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## Observations on nest construction by *Polydesmus denticulatus*

C. L. Koch, 1847

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### Abstract

The construction of a nest by *Polydesmus denticulatus* C. L. Koch, 1847, is described and compared with observations of other *Polydesmus* species.

### Zusammenfassung

#### Beobachtungen zum Nestbau von *Polydesmus denticulatus* C. L. Koch, 1847

Der Bau eines Nestes von *Polydesmus denticulatus* C. L. Koch, 1847 wird beschrieben und mit dem Nestbau anderer *Polydesmus*-Arten verglichen.

Observations concerning the building and construction of nests of Polydesmids have so far only been made for five *Polydesmus* species: *P. angustus* (BANERJEE 1973, DAVID et al. 1993), *P. monticolus* (VERHOEFF 1915), *P. inconstans* (MACHAN SNIDER 1981), *P. (Brachydesmus) superus* (STEPHENSON 1960) and *P. complanatus*. That of the latter mentioned species, one of the most common in Germany, was already described towards the end of the 19<sup>th</sup> century by well-known myriapodologists (v. SCHLECHTENDAHL 1883 (cited according to VERHOEFF 1915), v. RATH 1890, 1891 and LATZEL 1884). In the early 20<sup>th</sup> century, EFFENBERGER (1909), EVANS (1910), VERHOEFF (1915) and VOGES (1916) dealt with the subject in detail. A controversial issue in the description of the nest-building procedure was the processing of the building material, which, according to v. RATH, was simply taken from the immediate surroundings. Observations by v. SCHLECHTENDAHL, however, indicated that the building material had to pass through the intestinal tract prior to use. This issue was resolved in the years following in favour of v. SCHLECHTENDAHL's opinion, which is also confirmed by the observations on *P. denticulatus* presented here.

Nest-building procedure: The *P. denticulatus* female was collected in the field on 14 Sept. 2000, and kept in a plastic box that had been coated on the inside with gypsum. Only a small amount of organic material and soil were provided. For want of leaves or other smooth surfaces that usually serve as a support for the nest, the millipede began to build its nest directly on the gypsum surface of the box. At regular intervals it took in material (leaf fragments, soil particles, and small pieces of gypsum) from its surroundings, but held

with its anterior continuous contact with the rim of the nest. The excrement, mixed with a sticky secretion, was formed to a wall-like structure using the last few hind-leg pairs and vibration of the everted rectum ('Aftersack'). The hind legs were used to mould the wall thinner. After the wall had reached about two-thirds of its final height the eggs were laid. In contrast to the large number of eggs laid by other Polydesmida, (VOHLAND & ADIS 1999, summarising tables can be found in BHAKAT et al. 1989 and MACHAN SNIDER 1981), the *P. denticulatus* female observed laid only approx. 35 eggs. Following this, the nest chamber was closed to a dome, at the top of which a 'ventilation chimney' was placed. This type of nest structure is, with the exception of *P. inconstans* (MACHAN SNIDER 1981), typical for all *Polydesmus* species investigated so far. Adjacent to the 'chimney' the *P. denticulatus* female left a second ventilation hole open, which has never previously been described in the literature. The process of nest building took approximately 8 hours. The building time for other species varies between 2–3 h (v. RATH 1891) and 1½ days (VERHOEFF 1915), and seems to be individually quite variable (VOGES 1916). After completion of the nest dome, the female covered it with leaf and stem fragments, as is also usual for other species. In contrast to *P. complanatus* and *P. angustus* (EVANS 1910, VOGES 1916), *P. denticulatus* did not display any prolonged protective behaviour towards the nest. This has also been observed for *P. inconstans* (MACHAN SNIDER 1981).

Description of the nest (Fig. 1): The nest had a bottom diameter of 4.2 mm, tapering to 2.4 mm at the top of the dome, total height of the nest was 3.2 mm. The diameter of the chimney-like structure was 1 mm at the base. On the side there was a 0.6 mm long, 0.2 mm wide crack. Adjacent to the 'chimney' was a further ventilation hole of 0.2 mm in diameter.



Fig. 1 Nest chamber of *P. denticulatus*

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