The impact of electrical pulses on benthic invertebrates

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Pulse trawling is the most promising alternative for conventional beam trawls targeting sole, meeting both the fisherman's aspirations and the need for ecological progress. The application of electrical pulses in flatfish fishery can reduce the fuel consumption and (benthos) discards with more than 50% and hence increasingly gains international public and political attention, especially with the upcoming discard ban in Europe. However, engendered information about possible side effects of electric pulses on benthic invertebrates is imperative to enable the further development/application/promotion of electric pulses, which provides the rationale for the current research. The present experiments adopted brown shrimp (*Crangon crangon* L.) and sandworm (*Nereis virens* S) as model species for crustaceans and polychaetes, respecitvely. These animals were exposed in a homogenous field to electric pulses with varying values of parameters: frequency (5-200 Hz), field strength (150-200 V/m), pulse polarity, pulse shape, pulse duration (0.25-1 ms) and exposure time (1-5s) in order to determine the range of safe pulses. Behaviour during exposure, 14-d survival rates and histological examination were used to evaluate possible side-effects. No significant increase in mortality or injuries was encountered for the broad range of pulse parameters tested. However, the score attributed for the presence of intranuclear baculoform viruses in brown shrimp was significant higher for the group exposed to 200 V/m. But, seen the much shorter exposure times, it is unlikely that this effect would occur in the field. Nevertheless, strengthened by the reduced physical impact, these results indicate a smaller effect of pulse trawls on benthic invertebrates compared to conventional beam trawlers.

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