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Original article

The first known fossil record of pygmy pipehorses (Teleostei: Syngnathidae: Hippocampinae) from the Miocene Coprolitic Horizon, Tunjice Hills, Slovenia

La première découverte de fossiles d'hippocampes « pygmy pipehorses » (Teleostei : Syngnathidae : Hippocampinae) de l'Horizon Coprolithique du Miocène des collines de Tunjice, Slovénie

Jure Žalohar [a,*], Tomaž Hitij [b]

[a] *Department of Geology, Faculty of Natural Sciences and Engineering, University of Ljubljana, Aškerčeva 12, SI-1000 Ljubljana, Slovenia*

[b] *Dental School, Faculty of Medicine, University of Ljubljana, Hrvatski trg 6, SI-1000 Ljubljana, Slovenia*

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Abstract

The first known fossil record of pygmy pipehorses is described. The fossils were collected in the Middle Miocene (Sarmatian) beds of the Coprolitic Horizon in the Tunjice Hills, Slovenia. They belong to a new genus and species *Hippotropiscis frenki*, which was similar to the extant representatives of *Acentronura*, *Amphelikturus*, *Idiotropiscis*, and *Kyonemichthys* genera. *Hippotropiscis frenki* lived among seagrasses and macroalgae and probably also on a mud and silt bottom in the temperate shallow coastal waters of the western part of the Central Paratethys Sea. The high coronet on the head, the ridge system and the high angle at which the head is angled ventrad indicate that *Hippotropiscis* is most related to *Idiotropiscis* and *Hippocampus* (seahorses) and probably separated from the main seahorse lineage later than *Idiotropiscis*.
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Keywords: Seahorses; Slovenia; Coprolitic Horizon; Sarmatian; Miocene

Résumé

L'article décrit la première découverte connue de fossiles d'hippocampes « pygmy pipehorses ». Les fossiles ont été trouvés dans les plages du Miocène moyen (Sarmatien) de l'horizon coprolithique dans les collines de Tunjice, en Slovénie. Le fossile appartient au nouveau genre et à la nouvelle espèce *Hippotropiscis frenki*, semblable aux représentants existants des genres *Acentronura*, *Amphelikturus*, *Idiotropiscis* et

* Corresponding author.
E-mail address: jure.zalohar@guest.arnes.si (J. Žalohar).

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Kyonemichthys. *Hippotropiscis frenki* vivait dans les herbiers marins, les macro-algues et probablement aussi dans la boue et le limon des eaux côtières peu profondes et tempérées de la partie occidentale de la Parathétys centrale. La haute couronne sur la tête, le système des crêtes et l'angle élevé sous lequel la tête est orientée vers le ventre indiquent que *Hippotropiscis* est étroitement apparenté à *Idiotropiscis* et *Hippocampus* et probablement séparé plus tard qu'*Idiotropiscis* de la lignée principale des hippocampes.
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Mots clés : Hippocampes ; Slovénie ; L'Horizon coprolithique ; Sarmatien ; Miocène

1. Introduction

In 2009, the beds of the Coprolitic Horizon in the Tunjice Hills, Slovenia, became known worldwide for the oldest fossil record of seahorses (Žalohar et al., 2009). Two seahorse species were described from these beds, *Hippocampus sarmaticus* Žalohar et al., 2009, and *Hippocampus slovenicus* Žalohar et al., 2009. In February, 2009, and June, 2011, new excavations were performed, yielding several fossils of seahorses and pipefishes. Among highly diverse syngnathid material, the pygmy pipehorses were discovered for the first time.

Extant members of pygmy pipehorses refer to four genera *Acentronura* Kaup, 1853, *Amphelikturus* Parr, 1930, *Idiotropiscis* Whitley, 1947, and *Kyonemichthys* Gomon, 2007 (Fraser-Brunner and Whitley, 1949; Dawson, 1984; Kuiter, 2004; Gomon, 2007) comprising only eight known species. Together with pygmy seahorses and seahorses they belong to the subfamily Hippocampinae Kaup, 1856, of the family Syngnathidae Rafinesque, 1810 (Kuiter, 2000; Teske and Beheregaray, 2009a). Pygmy pipehorses are morphologically very similar to seahorses but all lack the upright posture. This suggests that they could be a surviving evolutionary link between seahorses and remaining members of the family Syngnathidae, all of which have a horizontal posture (Teske and Beheregaray, 2009a). Just like seahorses, most pygmy pipehorses have a prehensile tail that they use to hold onto vegetation, a tough exoskeleton consisting of bony rings, and fused jaws used to suck in small prey items. Like in seahorses, their males have a brood pouch in which they fertilize the eggs which they collect from the females and brood their young. The only major difference is that they do not swim upright (Teske and Beheregaray, 2009b).

Revision of the data on the fossil syngnathids (Wilson and Orr, 2001) shows that no fossil forms of the pygmy pipehorses were described to date. It appears that the fossil pygmy pipehorses found in the Middle Miocene beds of the Coprolitic Horizon in the Tunjice Hills, Slovenia, are the first known fossil record of this group.

In this article we describe the new and the only known extinct genus and species of pygmy pipehorses, *Hippotropiscis frenki*, and discuss its possible relationship to other pygmy pipehorses and seahorses. Because a new genus and a (single) new species are described, the genus diagnosis corresponds to the species diagnosis. We have no argument to decipher which is a species feature or a generic one. In the "Systematic paleontology" section we first give the "Diagnosis" with the features that allow the recognition of the species. In the "Description" we describe additional characters. Finally, in the "Systematic discussion" we compare the new species with other pygmy pipehorses. A "Systematic discussion" is necessary to discuss the fact that we define a new genus, as well as to discuss its possible relationships among the subfamily. As most of the pygmy pipehorse genera are mono-specific, most of the characters might have a specific and/or a generic status.

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