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Neotype designation for *Cladotanytarsus (Lenziella) bicornutus* (Kieffer), and first description of the distinctive female (Diptera: Chironomidae: Tanytarsini)

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Abstract

A neotype for *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922), the type species of *Lenziella* Kieffer, 1922, is designated from material sampled by Krüger in the 1940's and recently discovered in the Thienemann collection. The adult female of *C. (L.) bicornutus* is described for the first time, and its diagnostic characters are discussed.

Key words: Diptera, Chironomidae, *Cladotanytarsus*, *Lenziella*, nomenclature, systematics

Introduction

Giłka (2011) revalidated the previously dubious species name *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922), and the subgenus name it typifies, treating *C. wexionensis* Brundin, 1947 as a junior synonym. No neotype for *C. bicornutus* was designated, as the available material (adult males and pupae) was considered to have been collected too far away from the type locality ("Holstein" in Germany; Kieffer 1922: 362). Specifically, no material had been seen from the samples by F.W.C. Krüger in which "*Cladotanytarsus wexionensis*" was reported to "occur sporadically among *C. mancus* Walk." by Thienemann (1951: 642).

Following Giłka (2011), the present second author searched the Thienemann material and documents preserved at the Zoologische Staatssammlung München, and discovered an alcohol vial labeled "*Cladotanytarsus mancus* v.d.W. / Peene-Untersuchung Krügers" [Krüger's Peene study] in Thienemann's handwriting. This sample has been found to contain many specimens of all life stages belonging to the *Cladotanytarsus (Cladotanytarsus) mancus* group, but also a few fully emerged or pharate adults, pupae and exuviae of a member of *C. (Lenziella)*. The latter material is conspecific with the one described as *C. (L.) bicornutus* in Giłka (2011), and yields the new taxonomic and nomenclatural results presented below.

Methods

Specimens were dissected and slide-mounted in a mixture of phenol and Canada balsam using the method by Wirth and Marston (1968). Illustrations were prepared using the technique described by Giłka (2008). Morphological terminology and abbreviations follow Sæther (1980), wherever possible. Adult female body length was measured from the antennal pedicel to the end of the cercus. Length measurements were rounded off to the nearest full μm value; antennal and leg ratios (AR, LR) to the second digit after the decimal point. Head structures, wings and legs were not measured in pharate specimens.

Collection acronyms. DIZP = Department of Invertebrate Zoology and Parasitology, University of Gdańsk, Poland. ZSM = Zoologische Staatssammlung München, Munich, Germany.

Results

Cladotanytarsus (Lenziella) bicornutus (Kieffer, 1922)

Lenziella bicornuta Kieffer, 1922: 361.

Cladotanytarsus wexionensis Brundin, 1947: 81; Thienemann (1951: 642).

Cladotanytarsus (Lenziella) bicornutus (Kieffer, 1922): Gilka (2011: 4).

Material examined. Neotype, designated below; slide-mounted (Fig. 1), deposited at ZSM: adult male; GERMANY, Mecklenburg-Vorpommern, lower Peene river between Anklam and Peenemünde, 1941 or 1942 (see Thienemann 1951: 633), leg. F.W.C. Krüger.

Additional material (same data as neotype, except as follows): 2 adult males (deposited at DIZP), 1 pharate male (ZSM), 4 adult females (3 DIZP, 1 ZSM), 1 pharate female (ZSM), 5 pupal exuviae (2 DIZP, 3 ZSM).

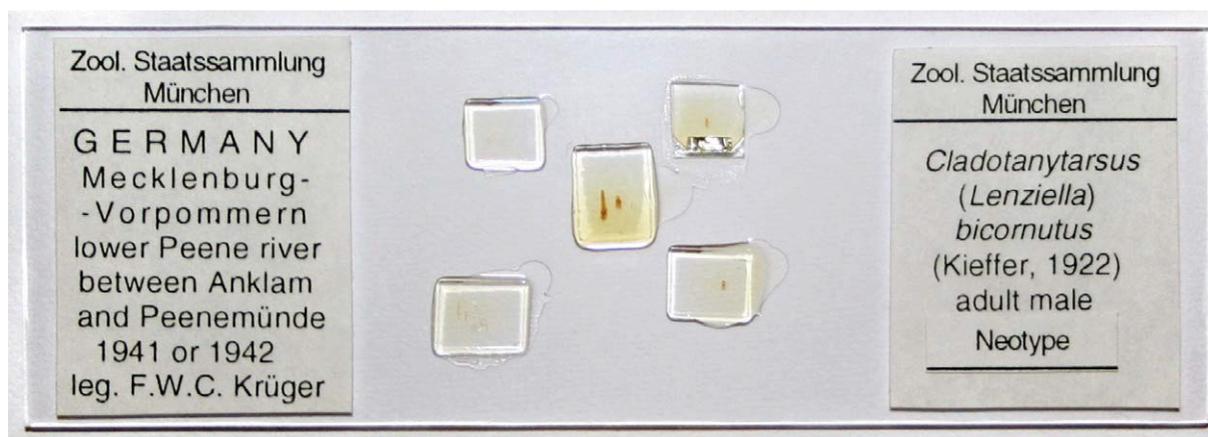


FIGURE 1. *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922), neotype, adult male slide-mounted.

Designation of neotype. A neotype fixation for *Lenziella bicornuta* Kieffer, 1922 is necessary to define objectively not only this species name but also the genus-group name *Lenziella* Kieffer, 1922, for which the former serves as the type species. Therefore a neotype is designated here, with the following particulars (as required in ICZN 1999: Article 75.3).

(1) The neotype is designated to permanently clarify the taxonomic status of the nominal taxon *Cladotanytarsus bicornutus* (Kieffer).

(2) Character-state combinations differentiating the known life stages of *C. bicornutus* from those of other taxa are given in Gilka (2011) and below.

(3) The specimen designated is identified above (see "Material examined").

(4) The original type material of *Lenziella bicornuta* Kieffer consisted of a single male caught (not reared) by A. Thienemann in Germany, Schleswig-Holstein, at Passader See [a lake east of Kiel] on 12 May 1921. These data are documented beyond doubt by entries of Kieffer's and Thienemann's on the original letter sheet exchanged along with the material (preserved at ZSM under letter code T24/7), and by entry of Thienemann's on the species-specific sheet in his personal taxon register (ZSM register code 1992). The (absence of) evidence in the literature strongly suggests that no one other than Kieffer ever studied that holotype, and there has been no trace of it in the collections known to contain what little has been preserved of Kieffer's specimens of Chironomidae (e.g. ZSM; Institut royal des Sciences naturelles de Belgique, Brussels; Museum national d'Histoire naturelle, Paris; Senckenberg Deutsches Entomologisches Institut, Müncheberg). Therefore, the holotype must be considered as lost.

(5) The neotype and the current species concept it represents are consistent in morphology with what is known of the holotype from the original description; see also Gilka (2011).

(6) Krüger's study area on the lower Peene river lies a little under 300 km east of Passader See, and in similar proximity to the German coastline along the Baltic Sea. No source of extant specimens of *C. bicornutus* is known that would be closer to the original type locality.

(7) The neotype is the property of ZSM, a recognized scientific institution that houses and permanently preserves numerous name-bearing types and other zoological voucher specimens.

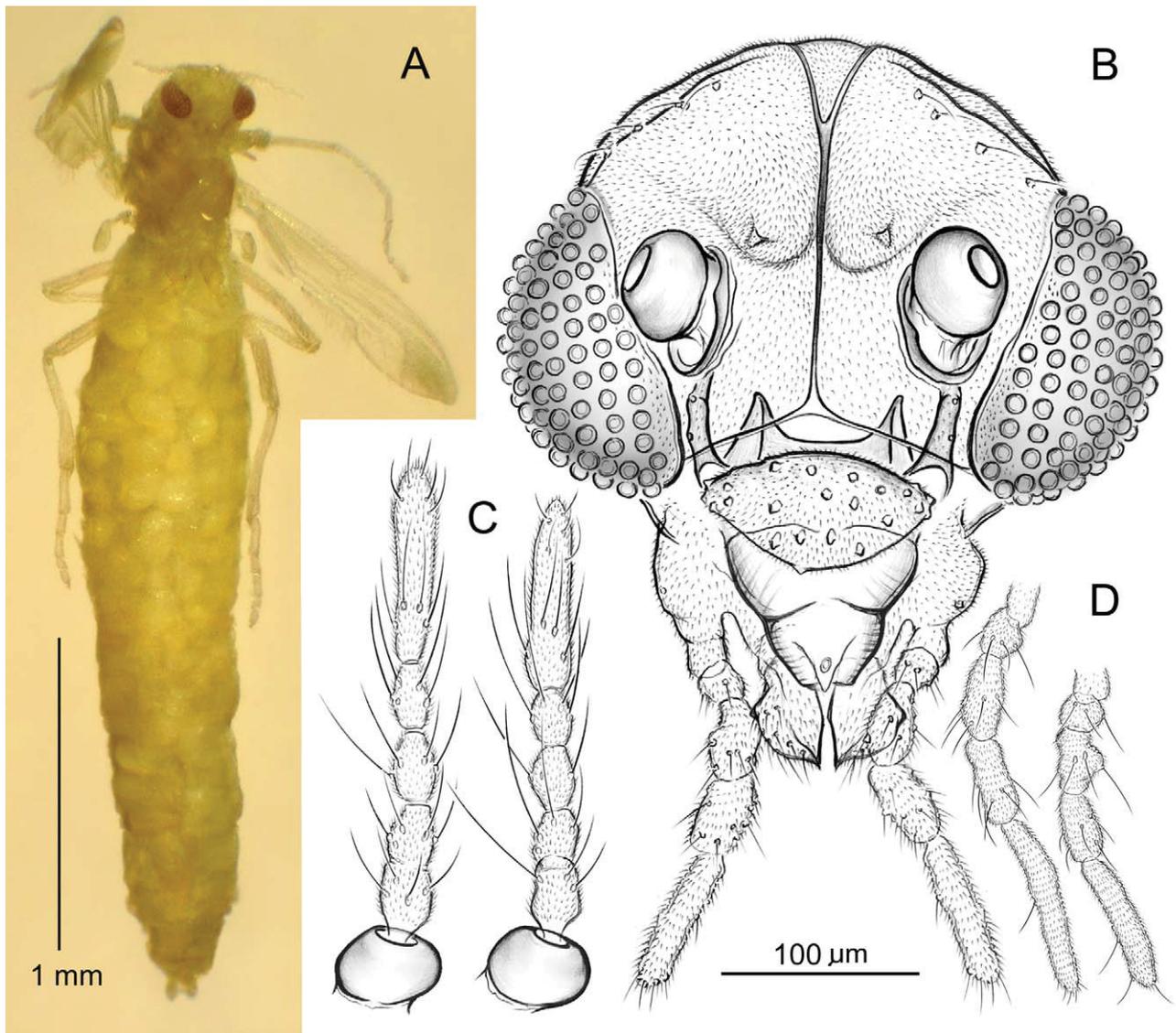


FIGURE 2. *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922), adult female. A—habitus (ventral), B—head, C—antenna (variation), D—palp (variation).

Description of adult female. *General dimensions.* Total length 2.50–2.95 mm; abdomen stout, elongate (Fig. 2A). Wing length 0.86–0.95 mm. Total length / wing length ratio c. 2.7–3.4 (emerged specimens).

Colouration (in alcohol). Similar to that of relatively light-coloured males; see Gilka (2011). Antennal pedicel, tentorium, scutal stripes, postnotum and sternum light brown. Eyes reddish brown. Other parts of body yellowish green to pale brownish. Wing transparent, with membrane slightly darker at apex (Fig. 3A).

Head (Fig. 2B–D). Eyes small, oval, broadly separated, with short pubescence at ventromedial margins. Frontal lobes wide, bearing 5–12 μm long tubercles. Antennal flagellum composed of 4 or 5 segments, with proximal flagellomeres fused in part or separated (Fig. 2C); AR 0.49–0.60. Palp short, variable (Fig. 2B, D); lengths of palpomeres 2–5 (μm): 20–24, 34–48, 36–48, 79–95. Clypeus elliptic or lens-shaped, with 15–23 strong setae.

Thorax chaetotaxy. Setae and their sockets weak, poorly observable. Ac 5–12; Dc 7–8(?), only posterior setae and/or tubercles well developed; Pa 1–2; Scts 4 in single row, outermost pair minute.

Wing (Fig. 3A). Somewhat cuneiform, bevelled or slightly concave at apex, broadest at 2/3 length. Veins bare except C, R, R₁ and distal half of R₄₊₅; membrane completely bare.

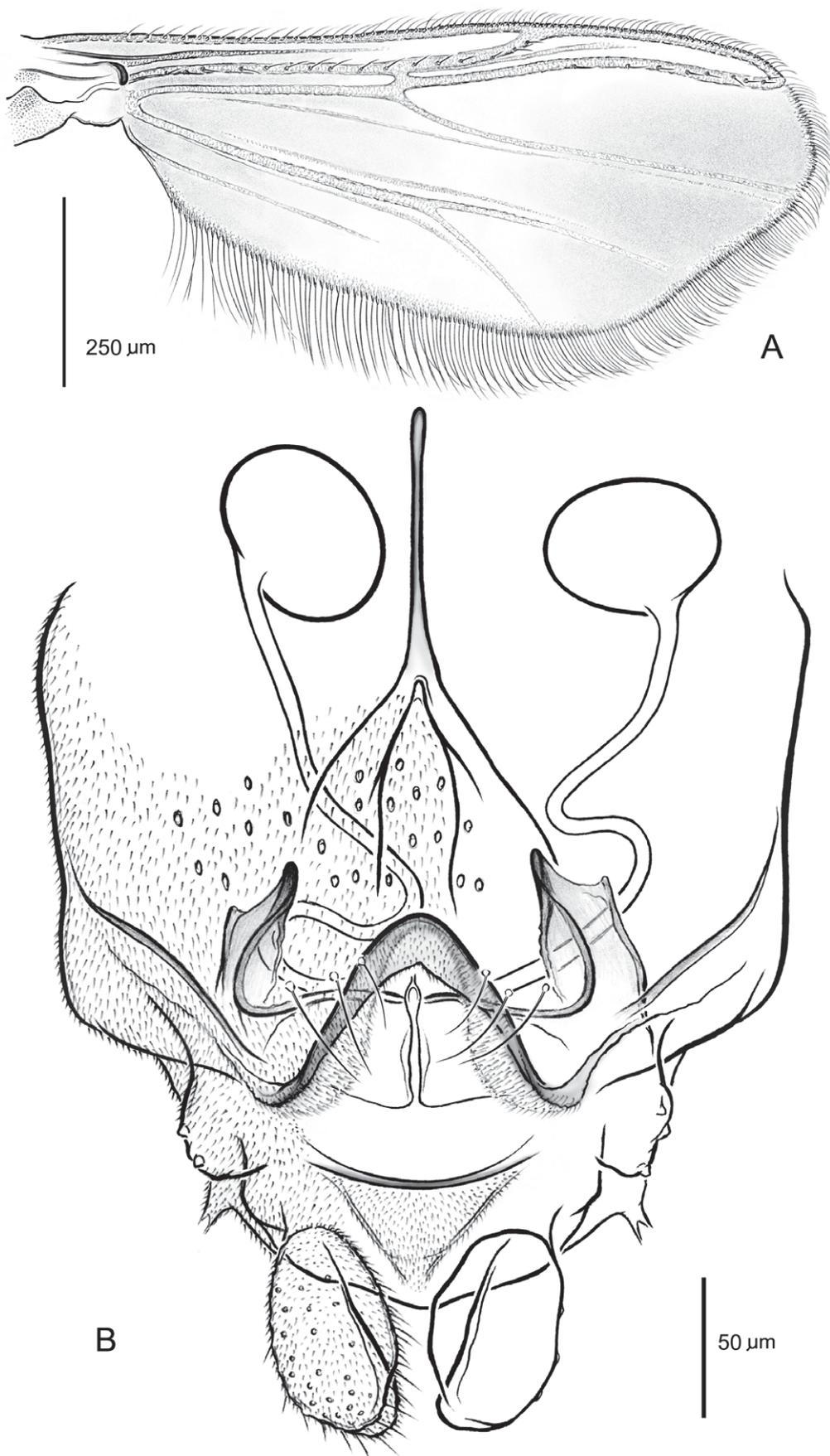


FIGURE 3. *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922), adult female. A—wing, B—genitalia.

Legs. Short but stout, as in male. Tibial spurs absent; single combs observed only on hind legs, vestigial, composed of 3–4 short teeth. Tibial apices of middle and hind leg as in male (see Gilka 2011: fig. 2C, D, variations drawn in full), enlarged, covered with relatively short setae on mid leg, and with tuft of long and finely bent setae on hind leg. Fourth tarsomere shorter than fifth (p_2 , p_3), third tarsomere longer than second (p_3). For lengths of leg segments and leg ratios, see Table.

TABLE. Lengths (μm) of leg segments and leg ratios of female *Cladotanytarsus (Lenziella) bicornutus* (Kieffer, 1922).

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR
P ₁	367–404	272–301	243–287	110–125	81–96	62–73	59–73	0.87–0.95
P ₂	397–434	320–360	103–125	55–62	40–44	29–40	44–51	0.32–0.36
P ₃	445–500	371–441	151–162	70–85	73–88	40–48	51–59	0.37–0.41

Genitalia (Fig. 3B). Gonocoxite with 1–3 setae. Tergite IX broadly subtriangular to semicircular, with 12–30 setae; lateral teeth bifid. Sternite VIII with 24–44 stout setae in extensive central field, and 6–8 weaker setae in a pair of rows close to margins of vaginal floor. Gonapophysis VIII single-lobed, extensive, its caudomedial margins broadly rounded, converging to moderately wide floor covering about one-fourth of anterior part of vagina, with dense and numerous microtrichia directed posteromedially. Rami robust, tapering to 91–99 μm long notum. Labia wide, with parallel posteromedial margins, broadly rounded caudally, reaching posterior margin of SVIII. Gonocoxapodeme almost straight or slightly curved. Coxosternapodeme angular, with well developed medial lobes connected by sinuous transverse bridge. Seminal capsules ovoid, the larger one 60–79 μm long and 52–64 μm wide, the smaller one 56–67 μm long and 48–60 μm wide, with necks in posterolateral positions; spermathecal ducts strongly curved, 205–255 μm long. Postgenital plate triangular. Cercus 70–75 μm long, roundish, with dorsomedial lobe extending slightly beyond ventromedial margin.

Discussion

Thienemann (1951: 634) gave a list of taxa found in the Peene by Krüger that includes numbers of samples per taxon. Unfortunately, no detailed itemization of the respective collecting localities, sample codes and/or dates has been found in other publications or in unpublished documents at ZSM. With 20 samples listed for *Cladotanytarsus mancus* in the paper, and given the lack of detail on the label found with the single (possibly lumped) sample recovered at ZSM, the provenance of the latter material cannot be narrowed down within the temporal and geographic ranges reported by Thienemann (1951: 633, first paragraph). Nevertheless, the data are considered as sufficient for confident species recognition and the neotype designation proposed above.

Thienemann (1951) reported *Cladotanytarsus bicornutus* (as "*Cl. wexionensis*") to occur in both, freshwater and weakly brackish conditions in the lower Peene river, citing it as "particularly common on 22 June 1942 at the Peenemünder Schanze" – a site near the river's mouth, in the northwest corner of Usedom island – "at a salt concentration of 3.45 g/litre" (op. cit.: 642). Compilation of all published data on habitat preferences indicates that *C. bicornutus* is a limnophilous species.

The characters found in the adult female of *Cladotanytarsus (Lenziella) bicornutus*, herein described for the first time, fit well the recently proposed subgeneric concept (Gilka 2011). The antenna showing a clear tendency towards increasing flagellomere number from 4 to 5, the shortened maxillary palp, the stout legs and enlarged tibial apices, the characteristic sternite VIII chaetotaxy, the extensive labia and the strongly curved spermathecal ducts form a set of diagnostic features shared by all known *Lenziella* females. The female of *C. (L.) bicornutus* can be identified by the following character combination: hind leg with third tarsomere longer than second, tergite IX broadly subtriangular to semicircular, labia with parallel posteromedial margins reaching posterior margin of SVIII, coxosternapodeme with stout medial lobes, cercus roundish. The diagnostic character for adults of both sexes, particularly useful in determination of pharate specimens, is the setation of the hind tibial apices. The apical tuft of several long setae, similar in male and female individuals, differentiates *C. (L.) bicornutus* from *C. (L.) cruscus* (Sæther) (setae placed in subapical rows), *C. (L.) latissimus* Gilka (single strong apical bristle) and from other *Lenziella*, in which the setae usually are distinctly shorter (Gilka 2011; cf. fig. 2D and respective

illustrations). In contrast, and with respect to the great variability known from males of *C. (L.) bicornutus*, the extraordinary shape and colouration of the wing (Fig. 3A) is suggested to be treated with caution in diagnostics. Wings of various shapes and colouration, i.e. darker and cut/concave at apex or elliptic and transparent, have been observed in male specimens, including those in the sample examined here. Thus we presume that these wing characters may be variable also in females.

Due to the lack of data on the specific methods by which Krüger obtained the material, one cannot explain definitively the peculiar adult female body proportions (Fig. 2A). However, since the strongly elongated abdomen is filled with distinctly enlarged eggs, we consider the most probable cause to be a physical process (taking place especially in dead individuals) of absorption of water by the gelatinous matrix surrounding the eggs that expands in contact with water. The eggs may have started their development despite being unfertilised, as has been observed in the parthenogenetic *Paratanytarsus grimmii* (Schneider) and the heterogonic *P. laccophilus* (Edwards) (Langton *et al.* 1988; Langton, Cranston pers. comms.).

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