



## **Tooth morphology and food processing in *Ophiothrix fragilis* (Abildgaard, in O.F. Müller, 1789) and *Ophiura albida* Forbes, 1839 (Echinodermata: Ophiuroidea)**

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### **Abstract**

Based on the main feeding modes of two common European brittlestars, *Ophiothrix fragilis* and *Ophiura albida*, the present study relates the species' tooth morphology to their function in processing food items of different structural quality. Clusters of grinding dental papillae in the suspension feeding *O. fragilis* seem most appropriate for loosening compound food items, *i.e.*, food boli, or potentially for grazing. Large triangular teeth are considered to be used as crushing and cutting instruments, most likely for processing loosened or broken up food masses into smaller digestible portions. In the mostly predating and scavenging *O. albida*, sharp and pointy or broad scale-like oral papillae may serve in gripping and fixing live benthic prey organisms or carrion, while the larger spine-like teeth may be applied as carnassial instruments thrusting into the flesh of a prey organism and tearing off pieces. Designating the two species either as grinders and cutters processing compound and hard structured food or as grippers and tearers handling softer textures, still awaits confirmation through feeding experiments and observational documentation.

**Key words:** Ophiuridae, Ophiothrichidae, feeding, teeth, functional morphology

### **Introduction**

Ophiuroids are known to perform a large variety of different feeding modes such as surface and sub-surface deposit feeding, suspension and filter feeding, browsing, scavenging and predating (Warner 1982 and references therein; Feder 1981). Most ophiuroids are capable of performing more than one feeding mode along with their designated main feeding mode, which in most cases may be directly linked to a specific life style. For example, epibenthic mobile species (*e.g.*, *Ophiura* spp.) typically feed as predators or scavengers, actively hunting their prey (Feder 1981; Warner 1982), whereas infaunal or rheophilic/cryptic species, such as *Amphiura* spp. or *Ophiothrix* spp. typically perform some mode of suspension feeding with their arms extending from their burrows (Warner & Woodley 1975; Loo *et al.* 1996).

Detailed descriptions have been given on behavioural, chemical and mechanical aspects of how food is sensed, trapped and collected in ophiuroids and how different structures (*e.g.*, tube feet and spines) may jointly interact (Austin 1966; Pentreath 1970; Reimer & Reimer 1975; Warner & Woodley 1975; Dearborn 1977; Dearborn *et al.* 1996). Yet, only little information is available on