

## Blue craneflies in Finnmark, a putative case of *Iridovirus* infection (Diptera, Tipulidae; Iridoviridae)

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A copula of brightly coloured blue craneflies were photographed in Finnmark, northern Norway. The species is identified as *Tipula (Beringotipula) unca* Wiedemann, 1817, and the blue colour is hypothesised to result from a blatant infection with an invertebrate iridovirus (IIV). It is the first report of a naturally occurring putative IIV infection in adult craneflies.

Keywords: invertebrate iridovirus, adult cranefly, Tipulidae, Iridoviridae

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### Introduction

On 11 July 2010 Espen Aarnes photographed a copula of blue craneflies in Sør-Varanger, Finnmark, outside his home in home in Svanvik (UTM 36W UC849079). The two pictured craneflies were the only blue specimens seen, and Fig. 1 is the only documentation of this sighting. About two weeks later, Louis Boumans visited the nearby Svanhovd Conference Centre in Svanvik. Hearing about the sighting of blue craneflies, he tried to find them as well. The only craneflies he found were specimens of both sexes of *Tipula (Beringotipula) unca* Wiedemann, 1817 in their usual yellow and dark colour pattern. While Aarnes' picture does not allow for an unequivocal identification, it appears to show the same species, an opinion shared by cranefly experts Pjotr Oosterbroek (Amsterdam) and Tony Irwin (Norwich).

As the most plausible explanation for their blue colour, we suggest a high concentration of particles of an invertebrate iridovirus (IIV, Iridoviridae) of the genus *Iridovirus*. The blue colour is very similar to that which results from

an IIV infection in woodlice, where such patent infections are a common phenomenon.

### Iridovirus

The research on iridoviruses is reviewed by Williams et al. (2005). The large (120–300 nm) iridoviruses, characterised by a capsid with 20-sided (isocahedral) symmetry, accumulate primarily in fat and epidermis cells. They have been found in a range of invertebrates and cold-blooded vertebrates. The iridescence phenomenon occurs only with invertebrate iridoviruses (IIV), and is explained by the crystallisation of self-assembling virus particles which occurs at high concentrations. The bluish colours are typical for the smaller particles of the genus *Iridovirus* (Williams 1996; Williams et al. 2005).

The first IIV isolated was actually found in England in larvae of the cranefly *Tipula (Tipula) paludosa* Meigen, 1830 (Xeros 1954). Elliott et al. (1977) report on a further isolate from a *Tipula* sp. larva. Naturally occurring iridovirus infections have since been reported for over a