

A nomenclature for the extant hermatypic scleractinian corals including type locations and taxonomic status for 2,338 nominal species

Augustine J. CROSBIE^{1,2}, Tom C.L. BRIDGE^{1,2}, Hanaka MERA¹, Sage H. RASSMUSSEN³, Patrick C. CABAITAN⁴, Peter F. COWMAN^{1,2,6}, Erika GRESS¹, Mila GRINBLAT^{5,6}, Jeremy HOROWITZ⁷, Rachel E. CAMILLERI¹, Andrew H. BAIRD¹

¹ College of Science and Engineering, James Cook University, Townsville, Queensland 4811, Australia

² Biodiversity & Geosciences Program, Queensland Museum Tropics, Townsville, Queensland 4810, Australia

³ KAUST Coral Restoration Initiative (KCRI), King Abdullah University of Science and Technology (KAUST), 23955, Thuwal, Saudi Arabia

⁴ Marine Science Institute, University of the Philippines Diliman, Quezon City 1101, Philippines

⁵ College of Medicine and Dentistry, James Cook University, Townsville, Queensland 4811, Australia

⁶ Centre for Tropical Bioinformatics and Molecular Biology, James Cook University, Townsville, Queensland 4811, Australia

⁷ Department of Invertebrate Zoology, Smithsonian Institution, National Museum of Natural History, Washington, DC 20560, USA

augustine.crosbie@my.jcu.edu.au

<https://doi.org/10.17082/hwmu8830>

Citation: Crosbie, A.J., Bridge, T.C.L., Mera, H., Rassmussen, S.H., Cabaitan, P.C., Cowman, P.F., Gress, E., Grinblat, M., Horowitz, J., Camilleri, R.E. & Baird, A.H. (2026). A nomenclature for the extant hermatypic scleractinian corals including type locations and taxonomic status for 2,338 nominal species. *Memoirs of the Queensland Museum | Nature* 67: 1–10. Brisbane ISSN 2204-1478 (Online), ISSN 0079-8835 (Print). Accepted: 16 December 2025. Published online: 22 January 2026.

Keywords:

biogeography | coral reef | topotypes | taxonomy | history.

ABSTRACT

Molecular phylogenetic analyses have revealed that many scleractinian coral species described using traditional taxonomic approaches are composed of multiple distinct genetic lineages. Resolving the taxonomy of these lineages requires an integrated approach that combines molecular phylogenies with additional lines of evidence (e.g. morphological, geographical and ecological data), alongside examination of type material. This approach is essential to determine which of these lineages represent distinct species, and in turn whether these distinct species represent nominal species that are valid, are currently considered synonyms, or are undescribed. Given that most scleractinian coral type specimens are bleached skeletons lacking tissue for molecular analysis, the key to testing the validity of nominal species is the collection of topotypes; specimens collected from the type location of the nominal species that closely match the morphology of the type material. These provide a molecular archetype of the nominal species to allow for robust molecular tests of specimen identity and species evolutionary relationships. Here, we collate information from 383 authorities, between 1758 to 2025, into a nomenclature containing the taxonomic status and type location for all nominal species of extant hermatypic Scleractinia. The nomenclature covers 2,338 nominal species and includes information such as nominal species name, species authority, year described, current status (valid, invalid, unaccepted), accepted species name and source of synonymy. Importantly, the type location was traced (to varying levels of precision) for 2,132 of these nominal species, with only 206 species type locations remaining untraceable at time of publication. The nomenclature also includes information on all 383 authorities and the 362 original texts they are contained within. This resource will facilitate the necessary taxonomic revisions to produce a workable taxonomy and provide valuable information for the wider coral reef scientific community and managers trying to confidently apply names to the distinct lineages increasingly revealed by molecular data.

BACKGROUND AND SUMMARY

Taxonomy and species names underpin virtually all research on coral physiology, ecology, and population genetics. A robust taxonomic framework that accurately reflects species boundaries and evolutionary relationships is therefore essential for scientific inference and communication, as well as the effective management and conservation of coral reefs. Historically, coral taxonomy was based largely on morphological characteristics of the skeleton. However, the extensive phenotypic plasticity within and between coral species has long posed challenges for delineating species boundaries and geographic ranges (Veron & Pichon 1976; Todd 2008; Paz-García et al. 2015; Brambilla et al. 2022). Molecular approaches have revealed that many of the morphological characters traditionally used to distinguish families, genera and species are not taxonomically informative and do not reflect corals' evolutionary history or systematic relationships (Romano & Palumbi 1996; Fukami et al. 2004, 2008), leading to revisions at every taxonomic level (Kitahara et al. 2016). The last 20+ years of molecular and morphological analysis has revealed fundamental flaws in the taxonomic framework of

the hermatypic Scleractinia that emerged in the later part of the 20th century, despite its continued use for coral identification in research and management (Huang et al. 2011, 2014a, 2014b; Arrigoni et al. 2014; Huang et al. 2016; Quek et al. 2023; Bridge et al. 2024; Rassmussen et al. 2025). The inability to accurately identify species, discern geographic ranges and assess population trajectories compromises our capacity to manage coral reefs in the face of existential threats such as climate change (Hughes et al. 2017).

Resolving the taxonomy of scleractinian corals will require the monumental task of revisiting past decisions on synonymies, along with a comprehensive molecular and morphological re-evaluation of all nominal species. Unfortunately, unlike many other taxonomic groups, type material for scleractinian corals is primarily dried and/or bleached calcium carbonate skeletons, lacking preserved tissue. Therefore, it is rarely possible to sequence original name-bearing type material using the increasingly effective high-throughput sequencing techniques used in other taxonomic groups (Blaimer et al. 2016; McCormack et al. 2016; McGuire et al. 2018). Instead, the integration

of type specimens into a molecular framework is best achieved through the collection and genetic sequencing of topotype specimens (Bonito et al. 2021). Although not formally regulated by the International Code of Zoological Nomenclature (ICZN), a topotype is a specimen of a species originating from the type location of the nominal species, with morphological features matching the diagnosis of the name-bearing type material. Topotypes can provide tissue from which DNA can be extracted and sequenced to anchor a nominal species identity within a molecular phylogeny. Combined with additional samples, these anchored phylogenies enable species boundaries to be more precisely circumscribed, improving both species delimitation and the consistency of their interpretation and application. For example, Bridge et al. (2024) included topotypes of *Acropora tenuis* (Dana, 1846) and *A. kenti* (Brook, 1892), which was synonymised with *A. tenuis* by Veron & Wallace (1984). These 2024 topotype anchored phylogenies demonstrated that both nominal species were distinct and valid, warranting the resurrection of *A. kenti*. Similarly, Rassmussen et al. (2025) investigated the *A. hyacinthus* (Dana, 1846) complex using topotype anchored phylogenies, leading to the removal of nine nominal species from synonymy and the description of five new species. Additionally, collecting topotypes allows for observations of field characters that are not evident from the skeletons of type material, providing additional information for species identification that can be used by non-taxonomists (e.g. colour, colonial morphology, habitat). In many cases, information on the type location of a nominal species requires investigating the original description, the museum catalogue, or the museum label that accompanies the type material. This information is scattered across more than 380 authorities published over the last 250 years, as well as specimens and archival records housed in numerous institutions around the globe, underscoring the need for a nomenclature database that consolidates this information and makes it readily available.

Here, we present a nomenclature with information on type location for 2,338 nominal species of extant hermatypic Scleractinia. This process involved online searches and interlibrary loans to access books or

PDF files for 383 authorities. The nomenclature includes the type location of each nominal species as well as other information that can be used to infer a type location, such as the person who collected it or the voyage/expedition on which the specimen was collected. This information is required for field collection of topotypes, but can also be used to determine the most likely name of a specimen collected from a particular location. Using the nomenclature, authors can identify nominal species described from their region, allowing them to apply the appropriate names to species in advance of formal taxonomic revisions. Ultimately, the aim of this nomenclature is to stimulate and enable the taxonomic revisions required to produce a workable taxonomic framework for science and conservation.

METHODS

An initial list of the nominal species of hermatypic scleractinian corals and associated information was retrieved from the World list of Scleractinia (Hoeksema & Cairns 2025), a section of the World Register of Marine Species (WoRMS) (WoRMS Editorial Board 2024). Through a combination of this list and additional searches by the authors, 362 publications were identified and located (either online or as an interlibrary loan) that contain original species descriptions. For a species to be included in the nomenclature, it required a binomial name and written description (e.g. some form of descriptive text beyond a name). Information under 'Data entry' was extracted from the 362 publications and cross-referenced with the information in WoRMS. Type material, museum collection records, and additional material (such as ship logs) were also consulted where appropriate to supplement and/or clarify original published information. Nominal species found in the publications but not listed in WoRMS were subsequently added to the species list.

On identifying type location

The type location of a nominal species is usually included in the species description. However, many of the authorities of species descriptions are over 100 years old and the way information is presented is not always as precise or clear as current standards. Original publications that contain location and

collector information have been presented in the nomenclature exactly as written, even if the place name is ambiguous or has changed over time. Alternatively, information on type location is often found elsewhere in the publication the authority was a part of, such as in the title, introduction, or the description of plates. Where the type location is vague, unclear, or not listed, additional material can provide relevant information. For example, physical labels associated with the type materials often provide location data that is not in the original description.

When the type location is not evident in the authority or on the specimen label, it is possible to infer from records of the ship or expedition on which the specimen was collected. For example, Verrill (1866) lists several species as having a type location of 'Ousima – Japan'. This could refer to Ōshima Island [大島], the largest of the Izu Islands in Tokyo prefecture, or Ōshima Island [大島] a large island in Fukuoka prefecture, or indeed any of the large islands in Japan because Ōshima literally means 'large island'. In this specific case, these specimens were collected on the U.S. North Pacific Exploring Expedition, a well-documented voyage, where the published ship logs give latitudes and longitudes for the sites where the vessel anchored (Small 1856). It is reasonable to assume that the specimens were therefore collected in the general area where the ship was anchored. From this information, we were able to identify the island Verrill called 'Ousima' as Amami Ōshima [奄美大島], a large island between Kagoshima and Okinawa prefectures.

Many nominal species were described by researchers based on specimens collected by others; the biography of the collector often helps infer a more precise type location if the one given by the authority is vague. For example, Lamarck (1816) used the following type locations for many of his specimens 'Habite les mers Australes' [inhabits the Southern Seas], or 'Habite les mers de la Nouvelle-Hollande' [inhabits the seas of New Holland]. Both describe too large an area or too vague a location to be particularly useful for the collection of topotypes. However, in some cases Lamarck also listed the collectors as 'Péron et le Sueur'. François Péron and Charles Alexandre le Sueur were naturalists on the

Baudin expedition (1800–1803). Peron's journal suggests that corals from 'Nouvelle-Hollande' were only collected at two locations on the west coast of Australia: Hamelin Bay (34.2°S, 115°E) and Shark Bay (25.5°S, 113.5°E) (Péron et al. 1807). Similarly, *Physophyllia ayleni* Wells, 1935 has a type location of 'Japan', with the collector listed as 'J.F.R. Aylen'. *Acropora pruinosa* (Brook 1893), with a more precise type location of 'Tsu-sima' [Tsushima Island], Korea Straits also lists the collector as J.F.R. Aylen Esq., R.N. (short for Esquire, Royal Navy). Furthermore, the tag on the lectotype in the British Museum lists his first name as John. With this information, British Navy records can be used to establish the collectors' movements. John Franklin Robins Aylen served as a Midshipman on the HMS *Perseus* (1861), where medical reports indicate he was injured at the age of 17 while the ship was involved in the Anglo-Japanese hostilities of 1863–64 in Kagoshima, Japan. Furthermore, the ship was posted to Nagasaki prefecture in June 1864, suggesting that Aylen's travels were limited to the waters of Kagoshima, Nagasaki and Tsushima Island in the Korea Strait. Therefore, it can be inferred that *P. ayleni* Wells, 1935 was likely collected from the west coast of Kyushu, potentially from Tsushima Island alongside *A. pruinosa* (Brook, 1893).

DATA ENTRY

WoRMS_AphiaID: A unique identifier (taxon Aphia ID number) listed in WoRMS, or 'Not Listed' if the nominal species is not in WoRMS.

Nominal_Species: A valid species can have multiple names through time. For example, *Pocillopora damicornis* (Linnaeus, 1758) was originally described as *Millepora damicornis*, then placed in the genus *Madrepora* by Pallas (1766), and finally moved into the genus *Pocillopora* by Lamarck (1816). Here, we list the nominal species name as spelled by the original authority, in this example *Millepora damicornis*. We also include *nomen novum* (Latin for 'new name') to provide clarity when a species has been renamed for nomenclatural reasons, e.g. because it was designated as a junior homonym under the International Code for Zoological Nomenclature (Article 53: ICZN 1999). For example, *Madrepora ornata* Brook, 1891 is a homonym of *Madrepora*

ornata DeFrance, 1826 (fossil) and was given the *nomen novum* *Madrepora affinis* Brook, 1893. Both *Madrepora ornata* Brook, 1891 and *Madrepora affinis* Brook, 1893 are included in the nomenclature.

Authority: The taxonomic authority of the nominal species. In many cases, this is the same as the publication where the nominal species was described, e.g. for *M. damicornis* the authority is Linnaeus, 1758. Occasionally the taxonomic authority differs from the citation for the publication in which the nominal species was described, e.g. for *Micromussa pacifica* the authority is Benzoni & Arrigoni, 2016, but the citation for the publication is Arrigoni et al. (2016). When the species name is a *nomen novum*, we cite the authority that provided the new name.

Year_Described: The year in which the original species description was published. Determining the correct publication year of nominal species descriptions can be complicated, e.g. if they were published as part of a larger series (see Ott, 1995). Consequently, some of the years presented in the nomenclature differ to those in WoRMS. Primarily, we list the year described as the date of publication, however, we use dates listed in Ott (1995) for the year of Esper's descriptions. Similarly, for species described by Milne-Edwards and Haime, we use the publication date of the monograph series they are contained within.

Valid_Invalid_Uncertain: The status of a nominal species, regardless of genus combination or spelling change.

- *Valid:* If the nominal species is considered valid.
- *Invalid:* If the nominal species is considered invalid, e.g. a junior synonym.
- *Uncertain:* If the nominal species has not been assessed.

Status_WoRMS: The status of the genus or species name currently listed in WoRMS. Explanations as defined in WoRMS.

- *Accepted:* Valid name (International Code for Zoological Nomenclature) or name considered to be taxonomically correct (International Code for Botanical Nomenclature).
- *Unaccepted:* Synonym name, or anything that is not accepted.

- *Uncertain:* To indicate taxonomic or nomenclatural uncertainty for cases that cannot be classed as either 'accepted' or 'unaccepted'.
- *Not listed:* Species not listed in WoRMS when present manuscript was submitted.

Status_Justification_WoRMS: The reason for the status of a genus or species as stated in WoRMS.

- *Synonym:* When a species/genus is synonymised with another species/genus.
- *Basionym, superseded combination:* When a species is transferred to another genus.
- *Homonym:* To indicate the invalid status of the junior or later established species with identical names.
- *Nomen nudum:* Latin (meaning 'naked name'), applied to a nominal species name that does not comply with the naming requirements of the Code because it lacks a description.
- *Nomen oblitum:* Latin (meaning 'forgotten name') applied after 1 January 2000 to a name, unused since 1899, which due to ICZN Article 23.9.2., does not take precedence over a younger synonym or homonym in prevailing usage.
- *Amended spelling:* When a species name is changed to correct errors in the original spelling.
- *Nomen dubium:* Latin (meaning 'doubtful name'), applied to a nominal species name of uncertain or doubtful taxonomic application (no appropriate type material or if the original description is vague or inadequate).
- *Taxon inquirendum:* A taxon of which the taxonomic validity is uncertain or disputed by different experts.

Evidence_of_Formal_Synonymy: The authority for the earliest evidence of synonymy (either made or upheld), if applicable. Species synonymy is not static, as nominal species can shift in and out of synonymy over time, or can shift between synonymy with different species. For example, *Acropora humilis* (Dana, 1846) has been associated with 15 synonymies by Wells (1954), five by Veron & Wallace (1984), and four by Wallace (1999). Further, of the 50+ synonymies listed within Wells (1954), only 19 remain unchanged (which is reflected in

the nomenclature); others have been resurrected, re-synonymised with different taxa, or since been deemed unresolved (e.g. *taxon inquirendum*).

Year_Synonymy: The year in which the 'Evidence_of_Formal_Synonymy' was published.

Valid_Name: The valid (accepted) name listed in WoRMS for a given nominal species.

Family and Genus (two categories): The family and genus names currently associated with the valid name in WoRMS. These columns have been included to capture all the relevant nominal species for those aiming to revise a given family or genus.

Valid_Name_Authority: The taxonomic authority of the species listed under 'Valid_Name'. If the name of a species has changed, either because it has been moved to a different genus, or through a change in spelling, the authority name is placed in parentheses, e.g.

- Nominal species: *Millepora damicornis* Linnaeus, 1758
- Valid name: *Pocillopora damicornis* (Linnaeus, 1758)

Type_Location_Original: Type location as originally written in the species description. If a type location is not mentioned in the species description, applicable information found elsewhere in the publication was used (e.g. title, introduction, description of plates). Additional material was consulted in cases where the type location was not immediately clear (see *On identifying type location* and 'Type_Location_Source').

Original_Language: The language the original species description was written in.

Type_Location_Translation: Translation of type locations when not originally recorded in English. Languages include Chinese, Danish, Dutch, French, German, Japanese, Latin, and Russian, and translations were performed by authors of this manuscript or by Google Translate.

Type_Location_Source: Source in which the type location information was found, e.g. in the original text, on the label of the type materials or in a museum catalogue.

Type_Location_Current: The type location given

in the authority often differs from the name used today. For example, the type location of *Lobophyllia sinuosa* (Quoy & Gaimard, 1833) is recorded as 'habite le havre Carteret de la Nouvelle-Irlande' [inhabits Carteret Harbor in New Ireland]. The current name for Carteret Harbor is Lamassa Bay in Papua New Guinea.

Type_Location_Precision: Type localities were categorised into six groups based on the precision of available information: Exact location (Given latitude and longitude, specific bay, reef, or small island), Specific area (within 200 km), General area (within 200–1000 km), Local region (within 1000–2000 km), Oceanic region (2000 km+), and untraceable.

Latitude and Longitude (two categories): The latitude and longitude of the type location. Precision is reflective of 'Type_Location_Precision'.

Collector: The person(s) who collected the specimen. The name of the expedition, ship, or institution is provided if the name of an individual is not listed.

DATA RECORDS

The nomenclature in xlsx format file can be downloaded from Figshare (Crosbie et al. 2026). The file contains two sheets: the first sheet ('Nomenclature') contains data entry described above; and the second ('Authorities') contains information on all 383 authorities and the 362 original publications they are contained within. The data includes information on 2,338 nominal species, of which 900 are currently considered 'Valid', 1047 are currently considered 'Invalid', and 391 are currently considered 'Uncertain' (unresolved). Of these 2,338 nominal species, the exact type location was traced for 1,385 species, the specific area for 242 species, the general area for 273 species, the local region for 118 species and the oceanic region of 114 species (Fig. 1). The type location was untraceable for 206 species. The PDFs of specific original text can be made available by request to the Editors of the nomenclature, Crosbie and Baird (AJC & AHB). All information has been through multiple quality control checks by all authors and will be updated annually as new information become available or if changes are requested by AJC & AHB. Contributions to the nomenclature are welcomed at any time

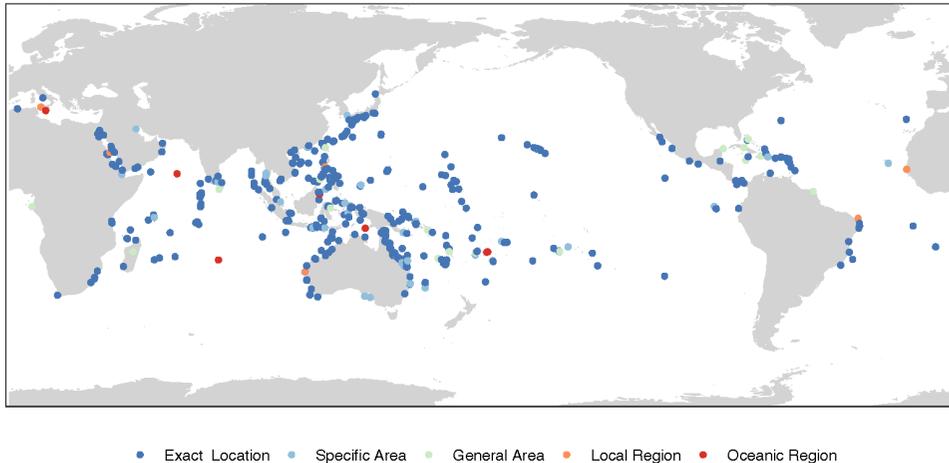


Figure 1. Type locations for the nominal species of extant hermatypic Scleractinia presented in the nomenclature. Type localities were categorised into six groups based on the precision of the information available: Dark blue = exact location (n= 1,385), light blue = specific area (n= 242), light green = general area (n= 273), orange = local region (n= 118), red = oceanic region (n= 114).

and should be sent to the contact details listed on Figshare (Crosbie et al. 2026).

Technical validation

The nomenclature is governed on a voluntary basis by Editors (AJC & AHB), Assistant Editor (TCLB), and an Administrator (AJC). Quality control of data and editorial procedures include:

1. User feedback: Any issues or errors can be reported for any species by email to the Editors (contact details listed on Figshare [Crosbie et al. 2026]).
2. Editorial approval: Once a user sends information to an editor, the information will be checked by all editors and then incorporated into the nomenclature where appropriate by the Administrator.

Usage notes

At the beginning of a project requiring coral sampling or identification, such as coral ecology, population genetics, population biology or taxonomy, we recommend that the nomenclature be used in two ways: 1) To identify the type locations of all nominal species within the genus or group of interest; 2) To identify all nominal species from the particular geographic area of interest. In both cases, once the

nominal species have been identified, the authorities for each nominal species can be consulted to obtain the original description or any other relevant information such as the museum where type material is located. Many museum collections are being actively digitised and made freely available, making it increasingly straightforward to locate and view images of type material online. For example, the extensive coral collections held by institutions such as the Smithsonian Institution, the Muséum national d'Histoire naturelle, and the Queensland Museum Tropics are now available through searchable digital platforms. The senior synonym can also be useful when collecting topotypes. For example, if searching for a topotype of *Acropora fruticosa* (Brook, 1892), it is reasonable to assume that it will look like *A. humilis* (Dana, 1846), the current senior synonym (Wells, 1954). In some recently described species (generally within the last 10 years) genetic material and/or sequence data are available and should be incorporated into genetic studies; ideally this data will be made available for every future new species description.

One challenge when designating topotypes is determining how close to the type location a specimen must be collected. There is no specific answer to this question (either for corals specifically or taxonomy more broadly), as it is highly dependent

on the intrinsic characters of the taxon of interest, along with extrinsic factors such as the position of biogeographic and political boundaries. Ideally the closer the better, as a topotype becomes a more accurate proxy for the original type material the closer it is collected to the type location. If the exact type location is known, then this process is relatively straightforward. If it is not known, then several additional specimens should be presented from across its potential range, along with supporting evidence such as ship logs or museum collection history used to infer type location where required. However, geographic proximity alone is not sufficient. Morphological similarity to the type material is the priority, as a topotype that does not match the type material undermines its utility. Given that this involves comparing one specimen to another, the capacity for quantitative comparisons is limited. This limitation reflects the intrinsic problems with the type-based approach used in taxonomy, as a holotype is unlikely to capture the natural variation in morphology among all individuals of a species. In addition, even when a topotype specimen closely matches the morphology of the original type, the potential for the existence of multiple genetic lineages with little or no morphological differences cannot be ruled out. Nevertheless, the designation of topotypes should prioritise both proximity to the type location and close morphological correspondence with the type material. Neither criterion alone is sufficient, but when applied together they provide a practical and defensible basis for anchoring species identities in coral taxonomy, despite the recognised limitations of type-based approaches.

Given these limitations, we advocate the routine use of open nomenclature to ensure consistent documentation of species and samples across publications, including the qualifiers *cf.* and *aff.*, or the assignment of unique provisional labels (e.g. *Acropora sp. 1*; *Acropora aff. digitifera* 'Ningaloo'), with all usages documented by photographs of vouchers, preferably of both living colonies and skeletal material. Open nomenclature provides a transparent way to express uncertainty when linking samples to an existing nominal species and is preferable to forcing specimens into named taxa when correspondence with type material

is uncertain. The use of *cf.* is appropriate where specimens closely resemble a named species but cannot be identified with confidence (e.g. not linked to a topotype), whereas *aff.* should be reserved for material showing consistent differences suggestive of a distinct lineage (i.e. a different species). Such usage does not constitute the description of new taxa, but documents testable hypotheses of morphological affinity that can be refined as additional comparative and molecular data become available, while also making the basis of identification clear and reproducible for future reassessment.

ACKNOWLEDGEMENTS

The authors thank the many museum curators and collection managers at institutions around the world who were contacted for their collaboration and for providing access to specimens, original descriptions, and archival records. We thank Lisa Boström-Einarsson and James Tarte for their assistance with the initial survey of nominal species authorities. We are grateful to the anonymous reviewers for their constructive suggestions, and to Megan Harris for final proofing, which helped improve this manuscript. This work also benefited greatly from the considerable efforts of Bert Hoeksema and colleagues associated with WoRMS. We additionally thank Josh Clark and Chuck Bryant for their thoughtful discussions throughout the course of this project.

LITERATURE CITED

- Arrigoni, R., Benzoni, F., Huang, D., Fukami, H., Chen, C.A., Berumen, M.L., Hoogenboom, M., Thomson, D.P., Hoeksema, B.W., Budd, A.F., Zayasu, Y., Terraneo, T.I., Kitano, Y.F. & Baird, A.H. (2016). When forms meet genes: revision of the scleractinian genera *Micromussa* and *Homophyllia* (Lobophylliidae) with a description of two new species and one new genus. *Contributions to Zoology*, **85**(4), pp. 387–422. <https://doi.org/10.1163/18759866-08504002>
- Arrigoni, R., Terraneo, T.I., Galli, P. & Benzoni, F. (2014). Lobophylliidae (Cnidaria, Scleractinia) reshuffled: Pervasive non-monophyly at genus level. *Molecular Phylogenetics and Evolution*, **73**, pp. 60–64. <https://doi.org/10.1016/j.ympev.2014.01.010>
- Blaimer, B.B., Lloyd, M.W., Guillory, W.X. & Brady, S.G. (2016). Sequence capture and phylogenetic utility

- of genomic ultraconserved elements obtained from pinned insect specimens. *PLoS One*, **11**(8), e0161531. <https://doi.org/10.1371/journal.pone.0161531>
- Bonito, V.E., Baird, A.H., Bridge, T., Cowman, P.F. & Fenner, D. (2021). Types, topotypes and vouchers are the key to progress in coral taxonomy: Comment on Wepfer et al. (2020) (2021). *Molecular Phylogenetics and Evolution*, **159**, 107104. <https://doi.org/10.1016/j.ympev.2021.107104>
- Brambilla, V., Barbosa, M., Dehnert, I., Madin, J.S., Maggioni, D., Peddie, C. & Dornelas, M. (2022). Shaping coral traits: plasticity more than filtering. *Marine Ecology Progress Series*, **692**, pp. 53–65. <https://doi.org/10.3384/meps14080>
- Bridge, T.C.L., Cowman, P.F., Quattrini, A.M., Bonito, V.E., Sinniger, F., Harii, S., Head, C.E.I., Hung, J.Y., Halafih, T., Rongo, T. & Baird, A.H. (2024). A *tenuis* relationship: traditional taxonomy obscures systematics and biogeography of the ‘*Acropora tenuis*’ (Scleractinia: Acroporidae) species complex. *Zoological Journal of the Linnean Society*, **202**(1), zlad062. <https://doi.org/10.1093/zoolinlean/zlad062>
- Brook, G. (1891). Descriptions of new species of *Madrepora* in the collections of the British Museum. *Annals and Magazine of Natural History*, **8**, pp. 458–471. <https://doi.org/10.1080/00222939109459223>
- Brook, G. (1892). Preliminary descriptions of new species of *Madrepora* in the collections of the British Museum. Part II. *Annals and Magazine of Natural History*, **10**, pp. 451–465.
- Brook, G. (1893). ‘The genus *Madrepora*’ in *Catalogue of the Madreporarian Corals in the British Museum*, British Museum, London.
- Crosbie, A.J., Bridge, T.C.L., Mera, H., Rassmussen, S.H., Cabaitan, P.C., Cowman, P.F., Gress, E., Grinblat, M., Horowitz, J., Camilleri, R.E. & Baird, A.H. (2026). Database — A nomenclature for the extant hermatypic scleractinian corals including type locations and taxonomic status for 2,338 nominal species. <https://doi.org/10.6084/m9.figshare.29987791>
- Dana, J.D. (1846). Zoophytes. United States Exploring Expedition during the years 1838-1842. Lea and Blanchard, Philadelphia.
- Defrance, M. (1826) Polypiers. Dictionnaire des sciences naturelles (F Cuvier, ed), Levrault, Strasbourg & Le Normant, Paris, **42**, pp. 377–398
- Fukami, H., Budd, A.F., Paulay, G., Solé-Cava, A., Allen Chen, C., Iwao, K. & Knowlton, N. (2004). Conventional taxonomy obscures deep divergence between Pacific and Atlantic corals. *Nature*, **427**, pp. 832–835. <https://doi.org/10.1038/nature02339>
- Fukami, H., Chen, C.A., Budd, A.F., Collins, A., Wallace, C., Chuang, Y-Y., Chen, C, Dai, C-F., Iwao, K., Sheppard, C. & Knowlton, N. (2008). Mitochondrial and nuclear genes suggest that stony corals are monophyletic but most families of stony corals are not (Order Scleractinia, Class Anthozoa, Phylum Cnidaria). *PLoS One*, **3**, e3222. <https://doi.org/10.1371/journal.pone.0003222>
- Hoeksema, B.W. & Cairns, S. (2025). World list of Scleractinia. <https://www.marinespecies.org/scleractinia>
- Huang, D, Arrigoni, R., Benzoni, F., Fukami, H., Knowlton, N., Smith, N.D., Stolarski, J., Chou, L.M. & Budd, A.F. (2016). Taxonomic classification of the reef coral family Lobophylliidae (Cnidaria: Anthozoa: Scleractinia). *Zoological Journal of the Linnean Society*, **178**(3), pp. 436–481. <https://doi.org/10.1111/zoj.12391>
- Huang, D., Benzoni, F., Arrigoni, R., Baird, A.H., Berumen, M.L., Bouwmeester, J., Chou, L.M., Fukami, H., Licuanan, W.Y., Lovell, E.R., Meier, R., Todd, P.A. & Budd, A.F. (2014a). Towards a phylogenetic classification of reef corals: the Indo-Pacific genera *Merulina*, *Goniastrea* and *Scapophyllia* (Scleractinia, Merulinidae). *Zoologica Scripta*, **43**(5), pp. 531–548. <https://doi.org/10.1111/zsc.12061>
- Huang, D., Benzoni, F., Fukami, H., Knowlton, N., Smith, N.D. & Budd, A.F. (2014b). Taxonomic classification of the reef coral families Merulinidae, Montastraeidae, and Diploastraeidae (Cnidaria: Anthozoa: Scleractinia). *Zoological Journal of the Linnean Society*, **171**(2), pp. 277–355. <https://doi.org/10.1111/zoj.12140>
- Huang, D., Licuanan, W.Y., Baird, A.H. & Fukami, H. (2011). Cleaning up the ‘Bigmessidae’: Molecular phylogeny of scleractinian corals from Faviidae, Merulinidae, Pectiniidae and Trachyphylliidae. *BMC Evolutionary Biology*, **11**(37).
- Hughes, T.P., Kerry, J.T., Álvarez-Noriega, M., Álvarez-Romero, J.G., Anderson, K.D., Baird, A.H., Babcock, R.C., Beger, M., Bellwood, D.R., Berkelmans, R., Bridge, T.C., Butler, I.R., Byrne, M., Cantin, N.E., Comeau, S., Connolly, S.R., Cumming, G.S., Dalton, S.J., Diaz-Pulido, G... Wilson, S.K. (2017). Global warming and recurrent mass bleaching of corals. *Nature*, **543**, pp. 373–377. <https://doi.org/10.1038/nature21707>
- ICZN (1999) The Code Online | International Commission on Zoological Nomenclature. Archived from the original on 2016-12-20.
- Kitahara, M.V., Fukami, H., Benzoni, F. & Huang, D. (2016). The new systematics of Scleractinia: Integrating molecular and morphological evidence in Goffredo, S., Dubinsky, Z. (eds) *The Cnidaria, Past, Present and Future*. Springer International Publishing, Switzerland, pp. 41–59. https://doi.org/10.1007/978-3-319-31305-4_4

- Lamarck, J-BM de (1816). Histoire naturelle des animaux sans vertèbres. Tome second. Paris, Verdière.
- Linnaeus, C.V. (1758). Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis.
- McCormack, J.E., Tsai, W.L.E. & Faircloth, B.C. (2016). Sequence capture of ultraconserved elements from bird museum specimens. *Molecular Ecology Resources*, **16**(5), pp. 1189–1203. <https://doi.org/10.1111/1755-0998.12466>
- McGuire, J.A., Cotoras, D.D., O'Connell, B., Lawalata, S.Z.S., Wang-Claypool, C.Y., Stubbs, A., Huang, X., Wogan, G.O.U., Hykin, S.M., Reilly, S.B., Bi, K., Riyanto, A., Arida, E., Smith, L.L., Milne, H., Streicher, J.W. & Iskandar, D.T. (2018). Squeezing water from a stone: high-throughput sequencing from a 145-year old holotype resolves (barely) a cryptic species problem in flying lizards. *PeerJ*, **6**, e4470. <https://doi.org/10.7717/peerj.4470>
- Ott, F.D. (1995). The taxa depicted in E.J.C. Esper's 'Die Pflanzenthiere in Abbildungen nach der Natur' (1788–1830) and its 'Fortsetzungen' (1794–1806) with a combined index to both works. *Annalen des Naturhistorischen Museums in Wien*.
- Pallas, P.S. (1766). *Elenchus zoophytorum sistens generum adumbrationes generatioris et specierum cognatarum succintas descriptiones, cum selectis auctorum synonymis*.
- Paz-García, D.A., Aldana-Moreno, A., Cabral-Tena, R.A., García-De-León, F.J., Hellberg, M.E. & Balart, E.F. (2015). Morphological variation and different branch modularity across contrasting flow conditions in dominant *Pocillopora* reef-building corals. *Oecologia*, **178**, pp. 207–218. <https://doi.org/10.1007/s00442-014-3199-9>
- Péron, F., Freycinet, L.C.D.D., Lesueur, C.A., Petit, N-M, Péron, F. & Baudin, N. (1807). Voyage de découvertes aux terres australes: Exécuté par ordre de Sa Majesté l'empereur et roi, sur les corvettes le Géographe, le Naturaliste, et la goëlette le Casuarina, pendant les années 1800, 1801, 1802, 1803 et 1804; [Historique] publié par décret impérial, sous le ministère de M. de Champagny et rédigé par M. F. Péron ..., De l'Imprimerie impériale, Paris.
- Quek, Z.B.R., Jain, S.S., Richards, Z.T., Arrigoni, R., Benzoni, F., Hoeksema, B.W., Carvajal, J.L., Wilson, N.G., Baird, A.H., Kitahara, M.V., Seiblit, I.G.L., Vaga, C.F. & Huang, D. (2023). A hybrid-capture approach to reconstruct the phylogeny of Scleractinia (Cnidaria: Hexacorallia). *Molecular Phylogenetics and Evolution*, **186**, 107867. <https://doi.org/10.1016/j.ympev.2023.107867>
- Quoy, J.R.C. & Gaimard, J.P. (1833). Voyage au tour du monde fait par ordre du roi, sur les corvettes de S. M. l'Uranie et la Physicienne pendant les années 1817 à 1820.
- Rasmussen, S.H., Cowman, P.F., Baird, A.H., Crosbie, A.J., Quattrini, A.M., Bonito, V., Sinniger, F., Harii, S., Cabaitan, P.C., Fadli, N., Tan, C.H., Hung, J.Y.H., Rongo, T., Huang, D., Halafih, T. & Bridge, T.C.L. (2025). The tables have turned: Taxonomy, systematics and biogeography of the *Acropora hyacinthus* (Scleractinia: Acroporidae) complex. *Invertebrate Systematics*, **39**(8), IS24049. <https://doi.org/10.1093/jhered/esaf010>
- Romano, S.L. & Palumbi, S.R. (1996). Evolution of Scleractinian corals inferred from molecular systematics. *Science*, **271**(5249), pp. 640–642. <https://doi.org/10.1126/science.271.5249.640>
- Small, J. (1856). Itinerary of North Pacific Exploring Expedition between March 16, 1856 and September 9, 1856, including latitude and longitude. Charles Wright papers, 1853–1871. Harvard University Botany Libraries, pp. 1–2.
- Todd, P.A. (2008). Morphological plasticity in scleractinian corals. *Biological Reviews*, **83**(3), pp. 315–337. <https://doi.org/10.1111/j.1469-185X.2008.00045.x>
- Veron, J. & Pichon, M. (1976). 'Part I. Families Thamnasteriidae, Astroconiidae, Pocilloporidae' in *Scleractinia of Eastern Australia*. Australian Institute of Marine Science Monograph Series 1, pp. 1–86.
- Veron, J. & Wallace, C. (1984). 'Part V. Family Acroporidae' in *Scleractinia of Eastern Australia*. Australian Institute of Marine Science Monograph Series 5, pp. 1–485.
- Verrill, A.E. (1866). Synopsis of the polyps and corals of the North Pacific Exploring Expedition, under Commodore C. Ringgold and Capt. John Rodgers, U.S.N., from 1853 to 1856. Collected by Dr. Wm. Stimpson, Naturalist to the Expedition. With descriptions of some additional species from the west coast of North America. Part III. Madreporaria. Communications of the Essex Institute, Salem.
- Wallace, C. (1999). Staghorn corals of the world: A revision of the genus *Acropora*. CSIRO Publishing.
- Wells, J.W. (1935). The genotype of *Physophyllia* and living species of *Astrocoenia*. *Annals and Magazine of Natural History*, **15**, pp. 339–344.
- Wells, J.W. (1954). Recent corals of the Marshall Islands: Bikini and nearby atolls, part 2, oceanography (biologic). *US Geological Survey Professional Paper*, **260**, pp. 385–486.
- WoRMS Editorial Board (2024). World Register of Marine Species, <https://www.marinespecies.org>