

# Norwegian water bugs. Distribution and ecology (Hemiptera–Heteroptera: Gerromorpha and Nepomorpha)

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The distribution of the 53 species of water bugs in Norway is shown by 50-km square maps. A total of 8,832 specimens from various collections were identified and inspected. Species records from 139 squares included the northernmost sites on the European continent for eight species and at the highest altitude in Northern Europe for one species. More than one half of the species (28) had a southern type of distribution, occurring in the southernmost part of Norway, south of Trøndelag. This is well in line with a general decrease in European biodiversity going northwards from Central Europe. Most tolerant to climate were six all-Norwegian species. Three hypothetical late- and postglacial immigration routes for water bugs into Norway were suggested.

Material on hibernation, life cycles and wing morphology are presented and discussed. New material on habitat preferences and avoidances was based on 602 sites (476 lakes) investigated from 1960–1978. Water bugs were searched for (but not always found) and environment variables registered or measured (type of surface water like lake, pond etc., elevation above sea level, water temperature, aquatic vegetation, sediment, wave action, content of Ca and Mg, pH, and water colour). A statistical method based on deviations from a hypothetical random distribution was employed and significant environmental preferences, absences and/or avoidances could be shown for the 12 most frequent species. Most species preferred lakes or ponds and were significantly absent from smaller water bodies. Some of the significant preferences for a particular environmental variable were probably of indirect nature due to correlation with other factors.

Key words: distribution, ecology, freshwater, Hemiptera, Heteroptera, Gerromorpha, Nepomorpha, Norway.

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## INTRODUCTION

The water bugs are true bugs (Hemiptera–Heteroptera) and comprise semiaquatic (Gerromorpha) and aquatic members (Nepomorpha). The present paper gives updated information on the distribution of the Norwegian water bugs. It also uses statistical methods for

elucidating habitat preferences. In this paper “Norway” refers to the shaded area in Figure 1.

Recent contributions to the knowledge of the distribution of water bugs in Norway are Jastrej (1981) who listed 44 species from Norway with information on their distribution and habitat preferences, and Dolmen (1996) who listed