

# Morphological aberrations in culicoid biting midges (Diptera: Ceratopogonidae) collected in Germany: four case studies

[Morphologische Abweichungen bei Gnitzen der Gattung *Culicoides*  
(Diptera: Ceratopogonidae) aus Deutschland: vier Fallbeispiele]

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## Abstract

Morphological anomalies were found in four adult ceratopogonid specimens of the genus *Culicoides* LATREILLE, 1809 collected at three different locations in Germany. Two females of *Culicoides punctatus* (MEIGEN, 1804) from Siegelsbach (federal state of Baden-Württemberg) and one female of *Culicoides deltus* EDWARDS, 1939 from Nörting (Bavaria) had three, instead of two, functional spermathecae but showed no other peculiarities. The fourth specimen could not be definitely identified to species but belonged either to *Culicoides chiopterus* (MEIGEN, 1830) or to *Culicoides dewulfi* GOETGHEBUER, 1936, according to its wing pattern. This specimen, collected in Borken (North Rhine-Westphalia), displayed gynandromorphic features. All these anomalies are here described in detail. The literature on sex-related morphological anomalies found in culicoids is compiled.

## Key words

Ceratopogonidae, *Culicoides*, biting midges, Palaearctic Region, Germany, morphological anomaly, gynandromorphism, intersexualism, spermathecae

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## Zusammenfassung

Morphologische Anomalien wurden bei vier adulten Ceratopogoniden der Gattung *Culicoides* LATREILLE, 1809 gefunden. Die Exemplare stammen von drei verschiedenen Orten in Deutschland. Zwei Weibchen von *Culicoides punctatus* (MEIGEN, 1804) aus Siegelsbach (Baden-Württemberg) und ein Weibchen von *Culicoides deltus* EDWARDS, 1939 aus Nörting (Bayern) wiesen jeweils drei anstatt zwei funktionelle Spermatheken auf, zeigten ansonsten jedoch keine weiteren Auffälligkeiten. Bei dem vierten Exemplar, das nicht eindeutig identifiziert werden konnte, handelte es sich dem Flügelmuster zufolge entweder um *Culicoides chiopterus* (MEIGEN, 1830) oder *Culicoides dewulfi* GOETGHEBUER, 1936. Das in Borken (Nordrhein-Westfalen) gesammelte Exemplar zeigte gynandromorphe Eigenschaften. Die beobachteten Anomalien werden im Einzelnen beschrieben. Ferner gibt der Artikel eine Übersicht über die Literatur zu geschlechtsgebundenen morphologischen Anomalien in der Gattung *Culicoides*.

## Stichwörter

Ceratopogonidae, *Culicoides*, Gnitzen, paläarktische Region, Deutschland, morphologische Anomalie, Gynandromorphie, Intersexualismus, Spermatheken

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## Introduction

Although not particularly rare in nature, morphological aberrations in insects have only been described as an aside in the literature. Not only are they often overlooked by their collectors but in many cases purposely ignored after detection. KRONEFELD et al. (2014) have recently presented a literature review on such aberrations for mosquitoes (Diptera: Culicidae) but there is no comparable compilation for the Ceratopogonidae. We here describe four cases of morphological aberrations in culicoid biting midges recently observed in our collections and at the same time give an overview of the scientific literature on sex-related morphological anomalies in the genus *Culicoides* LATREILLE, 1809.

The most obvious anomalies in dipterans pertain to the head protuberances such as palps and antennae, the extremities (wings and legs) and the genitalia including spermathecae (receptacula seminis). As parts of the