

A case of seabird mortality in the Netherlands during the winter of 1988/1989 caused by a spillage of Nonylphenol and vegetable oils

*(summary of a report published in Dutch *)*

From December 1988 to March 1989 thousands of seabirds, mainly Guillemots *Uria aalge* and Razorbills *Alca torda*, drifted ashore along the Dutch coast. The birds were covered with a sticky and oil-like substance. About 1500 sick birds were taken to specialized bird hospitals. Many of them showed signs of emaciation, aggressive behaviour, bloody stool and a leak plumage. In spite of intensive attendance, nearly all the birds died. Carcasses of 30 birds were submitted for pathological and toxicological examinations at the Central Veterinary Institute. Necropsy and histopathological examinations revealed hepatic degeneration and necrosis, while in many birds aspergillosis was found in the air sacs and lungs. Chemical analysis of samples from feathers and organs was performed by gas liquid chromatography with mass selective detection (GC/MS) and by high performance liquid chromatography (HPLC) using ultraviolet detection.

The presence of nonylphenol was demonstrated in 22 out of 54 organs samples, and in all feather samples (23). Nonylphenol contents of feathers ranged from 10 to 80,000 mg/kg, with a mean value of 9,676 mg/kg. Chemical investigations at the TNO-institutes (Delft) also revealed the presence of vegetable oils (such as palmoil) on feathers. Nonylphenol and vegetable oils are lipophilic and therefore adhere easily to feathers, affecting heat isolation and water repellancy of exposed birds. With respect to the toxicity of nonylphenol, literature data are scarce and only concern alkylphenols in general. The observed lesions of the exposed birds, however, are well in agreement with these data, indicating that also the toxicity of nonylphenol has markedly contributed to the mortality. A relation with off-shore activities, like spillage of drilling muds during oil and gas drilling operations, could not be established. Hence it is suggested that in December 1988 nonylphenol and vegetable oils were discharged by a ship probably carrying raw materials for detergent and/or foodstuff industries.

Samenvatting Een geval van zeevogelsterfte in Nederland in de winter van 1988/1989 als gevolg van een lozing van nonylphenol en plantaardige oliën (*)

Van december 1988 tot maart 1989 spoelden duizenden zeevogels aan (vooral Zeekoet en Alk), bedekt met een kleverige en olieachtige substantie. Bijna alle ca. 1500 bij asiels afgeleverde vogels stierven. Het Centraal Diergeneeskundig Instituut (CDI) verrichte onderzoek op 30 kadavers. Bloederige ontlasting, gedegeneerde en necrotische levers, en aspergillose behoorden tot de algemene ziekteverschijnselen. In monsters van organen werd in 22 van de 54 gevallen nonylphenol aangetoond, terwijl in alle veermonsters (23) nonylphenol zat met een gemiddelde concentratie van 9,676 mg/kg (range 10 tot 80,000 mg/kg). Plantaardige olie, bijv. palmolie werd door TNO in veerresten aangetoond. Zowel nonylphenol als plantaardige oliën zijn lipofiele stoffen die gemakkelijk aan vogelveren hechten en warmte-isolatie en waterdichtheid aantasten. Het ziektebeeld van slachtoffers wijst erop dat de giftigheid van nonylphenol sterk heeft bijgedragen aan de sterfte. De lozing kon niet in verband worden gebracht met offshore activiteiten maar is waarschijnlijk afkomstig van een chemicaliën tanker die grondstoffen voor de was- en/of levensmiddelenindustrie vervoerde.

(*) Zoun P.E.F. 1991. Onderzoek naar de oorzaak van de vogelsterfte langs de Nederlandse kust gedurende december 1988 en januari 1989. CDI-rapport nr. H121519.

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