

Perspective

RADIAL SYMMETRY IN FRAGILE BRITTLE STARS AND USE OF FLEXIBLE ARMS

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INTRODUCTION

Brittle stars are echinoderms in the Ophiuroidea class, which is related to starfish, they creep across the sea floor using their flexible arms. Ophiuroids are now found in every major marine region, from the poles to the tropics. Basket stars are typically found in the deeper sections of this range, however ophiuroids have been found as deep as the abyss. Brittle stars, on the other hand, are common members of reef communities, where they lurk beneath rocks and even within other living species. Some ophiuroid species can even survive in brackish water, which is almost unheard of in echinoderms. The Ophiuroidea may have the strongest inclination toward five-segment radial symmetry of any echinoderm. The body form of ophiuroids is similar to that of starfish, with five limbs connected to a central body disc. In ophiuroids, however, the central body disc is clearly separated from the arms.

The nervous system is made up of a primary nerve ring that circles the core disc. The ring connects to a radial nerve that runs from the base of each arm to the end of the limb [1]. Each limb's nerves pass through a canal at the base of the spinal ossicles. The majority of ophiuroids lack eyes and other specialised sensory organs. They do, however, contain numerous types of sensitive nerve endings in their epidermis that allow them to detect chemicals in water, touch, and even the presence or absence of light. Furthermore, tube feet can detect light as well as scents. These are especially common at the tips of their arms, where they detect light and withdraw into crevices. The mouth is ringed with five jaws and functions as both an anus and a mouth [2]. Behind the jaws are short oesophagus and a stomach chamber that takes up much of the disk's dorsal half. Scavengers or detritivores are the most common types of ophiuroids. The tube feet transport small organic particles into the mouth. Small crustaceans and worms may also be eaten by ophiuroids. Basket stars, in particular, may be capable of suspension feeding, trapping plankton and bacteria with the mucus coating on their arms.

Gas exchange and excretion take place through bursae, which are cilia-lined sacs that open between the arm bases on the underside of the disc [3]. There are typically ten bursae, each of which fits between two stomach digesting pouches. Water is moved through the bursae via cilia or muscle contraction. The hemal system, a network of sinuses and veins distinct from the aqueous vascular system, transports oxygen throughout the body [4]. The Ophiuroidea, like all echinoderms, has a skeleton

made of calcium carbonate in the form of calcite. The calcite ossicles in ophiuroids combine to generate armour plates known collectively as the test. The epidermis, which is made up of a smooth syncytium, covers the plates. The joints between the ossicles and superficial plates in most animals allow the arm to bend to the side but not upwards. The arms of the basket stars, on the other hand, are flexible in all directions. The ossicles are encircled by a thin ring of soft tissue, followed by four sets of jointed plates, one on each of the arm's upper, lower, and lateral sides. A number of elongated spines extending from the two lateral plates help to generate traction on the substrate while the animal is moving [5].

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