



Magallana or mayhem?

Richard C. Willan

To cite this article: Richard C. Willan (2021): *Magallana* or mayhem?, Molluscan Research, DOI: [10.1080/13235818.2020.1865514](https://doi.org/10.1080/13235818.2020.1865514)

To link to this article: <https://doi.org/10.1080/13235818.2020.1865514>



Published online: 03 Mar 2021.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Magallana or mayhem?

Richard C. Willan^{a,b}

^aMuseum and Art Gallery of the Northern Territory, Darwin, Australia; ^bHonorary Member, Malacological Society of Australasia

ABSTRACT

Given the competitive side of human nature, it is inevitable that some people will wish to suppress the openly available (i.e. published) hypotheses of others in favour of their own. This opinion piece uses three molluscan examples at the level of genus – involving oysters (*Magallana*: Ostreidae), land snails (*Powelliphanta*: Rhytididae) and nudibranchs (*Trinchesia*: Trinchesiidae) – wherein workers suffering from ‘revision shock’ have used non-taxonomic courses of action to express their dissidence by attempting to suppress the taxonomy of others (i.e. by recommending avoidance, personal attacks, or omission, respectively). Although ‘revision shock’ is understandable following change at any taxonomic level and universal consensus within the research community is not always achievable, none of these courses for suppression is beneficial to scientific knowledge or endeavour in the long term. Such dissidence should be contained within the bounds of evidence-based published science; certainly not posted on social media sites. In the interests of objectivity and ethics, everyone should adopt the latest justified and openly published taxonomic hypothesis, even though they do not necessarily agree with it, and expect further changes with future research.

ARTICLE HISTORY

Received 14 July 2020
Final version received 14
December 2020

KEYWORDS

Nomenclature; published
science; taxonomic stability;
revision shock; dissidence

Discourse

All organisms struggle for existence (Darwin 1859) and the human species uses its sophisticated brain to struggle with competitors for scientific credibility in the mental space of the biological world. Those who have worked closely with molluscs seem to have struggled with widely accepted taxonomic conventions more than most taxonomists and expressed their dissidence more vehemently than most. Such challenges are, however, not confined to molluscs by any means (e.g. the works on Australasian Herpetofauna by Wells and Wellington (1983, 1985a, 1985b) or by Hoser (2000, 2007) which run strongly counter to taxonomic convention), but I am most conversant with those works related to molluscs and I want to use three examples to draw out the best way to treat works by ‘taxonomic dissidents’.

The avoidance response

My first example of an attempt to suppress the taxonomy of others relates to the genus for a species of oyster newly invasive in Australia (Willan *et al.* 2021). Salvi *et al.* (2014) and Salvi and Mariottini (2016) investigated genetically a large group of so-called ‘cupped’ oyster species and proposed the erection of a new genus, *Magallana* Salvi & Mariottini, 2016, for the numerically larger Indo-Pacific clade of species separating it from the numerically smaller Atlantic clade, *Crassostrea* Sacco, 1897. Thus the Indo-Pacific

Crassostreinae formed a monophyletic lineage comprising the genus *Magallana*. The genus *Magallana* was valid based on the 2016 description (the earlier designation in 2014 being deemed invalid), and all the species (including the type species *Ostrea gigas* Thunberg, 1793) were included by the then editor of MolluscaBase and entered into WoRMS in 2017. However, the genus *Magallana* was contested as ‘disruptive and destabilizing’ and ‘disruptive of the interests of the aquaculture industry’ by others (Bayne *et al.* 2017). Clearly, this argument was heard because the then editor of WoRMS (i.e. a different person to the previous editor) included the annotation (in red) ‘alternate representation’ alongside the taxonomic status for all 10 species of the genus *Magallana* recognised on WoRMS. The ‘alternate representation’ was the genus *Crassostrea*. So to this day, we have *Magallana bilineata* and *Crassostrea bilineata* as ‘alternate representations’ of the accepted name for the same species on WoRMS (2020a).

WoRMS purports to be an authoritative and comprehensive list of names of marine organisms arranged in the most up-to-date and stable hierarchy as determined by the appropriate taxonomic editor (Horton *et al.* 2017). For most people, myself included, the concept of ‘alternate representation’ of a scientific name is confusing and unacceptable. However, I now understand the editors of WoRMS interpret ‘alternate representations’ as meaning ‘any combination that appears in the literature, is distinct from the “accepted” name, but is not currently wrong or unaccepted’

CONTACT Richard C. Willan  richard.willan@nt.gov.au  Museum and Art Gallery of the Northern Territory, GPO Box 4646, Darwin, Northern Territory 0801, Australia

© 2021 The Malacological Society of Australasia and the Society for the Study of Molluscan Diversity

(Horton *et al.* 2017). Such a dual stance seems to me an Achilles heel of WoRMS because one cannot have ‘alternate representations’ for every species whenever a name changes and there is not instant agreement among all workers. Nomenclature of organisms would degenerate into chaos if there were multiple representations of a name derived from successive taxonomic changes as, for example, with the common, widely naturalised and widely cultivated land snail that was universally known until recently as *Helix aspersa* O.F. Müller, 1774, then briefly as *Cantareus aspersus* (O.F. Müller, 1774), and presently as *Cornu aspersum* (O.F. Müller, 1774) (ICZN 2015: Opinion 2354; WoRMS 2020b). Would the heliciculture industry prefer to maintain the name *Helix aspersa* forever and oppose any change (of genus or of specific epithet) from that name only?

Bayne *et al.* (2017) concluded their paper with a remarkably non-scientific request: ‘We urge the authors proposing this change and the international bodies involved in accepting it to reconsider and withdraw it.’ The editors of WoRMS may have vacillated but many taxonomists (myself included), ecologists, marine biosecurity personnel, and some in the oyster aquaculture industry itself (e.g. Kumar *et al.* 2019; Suja *et al.* 2020), are now using the genus *Magallana*. In my opinion, it is scientifically inappropriate for Bayne and colleagues to encourage the authors and other influential international bodies to ‘withdraw’ such nomenclatural changes. Indeed, the International Code of Zoological Nomenclature contains no provision for withdrawing a nomenclatural act (ICZN 1999), even if a paper were retracted (because, for example, it contained fraudulent data). The nomenclatural acts contained in that paper would still stand unless they were suppressed by the Commission.

Bayne *et al.* (2019) subsequently published another paper in the international journal *Aquaculture* in which they requested the editor to require all manuscripts submitted for publication in that journal ‘to use *Crassostrea* as the accepted genus for all Pacific and Atlantic “cupped” oysters, until a more detailed and comprehensive genetic analysis resolves the correct nomenclature.’ I think this request is also inappropriate.

A strong and thorough scientific rebuttal of the requests in both papers by Bayne *et al.* (2017, 2019) including a new molecular analysis that provides additional, unambiguous support for *Magallana* has been published very recently (Salvi and Mariottini 2020).

The personal attack

In 1980 I was preparing a bibliographic paper listing all the works on New Zealand molluscs that had appeared between 1973 and 1980 (Willan 1981); that is the period immediately after the publication of Powell’s

(1979) seminal book *New Zealand Mollusca: Marine, Land and Freshwater Shells* that contained an incomplete analytical addendum of some papers on molluscs published between 1974 and 1979. One work I could not include in that bibliography was that by Parkinson (1979) because my efforts to obtain a copy were unsuccessful, despite me making a written request to the author for a copy for my own reference. That work, of which I subsequently obtained a copy (number 13, of 40 supposedly published), had a tone that was intemperate in part and contained a personal attack on F.M. Climo for his ‘ring cline’ hypothesis on the evolutionary biogeography of the New Zealand land snail genus *Powelliphanta* O’Connor, 1945 (Climo 1977, 1978). The language used by Parkinson contained sentences like: ‘This classification is so contrary to common sense, established evidence and the opinion of others who have studied the group that it can only be dismissed as a ludicrous exercise in whimsical fantasy.’ The work ended with: ‘Regretting that the grip of the professional academics on publishing is now so strong that the good work of amateurs no longer stands a chance of publication when confronted with their blinkered myopia, arrogant self-interest and pusillanimous nit picking, he hopes that the private issue of this study will encourage other victims of the scientific mafia to issue their own work in such a guide.’ I believe such defamatory language is unacceptable in a scientific publication; indeed, it reduces the credibility of the entire work.

The omission response

Using morphology, Alexander Martynov and Michael Miller, two specialists in heterobranch sea slugs, independently examined aeolid nudibranchs previously assigned to the genus *Cuthona* Alder & Hancock, 1855. They each restricted *Cuthona* just to its type species, *C. nana* (Alder & Hancock, 1842), and reintroduced the genus *Trinchesia* von Ihering, 1879 for the remainder of the species previously included in *Cuthona* (Martynov 2002; Miller 2004). Although the change, which affected many named species, was accepted by many researchers internationally and is now incorporated into WoRMS, it was inexplicably omitted by the authors of the influential guide books *Field Guide to the Sea Slugs of the Tropical Eastern Pacific* (Camacho-García *et al.* 2005), *Eastern Pacific Nudibranchs: A Guide to the Opisthobranchs from Alaska to Central America* (Behrens and Hermosillo 2005), *Caribbean Sea Slugs: A Field Guide to the Opisthobranch Mollusks from the Tropical Northwestern Atlantic* (Valdés *et al.* 2006), *Opisthobranchios de México: Guía de babosas marinas del Pacífico, Golfo de California y las islas oceánicas* (Hermosillo *et al.* 2006) and *Nudibranch & Sea Slug Identification: Indo-Pacific* (Gosliner *et al.* 2015). Consequently, the separate usage of *Cuthona*

and *Trinchesia* for the same genus caused great confusion for some 20 years among citizen scientists who were finding ever more species of ‘tergipedid’ aeolids, but it has now been largely settled by the recognition of three separate families in the ‘tergipedid’ clade – Cuthonidae, Cuthonellidae, and Tergipedidae – with *Cuthona* in the former family and *Trinchesia* in the latter family (Korshunova *et al.* 2017).

Solutions

‘Revision shock’, a term coined by Hedges (2013), is real and to be expected in people who have become accustomed to one particular scientific name for a lifetime and discover it changed unexpectedly. I would liken the ‘revision shock’ reaction by Bayne *et al.* (2017, 2019) to the genus *Magallana* to that of those who opposed the reassigning of the former *Drosophila melanogaster* to *Sophophora* (van der Linde *et al.* 2007; ICZN 2010; Dalton 2010), or the dismemberment of the bloodwoods from *Eucalyptus* (Hill and Johnson 1995; Brooker 2000). After some time the scientific ‘community’ (i.e. both researchers and non-academics) recovers from ‘revision shock’, and the names *Sophophora melanogaster* for the ‘Drosophila fly’ and *Corymbia* for the bloodwoods are now embraced (albeit not universally).

Bayne *et al.* (2017) argued that the ‘research community, including other phylogeneticists’ ought to have had the opportunity to reflect and to comment on a new genus. This is akin to the argument ‘let’s just wait and see what the consensus is’; however taxonomy doesn’t operate on consensus. If not achievable, then the search for consensus perhaps may be considered illusory, and maybe rightly so because it could stifle the production of alternative hypotheses. There is of course nothing stopping the scientific community reflecting on taxonomic hypotheses (such as those for *Magallana*, *Powelliphanta* or *Trinchesia*) or countering them, provided they produce some scientific evidence to render a balanced objection. In fact, Parkinson (1979) did this in his work by presenting arguments for a new classification of the New Zealand Rhytididae.

I acknowledge that universal or even widespread consensus on taxonomic issues is not always achievable. Collareta *et al.* (2020) have put the wider issue succinctly: ‘... while widespread scientific consensus may often be hard to reach, the search for it can neither be sidetracked nor limited to a relatively small group of researchers.’

In conclusion, I observe that some professional scientists now advocate for a utopian solution of a ‘universal governance framework’ as a form of consensus for deciding which species names should be accepted when there are alternative taxonomic treatments (and, by extension, which scientific names should be applied

to those species) (Garnett *et al.* 2020). But any agency overseeing such ‘universal governance’ of names will inevitably have internal dissidence, and, in reality, even the supposedly most august scientific bodies are not immune from discreditable action arising from dissidence. For example, in one case in which I was involved, the secretary of the agency deliberately altered the page proofs, after final approval had been given by the authors, in such a way that an application to the International Commission on Zoological Nomenclature was affected (Alvarez and Willan 2003a, 2003b).

The strength of open science is its capacity to adopt taxonomic change (as presented in a new phylogenetic hypothesis or a new name), to test it, and to produce an alternate hypothesis, even though this might be (temporarily) uncomfortable for some practitioners because it involves accepting a different name.

Given human nature, it is inevitable that some people will wish to suppress the taxonomic hypotheses of others to advance their own causes. I recommend they do so within the bounds of evidence-based published science (which is tolerable, testable and durable) rather than ignoring them or making attempts to suppress them. Being ephemeral and non-archiveable repositories, people certainly should not voice their dissidence in postings on social media sites. Therefore, in the light that dissidence should be expressed in published science, I continue to advocate for the only scientifically objective and ethical course: that is, scrupulously following the latest taxonomy, though not necessarily agreeing with it, and expecting further changes with future research (Spencer and Willan 1996: 6). Ironically, this course applies most strongly to the aquaculture industry which has the most to benefit from further taxonomic work (Salvi and Mariottini 2020).

Acknowledgements

The author has discussed the topic of nomenclatural stability versus changing taxonomy with numerous (‘professional’ and ‘amateur’) scientific colleagues over 45 years. He gratefully acknowledges the comments of the following colleagues on earlier drafts of this Opinion Piece: Stephen Garnett, Carmel McDougall, Paolo Mariottini, Sasha Martynov, Daniele Salvi, Hamish Spencer, Barry Russell and Kevin Thiele.

Disclosure statement

The work by Parkinson (1979) is, according to the title page, copyright to the author. The term copyright is here interpreted as prevention of reproduction without attribution rather than prevention of reproduction (with due attribution) of small parts for the purposes of research and review, as is done in this Opinion Piece.

References

- Alvarez, B. & Willan, R.C. (2003a) Case 3216. *Spongia ventilabra* Linnaeus, 1767 (currently *Phakellia ventilabra*; Porifera): proposed conservation of the specific name and designation of a neotype. *Bulletin of Zoological Nomenclature* 60, 16–19.
- Alvarez, B. & Willan, R.C. (2003b) Comment on the proposed conservation of the specific name of and designation of a neotype for *Spongia ventilabrum* [sic] Linnaeus, 1767 (currently *Phakellia ventilabrum*; Porifera). *Bulletin of Zoological Nomenclature* 60, 300.
- Bayne, B.L., Ahrens, M., Allen, S.K., Anglès D'Auriac, M., Backeljau, T., Beninger, P., Bohn, R., Boudry, P., Davis, J., Green, T., Guo, X., Hedgecock, D., Ibarra, A., Kingsley-Smith, P., Krause, M., Langdon, C., Lapègue, S., Li, C., Manahan, D., Mann, R., Perez-Paralle, L., Powell, E.N., Rawson, P.D., Speiser, D., Sanchez, J.L., Shumway, S. & Wang, H. (2017) The proposed dropping of the genus *Crassostrea* for all Pacific cupped oysters and its replacement by a new genus *Magallana*: a dissenting view. *Journal of Shellfish Research* 6(3), 545–547.
- Bayne, B., Anglès d'Auriac, M., Backeljau, T., Beninger, P., Boudry, P., Carnegie, R., Davis, J., Guo, X., Hedgecock, D., Krause, M., Langdon, C., Lapègue, S., Manhatan, D., Powell, E. & Shumway, S. (2019) A scientific name for Pacific oysters. *Aquaculture* 499, 373.
- Behrens, D.W. & Hermosillo, A. (2005) *Eastern Pacific Nudibranchs: A Guide to the Opisthobranchs from Alaska to Central America*. Sea Challengers, Monterey, CA.
- Brooker, M.I.H. (2000) A new classification of genus *Eucalyptus* L'Hér (Myrtaceae). *Australian Systematic Botany* 13, 79–148.
- Camacho-García, Y., Gosliner, T.M. & Valdés, A. (2005) *Field Guide to the Sea Slugs of the Tropical Eastern Pacific*. California Academy of Sciences, San Francisco, CA.
- Climo, F.M. (1977) The *Powelliphanta gilliesi-traversi-hochstetteri-rossiana-lignaria-superba* ring species (Mollusca: Pulmonata: Rhytididae). *Cookia* 2, 54–62.
- Climo, F.M. (1978) The *Powelliphanta gilliesi-traversi-hochstetteri-rossiana-lignaria-superba* ring species (Mollusca: Pulmonata: Rhytididae). *New Zealand Journal of Zoology* 5, 289–294.
- Collareta, A., Perreault, R.T., Buckeridge, J.S., Coletti, G., Koci, T., Jones, D.S., Bosselaers, M. & Newman, W.A. (2020) Taxonomic databases should reflect, and not substitute, published scientific literature and community consensus: some observations on WoRMS and barnacles. *Integrative Zoology* 15, 626–628.
- Dalton, R. (2010) What's in a name? Fly world is abuzz. *Nature* 464, 825.
- Darwin, C. (1859) *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, 1st edition. John Murray Publishers, London.
- Garnett, S.T., Christidis, L., Conix, S., Costello, M.J., Zachos, F.E., Bánki, O.S., Bao, Y., Barik, S.K., Buckeridge, J.S., Hobern, D., Lien, A., Montgomery, N., Nikolaeva, S., Pyle, R.L., Thomson, S.A., van Dijk, P.P., Whalen, A., Zhang, Z.-Q. & Thiele, K.R. (2020) Principles for creating a single authoritative list of the world's species. *PLoS Biology*, <https://doi.org/10.1371/journal.pbio.3000736>. [Accessed on 8 July 2020].
- Gosliner, T.M., Valdés, A. & Behrens, D.W. (2015) *Nudibranch & Sea Slug Identification Indo-Pacific*. New World Publications, Singapore.
- Hermosillo, A., Behrens, D.W. & Jara, E.R. (2006) *Opisthobranchios de México: Guía de Babosas Marinas del Pacífico, Golfo de California y Las Islas Oceánicas*. CONABIO, Guadalajara.
- Hedges, S.B. (2013) Revision shock in taxonomy. *Zootaxa* 3681, 297–298.
- Hill, K.D. & Johnson, L.A.S. (1995) Systematic studies in the eucalypts. 7. A revision of the bloodwoods, genus *Corymbia* (Myrtaceae). *Telopea* 6, 185–504.
- Horton, T., Gofas, S., Kroh, A., Poore, G.C.B., Read, G., Rosenberg, G., Stöhr, S., Bailly, N., Boury-Eschault, N., Brandao, S.N., Costello, M.J., Decock, W., Dekeyser, S., Hernandez, F., Mees, J., Paulay, G., Vandepitte, L., Vanhoorne, B. & Vranken, S. (2017) Improving nomenclatural consistency: a decade of experience in the World Register of Marine Species. *European Journal of Taxonomy* 389, 1–24.
- Hoser, R.T. (2000) A revision of the Australasian pythons. *Ophidia Review* 1, 7–27.
- Hoser, R.T. (2007) Wells and Wellington – it's time to bury the hatchet! *Calodema, Supplementary Paper* 1, 1–7.
- ICZN [International Commission on Zoological Nomenclature] (1999) *International Code of Zoological Nomenclature Third Edition Adopted by the XX General Assembly of the International Union of Biological Sciences*. International Trust for Zoological Nomenclature, London.
- ICZN [International Commission on Zoological Nomenclature] (2010) Opinion 2245 (Case 3407) *Drosophila Fallén*, 1823 (Insecta, Diptera) *Drosophila funebris* Fabricius, 1787 is maintained as the type species. *Bulletin of Zoological Nomenclature* 67, 106–115.
- ICZN [International Commission on Zoological Nomenclature] (2015) Opinion 2354 (Case 3518) *Cornu Born*, 1778 (Mollusca, Gastropoda, Pulmonata, Helicidae): request for a ruling on the availability of the generic name granted. *Bulletin of Zoological Nomenclature* 72, 157–158.
- Korshunova, T., Martynov, A. & Picton, B. (2017) Ontogeny as an important part of integrative taxonomy in tergipedid aeolidaceans (Gastropoda: Nudibranchia) with the description of a new genus and species from the Barents Sea. *Zootaxa* 4324, 1–22.
- Kumar, B.A., Ravinesh, R., Oliver, P.G., Tan, K.S. & Sadasivan, K. (2019) Rapid bioinvasion of alien mussel *Mytella strigata* (Hanley, 1843) (Bivalvia: Mytilidae) along Kerala coast, India: will this impact the livelihood of fishers in Ashtamudi Lake? *Journal of Aquatic Biology and Fisheries* 7, 31–45.
- Martynov, A.V. (2002) Two new species of the genus *Trinchesia* Ihering, 1879 from Peter the Great Bay, Japan Sea (Nudibranchia, Tergipedidae), with notes on the taxonomy of the family. *Ruthenica* 12, 45–54.
- Miller, M.C. (2004) An appraisal of the identity of the New Zealand species of the aeolid nudibranch family Tergipedidae (Gastropoda: Opisthobranchia). *Journal of Natural History* 38, 1183–1192.
- Parkinson, P.G. (1979) *A Consideration of the Systematics of the New Zealand Rhytididae (Mollusca: Pulmonata) with a Repudiation of the Nonsensical 'Ring Species' Speculation Lately Indulged in by Dr. Climo*. Pettifogging Press, Auckland.
- Powell, A.W.B. (1979) *New Zealand Mollusca: Marine, Land and Freshwater Shells*. Collins, Auckland.
- Salvi, D., Macali, A. & Mariottini, P. (2014) Molecular phylogenetics and systematics of the bivalve family Ostreidae

- based on rRNA sequence-structure models and the multi-locus species tree. *PLoS One* 9, e108696.
- Salvi, D. & Mariottini, P. (2016) Molecular taxonomy in 2D: a novel ITS2 rRNA sequence-structure approach guides the description of the oysters' subfamily Saccostreinae and the genus *Magallana* (Bivalvia: Ostreidae). *Zoological Journal of the Linnean Society* 179, 263–276.
- Salvi, D. & Mariottini, P. (2020) Revision shock in Pacific oysters taxonomy: the genus *Magallana* (formerly *Crassostrea* in part) is well-founded and necessary. *Zoological Journal of the Linnean Society* zlaa112, [doi.org/10.1093/zoolinnea.zlaa112](https://doi.org/10.1093/zoolinnea/zlaa112).
- Spencer, H.G. & Willan, R.C. (1996) The marine fauna of New Zealand: Index to the fauna 3. Mollusca. *New Zealand Oceanographic Institute Memoir* 105, 1–125.
- Suja, G., Lijo, J., Kripa, V., Sunil Mohamed, K. & Sanil, N.K. (2020) A comparison of parasites, pathological conditions and condition index of wild and farmed populations of *Magallana bilineata* (Röding, 1798) from Vembanad Lake, west coast of India. *Aquaculture* 515, <https://doi.org/10.1016/j.aquaculture.2019.734548>. [Accessed on 27 April 2020].
- Valdés, A., Hamann, J., Behrens, D.W. & DuPont, A. (2006) *Caribbean Sea Slugs: A Field Guide to the Opisthobranch Mollusks from the Tropical Northwestern Atlantic*. Sea Challengers, Gig Harbour.
- van der Linde, K., Bächli, M.J., Toda, W., Zhang, W.X. & Katoh, T. (2007) *Drosophila* Fallen, 1832 (Insecta, Diptera) proposed conservation of usage. *Bulletin of Zoological Nomenclature* 64, 238–242.
- Wells, R.W. & Wellington, C.R. (1983) A synopsis of the class Reptilia in Australia. *Australian Journal of Herpetology* 1, 73–129.
- Wells, R.W. & Wellington, C.R. (1985a) A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology, Supplementary Series* 1, 1–61.
- Wells, R.W. & Wellington, C.R. (1985b) A synopsis of the Amphibia and Reptilia of New Zealand. *Australian Journal of Herpetology, Supplementary Series* 1, 62–64.
- Willan, R.C. (1981) Bibliography of publications on New Zealand Mollusca (1973–1980). *Miscellaneous Publications New Zealand Oceanographic Institute* 94, 1–50.
- Willan, R.C., Nenadic, N., Ramage, A. & McDougall, C. (2021) Detection and identification of the large, exotic, crassostreine oyster *Magallana bilineata* (Röding, 1798) in northern Queensland, Australia. *Molluscan Research* 41, <https://doi.org/10.1080/13235818.2020.1865514>.
- WoRMS [World Register of Marine Species] (2020a) MolluscaBase eds. MolluscaBase. *Crassostrea bilineata* (Röding, 1798). Accessed through: World Register of Marine Species at: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=506707> [Accessed on 27 April 2020].
- WoRMS [World Register of Marine Species] (2020b) MolluscaBase eds. MolluscaBase. *Cornu aspersum* (O. F. Müller, 1774). Accessed through: World Register of Marine Species at: <http://marinespecies.org/aphia.php?p=taxdetails&id=820000> [Accessed on 2 July 2020].