FirstView Article (*after the review and corrections, before the final formatting*)
Studia Historiae Scientiarum 22. DOI: 10.4467/2543702XSHS.23.017.17708. CC BY 4.0.

Jaime A. Teixeira da Silva
ORCID 0000-0003-3299-2772
Independent researcher (Kagawa, Japan)
jaimetex@yahoo.com

The Misrepresentation of Petri Dish, as "petri" Dish, in the Scientific Literature

Abstract

The Petri dish is, without a doubt, a very basic, yet important and popular tool in microbiological and other biomedical experiments. It serves primarily as a support or structural platform for placing, growing or testing biological specimens, whether these be microbiological, animal, plant or human. Given its size, usually about 10 cm in diameter, the Petri dish is an ideal platform for cellular and tissue cultures.

Despite the commonality of Petri dishes, quite surprisingly, there is a pervasive error throughout the biomedical literature, namely its misspelling as "petri" dish. This is not a trivial issue since this dish is named after a scientist, Julius Richard Petri (1852–1921), so the upper-case "P" should not be represented as a lower-case "p".

It is important to alert students and seasoned biomedical researchers, as well as the wider public, who might use this term, about the need to use the term Petri accurately, in order to respect its historical foundation.

To garner some appreciation of the extent of this error in the biomedical literature, a 2022 search on PubMed for either "Petri dish" or "petri dish" revealed 50 search results, 24 (or 48%) of which were of the latter, erroneous form in titles or abstracts. This suggests that the indicated error, which is in need of correction, may be widely pervasive in the biomedical literature.

Keywords: *Petri dish*, *"petri" dish*, *basic and applied biology*, *cell*, *tissue and organ culture*, *microbiology*, *synthetic meat*

PUBLICATION INFO	Studia Historiae Scientiarum	e-ISSN 2543-702X ISSN 2451-3202	POLSKA AKADEMIA UMIEJĘTNOŚCI	DIAMOND OPEN ACCESS
Teixeira da Silva, Jaime A. 2023: The Misrepresentation of Petri Dish, as "petri" Dish, in the Scientific Literature. *Studia Historiae Scientiarum* 22. DOI: 10.4467/2543702XSHS.23.017.17708.				
RECEIVED: 13.04.2022 ACCEPTED: 25.03.2023 PUBLISHED ONLINE: 05.10.2023		ARCHIVE POLICY Green SHERPA / RoMEO Colour	LICENSE	Crossref
WWW	https://ojs.ejournals.eu/SHS/; https://pau.krakow.pl/Studia-Historiae-Scientiarum/archiwum			

Fałszywe przedstawienie szalki Petriego jako szalki „petriego”, w literaturze naukowej

Abstrakt

Szalka Petriego jest bez wątpienia bardzo podstawowym, ale ważnym i popularnym narzędziem w eksperymentach mikrobiologicznych i innych biomedycznych. Służy przede wszystkim jako platforma wspierająca lub strukturalna, na której można umieszczać, hodować lub testować próbki biologiczne, niezależnie od tego, czy są to próbki mikrobiologiczne, zwierzęce, roślinne lub ludzkie. Biorąc pod uwagę jej rozmiar, zwykle około 10 cm średnicy, szalka Petriego jest idealna do kultur komórkowych i tkankowych.

Pomimo powszechności szalek Petriego, co dość zaskakujące, występuje wszechobecny błąd, a mianowicie błędna pisownia jako „szalka petriego”. To nie jest błahy problem, ponieważ szalka ta nosi imię naukowca Juliusa Richarda Petri (1852–1921), więc wielka litera „P” nie powinna być reprezentowana jako mała litera „p”.

Ważne jest, aby ostrzec studentów i doświadczonych badaczy biomedycznych, a także szerszą opinię publiczną, która może używać tego terminu, o potrzebie dokładnego używania terminu Petri, aby uszanować jego historyczne podstawy.

Aby ocenić zakres tego błędu w literaturze biomedycznej, wyszukiwanie w PubMed w 2022 r. terminów „szalka Petriego” lub „szalka petriego” ujawniło 50 rezultatów, z których 24 (lub 48%) dotyczyło tej drugiej, błędnej formy w tytule lub abstrakcie. Sugeruje to, że wskazany błąd, który wymaga korekty, może być szeroko rozpowszechniony w literaturze biomedycznej.

Słowa kluczowe: *szalka Petriego*, *szalka „petriego”*, *biologia podstawowa i stosowana*, *hodowla komórek*, *tkanki i organy*, *mikrobiologia*, *mięso syntetyczne*

1. Introduction

Biomedical researchers might take some very basic tools for granted in the laboratory, not because they are not important, but because they are so commonly used that they have become almost common place. One of those tools is the Petri dish (sometimes referred to as Petri plate), a plastic or glass dish, typically about 10 cm in diameter, but also found in varying diameters, that is most frequently used in the culture of microbial, plant, animal, or human cells, or tissues and organs in the latter three groups, to study wide-ranging hypotheses in biomedicine. Experiments in basic and applied biology often require Petri dishes, and in most instances, except for rare exceptions, they need to be sterile in order to avoid microbial contamination. Pre-ordered plastic Petri dishes are often packaged and pre-sterilized because they are cannot be autoclaved since they melt, so they tend to serve only once (i.e., disposable Petri dishes), whereas glass Petri dishes can be easily autoclaved and reused multiple times. The gap between the base and lid can be sealed with a gas-permeable membrane such as Parafilm®, making it suitable for the culture of living cells and tissues. These characteristics make Petri dishes practically useful and versatile. In contrast to literal and thus tangible Petri dishes, figurative or intangible Petri dishes or experimental sand-pits, are where ideas are theoretically tested and explored (Wei *et al.* 2021)[1], but these are not covered in this paper.

The origin of the word “Petri dish” is historically ascribed to a German scientist, a microbiologist, Julius Richard Petri (1852–1921), hence the use of his last or family name in the term, Petri dish (Grote 2018). The self-attribution of the name to a single scientist has been the subject of some challenge and controversy, the main argument being that other deserving scientists also contributed to the use and popularization of these dishes, and not only Petri (Shama 2019). Placing that controversy aside, until

[1] Of eight mentions in this paper, only one (in the title) was as “Petri dish”, the remainder were as “petri dish”.

such time the name of the Petri dish is revised to something else, such as "culture dish" in order to reflect a more historically neutral name, in the context of this paper, the correct term, with an upper-case "P", i.e., Petri dish, is assumed in this paper. Consequently, the spelling as "petri" dish, with a lower-case "p", is considered an error. This issue is not limited to academic research. In May 30, 2022, a US Republican politician, Marjorie Taylor Greene, unfortunately referred to Petri dishes as "peach tree dishes" while attempting to describe the artificial culture of meat cells[2].

This paper has two objectives. First, to provide an appreciation of the use of Petri dishes in a wide range of fairly recent (2021–2022) research applications. Second, given that "petri" dish is a *de facto* erroneous form of Petri dish, i.e., an orthographic error, a major medical database (PubMed) was consulted in order to gain an appreciation of the extent of this error by assessing the frequency of this error in 2022 indexed literature.

2. The wide use of Petri dishes in biomedical – and other – research

A search (June 4, 2022) for "Petri dish" on some popular openly available databases[3], namely PubMed, Elsevier's sciencedirect.com, Springer Nature's Springerlink and Google Scholar revealed 1880, 107,649 123,168 and 588,000 hits, respectively. Evidently, even though many results are likely to be false positives, these findings point towards a popular topic and/or tool, primarily in the biomedical literature. To identify papers that exemplify the wide-ranging use of Petri dishes in the biomedical literature, the search in Google Scholar was limited to 2021-2022, in an attempt to identify select studies that represented the use of Petri dishes in a wide range of experimental settings. Some papers, including those that are cited, employed the erroneous spelling "petri", as indicated in Table 1, and where this error exists in the original title, the error is faithfully transcribed as such in the reference list, but is labelled with "[sic]" (e.g., Singh *et al.* 2022), to indicate this error.

This section is neither a review, nor a comprehensive or exhaustive exploration of the application of Petri dishes in biomedical and other research, but serves only to highlight a wide range of studies that showcase their application. Generally, Petri dishes are used either as a solid base or with a liquid. In the latter case, typically, shake flasks would likely be used for liquid-based cell cultures. In the case of solid use, Petri dishes may be dry, with a solidified medium, such as agar, or with a moistened base, such as filter paper, directly on the base of the dish, or overlaying the medium. In several cases in Table 1, Petri dishes are used for very simplistic – yet important, standard and convenient – purposes, such as a platform on which to place experimental biological samples. In such cases, they are almost essential materials. Petri dishes also serve as a useful tray to weigh reagents on a scale. Petri dishes are popular containers for studying the behavior of organisms because they are transparent, so biological samples can be observed at least clearly from the top and bottom, and can also be photographed under a light microscope. A wide range of applications across several fields of study, often multidisciplinary in nature, are presented in Table 1. Even though several (16/38, or 42%) of these studies employed the erroneous version of Petri dish (i.e., petri dish), as indicated by an asterisk in Table 1, readers are cautioned that the existence of this error alone should not exclude the use and citation of such studies, i.e., this orthographic and/or typographic error does not invalidate these studies' scientific merit.

3. Petri dish-related errors in PubMed

As briefly mentioned above, a search on PubMed revealed 1880 results, including in all fields (title, abstract, etc.). Curiously, a search for "Petri dish" and "petri dish" revealed identical search results, suggesting that

[2] See Kaonga 2022 (at 13/14 seconds): "…a cheeseburger which is very bad because Bill Gates wants you to eat his fake meat that grows in a peach tree dish, so you'll probably get a little zap inside your body and that say "no, no", don't eat a real cheeseburger, you need to eat the fake, the fake burger, the fake meat from Bill Gates" (transcribed by the author after listening carefully to the video transcript) (May 30, 2022; last accessed, June 4, 2022).

[3] Scopus and Web of Science were not consulted since they are proprietary and thus not free to access or search.

PubMed does not recognize, or is unable to differentiate, this error. This compounds concerns about errors, inaccuracies and scientifically suspect literature on this popular biomedical database (Teixeira da Silva 2023).

Limiting the search to 2022 revealed a total of 50 hits, the entries of which were manually examined to ascertain where the error existed (i.e., in the title or abstract). The full texts, several of which could not be accessed, were not examined, also because full texts do not form part of indexing in PubMed. That assessment revealed that out of 50 hits, 24 (48%) contained the erroneous "petri dish". Strictly speaking, in a biomedical literature that strives to be as accurate and error-free as possible, such errors would need to be corrected (Teixeira da Silva 2016). The reason is that a biomedical researcher that unsuspectingly uses (i.e., by citation) a paper that employs the erroneous form of "Petri dish" may unwittingly carry this error forward in their own scientific paper, thereby propagating the error downstream in the information flow (Teixeira da Silva 2016). Finally, some may argue that if such errors would be corrected every time that an error is detected, for example during post-publication peer review, especially those who may argue that such errors are minor or trivial, that the literature would be awash with errata. This suggests that current models to correct the literature are still insufficiently robust or unsustainable (Teixeira da Silva, 2022). It is precisely for this reason that the dual-DOI-based "publication history" was devised, in order for the publication record of a scientific paper to be continually updated or corrected without disrupting the flow of information caused by intrusive or obtrusive errata or other literature updates (Teixeira da Silva, Nazarovets 2022).

4. Conclusion and limitations

The Petri dish is, as can be appreciated in this paper, and even given how widely it appears in some major databases, a popular, useful, and versatile tool and support structure in basic and applied biomedical research. In some cases, given its pertinent application to technologies and scientific discoveries that may find practical applications in society, it is a term that might appear in public, and thus be the subject of public and even political debate. The "petri dish" error is thus not only limited to biomedical researchers, but is also of interest and relevance to the wider public. In that sense, this paper serves informative, educational and corrective purposes. Finally, the argument is made that since "petri" dish is a *de facto* erroneous form of Petri dish, scientific literature – especially that indexed in leading scientific platforms such as Scopus, Web of Science, PubMed, and Google Scholar – is in need of correction. It can be argued that journals or publishers that derive benefit (e.g., citations, subscriptions, sales, etc.) from erroneous literature, and who turn a blind eye to errors in literature that they distribute and sell, derive such benefit unfairly (Teixeira da Silva, Vuong 2021).

In the third section of this paper, a small analysis was conducted using only PubMed, a public portal, because Web of Science and Scopus are proprietary and thus the databases are not freely accessible. In PubMed, to gain a crude appreciation of the level of this error, 2022 data was examined in detail, revealing a 48% error rate (title or abstract), or 42% in the sample set examined separately in Table 1 (whole texts). Scientific sleuths with advanced bibliometric and informatics skills that are interested in this topic would do well to explore PubMed and other major databases in greater detail to appreciate if these values are consistent over several years, or if there are country-, journal-, or publisher-based patterns of errors.

5. Conflicts of interest

The author declares no conflicts of interest of relevance to this topic.

6. Author contributions

The author contributed fully to the intellectual discussion underlying this paper, literature exploration, writing, reviews and editing, and accepts responsibility for the content, analyses and interpretation herein.

Table 1. Wide range of uses of Petri dishes in biomedical – and other – research, pure and applied

Broad field of research (sub-field)	Brief description of application of Petri dishes	Reference*
Algology	To assess the impact of dehydration on photochemical efficiency of a red alga (*Neopyropia yezoensis*).	Terada *et al*. 2021*
Biocontrol (insect)	For rearing, and assessment of the development, reproduction, and oviposition of pests (thrips, whiteflies and spider mites).	San *et al*. 2021
Biocontrol (plant)	To expose aphids to companion plant (leek; *Allium porrum*) volatile organic compounds to assess impact of colonization of host plants (sweet pepper; *Capsicum annuum*).	Baudry *et al.* 2021
Biocontrol (plant)	To assess phytopathological potential of two plant (*Parthenocissus quinquefolia* and *Plectranthus neochilus*) extracts to control tomato early blight (*Alternaria solani*).	Mohamed *et al.* 2021
Development	To grow *Dictyostelium discoideum* cells with *cln5*-deficiency in various assays to assess cellular growth and development.	McLaren *et al.* 2021
Ecology (arthropod)	To place arthropod samples whose images were captured, and applied, using computer vision-aided deep learning, to appreciate arthropod abundance, biomass and diversity.	Schneider *et al.* 2022*
Ecology (climate change)	To rear two marine invertebrates (*Pyura herdmani*, *Pyura stolonifera*), and assess the performance of parental and hybrid crosses under different climate change scenarios.	Hudson *et al.* 2021
Ecology (fish conservation)	To count and measure the size of fish (Round Hickorynut; *Obovaria subrotunda*) glochidia.	Shepard *et al.* 2021
Ecology (invertebrate)	To rear an invasive insect (fall armyworm; *Spodoptera frugiperda*) that impacts corn in China, to appreciate its life history.	Huang *et al.* 2021
Ecology (plant)	To assess the germination of seeds of perennial grasses (*Festuca valesiaca*, *Poa densa*, *Stipa zalesskii*) that had been exposed to mountain fires, and thus smoke and heat.	Zaki *et al.* 2021
Ecology (vertebrate)	To appreciate the impact of passage through the digestive tract of a marsupial (*Dromiciops gliroides*) in a temperate forest on seed germination ability of seeds from consumed fruits.	Vazquez *et al.* 2022
Engineering	To serve as a chemical reactor to appreciate the fractal growth of copper.	Wang *et al.* 2021*
Entomology	To assess the survival of susceptible and *kdr*-resistant strains of malaria mosquito (*Anopheles gambiae*) larvae in an insecticide-free environment.	Medjigbodo *et al.* 2021*
Environment (pollution)	To microscopically examine microplastics isolated from salt marsh sediments.	Lloret *et al.* 2021*
Evolution (fly sexual selection)	To rear fruit fly (*Drosophila melanogaster*) eggs.	Hotzy *et al.* 2022

Materials science (microbiology)	For culture of alkali-resistant bacterium (*Bacillus subtilis* M9) to assess its ability to precipitate calcium carbonate in the repair of a fiber matrix.	Feng *et al.* 2021*
Materials science (nanotechnology)	Use as a platform for the creation of copper nanowires to develop cotton-based wearable heat fabrics.	Guo *et al.* 2021*
Materials science (nanomedicine)	Use as a base to coat the nanopatterned surface of polycaprolactone with gelatin to create fortified biomedical patches.	Kim *et al.* 2021*
Microbiology (antimicrobial)	Assays to assess the effectiveness of 19 essential oils on the growth and sensitivity of 10 microbes.	Abers *et al.* 2021*
Microbiology (bacteria)	To assess surface motility as a precursor for software designed to measure spread.	Casado-García *et al.* 2021
Microbiology (fungi)	To assess the characteristics of nono- and cocultures of *Monascus* spp. and *Aspergillus niger*, which are used to brew rice wine and cereal vinegar.	Yuan and Chen 2021*
Microbiology (viruses)	To assess the efficiency of collection of respiratory viruses (influenza A virus, human metapneumovirus, parainfluenza virus type 3, and respiratory syncytial virus) on a cascade impactor with solid or semi-solid media.	Kutter *et al.* 2021*
Neurobiology	To culture mouse embryonic stem cells and P19 embryonal carcinoma cells for the assay of mesoderm-specific transcript in primary hippocampal or cortical neurons.	Prasad *et al.* 2021
Oncology	To culture human malignant melanoma cells (A375) for the live-dead assay.	Tang *et al.* 2021*
Parasitology (veterinary)	To count the number of fluke (*Fasciola hepatica*) eggs in livestock (sheep and cattle) feces.	Reigate *et al.* 2021
Plant science (ecology)	To assess the growth of hyphae of homo- and dikaryotic strains of an arbuscular mycorrhizal fungus (*Rhizophagus irregularis*) in root organ cultures of three plant hosts.	Serghi *et al.* 2021
Plant science (phytopathology)	Use in pathogenicity assays to test the antifungal activity of bioactive compounds from an antagonistic rhizobacterium (*Bacillus vietnamensis*), isolated from ginger (*Zingiber officinale*) rhizosphere against the agent of Pythium rot (*Pythium myriotylum*).	Jimtha John *et al*. 2021*
Plant science (reproduction)	Study of life history and sex-specific characteristics of a moss, of *Weissia jamaicensis.*	Santos *et al*. 2022
Plant science (thermotropism)	To establish a thermogradient for the assessment of thermotropism of maize (*Zea mays*) roots.	van Zanten *et al*. 2021
Plant science (tissue culture)	To immobilize, culture and proliferate seedling-derived protoplasts of *Arabidopsis thaliana.*	Jeong *et al*. 2021
Postharvest (seed germination)	To assess germination capacity of rice (*Oryza sativa*) grains that had been stored for variable periods of time.	Shu *et al.* 2021

Reproductive biology	To examine testicular tissues or spermatozoa to determine sperm count in azoospermia.	Amer *et al.* 2022
Soil science	To probe reflectance spectra from the surface of soil samples.	Alomar *et al.* 2022
Stem cells (synthetic meat)	To culture skeletal muscle tissue on a hydrogel, or to induce muscle cells from embryonic or muscle stem cells, to generate *in vitro*-cultured meat.	Singh *et al.* 2022*
Toxicology (food)	To assess the ability of lactic acid bacteria to detoxify aflatoxins (AFB_1, AFB_2) derived from *Aspergillus flavus*.	Ibitoye *et al.* 2021
Toxicology (herbicide)	To assess the toxicity of a chloroacetanilide herbicide (alachlor) on earthworm (*Eisenia fetida*).	Gangadhar *et al.* 2021*
Toxicology (nanoscience)	To assess the toxicological response of fruit fly (*Drosophila melanogaster*) eggs to cadmium oxide nanoparticles.	El Kholy *et al.* 2021*
Toxicology (pesticide)	To assess the toxicity of a systemic pesticide (fluralaner) on three insect pests (*Henosepilachna vigintioctopunctata*, *Megalurothrips usitatus*, *Phyllotreta striolata*).	Liu *et al.* 2021

* Indicates papers in which Petri dish was used erroneously as petri dish, in the paper (any location), any number of times; even if both correct (Petri dish) and incorrect (petri dish) uses appear in the same paper, an asterisk is indicated.

REFERENCES

Abers, Mareshah; Schroeder, Sydney; Goelz, Linna; Sulser, Adrienne; St. Rose, Tiffany; Puchalski, Keely; Langland, Jeffrey 2021: Antimicrobial activity of the volatile substances from essential oils. *BMC Complementary Medicine and Therapies* 21(1), Art. No. 124. DOI: 10.1186/s12906-021-03285-3.

Alomar, Samer; Mireei, Seyed Ahmad; Hemmat, Abbas; Masoumi, Amin Allah; Khademi, Hossein 2022: Prediction and variability mapping of some physicochemical characteristics of calcareous topsoil in an arid region using Vis-SWNIR and NIR spectroscopy. *Scientific Reports* 12(1), Art. No. 8435. DOI: 10.1038/s41598-022-12276-4.

Amer, Medhat; GamalEl Din, Sameh Fayek; Zeidan, Ashraf; Adel, Ahmed; Elsisi, Islam; Fakhry, Emad; Sadek, Ahmed Raef 2022: Intrasurgical seminiferous tubular diameter correlates with total motile sperm count in azoospermia: A prospective cohort study. *Reproductive Sciences* 29(6), pp. 1836–1843. DOI: 10.1007/s43032-022-00927-w.

Baudry, Xavier; Doury, Géraldine; Couty, Aude; Fourdrain, Yvelise; van Havermaet, Robin; Lateur, Marc; Ameline, Arnoud 2021: Antagonist effects of the leek *Allium porrum* as a companion plant on aphid host plant colonization. *Scientific Reports* 11, Art. No. 4032. DOI: 10.1038/s41598-021-83580-8.

Casado-García, Ángela; Chichón, Gabriela; Domínguez, César; García-Domínguez, Manuel; Heras, Jónathan; Inés, Adrián; López, Maria; Mata, Eloy; Pascual, Vico; Sáenz, Yolanda 2021: MotilityJ: An open-source tool for the classification and segmentation of bacteria on motility images. *Computers in Biology and Medicine* 136, Art. No. 104673. DOI: 10.1016/j.compbiomed.2021.104673.

El Kholy, Samar; Giesy, John P.; Al Naggar, Yahya 2021: Consequences of a short-term exposure to a sub lethal concentration of CdO nanoparticles on key life history traits in the fruit fly (*Drosophila melanogaster*). *Journal of Hazardous Materials* 410, Art. No. 124671. DOI: 10.1016/j.jhazmat.2020.124671.

Feng, Jun; Chen, Bingcheng.; Sun, Weiwei; Wang, Yang 2021: Microbial induced calcium carbonate precipitation study using *Bacillus subtilis* with application to self-healing concrete preparation and characterization. *Construction and Building Materials* 280, Art. No. 122460. DOI: 10.1016/j.conbuildmat.2021.122460.

Gangadhar, Dereddy; Babu, Paritala Venu; Pamanji, Rajesh; Srikanth, Kaigoora 2021: The pursuit of alachlor herbicide toxicity on *Eisenia fetida* and its biochemical responses. *Water, Air, & Soil Pollution* 232, Art. No. 149. DOI: 10.1007/s11270-021-05109-z.

Grote, Mathias 2018: Petri dish versus Winogradsky column: A longue durée perspective on purity and diversity in microbiology, 1880s–1980s. *History and Philosophy of the Life Sciences* 40, Art. No. 11. DOI: 10.1007/s40656-017-0175-9.

Guo, Zhiguang; Sun, Chao; Wang, Juan; Cai, Zaisheng.; Ge, Fengyan 2021: High-performance laminated fabric with enhanced photothermal conversion and Joule heating effect for personal thermal management. *ACS Applied Materials & Interfaces* 13(7), pp. 8851–8862. DOI: 10.1021/acsami.0c23123.

Hotzy, Cosima; Fowler, Emily; Kiehl, Berrit; Francis, Roy; Mason, Janet; Moxon, Simon; Rostant, Wayne; Chapman, Tracey; Immler, Simone 2022: Evolutionary history of sexual selection affects microRNA profiles in *Drosophila* sperm. *Evolution* 76(2), pp. 310–319. DOI: 10.1111/evo.14411.

Huang, Li-Li; Xue, Fang-Sen; Chen, Chao; Guo, Xin; Tang, Jian-Jun; Zhong, Ling; He, Hai-Min 2021: Effects of temperature on life-history traits of the newly invasive fall armyworm, *Spodoptera frugiperda* in Southeast China. *Ecology and Evolution* 11(10), pp. 5255–5264. DOI: 10.1002/ece3.7413.

Hudson, Jamie; McQuaid, Christopher D.; Rius, Marc 2021: Contemporary climate change hinders hybrid performance of ecologically dominant marine invertebrates. *Journal of Evolutionary Biology* 34(1), pp. 60–72. DOI: 10.1111/jeb.13609.

Ibitoye, Olukayode Adebola; Olaniyi, Oladipo Oladiti; Ogidi, Clement Olusola; Akinyele, Bamidele Juliet 2021: Lactic acid bacteria bio-detoxified aflatoxins contaminated cereals, ameliorate toxicological effects and improve haemato-histological parameters in albino rats. *Toxin Reviews* 40(4), pp. 985–996. DOI: 10.1080/15569543.2020.1817088.

Jeong, Yeong Yeop.; Lee, Hung-Young; Kim, Suk Weon; Noh, Yoo-Sun; Seo, Pil Joon 2021: Optimization of protoplast regeneration in the model plant *Arabidopsis thaliana*. *Plant Methods* 17(1), Art. No. 21. DOI: 10.1186/s13007-021-00720-x.

Jimtha John, C.; Mallikarjunaswamy, G.E.; Najiya, Noushad 2021: Probiotic rhizospheric *Bacillus* sp. from *Zingiber officinale* Rosc. displays antifungal activity against soft rot pathogen *Pythium* sp. *Current Plant Biology* 27, Art. No. 100217. DOI: 10.1016/j.cpb.2021.100217.

Kaonga, Gerrard 2022: Marjorie Taylor Greene's 'Peach Tree Dish' Blunder Viewed Over 1M Times. URL: https://www.newsweek.com/marjorie-taylor-greene-peach-tree-dish-petri-mtg-bill-gates-fake-meat-georgia-1711261 (accessed on 6 April 2023).

Kim, Susjin; Gwon, Yonghyun; Park, Sunho; Kim, Woochan; Jeon, Yubin; Han, Taeseong; Jeong, Hoon Eui; Kim, Jangho 2021: Synergistic effects of gelatin and nanotopographical patterns on biomedical PCL patches for enhanced mechanical and adhesion properties. *Journal of the Mechanical Behavior of Biomedical Materials* 114, Art. No. 104167. DOI: 10.1016/j.jmbbm.2020.104167.

Kutter, Jasmin S.; de Meulder, Dennis; Bestebroer, Theo M.; Mulders, Ard; Fouchier, Ron A.M.; Herfst, Sander 2021: Comparison of three air samplers for the collection of four nebulized respiratory viruses – Collection of respiratory viruses from air. *Indoor Air* 31(6), pp. 1874–1885. DOI: 10.1111/ina.12875.

Liu, Zhuoqi; Khan, Muhammad Musa; Fajar, Anugerah; Chen, Shimin; Guo, Mujuan; Chen, Yueyin; Yang, Chunxiao; Wu, Jianhui; Qiu, Baoli; Zhou, Xuguo; Pan, Huipeng 2021: Toxicity of fluralaner against vegetable pests and its sublethal impact on a biocontrol predatory ladybeetle. *Ecotoxicology and Environmental Safety* 225, Art. No. 112743. DOI: 10.1016/j.ecoenv.2021.112743.

Lloret, Javier; Pedrosa-Pamies, Rut; Vandal, Nicole; Rorty, Ruby; Ritchie, Miriam; McGuire, Claire; Chenoweth, Kelsey; Valiela, Ivan 2021: Salt marsh sediments act as sinks for microplastics and reveal effects of current and historical land use changes. *Environmental Advances* 4, Art. No. 100060. DOI: 10.1016/j.envadv.2021.100060.

McLaren, Meagan D.; Mathavarajah, Sabateeshan; Kim, William D.; Yap, Shyong Q.; Huber, Robert J. 2021: Aberrant autophagy impacts growth and multicellular development in a *Dictyostelium* knockout model of CLN5 disease. *Frontiers in Cell and Developmental Biology* 9, Art. No. 657406. DOI: 10.3389/fcell.2021.657406.

Medjigbodo, Adandé A.; Djogbénou, Luc S.; Djihinto, Oswald Y.; Akoton, Romaric B.; Abbey, Emmanuella; Kakossou, Rosaria M.; Sonounameto, Eric G.; Salavi, Esther; Djossou, Laurette; Badolo, Athanase 2021: Putative pleiotropic effects of the knockdown resistance (L1014F) allele on the life-history traits of *Anopheles gambiae*. *Malaria Journal* 20(1), Art. No. 480. DOI: 10.1186/s12936-021-04005-5.

Mohamed, Abeer A.; Salah, Mohsen M.; El-Dein, Manal M. Zen; EL-Hefny, Mervat; Ali, Hayssam M.; Farraj, Dunia A. Al; Hatamleh, Ashraf A.; Salem, Mohamed Z.M.; Ashmawy, Nader A. 2021: Ecofriendly bioagents, *Parthenocissus quinquefolia*, and *Plectranthus neochilus* extracts to control the early blight pathogen (*Alternaria solani*) in tomato. *Agronomy* 11, Art. No. 911. DOI: 10.3390/agronomy11050911.

Prasad, Renuka; Jung, Hwajin; Tan, Anderson; Song, Yonghee; Moon, Sungho; Shaker, Mohhamed R.; Sun, Woong; Lee, Junghee; Ryu, Hoon; Lim, Hyun Kook; Jho, Eek-Hoon 2021: Hypermethylation of Mest promoter causes aberrant Wnt signaling in patients with Alzheimer's disease. *Scientific Reports* 11(1), Art. No. 20075. DOI: 10.1038/s41598-021-99562-9.

Reigate, Claire; Williams, Heffin W.; Denwood, Matthew J.; Morphew, Russell M.; Thomas, Eurion R.; Brophy, Peter M. 2021: Evaluation of two *Fasciola hepatica* faecal egg counting protocols in sheep and cattle. *Veterinary Parasitology* 294, Art. No. 109435. DOI: 10.1016/j.vetpar.2021.109435.

San, Phyu Phyu; Tuda, Midori; Takagi, Masami 2021: Impact of relative humidity and water availability on the life history of the predatory mite *Amblyseius swirskii*. *BioControl* 66(4), pp. 497–510. DOI: 10.1007/s10526-021-10081-y.

Santos, Wagner L.; Pôrto, Katia C.; Pinheiro, Fabio 2022: Sex-specific differences in reproductive life-history traits of the moss *Weissia jamaicensis*. *American Journal of Botany* 109(4), pp. 645–654. DOI: 10.1002/ajb2.1840.

Schneider, Stefan; Taylor, Graham W.; Kremer, Stefan C.; Burgess, Patrick; McGroarty, Jillian; Mitsui, Kyomi; Zhuang, Alex; de Waard, Jeremi R.; Fryxell, John M. 2022: Bulk arthropod abundance, biomass and diversity estimation using deep learning for computer vision. *Methods in Ecology and Evolutio* 13, pp. 346–357. DOI: 10.1111/2041-210X.13769.

Serghi, Edward Umberto; Kokkoris, Vasilis; Cornell, Calvin; Dettman, Jeremy; Stefani, Franck; Corradi, Nicolas 2021: Homo- and dikaryons of the arbuscular mycorrhizal fungus *Rhizophagus irregularis* differ in life history strategy. *Frontiers in Plant Science* 12, Art. No. 715377. DOI: 10.3389/fpls.2021.715377.

Shama, Gilbert 2019: The "Petri" dish: A case of simultaneous invention in bacteriology. *Endeavour* 43(1–2), pp. 11–16. DOI: 10.1016/j.endeavour.2019.04.001.

Shepard, A.; McGregor, M. A.; Haag, W. R. 2021: Host fishes and life history of the round hickorynut (*Obovaria subrotunda*). *Freshwater Mollusk Biology and Conservation* 24(1), pp. 18–25. DOI: 10.31931/fmbc-d-20-00010.

Singh, A.; Verma, V.; Kumar, M.; Kumar, A.; Sarma, D. K.; Singh, B.; Jha, R. 2022: Stem cells-derived *in vitro* meat: from petri [sic] dish to dinner plate. *Critical Reviews in Food Science and Nutrition* 62(10), pp. 2641–2654. DOI: 10.1080/10408398.2020.1856036.

Shu, Z-X.; Jia, W-Q.; Zhang, W.; Wang, P-P. 2021: Selected quality attributes of paddy rice as affected by storage temperature history. *International Journal of Food Properties* 24(1), pp. 316–324. DOI: 10.1080/10942912.2021.1879132.

Tang, J-D.; Yin, Q-F.; Shi, M-T.; Yang, M.; Yang, H.; Sun, B-N.; Guo, B-L.; Wang, T-J. 2021: Programmable shape transformation of 3D printed magnetic hydrogel composite for hyperthermia cancer therapy. *Extreme Mechanics Letters* 46, Art. No. 101305. DOI: 10.1016/j.eml.2021.101305.

Teixeira da Silva, Jaime A. 2016: An error is an error… is an erratum. The ethics of not correcting errors in the science literature. *Publishing Research Quarterly* 32(3), pp. 220–226. DOI: 10.1007/s12109-016-9469-0.

Teixeira da Silva, Jaime A. 2022: A synthesis of the formats for correcting erroneous and fraudulent academic literature, and associated challenges. *Journal for General Philosophy of Science* 53(4), pp. 583–599. DOI: 10.1007/s10838-022-09607-4.

Teixeira da Silva, Jaime A. 2023: Is the validity, credibility and reliability of literature indexed in PubMed at risk? *Medical Journal Armed Forces India* (in press). DOI: 10.1016/j.mjafi.2021.03.009.

Teixeira da Silva, Jaime A.; Nazarovets, Serhii 2022: Publication history: A double DOI-based method to store and/or monitor information about published and corrected academic literature. *Journal of Scholarly Publishing* 53(2), pp. 85–108. DOI: 10.3138/jsp-2017-0017.

Teixeira da Silva, Jaime A.; Vuong, Quan-Hoang 2021: Do legitimate publishers profit from error, misconduct or fraud? *Exchanges* 8(3), pp. 55–68. DOI: 10.31273/eirj.v8i3.785.

Terada, Ryuta; Nishihara, Gregory N.; Arimura, Kaname; Watanabe, Yuki; Mine, Takayuki; Morikawa, Tarou 2021: Photosynthetic response of a cultivated red alga, *Neopyropia yezoensis* f. *narawaensis* (=*Pyropia yezoensis* f. *narawaensis*; Bangiales, Rhodophyta) to dehydration stress differs with between two heteromorphic life-history stages. *Algal Research* 55, Art. No. 102262. DOI: 10.1016/j.algal.2021.102262.

van Zanten, Martijn; Ai, Haiyue; Quint, Marcel 2021: Plant thermotropism: An underexplored thermal engagement and avoidance strategy. *Journal of Experimental Botany* 72(21), pp. 7414–7420. DOI: 10.1093/jxb/erab209.

Vazquez, Miriam Soledad; Rodriguez-Cabal, Mariano A.; Amico, Guillermo C. 2022: The forest gardener: A marsupial with a key seed-dispersing role in the Patagonian temperate forest. *Ecological Research* 37(2), pp. 270–283. DOI: 10.1111/1440-1703.12289.

Wang, Jiqin; Yi, Xiaoxia; Zeng, Xiangfei; Chen, Shuyuan; Wang, Rui; Shu, Jiancheng; Chen, Mengjun; Xiao, Zengxue 2021: Copper fractal growth during recycling from waste printed circuit boards by slurry electrolysis. *Frontiers of Environmental Science & Engineering* 15(6), Art. No. 117. DOI: 10.1007/s11783-021-1405-7.

Wei, Jerry; Suriawinata, Arief; Ren, Bing; Liu, Xiaoying; Lisovsky, Mikhail; Vaickus, Louis; Brown, Charles; Baker, Michael; Tomita, Naofumi; Torresani, Lorenzo; Wei, Jason; Hassanpour, Saeed 2021: A Petri dish for histopathology image analysis. [In:] Alan Tucker, Pedro Henriques Abreu, Jaime Cardoso, Pedro Pereira Rodrigues, David Riaño (eds), *Artificial Intelligence in Medicine. AIME 2021*. "Lecture Notes in Computer Science" vol. 12721. Cham, Switzerland: Springer, pp. 11–24. DOI: 10.1007/978-3-030-77211-6_2.

Yuan, Xi; Chen, Fusheng 2021: Cocultivation study of *Monascus* spp. and *Aspergillus niger* inspired from black-skin-red-koji by a double-sided Petri dish. *Frontiers in Microbiology* 12, Article number: 670684. DOI: 10.3389/fmicb.2021.670684.

Zaki, Elnaz; Abedi, Mehdi; Naqinezhad, Alireza 2021: How fire history affects germination cues of three perennial grasses from the mountain steppes of Golestan National Park. *Flora* 280, Art. No. 151835. DOI: 10.1016/j.flora.2021.151835.