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ANNOTATED CHECKLIST OF ANOMURAN DECAPOD CRUSTACEANS OF THE WORLD (EXCLUSIVE OF THE KIWAOIDEA AND FAMILIES CHIROSTYLIDAE AND GALATHEIDAE OF THE GALATHEOIDEA) PART IV – HIPPOIDEA

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INTRODUCTION

The Hippoidea Latreille, 1825 was comprised of the Albuneidae Stimpson, 1858, and Hippidae Latreille, 1825, until, in a monographic revision by Boyko (2002), the new family Blepharipodidae Boyko, 2002, was separated from the Albuneidae. The Hippidae has received far less attention, with the last major revisionary work being that of De Man (1896) for the genus *Hippa* Fabricius, 1787. However, Snodgrass (1952) provided a detailed account of morphological structure and adaptations found in *Emerita* Scopoli, 1777, and comparative information on the other two genera of the family, *Hippa* and *Mastigochirus* Miers, 1878. There has been only a slight increase in the number of recognized valid species of hippoids since Boyko's reassessment of the superfamily: Albuneidae, 48 species in nine genera; Blepharipodidae, six species in two genera; Hippidae, 27 species in three genera.

HISTORY OF CLASSIFICATION

There was some confusion in the late 1700s to early 1800s regarding the composition of the genus *Albunea* Weber, 1795, primarily because of the convergent morphologies of the sand burrowing pereopods seen in the Albuneidae and the brachyuran families Raninidae De Haan, 1839 and Corystidae Samouelle, 1819 (see Boyko, 2002), but this uncertainty has been long sorted out. Boyko (2002) provided information on species of Albuneidae and Blephripodidae up to that date. As previously noted, no revisions of *Hippa* have been made subsequent to De Man's (1896, 1898, as *Remipes*), although problems in the interpretation of *Remipes testudinarius* Latreille, 1806 were addressed by Haig (1970). Lists of species of *Hippa* were presented by Haig et al. (1986) and Boyko & Harvey (1999). *Emerita* has not been treated comprehensively since Schmitt's (1935) work, but Efford (1976) provided a biogeographic treatment of the genus.

INFRAORDER ANOMURA MACLEAY, 1838

Extant families and subfamilies of the superfamily Hippoidea

Albuneidae Stimpson, 1858
- = Albuneidae Stimpson, 1858
- = Lepidopinae Boyko, 2002

Blepharipodidae Boyko, 2002
Hippidae Latreille, 1825

DESCRIPTIVE TERMS AND CURRENT STATUS

General morphology.– The carapace is ovate or subrectangular, covered with distinct grooves (Blepharipodidae, Albuneidae) or setose puncations (Hippidae), often with spines on the anterior margin (Albuneidae, Blepharipodidae). The antennules are elongate in deeper burrowing taxa (Albuneidae, Blepharipodidae) and form a respiratory tube. The eyes are variable, ranging from a single fused structure in *Zygopa* Holthuis, 1961 to plate-like forms in *Albunea* and *Lepidopa* Stimpson, 1858, to elongate unsegmented stalks in *Stemonopa* Efford & Haig, 1968, to pseudosegmented elongate stalks in Blepharipodidae and Hippidae. The mouthparts are adapted for scavenging (Albuneidae, Blepharipodidae, *Hippa*, *Mastigochirus*) or filter feeding (*Emerita*). The gills may be trichobranchiate (Blepharipodidae) or phyllobranchiate (Albuneidae, Hippidae). Pereopod 1 is subchelate (Albuneidae, Blepharipodidae) or non-chelate (Hippidae). Pereopods 2–4 have flattened dactyls, generally similar in shape on pereopods

2 and 3, and adapted for burrowing in sandy substrates. The telson is entire, adpressed to ventral surface of abdomen, and often sexually dimorphic in the Albuneidae. The uropodal rami do not form a tail-fan. Adult males lack pleopods, except in some Albuneidae where they are present but much reduced.

Development. – The zoeal larvae of hippoids are quite characteristic, with later zoeae having a very long recurved rostral spine and a pair of long posterolateral spines, and in this regard they have a superficial resemblance to brachyuran zoeae (Martin & Ormsby, 1991). Very few hippoids have been reared through a complete series of larval stages in laboratory conditions, with only a few others being recorded from plankton samples. In the Lepidopinae, only species of *Lepidopa* Stimpson, 1858 and *Paraleucolepidopa* Calado, 1996 have been reared and appear to pass through four zoeal stages and one megalopal stage (Knight, 1970; Stuck & Truesdale, 1986), although reports of only three zoeal stages for *Lepidopa "richmondi"*and more than five for *Lepidopa chilensis* Lenz, 1902 have also been recorded. However, the report of three stages was based on single specimen (Gore and Van Dover, 1981), while the five or more record (Sanchez & Aguilar, 1975) showed no morphological changes to the later zoeae, except in size, suggesting a delay in metamorphosis to the megalopal stage, perhaps based on substrate requirements. No species of *Albunea*, or any other Albuneinae, have been reared, but based on plankton samples, the number of zoeae appears to be five before the molt to the megalopal stage (Menon, 1937; Seridji, 1988). In the Blepharipodidae, larvae are known for all four species of *Blepharipoda* Randall, 1840, with four or five zoeal stages before the megalopal stage (Boschi et al., 1968; Knight, 1968), and for one species of *Lophomastix* Benedict, 1904, with three zoeal stages and the megalopal stage (Konishi, 1987). In the Hippidae, no larvae are known for the species of *Mastigochirus*, but larvae are known from several species of *Emerita*, which show considerable variability in the number of zoeal stages (6-11) both in natural conditions and in laboratory studies (see Knight, 1967; Siddiqui & Ghory, 2006), probably reflecting substrate requirements of the zoeae. A complete larval series is only known from a single species of *Hippa* (Hanson, 1969), and shows five or six zoeal stages preceeding the megalopal stage. Martin & Ormsby (1991) reported an exceptionally large zoea (6x12 mm carapace, length x width) of a probable *Hippa* sp., but it may have attained this size as a result of delayed metamorphosis to the megalopal stage.

Current status. – All morphological and molecular phylogentic studies show that the Hippoidea is monophyletic and is the basal taxon in the extant Anomura (e.g., Martin & Abele, 1986; Ahyong & O'Meally, 2004; Tsang, et al., 2008; Ahyong, et al., 2009). Within the Hippoidea, the Blepharipodidae is the sister-taxon to Albuneidae+Hippidae (Ahyong & O'Meally, 2004; Ahyong, et al., 2009; Boyko & Harvey, 2009). Monophyletic status of the Albuneidae, Blepharipodidae, and Hippidae is supported by Boyko & Harvey (2009). Within the Albuneidae, the Albuneidae and Lepidopinae form monophyletic groups, although the placement of *Stemonopa* is variable, and *Squillalbunea* Boyko, 2002, and *Zygopa* fall outside of either subfamily at the base of the Albuneidae (Boyko & Harvey, 2009). Although no one has questioned the monophyly of the genera in the Hippidae, no formal test of their relationships has been made outside of a molecular phylogeny by Haye et al. (2002) of the genus *Emerita*.

CHECKLIST

Family Albuneidae Stimpson, 1858 [spelling correction by Miers (1878)] {1}

= Albunidae Stimpson, 1858 (invalid original spelling of Albuneidae)

Albuneinae Stimpson, 1858

Albunea Weber, 1795

= *Albunea* Weber, 1795 [type species *Cancer symmysta* Linnaeus, 1758, by subsequent designation by Holthuis (1956); gender feminine] {2}

= *Albunaea* Duméril, 1806

= Albunée Duméril, 1806 (not Latin, invalid name)

= Albunéa Froriep, 1806 (not Latin, invalid name)

= *Symnista* Rafinesque-Schmaltz, 1815 (unnecessary replacement name for *Albunea* Weber, 1795) {3}

= *Albuminea* de Saussure, 1853 (misspelling)

= *Albanea* Hoffmann, 1874 (misspelling)

= *Aibunea* Menon, 1937 (misspelling)

= *Albunca* Kikuchi, 1961 (misspelling)

= *Albune* Coêlho & Calado, 1987 (misspelling)

= *Albunae* Seridji, 1988 (misspelling)

= *Albumienea* Calado, 1995 (misspelling)

Albunea bulla Boyko, 2002

Albunea carabus (Linnaeus, 1758) [*Cancer*]

= *Cancer carabus* Linnaeus, 1758

= *Albunea guerinii* Lucas, 1853

= *Albunea barbara* Ortmann, 1896 (nomen nudum)

Albunea catherinae Boyko, 2002

Albunea danai Boyko, 1999

Albunea elegans A. Milne-Edwards & Bouvier, 1898

Albunea elioti Benedict, 1904

Albunea galapagensis Boyko, 2002

Albunea gibbesii Stimpson, 1859

= *Albunaea Gibbesi* Stimpson, 1858 (nomen nudum)

= *Albunaea Gibbesii* Stimpson, 1859 (misspelling of *Albunea*)

Albunea groeningi Boyko, 2002

Albunea holthuisi Boyko & Harvey, 1999

Albunea lucasia de Saussure, 1853

= *Albuminea Lucasia* de Saussure, 1853 (misspelling of *Albunea*)

= *Albunea lucasii* Stimpson, 1857 (misspelling of *lucasia*)

= *Albunaea Lucasii* Stimpson, 1858 (misspelling of *lucasia*)

= *Albunea lucasi* von Prahl, Guhl & Grögl, 1979 (misspelling *lucasia*)
= *Albumienea lucasia* Calado, 1995 (misspelling of *Albunea*)
Albunea marquisiana Boyko, 2000
Albunea microps Miers, 1878
Albunea occulta Boyko, 2002 {4}
= *Albunea occultus* Boyko, 2002
Albunea okinawaensis Osawa & Fujita, 2007
Albunea paretii Guérin-Méneville, 1853
= *Albunea oxyophthalmus* White, 1847 (nomen nudum)
= *Albunaea oxyophthalma* Stimpson, 1858 (nomen nudum)
= *Albunaea Paretii* Stimpson, 1858 (misspelling of *Albunea*)
= *Albunea oxyophthalma* Miers, 1878
= *Albunea pareti* Ortmann, 1896 (misspelling of *paretii*)
= *Albunea axyophthalma* Moreira, 1901 (misspelling of *oxyophthalma*)
= *Albunea oxycephala* Verrill, 1901 (misspelling of *oxyophthalma*)
= *Albunea paretoi* Castro, 1967 (misspelling of *paretii*)
= *Albunea paretti* Rodriguez, 1980 (misspelling of *paretii*)
Albunea speciosa Dana, 1852
= *Albunea madagascariensis* Thomassin, 1973
Albunea steinitzi Holthuis, 1958
Albunea symmysta (Linnaeus, 1758) [*Cancer*] {5}
= *Cancer symnista* Linnaeus, 1767 (misspelling of *symmysta*) {6}
= Cancer *gymnista* Statius Müller, 1775 (misspelling of *symmysta*)
= *Cancer lymnista* Froriep, 1806 (misspelling of *symmysta*)
= *Albunea Symniste* Duméril, 1816 (misspelling of *symmysta*)
= *Albunaea symnista* Stimpson, 1858 (misspelling of *symmysta*)
= *Albunea symnysta* Chace & Kensley, 1992 (misspelling of *symmysta*)
= *Cancer symmista* Calado, 1995 (misspelling of *symmysta*)
= *Albunea symnestra* Dexter, 1996 (misspelling of *symmysta*)
= *Albunea edsoni* Calado, 1997a
Albunea thurstoni Henderson, 1893
Squillalbunea Boyko, 2002 {7}
= *Squillalbunea* Boyko, 2002 (type species *Albunea mariellae* Serène, 1973, by original designation; gender feminine) {7}
Squillalbunea scutelloides (Garstang, 1897) [*Albunea*]
= *Albunea scutelloides* Garstang, 1897 (senior synonym of *Albunea mariellae* and valid type species of *Squillalbunea*; gender feminine) {7}
= *Albunea mariellae* Serène, 1973
Stemonopa Efford & Haig, 1968 {8}
= *Stemonopa* Efford & Haig, 1968 (type species *Stemonopa insignis* Efford & Haig, 1968, by original designation; gender feminine)
Stemonopa insignis Efford & Haig, 1968
Zygopa Holthuis, 1961 {9}
= *Zygopa* Holthuis, 1961 (type species *Zygopa michaelis* Holthuis, 1961, by original designation; gender feminine)
Zygopa michaelis Holthuis, 1961
Zygopa nortoni Serène & Umali, 1965
Lepidopinae Boyko, 2002
Austrolepidopa Efford & Haig, 1968
= *Austrolepidopa* Efford & Haig, 1968 (type species *Austrolepidopa schmitti* Efford & Haig, 1968, by original designation; gender feminine)
Austrolepidopa caledonia Boyko & Harvey, 1999
Austrolepidopa schmitti Efford & Haig, 1968
Austrolepidopa trigonops Efford & Haig, 1968
Lepidopa Stimpson, 1858
= *Lepidopa* Stimpson, 1858 (type species *Lepidopa venusta* Stimpson, 1859, by subsequent designation by Opinion 693 [ICZN, 1964]; gender feminine) {10}
= *Lepidops* Stimpson, 1860 (incorrect subsequent spelling)
= *Lepidops* Miers, 1878 (unjustified emendation) {11}
= *Ledopipa* Calado, 1987 (misspelling)
Lepidopa benedicti Schmitt, 1935
Lepidopa californica Efford, 1971
= *Lepidopa californica* Coêlho & Calado, 1987 (misspelling of *californica*)
Lepidopa chilensis Lenz, 1902
Lepidopa deamae Benedict, 1903
= *Lepidopa rhomboocularis* Schuster-Dieterichs, 1956 (nomen nudum)
= *Lepidopa sorodeamae* Efford, 1971
= *Lepidopa daemae* Rios, Ramos & von Prahl, 1990 (misspelling of *deamae*)
Lepidopa dexterae Abele & Efford, 1972
Lepidopa esposa Efford, 1971
Lepidopa haigae Efford, 1971
Lepidopa luciae Boyko, 2002
Lepidopa mearnsi Benedict, 1903
Lepidopa mexicana Efford, 1971
Lepidopa richmondi Benedict, 1903
= *Lepidopa fernandesi* Garcia Mendes, 1945
Lepidopa venusta Stimpson, 1859 {12}
Lepidopa websteri Benedict, 1903
Lepidopa wollebaeki Sivertsen, 1934
= *Lepidopa wollebaecki* Gordon, 1938 (misspelling of *wollebaeki*)
= *Lepidopa wolleboecki* Garcia Mendez, 1945 (misspelling of *wollebaeki*)
= *Lepidopa wollebacki* Calado, 1987 (misspelling of *wollebaeki*)
= *Lepidopa wolleboeki* Hendrikx & Harvey, 1999 (misspelling of *wollebaeki*)

Leucolepidopa Efford, 1969
= *Leucolepidopa* Efford, 1969 (type species *Leucolepidopa sunda* Efford, 1969, by original designation; gender feminine)
Leucolepidopa sunda Efford, 1969
Paralbunea Serène, 1977 {13}{14}
= *Paralbunea* Serène, 1977 (type species *Paralbunea manihinei* Serène, 1977, by monotypy; gender feminine)
Paralbunea dayriti (Serène & Umali, 1965) [*Albunea*]
Paralbunea intermedia (Balss, 1916) [*Albunea*]
Paralbunea manihinei Serène, 1977
Paralbunea paradoxa (Gordon, 1938) [*Albunea*]
Paraleucolepidopa Calado, 1996 {15}
= *Paraleucolepidopa* Calado, 1996 (type species *Lepidopa panamaensis* Efford, 1971, by original designation, gender feminine)
Paraleucolepidopa distincta (Gomes Corrêa, 1968) [*Lepidopa*]
Paraleucolepidopa myops (Stimpson, 1860) [*Lepidops*]
= *Lepidopa panamaensis* Efford, 1971

Family Blepharipodidae Boyko, 2002

Blepharipoda Randall, 1840
= *Blepharipoda* Randall, 1840 (type species *Blepharipoda occidentalis* Randall, 1840, by monotypy; gender feminine)
= *Albunhippa* H. Milne Edwards & Lucas, 1841 (type species *Albunhippa spinosa* H. Milne Edwards & Lucas, 1841, by monotypy; gender feminine)
= *Albunhippe* Agassiz, 1845 (misspelling)
= *Abrote* Philippi, 1857 (type species *Abrote spinimana* Philippi, 1857 by monotypy; gender feminine)
= *Blepharopoda* Stimpson, 1858 (misspelling)
= *Blefaripoda* Porter, 1936 (misspelling)
= *Blephoripoda* Turner & Sexsmith, 1964 (misspelling)
= *Albunhipa* Calado, 1987 (misspelling)
Blepharipoda doelloi Schmitt, 1942
Blepharipoda liberata Shen, 1949
Blepharipoda occidentalis Randall, 1840
Blepharipoda spinosa (H. Milne Edwards & Lucas, 1841) [*Albunhippa*]
= *Abrote spinimana* Philippi, 1857
= *Blephaopoda speciosa* Bouvier, 1898 (misspelling of *Blepharipoda*)
Lophomastix Benedict, 1904
= *Lophomastix* Benedict, 1904 (type species *Lophomastix diomedeae* Benedict, 1904, by original designation; gender feminine)
= *Lophomastrix* Urita, 1934 (misspelling)
= *Lophopmastrix* Sun & Wang, 1996 (misspelling)
= *Lophmastrix* Sun & Wang, 1996 (misspelling)
Lophomastix diomedeae Benedict, 1904
Lophomastix japonica (Duruflé, 1889) [*Blepharopoda* (misspelling of *Blepharipoda*)]
= *Blepharopoda fauriana* Bouvier, 1898 (misspelling of *Blepharipoda*)
= *Lophomastix tchangsii* Yü, 1935
= *Lophomastrix brevirostris* Urita, 1934 (misspelling of *Lophomastix*)

Family Hippidae Latreille, 1825

Emerita Scopoli, 1777
= *Emerita* Scopoli, 1777 (type species *Cancer emeritus* Linnaeus, 1767, by subsequent monotypy; gender feminine) {16}
Emerita analoga (Stimpson, 1857) [*Hippa*]
Emerita austroafricana Schmitt, 1937
Emerita benedicti Schmitt, 1935
Emerita brasiliensis Schmitt, 1935
Emerita emeritus (Linnaeus, 1767) [*Cancer*] {17}
= *Hippa asiatica* H. Milne Edwards, 1837
Emerita holthuisi Sankolli, 1965
Emerita karachiensis Niazi & Haque, 1974
Emerita portoricensis Schmitt, 1935
Emerita rathbunae Schmitt, 1935
Emerita talpoida (Say, 1817) [*Hippa*] {18}
Hippa Fabricius, 1787
= *Hippa* Fabricius, 1787 [type species *Hippa adactyla* Fabricius, 1787, by subsequent designation by Rathbun (1900); gender feminine] {19}
= *Remipes* Latreille, 1806 (type species *Remipes testudinarius* Latreille, 1806 by monotypy; gender masculine) {20}
Hippa adactyla Fabricius, 1787 {21}
= *Remipes denticulatifrons* White, 1847 (nomen nudum)
= *Remipes testudinarius* Latreille, 1806
= Remipède tortue Latreille, 1816 (not Latin, not valid name)
= *Remipes testudinarius* var. *denticulatifrons* Miers, 1878
Hippa admirabilis (Thallwitz, 1892) [*Remipes*]
Hippa alcimede (De Man, 1902) [*Remipes*]
Hippa australis Hale, 1927
Hippa carcineutes Holthuis & Manning, 1970
Hippa caelano (De Man, 1896) [*Remipes*]
Hippa granulata (Borradaile, 1904) [*Remipes*]
= *Remipes granulatus* Borradaile, 1904
Hippa hirtipes (Dana, 1852) [*Remipes*]
Hippa indica Haig, Murugan & Balakrishnan Nair, 1986
Hippa marmorata (Hombron & Jacquinot, 1846) [*Remipes*] {22}
= *Remipes pacificus* Dana, 1852
Hippa ovalis (A. Milne-Edwards, 1862) [*Remipes*]
= *Remipes celebensis* Thallwitz, 1892
Hippa picta (Heller, 1861) [*Remipes*]
Hippa strigillata (Stimpson, 1860) [*Remipes*]

Hippa testudinaria (Herbst, 1791) [*Cancer*]
= *Remipes cubensis* de Saussure, 1857
= *Remipes barbadensis* Stimpson, 1858
Hippa truncatifrons (Miers, 1878) [*Remipes*]
Mastigochirus Miers, 1878
= *Mastigopus* Stimpson, 1858 (type species *Mastigopus gracilis* Stimpson, 1858, by original designation; gender masculine) {23}
= *Mastigochirus* Miers, 1878 (type species *Mastigopus gracilis* Stimpson, 1858, by original designation; gender masculine)
Mastigochirus gracilis (Stimpson, 1858)
= *Mastigopus gracilis* Stimpson, 1858
Mastigochirus quadrilobatus Miers, 1878

NOTES

{1} Placed on the Official List of Family-Group Names in Zoology (ICZN, 1958).

{2} Placed on the Official List of Generic Names in Zoology (ICZN 1958).

{3} Placed on the Official Index of Rejected and Invalid Generic Names in Zoology (ICZN, Opinion 522, 1958).

{4} The specific name was emended to *occulta* by Sakai & Sawada (2006).

{5} Placed on the Official List of Species Names in Zoology (ICZN, 1958).

{6} The spelling "*symnista*" by Linnaeus (1767) was either a *lapsus calami* or an unjustified emendation. In either case, it has been incorrectly used as the name of this species by many authors (see Boyko, 2002 for list).

{7} Boyko (2010) determined that *S. mariellae* was actually a junior synonym of *S. scutelloides*, a species described by Garstang (1897) but overlooked by all subsequent researchers. Garstang's species replaces *S. mariella* as the type species of the monotypic *Squillalbunea*. In the phylogenetic analyses of Boyko & Harvey (2009), *Squillalbunea* appears as the sister-taxon to Albuneinae+Lepidopinae.

{8} The placement of this genus is unclear. It appears within the Albuneinae or Lepidopinae, depending on whether fossil taxa are included in the phylogenetic analysis (Boyko & Harvey, 2009).

{9} *Zygopa* appears as the basal albuneid genus and sister-taxon to *Squillalbunea*+Albuneinae+Lepidopinae in the phylogenetic analyses of Boyko & Harvey (2009).

{10} Placed on the Official List of Generic Names in Zoology (ICZN, 1964).

{11} Placed on the Official Index of Rejected and Invalid Generic Names in Zoology (ICZN, 1964).

{12} Placed on the Official List of Generic Names in Zoology (ICZN, 1964).

{13} Although considered a member of the Albuneinae by Boyko (2002) and De Grave et al. (2009), the morphological analyses of Boyko & Harvey (2009) show *Paralbunea* to be the basal genus in the Lepidopinae.

14} Placed on the Official List of Specific Names in Zoology (ICZN, 1964). This genus is possibly not monophyletic with respect to all currently included species.

{15} Although Calado clearly intended that this generic name should be available from Calado (1997b), all the requirements for availability were met by its use in Calado (1996) and the name must be considered as available from the earlier paper.

{16} Placed on the Official List of Generic Names in Zoology (ICZN, 1963).

{17} Placed on the Official List of Specific Names in Zoology (ICZN, 1963).

{18} Placed on the Official List of Specific Names in Zoology (ICZN, 1963)

{19} Placed on the Official List of Generic Names in Zoology (ICZN, 1958).

{20} Some authors have credited *Remipes* to Latreille (1804) but the name was used therein without any included available specific names, or references to them, in combination with it. The name was made available from Latreille (1806) who included a single species in it with certainty. Latreille (1806) did list *Hippa adactyla* Fabricius and, by implication, *Cancer testudinarius* Herbst, but appended a question mark after both entries. Neither of these names can be considered to be originally included species in the genus, making *Remipes testudinarius* Latreille the type species by monotypy.

{21} Placed on the Official List of Specific Names in Zoology (ICZN, 1963)

{22} The correct date of publication for this species was given by Clark & Crosnier (2000). The correct authorship for the species was noted by Holthuis (2002). The name *marmoratus*, as published in the binomen *Remipes marmoratus*, was placed on the Official List of Specific Names in Zoology (ICZN, 2004).

{23} *Mastigopus* Stimpson, 1858 is a junior homonym of *Mastigopus* Leuckart, 1853 (a name given to larval stages of penaeid shrimp of the genus *Sergestes* H. Milne Edwards, 1830, and a junior synonym of *Sergestes*).

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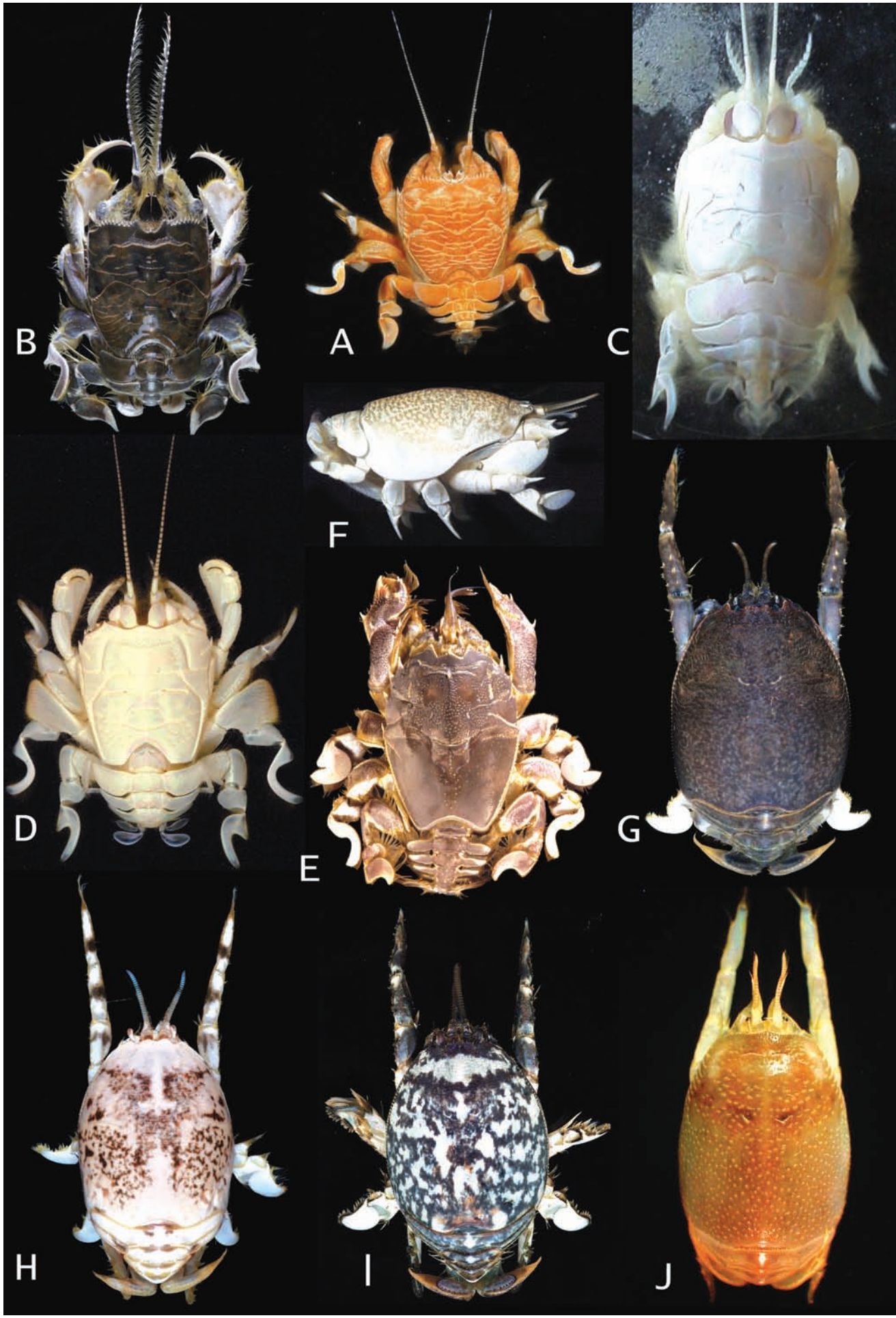
Fig. 1. Hippoidea. Representatives of Family Albuneidae Stimpson, 1858: A, *Albunea elioti* Benedict, 1904, Moorea, French Polynesia (A. Anker); B, *Albunea occulta* Boyko, 2002, Taiwan (T.-Y. Chan); C, *Lepidopa websteri* Benedict, 1903, Georgia, United States (C. Boyko); D, *Paraleucolepidopa myops* (Stimpson, 1860), Panama, eastern Pacific, ULLZ 10659 (D. L. Felder); E, *Blepharipoda occidentalis* Randall, 1840, California, United States (C. Boyko and S. Thurston); F, *Emerita rathbunae* Schmitt, 1935, Panama, eastern Pacific, ULLZ 10661 (D. L. Felder); G, *Hippa adactyla* Fabricius, 1787, Taiwan (T.-Y. Chan); H, *Hippa marmorata* (Hombron & Jacquinot, 1846), Taiwan (T.-Y. Chan); I, *Hippa ovalis* (A. Milne-Edwards, 1862), Taiwan (T.-Y. Chan); J, *Hippa truncatifrons* (Miers, 1878), Taiwan (T.-Y. Chan). ULLZ = University of Louisiana at Lafayette Zoological Collections.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