NOTE

Examination of type specimens for *Colliculoamphora reichardtiana* (Grunow) Williams and Reid, with a description of a new species, *Colliculoamphora johnwrightii* nov. sp.

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In the original description of the diatom genus *Colliculoamphora*, the type species of *Colliculoamphora reichardtiana* (Grunow) Williams and Reid (= *Amphora reichardtiana* Grunow) was mistakenly said to be from Honduras. Inspection of relevant specimens and manuscript material of *Amphora reichardtiana* in Grunow’s collection (held in W) has permitted a re-evaluation of the species. Type material has been identified and, after examination, a new species, *Colliculoamphora johnwrightii*, is separated from *Colliculoamphora reichardtiana*.

Keywords: Colliculoamphora, type material, new species

Introduction

The genus *Colliculoamphora* Williams & Reid was originally described for two species, the living marine species, *Amphora reichardtiana* Grunow, and the extinct fossil species *Eunotia reedii* Schrader, the former designated as the type of the genus (Williams & Reid 2006). Subsequently a further nine species were added, eight by Williams & Reid (2009) and one by Lobban (2015).

In the original description of *Colliculoamphora*, it was noted that the type species of *A. reichardtiana* was ‘originally described from “Sargassum von Honduras”’ (Grunow 1867: 25) ... ’ (Williams & Reid 2006: 148). This is not the case. Those locality details were derived from a mistaken assumption based on the title of Grunow’s paper in which the species description appeared: ‘Diatomeen auf Sargassum von Honduras, gesammelt von Lindig’ (Grunow 1867). In Grunow’s text for the original description of *A. reichardtiana* the Adriatic Ocean was indicated as the source of the specimens (‘... neue Amphora-Arten des adriatischen Meeres ... ’; Grunow 1867: 25). This is not the case. Those locality details were derived from a mistaken assumption based on the title of Grunow’s paper in which the species description appeared: ‘Diatomeen auf Sargassum von Honduras, gesammelt von Lindig’ (Grunow 1867). In Grunow’s text for the original description of *A. reichardtiana* the Adriatic Ocean was indicated as the source of the specimens (‘... neue Amphora-Arten des adriatischen Meeres ... ’; Grunow 1867: 25).

W-1901/3239; the ‘Bilder-Sammlung’ is Grunow’s image collection, which includes drawings, micrographs, printed pictures, etc. ‘Sansego’ is Italian for Sušak, an island in the Adriatic Sea near Croatia. Thus the actual type locality for *A. reichardtiana* is ‘Sansego’ (Sušak) and fig. 34 in Schmidt’s Atlas is the only published example of a specimen prior to the present paper.

Type material

Inspection of relevant specimens and manuscript material of *A. reichardtiana* in Grunow’s collection (held in Vienna [W]) has permitted a re-evaluation of the species. I begin with a consideration of Grunow’s ‘Bilder-Sammlung’ (image collection) for *A. reichardtiana* collected together on sheet no. W-1901/3240. There are nine drawings, two micrographs and a hand-written description in Latin. The drawings are grouped together in three sets:

(1) A set of seven illustrations depicting six specimens in valve view and one, possibly, in girdle view (reproduced in Fig. 2). The four drawings illustrated in the upper part of the sheet are all based on specimens from Campeche Bay, Mexico and ‘Sansego’ (fig. 33 = ‘Camp. Bai’; fig. 34 = ‘Sansego’; fig. 35 = ‘Camp. Bai, viell. äusserste Altersverkämerung derselben?’). Schmidt’s figures are reproduced here as Fig. 13 and 18; Grunow’s annotated copies of those figures are reproduced here as Figs 14 and 19. The latter are taken from Grunow’s ‘Bilder-Sammlung’ sheet no. W-1901/3239; the ‘Bilder-Sammlung’ is Grunow’s image collection, which includes drawings, micrographs, printed pictures, etc. ‘Sansego’ is Italian for Sušak, an island in the Adriatic Sea near Croatia. Thus the actual type locality for *A. reichardtiana* is ‘Sansego’ (Sušak) and fig. 34 in Schmidt’s Atlas is the only published example of a specimen prior to the present paper.

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Figs 1–2. *Coliculoamphora reichardtiana*. Fig. 1: Text of Grunow’s original description of *Amphora reichardtiana* (*... neue Amphora-Arten des adriatischen Meeres...* ’; Grunow (1867: 25). Fig. 2: Illustrations from Grunow’s ‘Bilder-Sammlung’ (image collection) for *A. reichardtiana* collected together on sheet no. W-1901/3240. Fig. 2a: Seven illustrations depicting six specimens in valve view and one, possibly, in girdle view, from Grunow sample W 869, identified as from Porto Zubzamki, Šušak Island, Gulf of Kvarner, [Jugoslavia] Croatia, leg. Reichardt. Fig. 2b: Micrograph possibly from Lesina; Fig. 2c: Drawing from sample W 1556, Campeche Bay, Mexico; Fig. 2d: Micrograph possibly from Campeche Bay.
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(2) A drawing of a single specimen, in valve view, taken from sample W 1696 (Campeche Bay, Mexico) (Fig. 20).

(3) A set of three drawings of specimens in valve view, all from sample W 869 (see above) (Fig. 7).

Material of interest with respect to the type of *A. reichardtiana* is thus Grunow’s sample W 869, from Porto Zubzamki, Sušak Island, Croatia. Three slides of this material were examined from Grunow’s collection: W 869, W 869b and W 869c, and all should be considered syntypes (following Ross 1963: 73, see below and McNeill et al. 2012: Article 9.5). There are also two packets containing Grunow’s sample W 869 in the herbarium, one labelled *Amphora reichardtiana* (Fig. 3, Grunow number W-1901/3867), the other labelled *Mastogloia braunii var. lata*, a nomen nudum (or maybe more accurately a nomen herbariorum as that name has never appeared in the literature, only on a herbarium label) (Fig. 4, Grunow ‘Bilder-Sammlung’ sheet no. W-1901/4935). Each packet includes a glass slide, locality details (Porto Zubzamki, Sušak Island, Gulf of Kvarner, [Yugoslavia] Croatia) and a rough drawing of a valve of *A. reichardtiana* (Figs 5 and 6). Examination of this material yielded numerous specimens of *A. reichardtiana* of which Figs 8–12 are a selection (Fig. 11 is from W 869, Figs 9 and 12 are from W 869b and Figs 8 and 10 are from W 869c; Fig. 13 is the published image reproduced from Schmidt 1876: pl. 39, with fig. 34, the specimen from ‘Sansego’, enclosed in a black box; Fig. 14 is Grunow’s annotated version of the same figure, on ‘Bilder-Sammlung’ sheet no. W-1901/3239). Unfortunately, raw material from Sušak Island is unavailable for electron microscopy.

Figs 3–6. *Colliculoamphora reichardtiana*. Fig. 3: Grunow’s sample W 869 labelled *Amphora reichardtiana*, Bilder-Sammlung W-1901/3867. Fig. 4: Grunow’s sample W 869 labelled ‘*Mastogloia braunii* var. *lata*’, Bilder-Sammlung W-1901/4935. Fig. 5: Drawing of a valve of *Colliculoamphora reichardtiana* accompanying Grunow’s Bilder-Sammlung W-1901/3867. Fig. 6: Drawing of a valve of *Colliculoamphora reichardtiana* accompanying Grunow’s Bilder-Sammlung W-1901/4935.
Figs 7–14. *Colliculoamphora reichardtiana*. Fig. 7: Set of three drawings of specimens in valve view, all from Bilder-Sammlung for *Colliculoamphora reichardtiana*, W-1901/3240. Figs 8, 10: *Colliculoamphora reichardtiana*, W 869c; specimen length 25 μm. Fig. 11: *Colliculoamphora reichardtiana*, W 869; specimen length 22 μm. Figs 9, 12: *Colliculoamphora reichardtiana*, W 869b; specimen length 25 μm. Fig. 13: *Colliculoamphora reichardtiana*, reproduced from Schmidt (1876: pl. 39, with fig. 34, from ‘Sansego’), enclosed in a black box. Fig. 14: Grunow’s annotated version of fig. 34, from Bilder-Sammlung W-1901/3239.
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Figs 15–21. *Colliculoamphora johnwrightii* sp. nov. Figs 15–17: *Colliculoamphora johnwrightii* sp. nov., Campeche Bay, BM 12890, Cleve & Möller, *Diatoms*, no 150, lectotype, specimens of length 30 – 35 µm. Figs 18–19: reproduced from Schmidt (1876: pl. 39, with figs 33 and 35, enclosed in black boxes) and Grunow’s annotated copy, from Grunow’s ‘Bilder-Sammlung’ sheet no. W-1901/3239. Fig. 20: Drawing from sample W 1696, Campeche Bay, Mexico. Fig. 21: Detail of drawing from sample W 1556, Campeche Bay, Mexico (detail from Fig. 2c).

Sample W 869 also happens to be the type of *Schizostauron fimbriatum* Grunow (= *Achnanthes fimbriata* (Grunow) Ross), which was discussed in detail by Ross (1963: 68)). In Grunow’s later article, translated into English (and with additional notes from Frederick Kitton), he did not write further about *A. reichardtiana* (Grunow 1877: 181) but did discuss other species from the Adriatic near Croatia (‘Adriatic Sea near Lussin piccolo (leg. Dr. Reichardt)’), thus a note is required concerning the microscope that may be from ‘Lesina’ (Fig. 2a). Lesina is another name for Hvar, a Croatian Island in the Adriatic Sea and could, therefore, be type material, but no specimens were ever published from this locality. In addition, Ross examined the type of *Schizostauron reichardtiana* Grun. and identified Grunow’s W 864a as its type, from ‘Mali Lošinj Island, Gulf of Kvarner [Croatia]’ (Ross 1963: 71), ‘formerly known as Lussin Piccolo’ (Ross 1963: 67, Grunow 1877: 181). It is unlikely that the name ‘Lesina’ on the micrograph in Fig. 2a refers to ‘Lussin Piccolo’, yet it remains interesting that *A. reichardtiana* was found along that Croatian coast of the Adriatic.

Grunow’s 1867 description was sufficient to allow subsequent identification and the three drawings of *A. reichardtiana* published sometime later in Schmidt’s *Atlas* (Schmidt 1876: pl. 39, figs 33–35, see Figs 2 and 3) complement the text. Grunow’s description from 1867, presumably based only on the Sušak Island specimens, is as follows:

Die andere “Amphora Reichardtiana m.” ist ganz ohne Analogen [Analogen], nicht complex, mit breit-linearen, an den Enden abgerundeten, schwach gebogenen Schalen, welche bisweilen an den Enden bögig aufwärts gekrümmt sind und den dicken, kurzen Formen der Eunotia monodon täuschend ähnlich sehen. Die Mittellinie fällt mit dem unteren Rande zusammen und zeigt längliche End- und Mittelknöten. Radiale punctirte [punctierte] Querstreifen 30 – 40 in 0,001”. Sie ist bis auf den Mittelknöten kaum von Eunotia zu unterscheiden (Grunow 1867: 25).

The unpublished Latin description (reproduced as part of Fig. 2) is as follows:

‘Amphora parva eunotiaeformis, a latere pri-mario oblonga, ad polas truncato rotundata medio constricta valvis lineari oblongis, leviter arcuatis, dorso subconvexo, ventre concavo, polis rotundatis; linea longitudinali nodulis ventralis et nodulis terminalibus instructa omnino cum latere inferiori valvae coincidente, striis punctatis (33–39 in 0.001) radiantibus’.

Both make direct comparisons to the genus *Eunotia* Ehrenberg and describe the shape of the valves. Comparison of specimens from Sušak Island (Figs 8–14) with those from Campeche Bay (Figs 15–21), even with just the light microscope, indicates clear differences between the two and hence it would be more accurate to consider these specimens as belonging to two separate species (in Schmidt’s *Atlas* the specimens in figs 33 and 35 demonstrate size variation, not structural variation, as can be seen from the actual specimens). As Grunow’s protologue includes reference only to specimens from Sušak Island, it is only these that should be referred to as *A. reichardtiana*. As material from Campeche Bay is widely available and the description of *A. reichardtiana* given in Williams & Reid (2006) was based entirely on those specimens, that description and the accompanying published images should refer to a new species of *Colliculoamphora*; this is described below.

### Taxonomic descriptions

*Colliculoamphora reichardtiana* (Grunow) Williams & Reid (2006: 153, excl. figs and descr.) (Figs 1–14)

**Basionym:** *Amphora reichardtiana* Grunow 1867, *Monthly Microscopical Journal* 18, p. 25.

**Description:** Valves linear, asymmetrical about the apical plane (17–30 µm in length, 7–10 µm in breadth) with a pronounced curving of the poles towards the ventral margin; striae uniseriate, regularly spaced at valve margins.
and perimeter of valve face (10–15 in 10 μm, slightly denser towards the apices). Raphe slit visible at each pole and along the margin, deflected towards ventral side of valve, extending from valve face towards mantle edge, terminating at mantle with small central nodule.

Lectotype: W 869c, lectotype, designated here (= Figs 8 and 10, specimen length 25 μm).

Type locality: Porto Zubzamki, Sušak Island, Croatia.

Distribution: This species is known only from the type locality and possibly from Hvar, Croatia. Although the specimens illustrated and described as C. reichardtiana in Williams & Reid (2006: 153) are now not considered to be that species, the combination remains valid but the description is redundant as it refers to the new species described below.

Colliculoamphora johnwrightii sp. nov. (Figs 15–21)

Description: Valves linear, asymmetrical about the apical plane (20–52 μm in length, 10–13 μm in breadth), striae uniseriate, regularly spaced at valve margins and perimeter of valve face, becoming scattered and irregular towards valve centre (10–15 in 10 μm, slightly denser towards the apices). Raphe slit present at each pole, deflected towards ventral side of valve, extending from valve face towards mantle edge, terminating on mantle with small central nodule. Raphe with helictoglossa, rimportulae absent, sternum present, ill-defined in external view, internally more obvious, occurring centrally along mid-point of valve. Girdle bands narrow, with two rows of simple pores, regularly spaced (c. 30–34 per 10 μm), total probably three, all open, shallow and lack any notable structure.

Holotype: BM 12890, Cleve & Möller, Diatoms, no 150, holotype, designated here; BM 12913, 12914, Cleve & Möller, Diatoms, nos 151–2, isotype.

Cleve & Möller note that A. reichardtiana is ‘rare’ (Cleve & Möller 1878: 5; images in Williams & Reid 2006: Figs 11–16 are from BM 12890, Cleve & Möller, Diatoms, no. 150, and in Figs 15–17) but in the raw material held at BM many specimens were found, including specimens with girdle bands (Williams & Reid 2006: Figs 17–29).

Type locality: Campeche Bay, Mexico.

Other examined material came from Pensacola, Florida, USA (BM 31004, BM 92544–6) and Colon, Panama (BM 53343, 54162).

Etymology: Named after John Wright, primarily in honour of his popular book on taxonomy (Wright, J. 2015. The Naming of the Shrew, Bloomsbury) but also for enduring a whole day of talks on Willi Hennig and cladistics at the Linnean Society in 2013 (Williams 2013) and for another book of which I have made enormous use (Wright, J. 2013. Booze. River Cottage Handbook no. 12, Bloomsbury).

Distribution: As stated before, this species is tropical, subtropical, distributed around South and Central America but commonly in Mexico (Krayesky et al. 2009).

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Disclosure statement

No potential conflict of interest was reported by the author.

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Note

1. He is also a mycologist – but we all make mistakes.

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