Taxonomic notes and genus reassignments for recently described species in the genus Macquartia Robineau-Desvoidy (Diptera: Tachinidae)

Authors: Cerretti, Pierfilippo, Zhang, Dong, Ascenzi, Aleida, and Zhang, Chuntian

Source: Integrative Systematics: Stuttgart Contributions to Natural History, 7(2) : 165-167

Published By: Stuttgart State Museum of Natural History

URL: https://doi.org/10.18476/2024.999322

The BioOne Digital Library (https://bioone.org/) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses

Downloaded From: https://staging.bioone.org/journals/Integrative-Systematics-Stuttgart-Contributions-to-Natural-History on 24 Mar 2025
Terms of Use: https://staging.bioone.org/terms-of-use

SHORT COMMUNICATION

Taxonomic notes and genus reassignments for recently described species in the genus *Macquartia* Robineau-Desvoidy (Diptera: Tachinidae)

Pierfilippo Cerretti[1], Dong Zhang[2], Aleida Ascenzi[1] & Chuntian Zhang[3]

Abstract

A brief taxonomic revision on seven recently described species originally assigned to the tachinid genus *Macquartia* Robineau-Desvoidy (Diptera: Tachinidae: Macquartiini) prompted the following taxonomic and nomenclatural changes: (i) *Macquartia setifacies* Zhang & Li, 2023 is reassigned to the genus *Gnadochaeta* in the tribe Myiophasiini (unplaced to subfamily in Tachinidae), as *Gnadochaeta setifacies* (Zhang & Li, 2023), **comb. nov.**; (ii) *Macquartia sichuanensis* Zhang & Zhang, 2023 is a junior synonym of *Pseudebenia trisetosa* Shima & Tachi, 2010, **syn. nov.**; (iii) *Macquartia barkamensis* Zhang & Zhang, 2023, *M. brunneisquama* Zhang & Li, 2022, *M. chinensis* Zhang & Li, 2022, *M. flavipedicel* Zhang & Li, 2022, and *M. flavifemorata* Zhang & Li, 2022 are moved to Tachinidae *incertae sedis*.

Keywords: *Gnadochaeta*, Macquartiini, nomenclatural changes, *Pseudebenia*, Tachininae, taxonomy.

Zusammenfassung

Eine taxonomische Revision von sieben kürzlich beschriebenen Arten, die ursprünglich der Tachinidengattung *Macquartia* Robineau-Desvoidy (Diptera: Tachinidae: Macquartiini) zugeordnet waren, führte zu folgenden taxonomischen und nomenklatorischen Änderungen: (i) *Macquartia setifacies* Zhang & Li, 2023 wird als *Gnadochaeta setifacies* (Zhang & Li, 2023), **comb. nov.** der Tribus Myiophasiini (ohne Unterfamilienzuordnung innerhalb der Tachinidae) zugeordnet; (ii) *Macquartia sichuanensis* Zhang & Zhang, 2023 ist ein jüngeres Synonym von *Pseudebenia trisetosa* Shima & Tachi, 2010, **syn. nov.**; (iii) *Macquartia barkamensis* Zhang & Zhang, 2023, *M. brunneisquama* Zhang & Li, 2022, *M. chinensis* Zhang & Li, 2022, *M. flavipedicel* Zhang & Li, 2022 und *M. flavifemorata* Zhang & Li, 2022 werden zu den Tachinidae *incertae sedis* verschoben.

In two recent studies, Li et al. (2022) and Zhang et al. (2023) treated various species from various localities in Palaearctic and Oriental China assigned to the genus *Macquartia* Robineau-Desvoidy, 1830. Collectively, the two works describe seven new species of *Macquartia* and provide diagnoses to genus, full descriptions, and differential diagnoses for 16 species, as well as full mitogenomic sequences for the new species. However, closer examination of the original descriptions and re-examination of the type material led to doubts regarding the correct generic assignment of these species. The purpose of this note is to highlight and discuss some inconsistencies between the current circumscription of the genus *Macquartia* and the shared characteristics of the aforementioned species. Our aim is to provide systematic arguments for reassigning two of these species to genera whose boundaries better accommodate their morphological characters, and to move five of them to Tachinidae *incertae sedis*. This decision is based on the integration of the *cox1* barcode sequence data and morphological characters, which provide no clues to their possible affiliation at either the genus or subfamily level, other than conclusively excluding them from the genus *Macquartia* as currently circumscribed.

Both studies (Li et al. 2022; Zhang et al. 2023) provide diagnoses of the genus *Macquartia*. However, these diagnoses do not completely align and omit key characters of the male terminalia, which could lead to potential misunderstandings. Additionally, the reported variation in the thoracic chaetotaxy, such us the presence of two or three presutural dorsocentral setae and two or three postsutural intra-alar setae, effectively incorporates morphological traits characteristic of related genera, including *Macroprosopa* Brauer & Bergenstamm, 1889 (Macquartiini) and *Gnadochaeta* Macquart, 1851 (Myiophasiini) among others. As reported by Tschorsnig & Richter (1998), the presence of three presutural dorsocentral setae and three postsutural intra-alar setae is diagnostic for distinguishing Palaearctic *Macquartia* from *Macroprosopa* and Palaearctic *Gnadochaeta* (as *Angiorhina* Brauer & Bergenstamm, 1889). Nevertheless, Li et al. (2022) and Zhang et al. (2023) assigned to *Macquartia* species that fall outside these boundaries.

© Staatliches Museum für Naturkunde Stuttgart

Downloaded From: https://staging.bioone.org/journals/Integrative-Systematics:-Stuttgart-Contributions-to-Natural-History on 24 Mar 2025
Terms of Use: https://staging.bioone.org/terms-of-use

Macquartia and related genera exhibit extraordinary morphological variation, which does not aid in inferring their phylogenetic relationships (Tschorsnig 1985), but the general shape of the phallus is helpful for distinguishing specimens of the myiophasiine *Gnadochaeta* and the macquartiine *Pseudebenia* Shima & Tachi, 2010 from the rest of the Macquartiini. A reanalysis of the barcode sequences (*cox1*) presented by Li et al. (2022) and Zhang et al. (2023) has further supported our morphological conclusions. In the absence of a comprehensive review of the World Macquartiini, we highlight the possibility that the future study of this material will lead to reconsideration of some other East Asian species.

Macquartia setifacies Zhang & Li, 2023

This species was described from eight male and four female specimens from Qinghai province (China). *Macquartia setifacies*, in addition to having an overall facies compatible with known species of *Gnadochaeta* from the Palaearctic and Nearctic regions, has a very broad parafacial (2.5–3.0 times as wide as postpedicel) entirely covered with long setae, a moderately developed genal dilation, two presutural acrostichal setae, two presutural dorsocentral setae, two postsutural intra-alar setae, and second costal sector bare ventrally. Also, and most importantly, the structure of the phallus in *M. setifacies* (Zhang et al. 2023, fig. 4d) clearly corresponds to that of *Gnadochaeta* (see Tschorsnig 1985: 96; Blaschke et al. 2018, fig. 2A), having the epiphallus in a basal position and distiphallus long, with well-developed and sclerotized extensions of both the dorsal and ventral sclerites. Following Tschorsnig (1985), Tschorsnig & Richter (1998), and Cerretti et al. (2012), this combination of character states suggests that *Macquartia setifacies* Zhang & Li, 2023 should be reassigned to the genus *Gnadochaeta* in the tribe Myiophasiini (unplaced to subfamily in Tachinidae), as *Gnadochaeta setifacies* (Zhang & Li, 2023), **comb. nov.**

Macquartia sichuanensis Zhang & Zhang, 2023

This species was described based on three male specimens from the Sichuan and Chongqing provinces (China). The long plumose arista, the chaetotaxy of the scutum, the presence of setulae on the proepisternal depression, and the shape of the male sternite 5, epandrial complex, and hypandrial complex unequivocally place *M. sichuanensis* in the genus *Pseudebenia* Shima & Tachi, 2010. This genus of Macquartiini currently includes six species from the Oriental and southeastern Palaearctic regions. In addition to this generic placement, the combination of a black abdomen with only a very thin whitish microtomentum on the anterodorsal portion of tergites 3 and 4, black palpus, three katepisternal setae, and pale male lower calypter clearly indicates that *Macquartia sichuanensis* Zhang & Zhang, 2023 is identical to *Pseudebenia trisetosa* Shima & Tachi, 2010, previously already recorded from China (Shima et al. 2010). Therefore, we propose that *Macquartia sichuanensis* Zhang & Zhang, 2023 is a junior synonym of *Pseudebenia trisetosa* Shima & Tachi, 2010, **syn. nov.**

Macquartia barkamensis Zhang & Zhang, 2023

This species was described based on one male specimen from Sichuan province (China). *Macquartia barkamensis* has parafacial with fine setulae confined to the upper half and 1.5–2.0 times as wide as the postpedicel. It also has one presutural acrostichal seta, two presutural dorsocentral setae, two postsutural intra-alar setae, two postpronotal setae, and ventral side of second costal sector bare. Following Tschorsnig & Richter (1998) and Cerretti et al. (2012), this combination of character states suggests that *M. barkamensis* Zhang & Zhang, 2023 does not belong to *Macquartia*. Instead, the shallow posterior cleft of the male sternite 5, the very short phallus, and the strongly posteriorly elongated hypandrial arms suggest a strongygastrine (Phasiinae) affiliation for this species, but further study is needed to confirm this. Meanwhile, we suggest moving *Macquartia barkamensis* Zhang & Zhang, 2023 to Tachinidae *incertae sedis*.

Macquartia brunneisquama Zhang & Li, 2022, *M. chinensis* Zhang & Li, 2022, *M. flavipedicel* Zhang & Li, 2022, *M. flavifemorata* Zhang & Li, 2022

These four species also exhibit character states that do not align with those of *Macquartia*. In particular, the hypandrial complex, although not clearly represented, shows characters that do not fit the range of variation of the Macquartiini, nor that of other Tachininae. However, a more detailed study of the specimens, including of the male terminalia, is necessary before formally assigning them to a subfamily, tribe, and genus.

Li et al. (2022) provided the mitogenomes of the four species, corresponding to NCBI accession numbers OL681848–OL681851. However, in their original work and the associated metadata, they did not assign these codes to the scientific names of the species they described. We clarify this information here: OL681848 ("M. sp.1 HNL 2022a") corresponds to *Macquartia brunneisquama* Zhang & Li, 2022, OL681849 ("M. sp.4 HNL 2022a") corresponds to *Macquartia flavipedicel* Zhang & Li, 2022, OL681850 ("M. sp.2 HNL 2022a") corresponds to *Macquartia chinensis* Zhang & Li, 2022, and OL681851 ("M. sp.3 HNL 2022a") corresponds to *Macquartia flavifemorata* Zhang & Li, 2022.

We selected the mitochondrial DNA *cox1* barcode fragments and analyzed them using the BOLD Identifi-

Downloaded From: https://staging.bioone.org/journals/Integrative-Systematics:-Stuttgart-Contributions-to-Natural-History on 24 Mar 2025
Terms of Use: https://staging.bioone.org/terms-of-use

cation System (Ratnasingham & Hebert 2007) and NCBI BLAST (Camacho et al. 2009). The sequences showed no matches on BOLD, and none of the top 100 BLAST hits from NCBI corresponded to the genus *Macquartia*. We then clustered the barcodes using Objective Clustering (Meier et al. 2006), with a 2% threshold (Srivathsan et al. 2019). OL681848 and OL681850 (i.e., *Macquartia brunneisquama* Zhang & Li, 2022 = "M. sp.1" and *Macquartia chinensis* Zhang & Li, 2022 = "M. sp.2", respectively) clustered together as one putative species, with an intracluster distance of 1.11%.

We suggest moving *Macquartia brunneisquama* Zhang & Li, 2022, *M. chinensis* Zhang & Li, 2022, *M. flavipedicel* Zhang & Li, 2022, and *M. flavifemorata* Zhang & Li, 2022 to Tachinidae *incertae sedis*.

References

Blaschke, J. D., Stireman, J. O. III, O'Hara, J. E., Cerretti, P. & Moulton, J. K. (2018): Molecular phylogenetics and piercer evolution in the bug-killing flies (Diptera: Tachinidae: Phasiinae). – Systematic Entomology **43** (1): 218–238. https://doi.org/10.1111/syen.12272

Camacho, C., Coulouris, G., Avagyan, V., Ma, N., Papadopoulos, J., Bealer, K. & Madden, T. L. (2009): BLAST+: architecture and applications. – BMC Bioinformatics **10**: 421. https://doi.org/10.1186/1471-2105-10-421

Cerretti, P., Tschorsnig, H.-P., Lopresti, M. & Di Giovanni, F. (2012): MOSCHweb – a matrix-based interactive key to the genera of the Palaearctic Tachinidae (Insecta, Diptera). – ZooKeys **205**: 5–18. https://doi.org/10.3897/zookeys.205.3409

Li, H., Zhang, B., Pei, W., Sun, H., Chen, J., Gao, X., Peng, H., Zhang, D. & Zhang, C. (2022): Four new species of *Macquartia* (Diptera: Oestroidea) from China and phylogenetic implications of Tachinidae. – Insects **13** (12): 1096. https://doi.org/10.3390/insects13121096

Meier, R., Shiyang, K., Vaidya, G. & Ng, P. K. L. (2006): DNA barcoding and taxonomy in Diptera: a tale of high intraspecific variability and low identification success. – Systematic Biology **55** :715–728. https://doi.org/10.1080/10635150600969864

Ratnasingham, S. & Hebert, P. D. N. (2007): BOLD: the Barcode of Life Data System (www.barcodinglife.org). – Molecular Ecology Notes **7**: 355–364. https://doi.org.10.1111/j.1471-8286.2007.01678.x

Shima, H., Han, H.-Y. & Tachi, T. (2010): Description of a new genus and six new species of Tachinidae (Diptera) from Asia and New Guinea. – Zootaxa **2516**: 49–67. https://doi.org/10.11646/zootaxa.2516.1.3

Srivathsan, A., Hartop, E., Puniamoorthy, J., Lee, W. T., Kutty, S. N., Kurina, O. & Meier, R. (2019): Rapid, large-scale species discovery in hyperdiverse taxa using 1D MinION sequencing. – BMC Biology **17**: 96. https://doi.org/10.1186/s12915-019-0706-9

Tschorsnig, H.-P. (1985): Taxonomie forstlich wichtiger Parasiten: Untersuchungen zur Struktur des männlichen Postabdomens der Raupenfliegen (Diptera, Tachinidae). – Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie) **383**: 1–137. https://www.biodiversitylibrary.org/part/75257

Tschorsnig, H.-P. & Richter, V. A. (1998): Family Tachinidae. – In: Papp, L. & Darvas, B. (eds.): Contributions to a Manual of Palaearctic Diptera (with special reference to flies of economic importance). Volume 3. Higher Brachycera, pp. 691–827; Budapest (Science Herald).

Zhang, B., Li, H., Li, J., Zhang, D. & Zhang, C. (2023): Taxonomic study of the genus *Macquartia* Robineau-Desvoidy (Diptera, Tachinidae) from China. – Biodiversity Data Journal **11**: e106273. https://doi.org/10.3897/BDJ.11.e106273

Authors' addresses:

[1]Department of Biology and Biotechnologies "Charles Darwin", Sapienza University of Rome, Piazzale Aldo Moro 5, 00185 Rome, Italy; e-mails: pierfilippo.cerretti@uniroma1.it (PC; corresponding author), aleida.ascenzi@uniroma1.it (AA); https://orcid.org/0000-0002-9204-3352 (PC), https://orcid.org/0009-0001-3056-2966 (AA)

[2]School of Ecology and Nature Conservation, Beijing Forestry University, Beijing 100083, China; e-mail: ernest8445@163.com; https://orcid.org/0000-0001-6427-7867

[3]Liaoning Key Laboratory of Biological Evolution and Biodiversity, College of Life Science, Shenyang Normal University, Shenyang 110034, China; e-mail: 13478194638@163.com (corresponding author); https://orcid.org/0000-0002-9514-0502

ZooBank registration: https://zoobank.org/References/07F6CF95-DBF9-4DDC-82A2-D3F10DFDA89B

Manuscript received: 27.IX.2024; accepted: 11.XII.2024.

Downloaded From: https://staging.bioone.org/journals/Integrative-Systematics:-Stuttgart-Contributions-to-Natural-History on 24 Mar 2025
Terms of Use: https://staging.bioone.org/terms-of-use