

Resource Summary Report

Generated by [dkNET](#) on Sep 13, 2026

High quality DNA extraction from very small individual insects

DOI:10.17504/protocols.io.bg6wjzfe

Type: Protocol

Proper Citation

Sam Mugford, Roland Wouters, Thomas C Mathers, Saskia Hogenhout 2020. High quality DNA extraction from very small individual insects. protocols.io
dx.doi.org/10.17504/protocols.io.bg6wjzfe

Protocol Information

URL: <https://dx.doi.org/10.17504/protocols.io.bg6wjzfe>

Authors: Sam Mugford, Roland Wouters, Thomas C Mathers, Saskia Hogenhout

Summary: Genomic studies of natural populations frequently benefit by having data from single individuals. This approach has a number of advantages: it avoids the risk of accidentally pooling together individuals of closely related species, and it enables better resolution of haplotypes by separating non-identical individuals. However, especially in the case of very small invertebrates, recovering sufficient nucleic acid from individual samples can be challenging. Here we present a method suitable for extraction of DNA from single individual aphids (weighing approximately 0.5mg). We are able to recover 100's of ng of high-quality DNA suitable for whole-genome sequencing using short-read technologies. DNA extraction using Cetrimonium bromide (CTAB) is a tried and tested method, and the protocol presented here is adapted from that of Marzachì et al. (1998). We present some modifications to optimize this popular method to maximize yield and quality from small single insect samples. We have used this method across a range of aphid species, and also other sap-sucking hemipteran insects. It has enabled sequencing and de-novo assembly of a range of species from single individuals collected from the field, and also resequencing of individuals of the model aphid *Myzus persicae*. This is compatible with the method of ambient storage of dehydrated field collected samples we describe in Wouters et al. (2020). Marzachì, C, Veratti, F, & Bosco, D (1998). Direct PCR detection of phytoplasmas in experimentally infected insects. *Annals of Applied Biology*, 133(1), 45-54. Wouters, R; Mugford S, & Hogenhout, S (2020). Ambient sample storage system of field-collected insect samples for genomics. protocols.io
dx.doi.org/10.17504/protocols.io.bgxnjxme

Affiliations: John Innes Centre, Norwich, UK, John Innes Centre, Norwich, UK, John Innes Centre, Norwich, UK, John Innes Centre, Norwich, UK

Version: 1

Publication Date: 2020

Proper Citation: Sam Mugford, Roland Wouters, Thomas C Mathers, Saskia Hogenhout 2020. High quality DNA extraction from very small individual insects. protocols.io dx.doi.org/10.17504/protocols.io.bg6wjzfe

Record Creation Time: 20210329T220523+0000

Record Last Update: 20210329T220857+0000

Data and Source Information

Source: