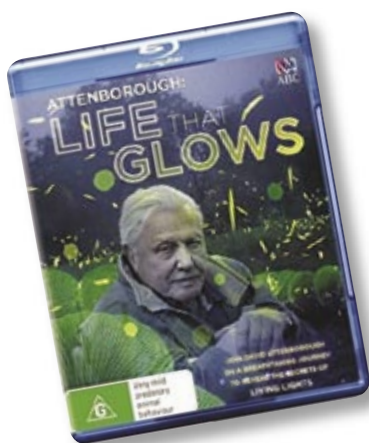


Life that glows!

It has been about five years since we looked at the topic of bioluminescence [1] in this Bulletin. Since that time there have been some revisions to the documentation relating to both Higher Biology and Higher Human Biology qualifications [2, 3] but in both subjects one of the suggested learning activities continues to be 'Experiments on ATP dependent reactions, e.g. luciferase, luminescent reactions'.



Figure 2 - Bioluminescent fungi (Image: <https://www.scineon.com/mushroom/bioluminescent-mushroom-glow-in-dark-to-attract-insects>).



Bioluminescence is an area where significant advances continue to be made in terms of the ability to film examples of organisms which exhibit arguably the most enchanting and alluring properties. For those of you who have yet to see David Attenborough's 'Life that glows' which was broadcast in July 2016 then we cannot recommend it too highly.

As yet the film does not appear to be available for purchase on DVD in a format suitable for UK players but it is available in Blu-Ray format and so if you have access to a machine which will play such discs than our advice is 'go for it!'

Life that glows gives details of the bioluminescent properties of a range of organisms covering both terrestrial and aquatic examples. Fireflies, as one might anticipate, feature prominently in the film but they are by no means the only stars of the show!

The life of bioluminescent fungi is explored in some detail and there is a short clip from the film available on the BBC website [3]. In his commentary David Attenborough points out that we do yet have 'all the answers'.

One of the most impressive bioluminescent organisms which is described is the humble ostracod, also known as the 'sea firefly', which 'pound for pound'



Figure 4 - Bioluminescence from 'sea fireflies' (image: <http://bluehorizonboutiqueresort.com/wp-content/uploads/2015/12/540b371e5fb229aa52effe65a045c6f7.jpg>).

probably gives the highest yield of bioluminescence. Despite its small size (a few mm in diameter (Figure 3)) when disturbed it gives rise to bright blue bioluminescence (Figure 4).

The good thing is that dessicated sea fireflies are now available from Scientific and Chemical (product number \$203431, 1 g quantities) - lots of fun to be had!



Figure 3 - Ostracod (image: <http://www.microscopy-uk.org.uk/mag/smallimag/ostra.jpg>).

References

- [1] SSERC (2012), Nature's Neons, SSERC Bulletin, **239**, 4-7.
- [2] Course Unit Support Notes for both Higher Biology and Higher Human Biology can be downloaded at http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_Higher_Sciences_Biology.pdf and http://www.sqa.org.uk/files_ccc/CfE_CourseUnitSupportNotes_Higher_Sciences_HumanBiology.pdf respectively (accessed 29th March 2017).
- [3] A glowing underground network of fungi (2016), available at <http://www.bbc.co.uk/programmes/p03syr6g> (accessed 29th March 2017).