On the abundance of Cassida nebulosa L. (Col. Chrysomelidae) in the sea-drift, on the northeastern shore of the Island of Terschelling, during the summer of 1947

by

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From August 1st to 16th 1947, I joined the field excursion of the staff and students of the Zoological Department of the State University of Utrecht to the National Park and Natural Reserve "Boschplaat" in the island of Terschelling [1]). Being interested in Coleoptera, I had the opportunity to collect many of them during the bio-ecological survey of the beach and dune biocenoses.

On August 3rd, while collecting at the limit of the dry and wet sand (approximately at average high water mark), I was struck by the abundance of the Chrysomelid beetle *Cassida nebulosa* L., which occurred by the thousands on a narrow line along the sea-shore. In some places 60 beetles could be counted in 30 square cm. Most of the individuals were dead, though some were moving their appendages; but nearly none showed normal activity.

Other specimens of this species were found in the Ammophiletum festucetosum on August 8th and in the Agropyretum boreo-atlanticum on August 11th, where they must have been blown by the wind. In these two biotopes only a very small number of individuals was collected. *C. nebulosa* is a phytophagous species attacking several plants of the family Chenopodiaceae, especially the common beet (*Beta vulgaris* L.) (Literature in Spaeth 1914).

The occurrence of such a number of individuals on the beach suggests that a swarm of these Coleoptera dropped into the North Sea and was washed up with other sea-drift material on the northeastern coast of the island. This conclusion seems to be supported by several previous observations. Kinker (1872) described a swarm of *Cassida* in which *C. nebulosa* prevailed, in Amsterdam on September 2, 1871. He suspected that the beetles had migrated southward from one of the dykes of the docks or from across the Y. The importance of the swarm was emphasized in the following terms: „De massa was aan zijn huis zo groot, dat aan de dienstbode bevel werd gegeven die met een lange stoffer te verwijderen. De voorbijgangers ergerden zich aan de dieren en men wilde voorkomen dat het niet entomologische publiek de platte ronde diertjes voor minder gewenste gasten — misschien *Acanthia lectularia* (=*Cimex lectularius* Merr.) — zou houden... Al de huizen aan de zonzijde van de gracht werden, zoals bij nader onderzoek bleek, in meerdere of mindere mate, door de onverwachte gasten bezocht." However, the next day nearly all the swarm had disappeared and their origin remained uncertain. To be complete we may mention an observation by Engel (1885) who suggested the possibility of a swarm of the same species

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previous to the mass attack of a field of beets near Frankfort on the Oder.

Much more interesting however is the important account by Frey (1937) on the presence of insects in the sea-drift material. Relating the occurrence of numerous species of insects brought in by the sea on the south coast of Finland, near the Zoological Station of Tvärminne, this author recalls the previous observations of Nordquist (1886) who noticed the presence of several insects at the surface of Lake Ladoga, *C. nebulosa* was among them. He then describes two successive "invasions" of insects washed up by the waves (13-17.VI.35 ; 30-31.VIII.35). *C. nebulosa* was recorded only during the first one. In the sample taken among weeds and various debris of the drift-line several thousand insects were counted, but only 15 individuals of *C. nebulosa*. Of course, this is not the total number of individuals of their species washed along the coast with the sea-drift. According to Frey, the insects had been driven out to sea and to the coast by a strong southwest wind. Many species rare or previously unknown in Finland thus were brought in passively, supposedly from Esthonia. Furthermore, on 19.VIII.35, remnants of *C. nebulosa* were found in pellets of herring-gulls at Borgå, a locality to the east of Tvärminne. Another record of *C. nebulosa* at the sea-shore is given by Backlund (1945) who found the beetle in the wrack of the drift line at Skanör (Scania, Sweden) on 9.IX.41.

I suggest the following explanation for the occurrence of *C. nebulosa* in the drift-material, in Terschelling : A swarm of *C. nebulosa* (and perhaps other species of the same genus, as it occurred for the swarm described by Kinker) coming from the continental part of Holland was blown to sea by a southwest wind, dropped in the water and was later washed up on the coast of the island. It would seem difficult to prove that they may have come from some other area.

In conclusion, it is interesting to note that the accumulations of insects in the beach-drift occur chiefly in the summer (June to September). Sharp (1909) has given a good explanation of what happens : "A hot sunny day after cold and wet weather acts on beetle-life as an extraordinary stimulus to active, extensive, but apparently undirected flight." The alternance of hot sunny days and days of rain and cold was particularly noticeable in Terschelling during the summer of 1947.

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