

# Sea Pens

## Scotland's secret forests

Sea pens are colonial cnidarians of the class Anthozoa and are the only octocorals adapted for life on soft muddy or sandy sediments. They have a feather-like appearance and when present in high densities they can look like a forest of surreal trees in an otherwise apparently barren sea bed; providing structure and complexity in an otherwise low relief habitat.



**ABOVE:** Group of *Pennatula phosphorea* in Loch Creran, Graham Saunders (SNH, Edinburgh)

**LEFT:** Close-up of *Pennatula phosphorea*, Graham Saunders (SNH, Edinburgh)

**BELOW:** Group of *Funiculina quadrangularis*, Bernard Picton (Picton, B.E. & Morrow, C.C., 2005. [In] *Encyclopedia of Marine Life of Britain and Ireland*.

<http://www.habitas.org.uk/marinelife/species.asp?item=D10500>

Three species of sea pen occupy the deeper muddy habitats of Scottish coastal waters: *Virgularia mirabilis* (Pallas), *Pennatula phosphorea* (Linnaeus) and *Funiculina quadrangularis* (Müller).

*Funiculina quadrangularis* is long, slender and whitish in colour, and is possibly the most impressive, exceeding 2 m in length with approximately one-quarter embedded in the sediment. It is found in deep, sheltered waters from 20 m to over 2000 m, with some of the best examples found in west coast sea lochs, such as Loch Duich. The brittle nature of the axial rod and this species' inability to withdraw into the sediment, make *F. quadrangularis* the most sensitive of the British sea pens to physical disturbance.

*Pennatula phosphorea* is a much smaller sea pen, up to 40 cm in length, with only approximately half of this protruding above the sediment. It has a pinky red colour and exhibits bioluminescence when



disturbed in the dark, hence its specific name. It can also retract into the sediment to some extent. Some of the best known examples are found in Scottish sea lochs, such as Loch Broom on the north-west coast.

*Virgularia mirabilis* is long and slender, and may reach up to 60 cm in length, and is usually off-white to pale yellow in colour. Although this sea pen looks fragile, it is in fact the most robust with a highly muscular peduncle allowing it to burrow and retract completely into the sediment. This sea pen is also the most abundant and widespread of the British sea pens, perhaps due to its tolerance of a wide range of sediments, salinities and temperatures.

Trawling, particularly for *Nephrops* (Langoustine, Dublin Bay Prawn) and dredging, constitutes the most significant threat to these species, as they represent considerable physical interventions in an otherwise stable environment. Although the conservation importance of this habitat is recognised, under OSPAR ('Threatened and/or Declining Habitat'), and through the UK Biodiversity Action Plan (UKBAP), these species are particularly vulnerable to physical damage, providing strong justification for protection measures beyond those specifically put in place for commercially important species.

Moreover, there is increasing recognition that resource management incorporating protection of habitats from physical disturbance can result in significant benefits for both the sustainability of fisheries and the conservation of biodiversity.

**Clare F. Greathead**

E-mail: [greatheadc@marlab.ac.uk](mailto:greatheadc@marlab.ac.uk)

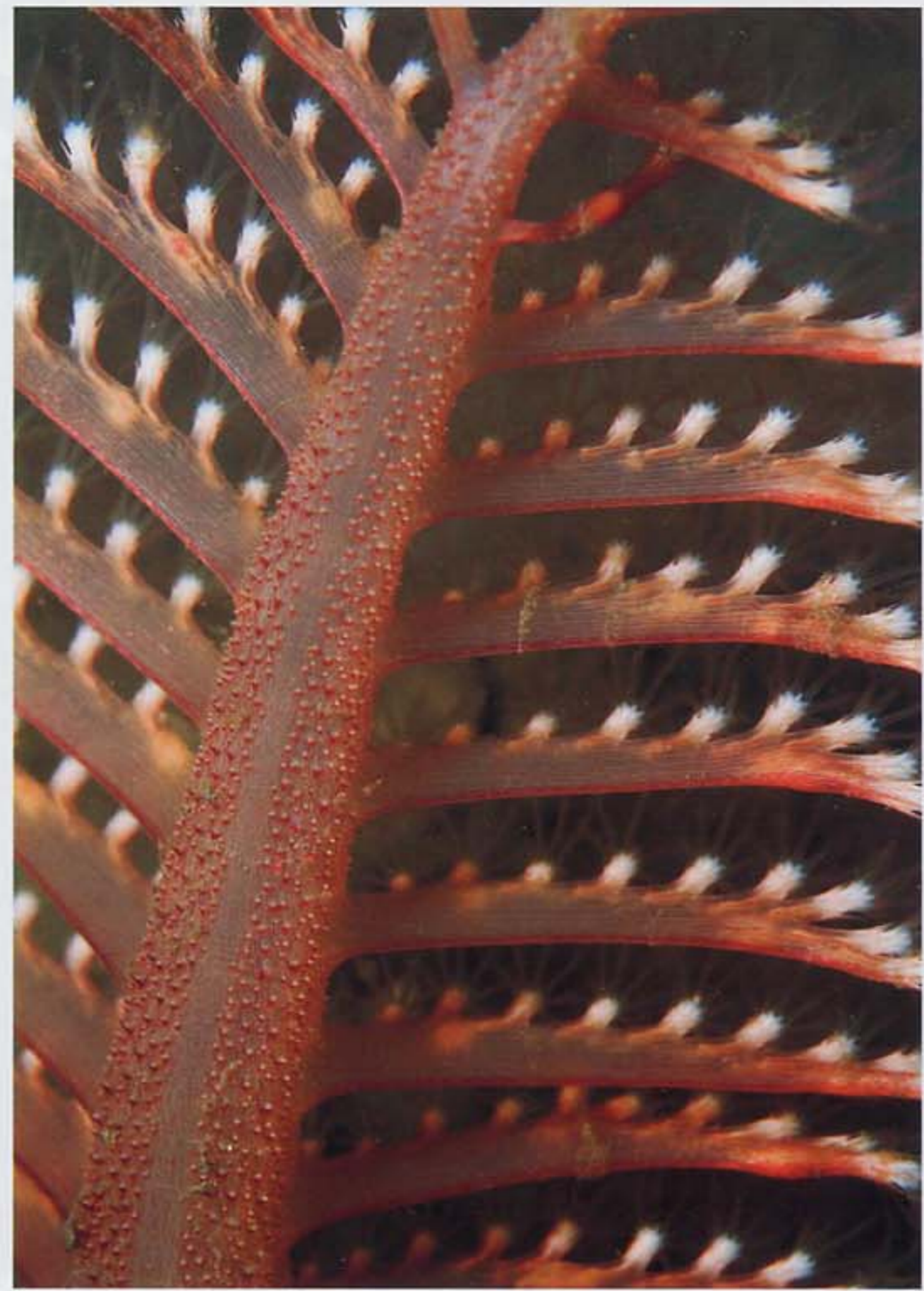
Fisheries Research Services Marine Laboratory, 375 Victoria Road, Aberdeen, Scotland, UK.

**David W. Donnan and Graham R. Saunders**

Scottish Natural Heritage, Battleby, Redgorton, Perth, Scotland, UK.

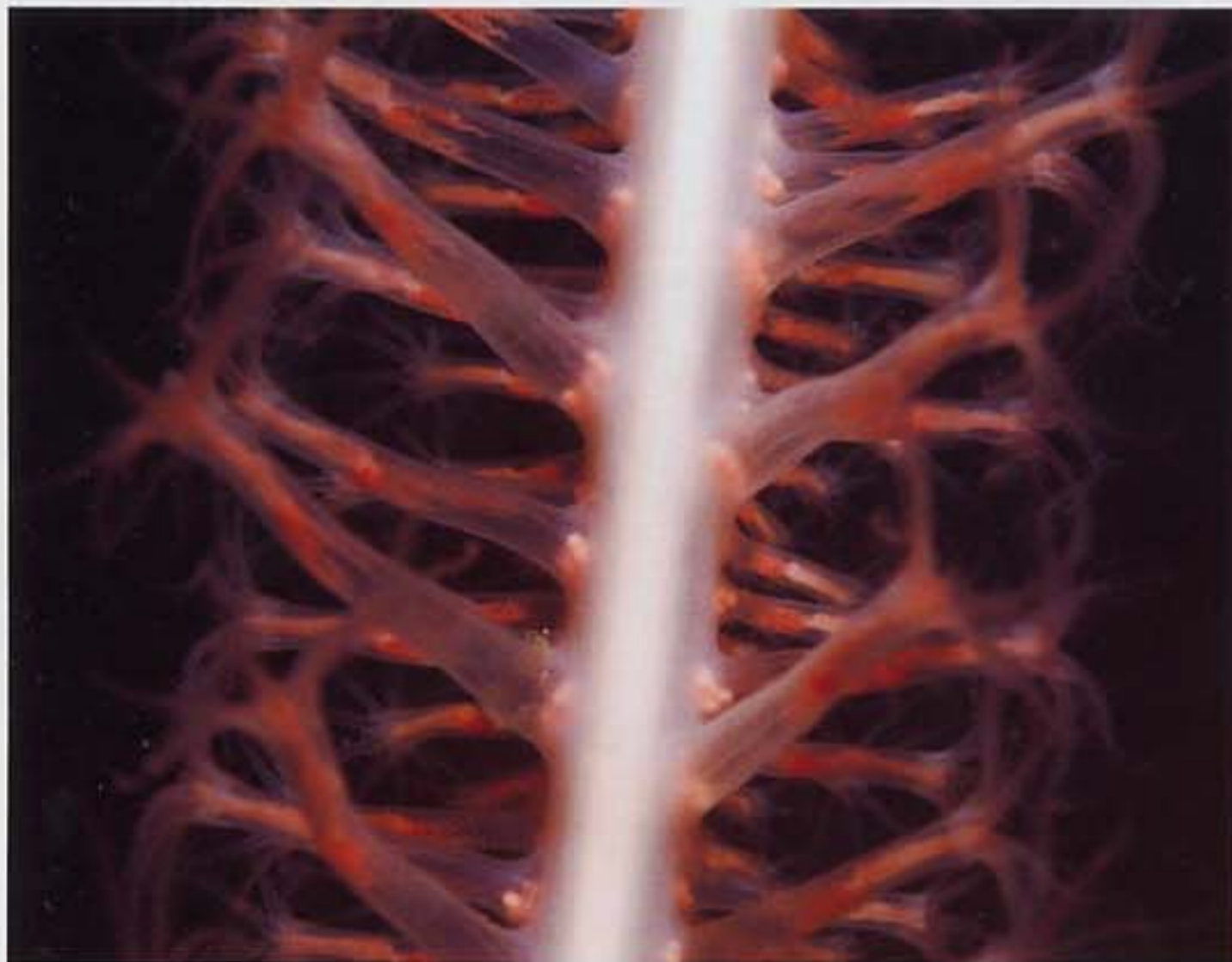
**James M. Mair**

Centre for Marine Biodiversity and Biotechnology, School of Life Sciences, John Muir Building, Heriot-Watt University, Edinburgh, Scotland, UK.

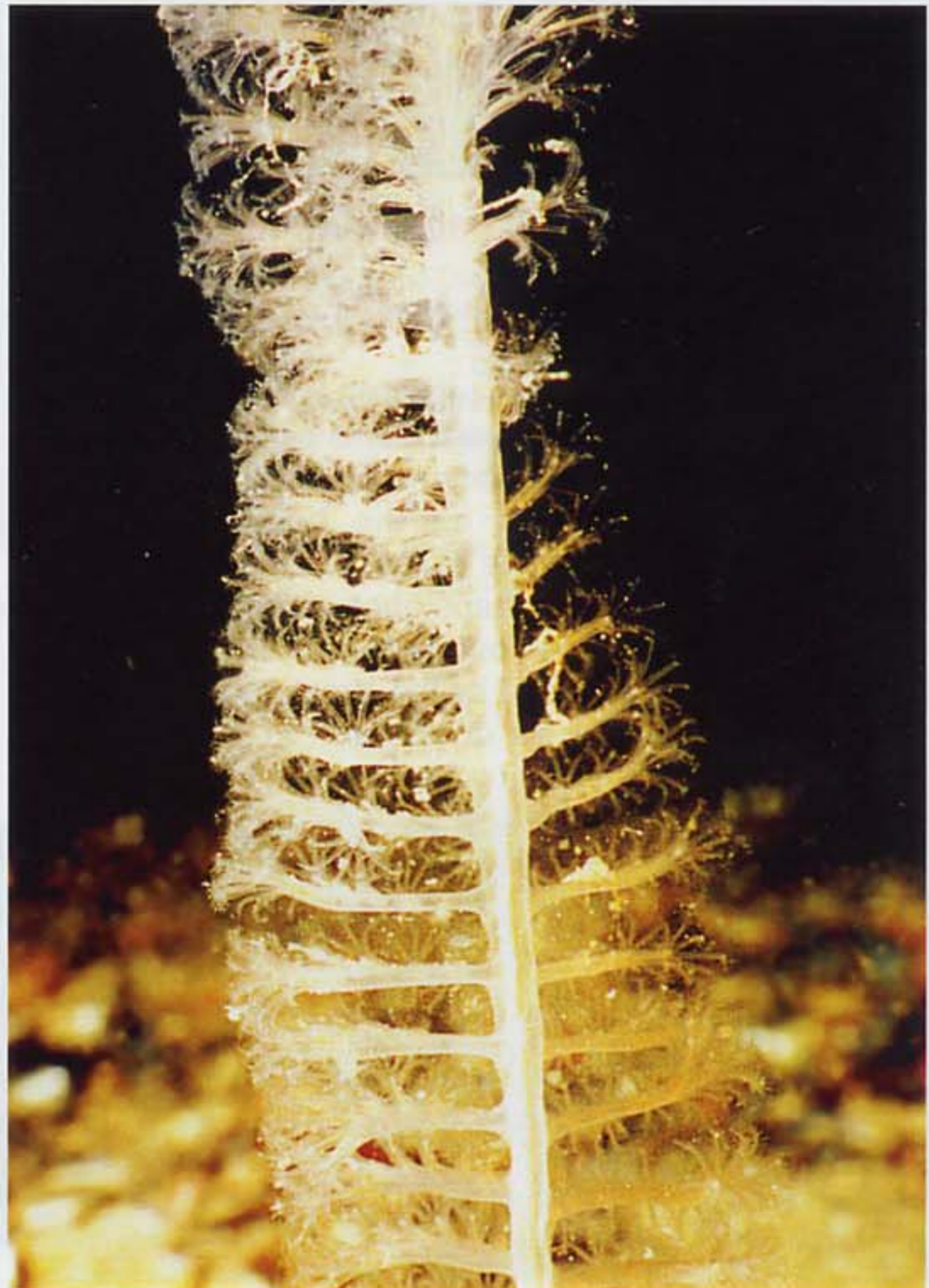


**ABOVE:** Detail of *Pennatula phosphorea*, Graham Saunders (SNH, Edinburgh)

**BELOW:** Detail of *Virgularia mirabilis*, Simon Greenstreet (FRS Marine Laboratory, Aberdeen)



**ABOVE:** Detail of a gravid female *Funiculina quadrangularis*, Graham Saunders (SNH, Edinburgh)



**Also Published in JMBA**

Greathead, C.F., Donnan, D.W., Mair, J.M. & Saunders, G.R., 2007. The sea pens *Virgularia mirabilis*, *Pennatula phosphorea* and *Funiculina quadrangularis*: distribution and conservation issues in Scottish waters. *JMBA*, **87**, 1095–1104.