NEW RECORDS OF FRESHWATER FLATWORM SPECIES ON LUNDY – *DALYELLIA VIRIDIS* AND *PHAGOCATA VITTA*

by

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Over the last ten years, I have surveyed most of the ponds on Lundy and found many of the species previously reported fully in Annual Reports and Journals of the Lundy Field Society (George 2012; George & Stone 1980, 1981; George & Sheridan 1987; George *et al.* 2004; Clabburn 1994; Long 1993). As someone who has come to freshwater biology fairly recently, most of the species I have found have been new to me and I have sought, and been given, determination by my mentor, Professor Jenny George.

The Phylum Platyhelminthes comprises three Classes: Turbellaria (Flatworms), Trematoda (Flukes) and Cestoda (Tapeworms). Both *Dalyellia viridis* and *Phagocata vitta* belong in the Class Turbellaria but in different Orders. *D. viridis* is of the Order Microturbellaria (small flatworms less than 5 mm in length) whereas *P. vitta* belongs in the Order Tricladida (larger flatworms over 5 mm in length with a three-branched alimentary canal). *Polycelis nigra* is a species which also belongs to the latter Order and is commonly found and recorded on Lundy.

Dalyellia viridis (Shaw) – see Figure 1, colour plate 16

During a routine survey of Ackland's Moor Pond in February 2010 (Rowland 2014), I found a species that I had not seen before and could not easily classify. I tried to preserve an example for later determination but it was insufficiently robust for preservation. I attempted a drawing and a photograph, both with limited success. In my notes at the time I described it as "when circular, approximately 1 mm in diameter, bright green containing small brown and yellow spheres but frequently elongated to move into a long 'tear-drop' shape". It was known familiarly as 'the green blob'. I have since found other examples in Ackland's Moor Pond (AMP). A specimen was also caught in November 2010 and again in March 2012 after the pond had dried up in 2011 but later refilled.

In the summer of 2016 Kistvaen Pond (KP) still retained some water. I had not surveyed this temporary pond since my early days in the field with Jenny George, so I decided it was time for another look. I was surprised to find 30 examples of *D. viridis* in my sample.

KP is the type of temporary pond that regularly dries up. It is a large shallow pond in a slight depression located on the plateau close to the Rocket Pole at the south end of Lundy (grid ref. SS135436). Williams (2006) has developed a classification system for temporary waters based on hydrological characteristics, size and chemical state. Under this framework, KP would be described as a 'seasonal, freshwater meso-habitat' (alternating annual wet and dry periods), whereas AMP, which is less predictable, would be a 'near-permanent, freshwater mesohabitat' which is nonetheless moving towards an 'intermittent, freshwater mesohabitat'. Adults of *D. viridis* are only to be found during the summer, providing the pool has water, when they can be seen with internal eggs – the brown and yellow spheres in Figure 1. The green coloration is due to a symbiotic relationship with an alga, *Zoochlorella parasitica* – the same as that which colours *Hydra viridisima* and which provides up to 50% of its host's oxygen requirements. *D. viridis* feeds on other flatworms or diatoms in temporary pools. As the pools dry, the eggs are deposited at the bottom of the drying pool, preferably within the water table. The following year, when the

pool refills, the dormant eggs will soften and a new generation of flatworms will hatch. This is temperature-dependent, requiring a low overwinter temperature of <5°C followed by a rise to around 9°C. (Young 2001). The occasional occurrences of this species must result from birds transferring dormant eggs from KP to AMP.

Phagocata vitta (Duges) – see Figure 2, colour plate 16

Reynoldson & Young (2000) describe this as a species typical of ponds in high peaty ground. This cannot be ascribed to Government House Pond (GHP) which is only 100 m above sea level and in a quarry excavation (grid ref. SS138440). It is about 6.5 m^2 in area and up to 0.5 m in depth. *P. vitta* is however noted as also occurring at lower altitudes in subterranean habitats (*ibid*), i.e. near the origins of springs and typical of cavernicolous streams. This could be applicable to GHP, where groundwater seeps through fissures in the rock face, offering a cave-like habitat. *P. vitta* is stenothermal and is known to be associated with interstitial and subterranean groundwater habitats (Robertson *et al.* 2008), and as GHP is so sheltered, it maintains a cool, even temperature. Leadley Brown (1987) states that *P. vitta* only occurs in ponds with a calcium concentration of <2.5 mg (1-1).

P. vitta reproduces both sexually (requiring both male and female) and asexually (by fission). Asexual reproduction takes place in summer, a time when GHP is generally dry; therefore the species in this location must reproduce sexually during the wet winter. It feeds on Oligochaeta and Chironomidae larvae, both of which have been found in GHP, and other similar easily caught live prey.

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