

Short Note

Anterior Regeneration in *Baseodiscus hemprichii* (Nemertea: Heteronemertea)

HIROSHI KAJIHARA^{1*} AND NATSUMI HOOKABE²

¹Faculty of Science, Hokkaido University, Sapporo 060-0810, JAPAN

²Graduate School of Science, Hokkaido University, Sapporo 060-0810, JAPAN

* Corresponding Author: Hiroshi Kajihara (kajihara@eis.hokudai.ac.jp)

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Nemerteans are mostly marine, benthic, carnivorous invertebrates, chiefly feeding on polychaetes, small crustaceans, and mollusks^{1,2}. They comprise the phylum Nemertea, with about 1,300 species known from the world oceans³. It is known for many species that nemerteans can regenerate posterior end of body after amputation. However, body fragments without head usually disintegrate within a few days or a few weeks⁴. Asexual reproduction by fragmentation has been confirmed in *Lineus sanguineus* (Rathke, 1799)⁵ and *Lineus pseudolacteus* Gontcharoff,

1951⁶; the latter is a triploid hybrid between the former and *Lineus lacteus* (Rathke, 1843)⁷. Four additional species — *Baseodiscus delineatus* (Delle Chiaje, 1825), *Cerebratulus lineolatus* Coe, 1905, *Tubulanus polymorphus* Renier, 1804, and *Tubulanus sexlineatus* (Griffin, 1898) — have been reported to possess the head-regenerative potential^{8,9}. In addition, limited anterior regenerative potential was reported for *Lineus pictifrons* Coe, 1904 and *Lineus rubescens* Coe, 1904^{10,11}. The record for the freshwater *Prostoma*¹² appears to be doubtful⁸.

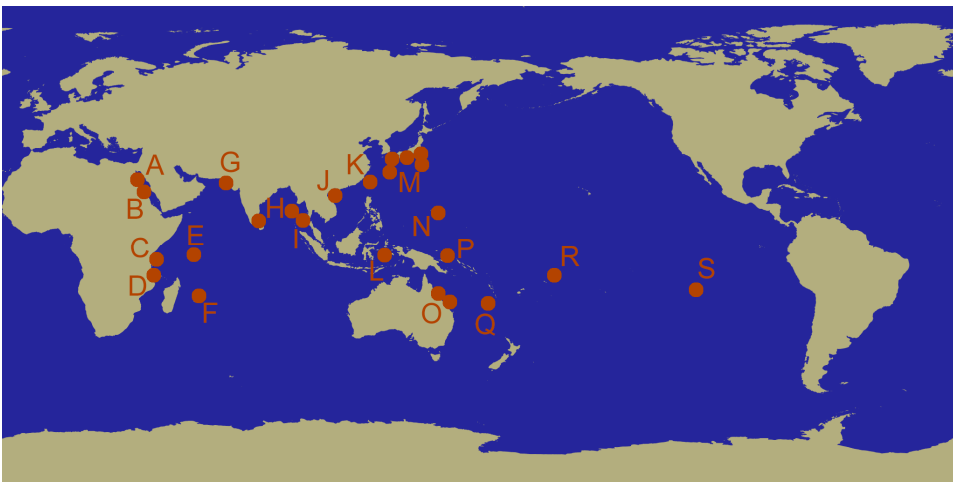


FIGURE 1. Map showing known localities of *Baseodiscus hemprichii*. A, Egypt¹³; B, Sudan¹⁴; C, Tanzania¹⁵; D, Mozambique¹⁵; E, Coëtivy Island¹⁶; F, Mauritius¹⁷; G, Pakistan^{18,19}; H, India^{20,21}; I, Thailand²²; J, Vietnam^{23,24}; K, Taiwan²⁵; L, Indonesia²⁶; M, Japan^{27–30}; N, Caroline Islands¹⁵; O, Australia³¹; P, Papua New Guinea¹⁵; Q, New Caledonia^{32,33}; R, Samoa¹⁵; S, Easter Island³⁴

In this short note, we report for the first time that the valenciiniid heteronemertean *Baseodiscus hemprichii* (Ehrenberg, 1831) is also capable to regenerate the head after spontaneous fragmentation under captive conditions. *Baseodiscus hemprichii* is one of the most common species of nemerteans in warm waters, and widely distributed in the Indo-Pacific^{13–34} (Fig. 1). It is one of the few

species of nemerteans that can be readily identified by a characteristic colour pattern that is even recognizable in a preserved state.

Specimens observed in this report were collected in southern Japan (Okinawa in May and Kagoshima in July) in 2018. Each individual was kept in a plastic container at room temperature; seawater was changed

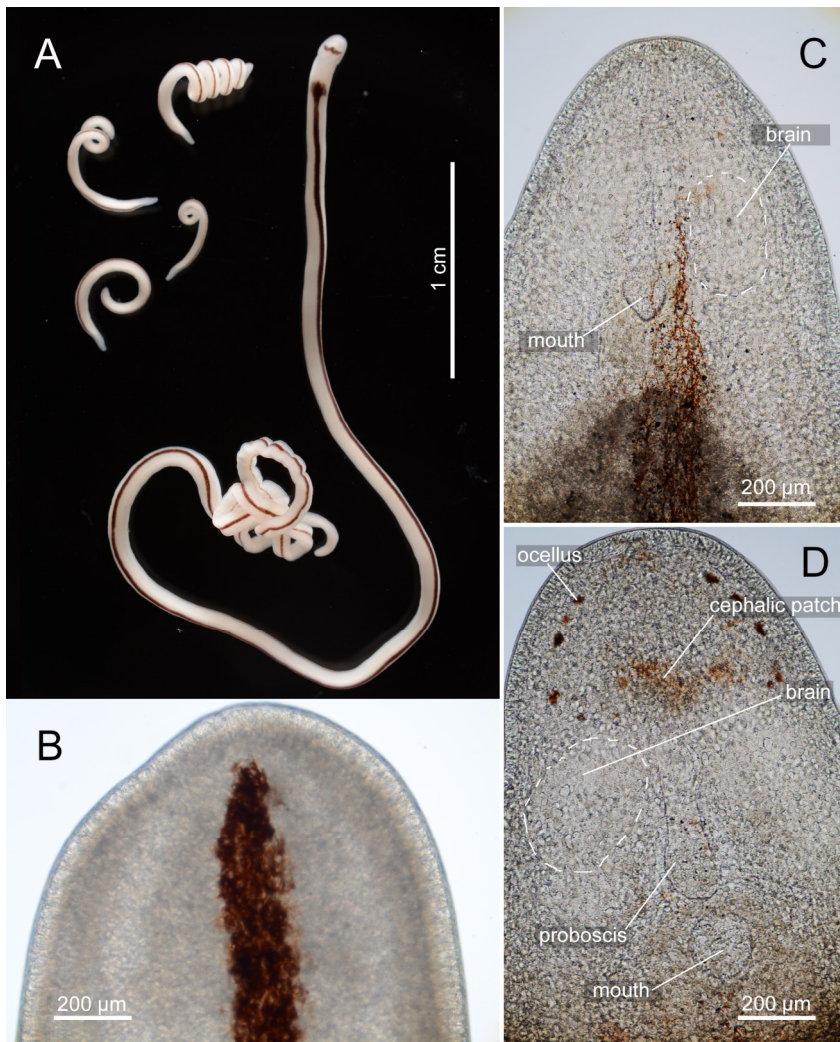


FIGURE 2. *Baseodiscus hemprichii* during the course of anterior regeneration after spontaneous fragmentation. A, Entire animal and fragments, 10 days after fragmentation; B–D, anterior end of fragment; B, 1 or 2 days after fragmentation; C, 10 days after fragmentation; D, 20 days after fragmentation

every week. Spontaneous fragmentation occurred about a month or two after the onset of observation. During the period of three and half months, five out of 12 worms underwent spontaneous fragmentation, which gave rise to 4–12 pieces of short fragments, ranging from 5 to 30 mm in length. The total length of all the fragments generated at once from an individual accounted for about 25–30% of the original body length. The number of resulting fragments appeared to be positively correlated to the original body length. An individual with a 15-cm body length cut its posterior end into four short fragments (6–14 mm in length), while the main body shortened to 11 cm (Fig. 2A). Another 55-cm-long specimen gave rise to eight short pieces (9–30 mm in length), and the remaining main body reduced to about 40 cm in length. The wound is closed one or two days after fragmentation (Fig. 2B). The mouth and brain are formed by 10 days after fragmentation at the latest (Fig. 2C). The proboscis and ocelli appeared no later than 20 days after fragmentation; by then, the cephalic patch becomes discernible (Fig. 2D). Anterior regeneration was confirmed in every fragment. The fully regenerated head looks almost the same as that of an intact individual before fragmentation.

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