Isolation and characterisation of salmonid alphavirus from wild caught ballan wrasse off the coast of Ireland

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The use of cleaner fish as a biological control of sea lice has increased in recent years.

Ireland – wild caught wrasse (ballan, goldsinny, corkwing, rock cook) and hatchery reared lumpfish.
In Ireland the first 60 wrasse from each Bay are screened for pathogens prior to use on marine sites:

- Cell culture on BF2 & EPC (pools of 5)
- Histopathology
- Bacteriology – SWA, CBA+

Species identity is confirmed by sequencing of the mitochondrial control region (Almada et al., 2017; Royal Society Open Science 4, 160773).
Sample F/58/17: 60 wrasse

- CPE observed on d14 in 1/12 pools (BF2 cells)
- VHS & IPN ELISA negative
- IHN IFAT negative

PCR
- Ranavirus negative
- Aquatic birnavirus negative
- Rhabdovirus (inc. vesiculovirus) negative
- VHS/IHN negative
- Salmonid alphavirus positive (+qRT-PCR)

Species
- All five fish in the pool confirmed as Ballan wrasse
Phylogenetic analysis based on 359 bp region of E2 gene
Comparison of the amino acid sequences of a partial nsP3 region from the salmonid alphavirus isolate IRE-F58-17 with an isolate from each of the six main SAV subtypes. Sequence alignments were performed by ClustalW analysis and amino acid deletions are indicated with a dash.
Second isolation of an SAV6 subtype (1st in 1996).

SAV(1,2,5) has been detected in flatfish and SAV5 was isolated from dab.

Increasing evidence that SAV is not restricted to salmonids.

No epidemiological link with aquaculture for the current isolate.
Evolution of alphaviruses – host switching and geographic introductions\textsuperscript{1} with a marine origin\textsuperscript{2}.

A wild reservoir (North Sea?) could account for multiple introductions of SAV leading to independent outbreaks or self-sustaining epizootics\textsuperscript{3}.

Is SAV6 an ancestral or wild-type SAV?

Has aquaculture production led to competitive exclusion of SAV6 in favour of endemic subtypes SAV1, 2 & 3?

• Health screening of all fish prior to deployment in fish cages is important.

\textsuperscript{1} Powers et al. 2001. J. Virol. 75, 10118-10131.
\textsuperscript{3} Karlsen et al. 2014. J. Gen. Virol. 95, 52-59.
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