.

WITLACZIL E. 1886: Die Ausbeute des „Pisani" an *Halobates* während der Erdumseglung 1882–1885. *Wiener Entomologische Zeitung* **5 (5)**: 177–182, 231–234.

WITT A., HULA V., SULEIMAN A. S. & VAN DAMME K. 2020: First record of the red palm weevil *Rhynchophorus ferrugineus* (Olivier) on Socotra Island (Yemen), an exotic pest with high potential for adverse economic impacts. *Rendiconti Lincei, Scienze Fisiche e Naturali* **31 (3)**: 645–654.

WRANIK W. 1998: Faunistic notes on Soqotra Island. Pp. 135−198. In: DUMONT H. J. (ed.): *Proceedings of the First International Symposium on Soqotra Island: Present and Future, Vol. 1*. United Nations Publications, New York, 326 pp.

WRANIK W. 1999: Die Tierwelt der Insel Sokotra. Pp. 81–181. In: WRANIK W. (ed.): *Sokotra. Mensch und Natur.* Jemen-Studien, Band 14. Dr. Ludwig Reichert Verlag, Wiesbaden, xxii + 258 pp + 24 pls.

WRANIK W. 2000: The Socotra Archipelago at the turn of the Millennium. A faunistic report on the occasion of the centennial anniversary of the Austrian expedition to South Arabia in 1898/99. *Quadrifina* **3**: 71–271.

WRANIK W. 2003: *Fauna of the Socotra Archipelago. Field Guide*. Universität Rostock, Rostock, 542 pp.

WRÓBLEWSKI A. 1980: *Pluskwiaki (Heteroptera). Fauna słodkowodna Polski. Zeszyt 8*. [*True Bugs (Heteroptera). Freshwater Fauna of Poland. Vol. 8*.] Państwowe Wydawnictwo Naukowe, Poznań, Warszawa, 154 pp (in Polish).

YANG Ch. M. & MURPHY D. H. 2011: Guide to the aquatic Heteroptera of Singapore and Peninsular Malaysia. 6. Mesoveliidae, with description of a new *Nereivelia* species from Singapore. *Raffles Bulletin of Zoology* **59 (1)**: 53–60.

YANO K., MIYAMOTO S. & CHU Y.-I. 1982: Faunal and biological studies on the insects of paddy fields in Asia. [VI.] Preliminary report on the aquatic and semiaquatic Heteroptera from Taiwan. *Chinese Journal of Entomology* **2 (1)**: 1–13.

YANO K., MIYAMOTO S. & GABRIEL B. P. 1981: Faunal and biological studies on the insects of paddy fields in Asia. IV. Aquatic and semiaquatic Heteroptera from the Philippines. *Esakia* **16**: 5–32.

ZETTEL H. 2000: Neue und wenig bekannte Hebridae (Insecta: Heteroptera) aus Süd-Indien, mit Neubeschreibungen von sechs Arten aus den Gattungen *Hyrcanus* Distant, 1910, *Timasius* Distant, 1909 und *Hebrus* Curtis, 1833. *Annalen des Naturhistorischen Museums in Wien, B* **102**: 97−110.

ZETTEL H. 2002: *Hebrus longipilosus* sp. n. (Heteroptera: Hebridae) aus Indien. *Annales Historico-Naturales Musei Nationalis Hungarici* **94**: 105–108.

ZETTEL H. 2005: A new sea-skater from the southern Philippines, with a key to the Philippine species of *Halobates* (Heteroptera: Gerridae). *Entomofauna* **26 (24)**: 409–420.

ZETTEL H. 2006: Neue Arten der Gattung *Hebrus* Curtis 1833 (Heteroptera: Hebridae) aus Südostasien – 2. Teil. *Linzer Biologische Beiträge* **38 (1)**: 1009–1040.

ZETTEL H. 2014: Annotated catalogue of the semi-aquatic bugs (Hemiptera: Heteroptera: Gerromorpha) of Luzon Island, the Philippines, with descriptions of new species. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen* **66**: 85–140.

ZETTEL H. & CHEN P.-P. 1996: Beitrag zur Taxonomie und Faunistik der Gerridae Vietnams mit Neubeschreibungen der Gattung *Andersenius* gen. nov. aus der Unterfamilie Ptilomerinae und weiterer Arten (Insecta: Heteroptera: Gerridae). *Entomologische Abhandlungen Staatliches Museum für Tierkunde Dresden* **57 (6)**: 149–182.

ZETTEL H., PHAUK S., KHEAM S. & FREITAG H. 2017: Checklist of the aquatic Hemiptera (Heteroptera: Gerromorpha and Nepomorpha) of Cambodia, with descriptions of new species of *Microvelia* Westwood, 1834 and *Ranatra* Fabricius, 1790. *Aquatic Insects* **38 (1–2)**: 21–48.

ZETTEL H. & TRAN A. D. 2009: First inventory of the water bugs (Heteroptera: Nepomorpha, Gerromorpha) of Langkawi Island, Kedah, Malaysia. *Raffles Bulletin of Zoology* **57 (2)**: 279–295.

ZIMMERMANN G. 1982: Beiträge zur Wasserwanzen-Fauna Griechenlands I. (Heteroptera, Nepomorpha, Gerromorpha, Saldidae). *Marburger Entomologische Publikationen* **1 (7)**: 183–216.

**Appendix.** Unrevised list of identified Heteroptera species recorded from the Socotra Archipelago from Taschenberg (1883) to Roca-Cusachs & Kment (2022). Endemic (sub)species are marked by a single asterisk (*), endemic genera by a double asterisk (**), A = Abd el Kuri Island, M = marine species, S = Socotra.

| Family | Species | | First record |
|---|---|---|---|
| Corixidae | *Sigara lateralis* (Leach, 1817) | S | Wranik (1999, 2000, 2003) |
| Ochteridae | *Ochterus socotranus* Kment & Carapezza, 2020 | S | Kment et al. (2020) |
| Notonectidae | **Anisops debilis socotrensis* Brown, 1956 | S | Brown (1956) |
| | *Anisops varius* Fieber, 1851 | S | Wranik (2000, 2003) |
| Mesoveliidae | *Mesovelia vittigera* Horváth, 1895 | S | Wranik (2000, 2003) |
| Veliidae | *Microvelia popovi* Brown, 1951 | S | Wranik (2000, 2003) |
| | **Rhagovelia infernalis socotrensis* Brown, 1956 | S | Taschenberg (1883, as *Velia* sp.), Brown (1956) |
| Gerridae | *Halobates germanus* White, 1883 | M | Herring (1961) |
| | *Halobates hayanus* White, 1883 | M | Witlaczil (1886, as *H. incanus*) |
| | *Onychotrechus rhexenor* Kirkaldy, 1903 | S | Andersen (1980) |
| Reduviidae | *Coranus angulatus* Stål, 1874 | S | Linnavuori (1994a) |
| | *Dasycnamus sahlbergi* Bergroth, 1898 | S | Wranik (2000, 2003) |
| | **Holotrichius insularis* Distant, 1903 | S | Distant (1903) |
| | **Oncocephalus linnavuorii* Moulet, 2001 | S | Moulet (2001) |
| | *Oncocephalus pilicornis* Reuter, 1882 | S | Moulet (2004) |
| | *Peirates strepitans* Rambur, 1839 | S | Linnavuori (1994a) |
| | **Reduvius azrael* Kirkaldy, 1899 | S | Kirkaldy (1899a, 1903a) |
| | **Reduvius nigroluteus* Moulet, 2022 | S | Moulet (2022) |
| | ***Socotredocla spinosa* Moulet, 2020 | S | Moulet (2020) |
| | **Stenolemus inopinatus* Moulet, 2022 | S | Moulet (2022) |
| Nabidae | *Prostemma antipodes* Kerzhner, 1990 | S | Wranik (2003) |
| Cimicidae | *Cimex hemipterus* (Fabricius, 1803) | S | Kirkaldy (1899a, 1903a, as *Klinophilos horrifer*) |
| Anthocoridae | *Xylocoris* sp. | S | Wranik (2003) |
| Joppeicidae | *Joppeicus paradoxus* Puton, 1881 | S | Roca-Cusachs & Kment (2022) |
| Miridae | **Peritropis selene* Linnavuori, 1994 | S | Linnavuori (1994a) |
| | *Taylorilygus figuratus* Linnavuori, 1975 | S | Linnavuori & van Harten (2002) |
| | **Volumnus rufus* Linnavuori, 1997 | S | Linnavuori (1997) |
| | **Yotvata erifyle* Linnavuori, 1994 | S | Linnavuori (1994a) |
| | **Yotvata hadibo* Linnavuori, 1994 | S | Linnavuori (1994a) |
| Tingidae | *Phaenotropis cleopatra* (Horváth, 1905) | S | Linnavuori (1994a) |
| Cydnidae | **Aethus attar* (Kirkaldy, 1903) | S | Kirkaldy (1903a) |
| | *Aethus perithrix* (Mancini, 1937) | S | Linnavuori (1994a) |
| | *Byrsinus pilosulus* (Klug, 1845) | S | Linnavuori (1994a) |
| | *Macroscytus brunneus* (Fabricius, 1803) | S | Linnavuori (1994a) |
| | *Nishadana arabica* Horváth, 1919 | S | Wranik (2003) |
| Dinidoridae | *Coridius viduatus* (Fabricius, 1794) | S | Taschenberg (1883), Kirkaldy (1899a, 1903a, as *Aspongopus assar*) |
| Pentatomidae | *Acrosternum heegeri* (Fieber, 1861) | S | Kirkaldy (1903a, as *Nezara* sp.), Distant (1903) |
| | *Acrosternum millierei* (Mulsant & Rey, 1866) | S | Linnavuori (1994a) |
| | *Bathycoelia alkyone* Linnavuori, 1989 | S | Linnavuori (1989a) |
| | *Carbula limpoponis limpoponis* (Stål, 1854) | S | Wranik (2003, as *C. marginella*) |
| | *Carbula trisignata* (Germar, 1837) | S | Distant (1903) |
| | *Chroantha ornatula* (Herrich-Schaeffer, 1842) | A | Kirkaldy (1899a, as *Ch. hataska*; 1903a) |
| | *Piezodorus hybneri* (Gmelin, 1790) | S | Linnavuori (1994a, as *P. rubrofasciatus*) |
| | ***Socantestia balfouri* (Distant, 1903) | S | Distant (1903) |
| | **Stenozygum jordiribesi* Carapezza, 2011 | S | Carapezza (2011) |
| | *Veterna* sp. | S | Wranik (2003) |
| Pyrrhocoridae | *Scantius forsteri* (Fabricius, 1781) | S | Taschenberg (1883, as *Pyrrhocoris* sp.), Linnavuori (1994a) |
| Rhopalidae | **Leptocoris bahram* Kirkaldy, 1899 | S | Kirkaldy (1899a, 1903a) |
| Coreidae | *Cletus binotulatus obtusulus* Linnavuori, 1978 | S | Wranik (2003) |
| Alydidae | *Euthetus granti* Kirkaldy, 1899 | S | Kirkaldy (1899a, 1903a) |
| | *Euthetus leucostictus* Stål, 1855 | S | Distant (1903) |
| | *Nariscus spinosus* (Burmeister, 1835) | S | Linnavuori (1994a) |
| | *Tenosius proletarius* (Schaum, 1853) | S | Linnavuori (1994a) |
| Lygaeidae | *Aspilocoryphus fasciativentris* (Stål, 1858) | S | Wranik (2003) |
| | *Camptocoris typus* (Distant, 1918) | S | Linnavuori (1994a) |
| | *Melanotelus villosus* (Stål, 1855) | S | Wranik (2003) |
| | **Microspilus ursulae* Deckert, 2012 | S | Deckert (2012) |
| | *Spilostethus pandurus* (Scopoli, 1763) | S | Wranik (2000, 2003) |
| Geocoridae | *Geocoris pallidipennis pallidipennis* (A. Costa, 1843) | S | Wranik (2003) |
| | **Geocoris sokotranus* Kirkaldy, 1899 | S | Kirkaldy (1899a, 1903a) |
| Pachygronthidae | *Opistholeptus pallidus* (Hesse, 1925) | S | Wranik (2003) |
| Rhyparochromidae | *Anepsiocoris encaustus* (Puton, 1869) | S | Linnavuori (1994a) |
| | **Dieuches forbesii* (Kirkaldy, 1899) | S | Kirkaldy (1899a, 1903a) |
| | *Emblethis gracilicornis* Puton, 1883 | S | Linnavuori (1994a) |
| | **Lanchnophorus seminitens* Kment & Carapezza, 2017 | S | Kment et al. (2017) |
| | **Plinthisus daneghanus* Linnavuori & van Harten, 2000 | S | Linnavuori & van Harten (2000) |
| | *Pseudopachybrachius reductus* (Walker, 1872) | S | Linnavuori (1994a, as *P. dubius*) |
| | *Serranegra petrophila* Lindberg, 1959 | S | Linnavuori (1994a) |